Empirical Investigation on Determinants of National Saving in Ethiopia

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OLKAMO, Degefe Anulo

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KDI School of Public Policy and Management

In Partial Fulfillment of the Requirements

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Abstract

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National saving is one of the driver sources for sustaining economic growth. However, low savings are cited as a constraint to sustained economic development in Ethiopia. The key aim of the study is to identify the determinant of national saving. The research carried out an Augmented Ducky-Fuller test to examine the stationary variables. The co-integration bound test scheme was applied to see the long-run association between variables. The result has shown that budget deficit, inflation rate, working-age dependency ratio, and trade openness, and deposit interest rate negatively determined national saving. Whereas; the GDP growth rate and broad money supply were positively affected in the long run. Based on these findings, the following policy implications suggest that prudent fiscal policy should be designed with a well-managed expenditure policy to reduce government budget deficits. The central bank needs hard work to enhance financial deepening and liberate deposit interest rates to ensure sustained savings. Give priority to establish a stable macroeconomic situation that will help to handle highly fluctuating prices. The age dependency ratio negatively affects the saving in the long run; therefore, the government should have worked to become out of the baby boom generations will positively contribute to the savings.

Key Word: *Ethiopia, ADL, National Savings, Determinants*

Acknowledgement

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List of Acronyms

ADFT	Augmented Dickey Fuller Test
APS	Average propensity to saving
ARDL	Autoregressive Distributive Lag
GNS	Gross National Saving
C	Consumption
DIR	Deposit Interest rate
DW	Durbin Watson
ECM	Error Correction Model
Eqco-1	Error Correction equation in one lag
RGDP	Real Gross domestic product
EQ	Equation
H0	Null Hypothesis
H1	Alternative Hypothesis
WB	World Bank
WDI	World Development Indicator
MLR	Multiple Linear Regression Model
GDP	Gross Domestic Product
IMF	International Monetary Fund
GNP	Gross National Product

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Chapter One

1. Background of the Study

1.1 Introduction

Ethiopia is the land of origin, which is the place in the horn of Africa. Ethiopia is the second-largest populous country next to Nigeria and the oldest independent and landlocked country in Africa. It has an area of land that is 1.104 million square kilometers, with thirteen months a year (Ethiopia, 2019).

The economy has a transition economy with a large public sector. Nowadays, the government has promoted growth in the manufacturing sectors to bolster potential economic growth. Coffee is an integral export crop in the country; yet, inadequate financial service and subsistence plotting system were a huge threat to economic growth in the country (Bank, Annual Economic Outlook, 2019).

The most developing countries try to form prudential macroeconomic policy toward how to reach the middle-income level by enhance their financial capacities through the domestic and national savings to realized economic growth. However, this suitable policy toward their aim was not effective due to large financial constraints. Understanding this nature of the economy, saving accumulation is the deriving power of economic growth. The economic growth in sub-Saharan countries is keep going to slowly down due to the low saving resources that making them depend on foreign loans and aids to finance their development processes. Indeed, the region, national saving to GDP has an average of 19 percent, compared to South Asia, 32.3%, and new industrialized zones 44.85% from 2009- 2019(Bank, Regional Macroeconomic Performance Outlook, 2019).

In Ethiopia, public investment is the driver of economic growth with poor export performances; this leads to a higher budget deficit. However, the country achieved remarkable economic growth

in the last decades; the actual gross domestic product annual growth rate was an average of 9.6 percent from the year 2011 -2019, and has long experiences external trade deficits, which resource gap contribute to the lower grow savings. The gross saving divided by gross domestic product is an average of 30.94 % from 2011-2019 during the same period; investment to GDP was 36.5 percent. This resource gap was financed through either external or domestic loans (Bank T. W, 2019).

 All those above problems are considered a determinate of the national saving growth. All those above problems are considered a determinate of the national saving growth. The saving and investment for the region are relatively low than Ethiopia on average accounted for 16.4% and 25.1 % of GDP from 2011-2019, respectively.

1.2 Statement of the Problem

Low saving rates have been cited as one of the constraints to sustain economic growth in Ethiopia. An additional illustrated was a high disorganized economic growth throughout the intact the regime from large of 11.8% in 1976-1986 to less than 1% in the last period of the Derg ear, because of increased public spending on armed forces expenditure. The recent development of national saving and domestic saving is to the ratio of GDP accounted for 29.6% and 18.8% on average, during the period from 2009-2019. The saving-investment gap is on average of 31 and 37percent of GDP in 2015/16 - 2018/19, respectively. On the other hand, the inflation rate and resource gaps were 11.7 percent and 17 percent in the same year (Ethiopia N. B., 2019), respectively. This study supports the empirical works of (Barrow 1990), the notion of saving, which plays in the economic growth differential across countries. However, the previous studies emphasized only an effect of domestic saving on economic growth in Ethiopia. Yet, there were no empirical investigations on which factors determine the national savings in Ethiopia. Therefore, this study filled this gap by identifying its determinants. Consequently, the study examines the fundamental causes that were the main reasons for lowering savings in the country.

1.3 The objective of the Study

The purpose of the study aimed to identify the determinants of national saving.

1.3.1 The Specific Objectives

Withstands of the main objective, study was to tried to intend some specific purpose.

To examine the long and short-term determinants of national savings

To evaluate policy enforcement of central bank on through-effect of response to long-run shocks.

Provide appropriate policy to support the further study that executed in the area.

1.4 Research Question

Given the general objective, the paper would have designed subsequent study questionnaires:

1. What are determinates of the national saving in Ethiopia, and which variables are potently affected the national saving growth?

2. What is the expected impact of policy response from the central bank on the national saving growth?

1.5 Research Hypothesis

The paper sets the following hypothesis. The first hypothesis

Ho: - Explanatory variables have no significant long-run impacts on national saving.

H1:- Explanatory variables had significant long-run impacts on the national savings in Ethiopia.

1.6 Significance

The right choice of any effective macroeconomics policy may derive a country to better economic positions through the monetary policy, which is essential to understand the real effects of policy on national savings. The study would help to afford useful information to the empirical bases needed for proper and sympathetic proceeding routes, emphasizes the process of future savings level. The study also put in importance the accumulation of knowledge by showing the determinants of national saving.

1.7 Scope of the study

The range of the investigation is limited in terms of exposure and technique. About assessments, the limitation of the study was emphasizing only the Ethiopian data. In terms of time, it covers the period (1980- 2019 G.C) due to the availability of reliable data for national savings.

1.8 Organization of the Study

The structure of the paper breaks down into five sections. Following the preliminary, the second part was consists review of the literature includes the theoretical literature. The third section

presented research methodologies. The fourth part would focus on discussions and interpretations of finding results. The fifth section is the finalized paper by making conclusions and formulating future study areas and policy implications.

Chapter Two

2.1 The Literature Review

The literature part widely discusses theoretical and empirical literature reviews that would have supported to develop of a conceptual and practical framework of the study. Nine theoretical hypotheses explain and are concerned about the determinants of national saving and behaviour of economic actors.

2.2 Theoretical Literature Review

2.2.1 Absolute Income Hypothesis

(Keynes, 1936), According to, this theory concerns how the household divides his/her disposable income into consumption and saving. He had asserted that actual spending is a function of real net income that is from disposable income.

Consumption = b + δYt---------------------------------------**eq** (1)

Where C has represented consumption in time (t), b shows autonomous consumption and continuous, **δ** is the MPS ($0 < b < 1$), Y represents disposable income in time (t), and usually saving function formed as follow:-

St = -α +βYt --------------------------------------- **eq (2)**

 'α' indicates a negative saving in the low level of income, St and Yt represent the actual value of saving and disposable income correspondingly in time (t), β= Where β is indicating MPS, its lies between zero and one, but less than one, show changes in saving and is represented changes in disposable income thus, the higher disposable income leads to higher savings.

2.2.2 Proportional Income Hypothesis

(Duisenberg J, 1949) This theory shows that the percentage change of households' income that either consumed or saved depends on their disposable incomes. As a result, household saved

some percentage from relative income. Thus, the income distribution has a relative effect on savings because it is average of consumer earnings.

2.1.3 Permanent Income Hypothesis

(Friedman, 1957), He argued that differentiates permanent and temporary components of income as determinants of consumption and savings. The essential point of theory changes in transistor income has a small effect on consumer spending behaviour, whereas the changes in permanent income may have large effects. Accordingly, transitory income (YT) is dominated by income from year to year fluctuations in the Permanent income hypothesis. There is a long-term variation in income, As a result of a rise or fall in the Permanent income (YP).

$Y = YP + YT$ ---eq. (4)

Where Y is current income in at, YP is permanent average income, which consumers expected to persist in the future, and YT is transistor income, which temporary deviation from average income. The economic agents were use saving and borrowing to respond to changes in transistor income and to smooth consumption.

Consumption = αYP ---**eq (5)**

Where C is consumption in t, α is a fraction of permanent income that the consumer consumed per year.

St = SP + ST ------------------------------------- **eq (6)**

In which S is saving in (t) SP is permanent savings, and ST is the transitory saving.

2.1.4 Modigliani's Life Cycle Hypothesis

(Modigliani, Jun 1986), According to this hypothesis, the consumer arranged their behaviours either spending or savings for future lifetimes. An assumption of this hypothesis, the consumer chooses to save in middle age rather than spending too to maintain stable lifestyles in the future, consequently, savings go up.

2.1.5 Goldman Sachs Theory

(Farrington, 2020) This hypothesis is the focus of two arguments on national savings. First, the substitution effect of higher expected income comes from the higher interest rate on deposit that may encourage consumers to save more by expecting more interest income. Thus, a higher deposit interest rate affects consumers through both substitution and income effects. On the other way, a higher interest rate boosts future spending through the income effect. A conventional view is referring to the higher interest rate reduced consumption as the negative substitution effect, and this effect has offset by the positive income effect and increasing savings.

2.1.6 Ricardian Equivalence

(Ricardo's 1988) This theory argued that an endeavor for stimulating growth by increase loan-financed government spending is doomed to failure because demand remains unchanged. Currently, economic agents have financed their spending by generate new revenues from the taxes cuts and issuing financial securities. The government must repay loans most likely by increasing taxes in the long term because financial securities are required loans. Therefore, households and firms will predict that will have to pay high taxes in the future. Thus, consumers will save more today rather than consumed.

Where, Government saving (T – G), Ns is the national saving in t, SP is private saving, and SG is government revenue (saving); T is tax revenues, and G is government spending.

$$NSt = SP + SG \text{--eq (7)}$$

2.1.7 External (Private) Saving

(Mankiw, 1997) Suppose; the economy is small and challenges a substantially flexible supply of funds on the global equilibrium interest rate. The availability of foreign finance, which makes the borrower country, is more explicitly better off. An increase in national saving will reduce repayment duties for the use of external debts. Therefore, in the closed economy, the gross

domestic investment is constrained by gross domestic savings. When a country's trade balance is a shortfall, the import is higher than the export, and gross domestic investment a larger than gross domestic saving. Therefore, this gap would have filled through foreign private savings or capital inflows, and it has a positive effect on savings.

2.2 Empirical Literature Review

(Ghebru, 2011), The determinants of national saving have been widely discussing in various forms. The researcher begins by observing the empirical enquire between determinants and national saving growth rates in different countries with different income level data. The study considered the determinants of savings in Ethiopia by employed time-series data from 1971-2011. Finding results were revealed that dependence ratio and consumer price index have a statistically insignificant impact on the gross national saving over the long term. The contemporary effect of the consumer price index and dependency ratio is also not significant.

(Jilani, 2013), endeavors to examine the main factors that affect gross national savings in Pakistan were the real economic growth (GDP), inflation (INF), budget deficit, and deposit interest rate (DR). Finding result shows, the real growth rate, inflation rate, and budget deficit have a high impact on shaping the gross national savings, and the coefficient of real GDP and enlarged public spending has a direct effect on the savings.

(Cardenas. M & Escobar. A, 1998), finding results were in support of the enduring income assumption that suggested the national saving responds to the changes in the real gross domestic product (RGDP). Furthermore, the study is concluded higher government spending leads to lower performance of the national saving growth. In the final, the researcher argued that the current crowd-out effect in the private sector is high due to enlarged tax rates.

(F, 2015), Another empirical investigation on the factors of national savings in the Pakistan by using annual data from 1972-2015, and incorporated a Johansen co-integration technique. The

researcher was finalizing that the real GDP and deposit interest rate have a positive effect on savings, while dependency ratio and inflation has a significant negative impact.

(Mojekwu, Rita Ogechukwu , 2015) The studies conducted on the main factors of national savings in Nigeria by using multiple regression models from the period 1981-2015. The real economic growth, inflation, the interest rate on deposits, and the working-age dependency ratio have statistically significant impacts in the long run.

(Epaphra, 2010), The empirical analysis of the national saving and its determinants in Tanzania, from the years 1970 to 2010. Finding results revealed that broad money supply real; growth rate, population growth rate, and life expectancy were statistically significant and positive effects, but inflation has negative impact.

(Gani, 2010) Study has been conducted on assessed the relationship between saving behaviors and the age dependency ratio for four Pacific Island countries. The result reveals a significant impact on national savings and has direct relationship between saving and the percentage of working population age. Researcher was concluded age structure is main factor of national savings.

(Abel, 2016) The study was carried out on the association among gross national saving and real GDP growth in Ethiopia by using Auto-Regressive Distribution Lag and Granger causality test. Finding results was showed an adverse and insignificant impact of saving on economic growth. Besides, causality is running from gross domestic product to national saving.

(Oageng, 2014) The study employed to investigates the impact of debt burden on national saving in Botswana by using annual data. The main findings are deposit rate, and economic growth had significant and positive impacts. The budget deficit to GDP has a negative impact on the national savings in Botswana.

(G, 2000) The study was conducted impact of budget deficits on national saving and interest rates in the USA. An output resulted an increase in the budget deficit substantially reduces

national saving. An increasing in the government spending drastically reduces net national savings. The reduction in the national saving is reproduce partially in enlarged form of overseas borrowing and final it reduce net home investments.

Table 1: Outline of Empirical literature Review Results

No	Authority(s)	Countries Studies	Study Years	Methods Applied	Major Finding Results
1	Ghebru	Ethiopia	2011	ARDL	Disposable income, the dependence ratio, and consumer price index do not affect the national saving over time, but in the short run, it does.
2	G, WILLIAM	USA	2000	ARDL	National saving affected negatively by budget deficits.
3	Jilani, S.	Pakistan	2013	OLS	The growth rate, inflation, government spending, budget deficit and deposit interest rates are directly affects national savings.
4	Cardenas.M & Escobar. A	Colombia	1998	Intertemporal Model	Bidirectional: Cause-effect relationship between government spending, RGDP and gross national saving
5	Ahmad F.	Pakistan	2015	OLS	Real GDP; GNDI and deposit rate have significant positive effect on saving. Inflation and age dependence ratio have a negative impact.
6	Mojekwu, Rita Ogechukwu	Nigeria	2015	VECM	Real economic growth, deposit rate, inflation and age dependence ratio are positively affects national saving.
7	Epaphra. M	Tanzania	2010	DSM	The population growth rate, GNDI, RGDP and age dependence ratio are affects national saving significantly and positively. But, inflation was affect negatively.
8	Gani, Azmat	Pacific Island	2010	Granger	Causality running from age structure to national

	countries			Causality Test	saving and it has a negative effect.
9	Mesfin Abel	Ethiopia	2016	ARDL	The growth rate has an insignificant impact on national saving rates in the long run.
10	Moreputla O.	Botswana	2014	VECM	The growth rate, gross capital formation, deposit interest rate has positive and significant effects. While the budget deficit to economic growth has negative and statistically significant impact on national saving.

Chapter Three

3.1 Methodology

Ethiopia is the land of origin placed in the Horn of Africa and occupies a region of sub-Saharan. It is the second-largest populous country next to Nigeria and the oldest independent and landlocked country in Africa. It has a total land of 1.104 million Square Kilo mater with thirteen months a year (Ethiopia, 2019). The research method holds the research design, sample population; sample size; sources and type of data, and model specification, estimation and analyzing techniques, co-integration, and unit root, and residual diagnostic tests insisted in the model.

3.2 Research design

The paper adopted the same empirical model and research design; (Angwenyi, 2012); to examine major determinants of national saving in Kenya. Study required ascertaining the impact of determinants on national saving.

3.3 Target of Sample

(Kothari, 2004) The sample data is constructed based on the secondary and annual time series for 40 years. The national savings to GDP ratio takes as a dependent variable. Real economic growth rate (GR), the budget deficit to GDP (BD/GDP) ratio, trade openness (TOP), inflation rate (INF), deposit interest rate (DIR), and working-age dependence ratio (ADR), and broad money supply to GDP (M2/GDP) ratio taken as explanatory variables.

3.4 Sample Size

The endogenous and exogenous variables are open, and the researcher adopted purposeful or judgmental sampling to select an appropriate sample size. As a result, the researcher select data for forty years ranging from 1980 to 2019 sample sizes. The 40 observations were incorporated from the year 1980 to 2019 to find the determinants of national savings.

3.5 Sources and Type of Data

The researcher collected all mandatory data from NBE (National Bank of Ethiopia), WB (World Bank), and WDI (world development indicator) and IMF (international monetary fund) data web sites. Paper was asses the data based on annual data that covered 1981 to 2019. The reason to select this period was the consistency and availability of all data.

3.6 Estimation Techniques

The study was to incorporate a quantitative method through the Multiple Linear Regression Model (MLRM). An Autoregressive Distributed Lag (ARDL) method was applied by Narayan (2006). This model aimed to design an accurate sample size, and series are mutually integrated, and therefore, the model is unbiased and efficient. The bounding co-integration was adopted to examine the long-run relationship between national saving and its determinants (Ramirez et al., 2002).

3.6.1 Unit Root Test

Central assumptions of the Classical Linear Regression model require a "stationary" test; the violation of unit root test assumptions goes to the spurious regression to avoid this breach; to support this assumption the Augmented Dickey-Fuller method was applied.

$\Delta yt = \alpha + \beta t + \gamma yt-1 + \delta 1 \Delta yt-1 + \gamma 2 \Delta yt-2$ ---eq (10)

Hence, the H0 hypothesis for both tests is that the data are non-stationary. We want to drop the H0 premise for this test, so we want a p-value is less than 0.05 (or smaller) and then accepted an alternative one, than imposing restrictions *($\delta = \gamma = 0$)*.

3.6.2 Co-integration

Accordingly, the bounding test has checked the existence of the long-run association between exogenous and endogenous series depending on the standard critical value of the co-integration test result table and comparing by the F-statistic value bound test. The residual term approach has taken to check the co-integration test (Pesaran & Shin, 1999 and Narayan 2006) method. We

test H0: $\gamma 0 = \gamma = 0$, this indicated does not exist in the long-run relationship between variables, to against this alternative hypothesis was applied; Ha: $= 0$ and Ha $\neq 0$, then the existence of long term association between variables and by running a usual F-statistic value.

3.6.3 Method of Analysis

The study has conducted two analysis ways to investigate the behavior of national savings. The first technique was a descriptive method used to look at macroeconomic behavior. To show the trends of the national saving growth and its determinants by using Microsoft excel application via statistic table (mean, median and range), graphic representation, and charts. The second technique was the econometric method. Those use to explain the long-run estimation results, and one lag of residual term or (ECM_1) and is also used to analyze the temporary effects of endogenous variables on the national saving and.

3.7 Model Specification

The single linear regression equation model has explicitly functioned as the following to investigate the major determinants and their relationship with national savings.

NS = f (Inf, GR, ADR, DIR, M2, TOP, BD) ---------------------------- eq (12)

Certainly, \$NS/gdp, %M2/gdp, and %BD/gdp were taken to ratio for gross domestic product (RGDP) except deposit interest rate; inflation rate and working age dependence ratio and trade openness are considered as percentages to running easily estimation tests.

The following equation also explained by using ARDL method and the coefficients of parameter α's are demonstrated the long run effects of a key determinants on national saving and their casual relationships.

$$\%NS/gdp_t = \beta o_t + \sum_{i=1}^{n} \alpha t \frac{NS}{gdp} - 1 + \sum_{i=1}^{n} \alpha t DIR + 1 + \sum_{i=1}^{n} \alpha t INF + 1 + \sum_{i=1}^{n} \alpha t ADR +$$

$$1 \sum_{i=1}^{n} \alpha t \frac{BD}{gdp_t} + 1 + \sum_{i=1}^{n} \alpha t \frac{M2}{gdp_t} + 1 + \sum_{i=1}^{n} \alpha t TOP + 1 + \sum_{i=1}^{n} \alpha t GR + 1 + ut$$

The following equation explicitly shows the ARDL approach and the coefficients of parameter β's are illustrated the short run impacts of major determinants on national savings.

$$\frac{\Delta NS}{gdpt} = \alpha ot + \sum_{i=1}^{n} \beta t\Delta \frac{NS}{gdp} - 1 + \sum_{i=1}^{n} \beta t\Delta DIR + 1 + \sum_{i=1}^{n} \beta t\Delta INF + 1 + \sum_{i=1}^{n} \beta t\Delta WADR +$$

$$1 \sum_{i=1}^{n} \beta t\Delta \frac{BD}{gdpt} + 1 + \sum_{i=1}^{n} \beta t\Delta \frac{M2}{gdpt} + 1 + \sum_{i=1}^{n} \beta t\Delta TOP + 1 + \sum_{i=1}^{n} \beta t\Delta GR + 1 + \mathcal{E}t$$

3.8 Definition of Variables

αo = Constant term, and β1- β8 are coefficient of parameters for contemporary effects

βo = Constant term, and α- α8 are coefficient of parameters, it measures the long run effects

ut & $\mathcal{E}_t$ = Stochastic disturbance terms – they are captured the factors that affects exogenous variable in both cases those are out of controlling in the model.

National Saving to GDP (%NS/GDP): National saving is dependent variable that is the sum of private and public savings. In general, it was calculated from the national income subtract by national consumptions and divided to gross domestic product (GDP).

Inflation Rate (INR): It was considered as an independent variable in which the rate of change continuously increases in the wide-ranging price level of goods and services in the economy over time. On the other hand, the life-cycle assumption implies that inflation is neutral in the saving due to the lack of money illusion. Nevertheless, ambiguity in the form of inflation would increase; risk-averse consumers tend to set some resources aside as a precaution against possible adverse changes in future income (Loayza, 2000). In other ways, economic agents reduce their current spending, and save more to spend more in the future. In other cases, for savers and investors, inflation erodes the purchasing powers of their investable assets; as a result, a negative net effect was expected.

Age Dependence Ratio (ADR): The economy per 100 working-age population (FDRE constitution, article 36, 1995). It is calculating by dividing the working-age population of the

country by the total population under considerable age - ranges. The life cycle hypothesis stated that the middle-age produced more than spending. The working-age population add to the number of active workers (savers) relative to the number of retired as well as early young ages. The working-age dependency ratio declined over time. However, its net impact would be expected negative on national savings (Athukorla and Sen, 2004).

Budget Deficit to GDP (BD/GDP) Ratio: The recent data imply that the government budget deficit, on average is nearly 5.1 percent of the country's GDP. This gradually reduced national savings and increases the interest rate in the economy and statistically significant quantities. It assumes as a percentage of GDP and is expecting to harm gross savings, and this hypothesis is supported by (Hanford 2007) in the USA.

Deposit Interest Rate (DIR): It takes as a percentage change of nominal deposit interest rates to look monetary policy framework that shows the disposable effect on the interest rate and savings that can decompose into two the effects. The replacement effect is implies high interest rate that pushes to rise the today's consumption price relatively future prices, and that has positive effect on savings. On another hand, the income effect, which shows if the household is a net lender, an increase in the interest rate will increase lifetime income. It reduce saving. An expected interest rate has a positive impact on the savings ratio when the substitution effect is dominated on income effect. If the financial market is not developed, the substitution effect is expecting to be much greater than the income effect, and the interest rate is likely to have a net positive impact on gross savings (Özcan, 2003).

Economic Growth (GR): Real economic growth using to measure the economic performances of the country, and the implication of life-cycle suggestion, given that national income behavior is rising and falls over the path, one stage in the life cycle is significant changes in the savings. The sustained economic growth is a rise, and the aggregate savings level also arises. Consequently, it has a positive impact on national savings (Mesfin, 2016).

Broad Money Supply to GDP (M2/GDP): (Desalegn, 2016), It shows a monetization of the economy. This variable implies the monetary sector growth supported the growth of national savings. The Money sector improvements, including the riddance of credit ceilings, setting the free interest rate, reduction of barriers for private sectors, and adopts the capital markets are essential factors to enhance savings. Though (Loayza et al., 2000) Hence, the expectation of the study was money supply has a positive effect on national savings.

Trade Openness (TOP): This variable is also considered as an average of gross import plus country gross export divided by gross domestic product (GDP). It was expecting a direct relationship between gross national savings and trade openness. The importance of trade openness, which is creating a good international trade atmosphere that could be a means for, attract foreign direct investments. This positive relationship implies that the higher degree of export on imports and the capacity of that measure of the country's gross national product (GNP) (Oageng, 2014).

Chapter Four

4.1 Descriptive Analysis

Figure 1 Growth Rate of National Savings for five countries (2010-2019)
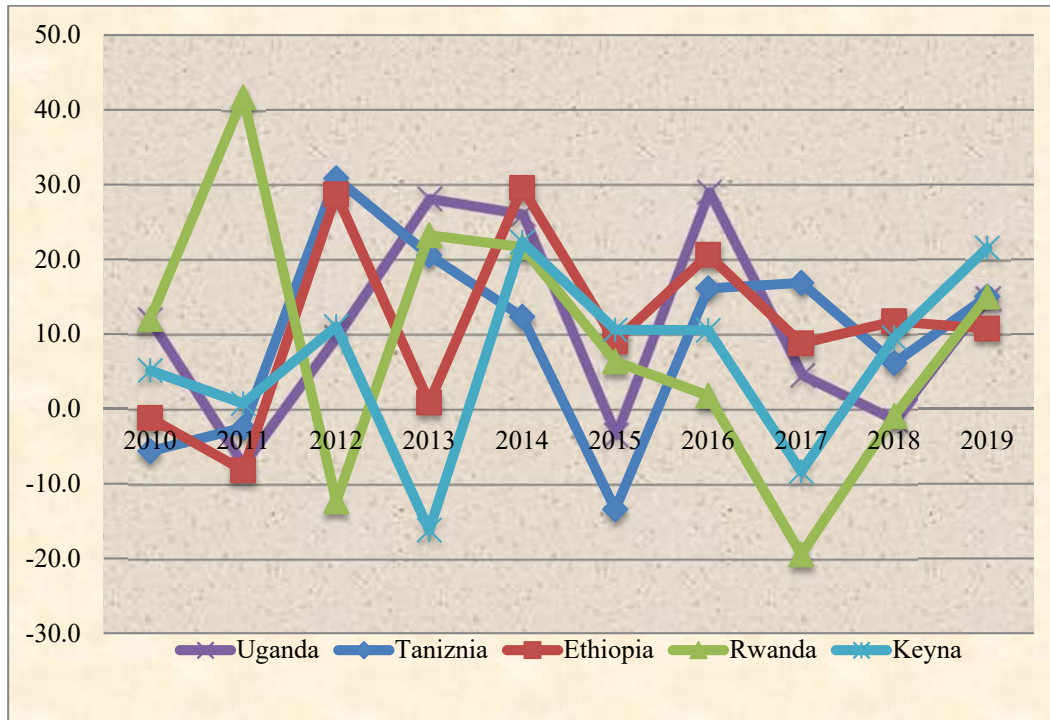
Source: Own Computation using Excel Working Sheets

Figure 1 indicated the trends of national savings for five regional countries are fluctuated up and downs through the selected periods of the year 2017, and trends show a positive growth rate.

Figures 2 The Dependent and Independent variables
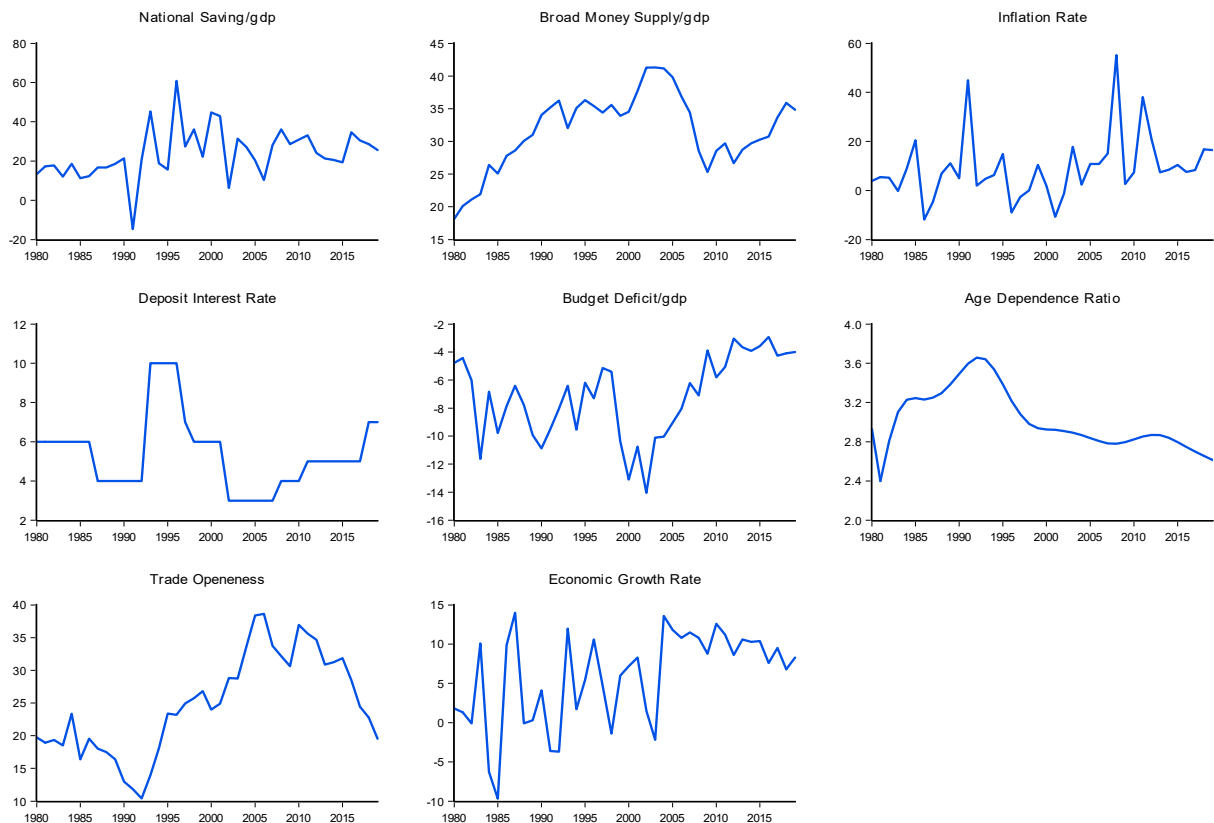
Sources: Own Computation using Eviews9

Figure 2 explains the trend of the national saving, broad money supply, and budget deficit, and trade openness were captured as a percentage of gross domestic products (GDP) at current market value except dependence ratio, inflation, and deposit interest rate, and economic growth because they were naturally growth rates. Therefore, the average of national saving fluctuated constantly at all study periods. But the year 1990 -2019 is highly fluctuated while the trends of inflation, budget deficits, and economic growth are highly fluctuates throughout the study periods.

4.2 Estimation Output Analysis

4.2.1 Unit Root Test Result

The unit root test results show in table 2 some variables which have unit roots at the level I (0) with the drift and without drift and others else have no unit roots at the same level. On the

other hand, all variables were stationary at first difference or order one thus, the variables were mutually integrated. To fix this inconsistency problem the autoregressive distributive lag method was adopted. The researcher concluded that variables were mutually integrated and stationary in both cases.

Table2 Summary of Unit Root Test Result

Variables	T-Stat. Values at Level I(0)			T-Stat. Values at First Difference I (1)			Remarks
	Intercept	Intercept & Trend	PV	Intercept	Intercept & Trend	PV	Order of integration
NS/gdp	-2.06	-2.13	0.51	-8.00*	-8.00*	0.00	I (1)
GR	-1.86	-5.88*	0.00	-10.10*	-9.95*	0.00	I(1) & I (0)
INF	-5.68*	-5.99*	0.00	-6.38*	-6.28*	0.00	I (1) & I (0)
ADR	-0.96	-3.79**	0.03	-4.19*	-4.02*	0.01	I(1) & I (0)
DIR	-2.06	-1.97	0.59	-5.73*	-5.68*	0.00	I (1)
M2/gdp	0.03	-1.40	0.84	-7.91*	-7.79*	0.00	I(1)
BD/gdp	-8.11*	-8.23*	0.00	-7.68*	-7.58*	0.00	I (1) & I (0)
TOP	-1.38	-3.25	0.09	-6.94*	-6.83*	0.00	I(1)
Critical. V	-2.93	-3.52	$\leq \geq 5\%$	-2.94	-3.53	<1%	

Source: Own Computation using Eivews Version 9

Note: * & ** indicates variables are statistically significant at 1% & 5% significance level.

4.2.1 Cointegration result Analysis

Table 3 indicates the bound cointegration test result that was calculated F-statistic value is slightly larger than the critical value at the 5% level. Therefore, the summary of the cointegration test results shown us there is no spurious regression in the estimated model; therefore, variables are interlinked in the long term.

Table3: Summary of Bound Test Cointegration Result

T- S. Value	Value	k
F-statistic	**3.95**	**7**
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.03	3.13
5%	**2.32**	**3.5**
2.5%	2.6	3.84
1%	2.96	4.26

Source: Own Computation using Eivews Version 9

4.2.2 Wald Test Output Analysis

The Wald coefficients restriction test is using to ascertain whether the sum impacts of independent variables have a statistically significant impact on the dependent variable or not. Therefore, the computed Wald test value stated that the determinant variables are jointly influenced national savings because the joint PV is less than α = 5%. As a result, we rejected the null hypothesis (H0) and accepted the alternative (Ha).

Table 4: Wald Test Estimation Result

Wald Test:			
Equation: ARDL02			
T- St. Value	Value	df	Probability
F-statistic	4.13	(8, 13)	0.01
Chi-square	33.04	8	0.00

Source: Own Computation using Eivews Version 9

4.2.3 Long Run Output Analysis

Table 5 reports the Durban Winston (DW) result is 2.34 that shows there is no autocorrelation problem in the estimation. The adjusted R-square is 0.88. It also sufficiently enough and signifying that about 88 percent of the variations in the dependent variable explained by determinant variables. The Prob (F-statistic) is 0.000; it implies the model is stable.

In the long run, broad money supply has a positive impact on national savings and statistically significant. One percentage change increase in the money supply as a result national saving will increase by 1.7 percent, this result in line with (Epaphra, 2010) empirical analysis of the savings and its determinants in Tanzania from the years 1970 to 2010. Results revealed that the broad money supply is positively affected the national saving.

The budget deficit has a long term negative and significant effect on national savings and supported by prior expectation. A percentage change increase in the budget deficit as a result of national savings will decline by 88 percent. The finding confirms by (Hanford 2007) the

cause of budget deficits on savings in the USA; finding result shows high budget deficit declined national savings.

The age dependence ratio is negatively harms saving, and it has statistically significant impact. An increase in one percentage change in age dependence ratio in result the sensitive response comes from the national savings and decreases by 3.12 percent. That implies the age dependency ratio dominates by the baby booms or inactive young generations. It is showed that the age dependence ratio in Ethiopia expected hard work to become out of the baby boom generations that will positively contribute to saving. This finding is in line with (Hanford 2007) in the USA.

The inflation rate affects national savings negatively, and it has a significant long-run impact. With the negative change in the inflation rate, as a result, savings will adversely affected by 53% percent. This negative impact agreed with prior expectations, and the adverse effect is indicating that there is macroeconomic uncertainty in the country. This finding results supported by different previous studies like (Epaphra M, 2010) in Tanzania; (Ahmad F, 2015) in Pakistan.

The economic growth rate has a positive and significant impact on national savings. It implies an increase in a percentage change in economic growth leads to savings will improve by 48 percent. This result agreed with the prior hypothesis support by an assumption of exogenous growth theory that has a sustained economic growth will support savings.

The deposit interest rate is harming national savings, in the long run, but the statistically insignificant and its result, contrary to prior hypothesis. This result is similar to (Hassan Raza, 2016) in Pakistan.

Furthermore, the implication of negative and statistically significant impact of trade openness on national savings shows that the country import is higher than exports and coexistence of trade liberalization. Finding the result is also contrary to the prior hypothesis.

Table 5: The Summary of Long Run Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2	1.70	0.28	6.06	0.00
INF	-0.53	0.16	-3.24	0.00
DIR	-0.33	0.76	-0.44	0.66
ADR	-3.12	0.80	-3.89	0.00
GR	0.49	0.22	2.25	0.04
TOP	-0.45	0.24	-1.91	0.08
BD	-0.89	0.23	-3.77	0.00
C	-7.73	0.70	-11.03	0.00

Source: Own Computation using Eivews Version 9

$R^2 = 0.96$, Adjusted $R^2 = 0.88$, DW = 2.3, F- Statistic = 11.12, AIC = 4.93 and

Prob (F-st.) = 0.0000

NS/gdp = -7.73 + 0.48GR -0.45TOP - 0.88BD – 0.33DIR + 1.70M2 - 3.12ADR -0.53INF

4.2.3.1 Long Run Diagnostic Analysis

The residual diagnostic test problems were detected, and there were no diagnostic test problems. All Results are presents in the annex part of the paper.

4.2.4 Short Run Output Analysis

The short-run results in table 6 explain that the short-run co-integration equation (ECM_1), which is statistically significant at a 1% significance level with an expected negative sign. The adjusted-R square is 0.86. It implies 86% of the variation comes from independent variables, which explain the dependent variable.

The coefficient of a deposit interest rate D (DIR) has a negative and significant short-run effect on national savings. It implies a monetary policy uncertainty. The economic growth D (GR), inflation rate D (INF), and age dependence ratio D (ADR (-1)), and trade openness D (TOP (-1)) have a positive and significant impact on the national savings. These findings are supported by (Moffat Boitumelo, 2014). In the short run, the age dependency ratio is a more sensitive and positive effect on national savings. This finding proves that the working-age population comes out from the inactive young generations, it confirmed to (Hanford 2007) in

the USA. The error correction term (ECM_1) is -0.89, which measures the speed of adjustment in which to restore the long-run disequilibrium shock. Therefore, this implies any divergence from the long-run equilibrium that will correct 89 percent within a year.

The short-run model has also conducted diagnostic checks to ensure the connivance of estimations. As a result, the findings show variables are normally distributed, the model is consistent, the auto-correlation problem was detected, and the model is fitted and stable. The figures and tables were presented in the annex part.

Table 6: Summary of Short Run Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(M2)	0.40	0.13	3.08	0.01
D(INF)	0.21	0.06	3.45	0.00
D(DIR)	-2.07	0.55	-3.77	0.00
D(ADR(-1))	6.89	0.72	9.53	0.00
D(GR)	0.43	0.17	2.58	0.02
D(TOP(-1))	0.48	0.24	2.04	0.00
D(BD(-1))	-0.33	0.11	-2.91	0.01
(ECT_1)	-0.89	0.16	-5.49	0.00

Source: Own Computation using Eivews Version 9

R^2 = 0.90, Adjusted R^2 = 0.83, DW =2.12, F-Statistic = 13.67 and ECM_1 = -0.889 ~ 0.890

Chapter Five

5. Conclusion and Policy Implication

5.1 Conclusion

The aim of the study was investigated to distinguish the main determinants of national saving in Ethiopia. The "research gap was identified" based on the empirical works' of saving and its determinants. The study has incorporated relevant literature reviews.

The Autoregressive Distributive Lag (ARDL) method was dedicated to run the long and short-run estimations. The research design has encompassed both econometric models and descriptive statistics analysis. The bounding cointegration test is deployed, which is used to examine the long-run relationship between variables. The result shows; there is a long-run relationship between variables.

In the long-run, national saving is adversely affected by the age dependency ratio, budget deficit, inflation rate, and trade openness, and deposit interest rate, whereas, growth rate and broad money supply were positively affected the national savings. The growth rates of inflation negatively harm savings in the short run and statistical significant. The implication of this, there was macroeconomic instability. In another way, in both terms, the broadly money supply has a positive impact on savings and statistically significant. This slightly high sensitive response is similar to the study expectation due to the adjustment of financial sector developments, releases credit ceiling, and interest rate liberalization, reduce barer to entry for private investors to the sector.

The ECM result is showed that a percentage of productive working age group increases by one percent result in national savings improves in the short run. On the other hand, a difference of broad money supply, one lag difference of trade openness, growth rate, and the

inflation rate will affect national savings positively and significantly. The budget deficit and deposit interest rate are affected by savings negatively and statistically significant.

National saving is affected positively by the deposit interest rate in the short-term, while inflation rate, working-age dependence ratio, trade openness, and budget deficit are determined negatively in the long run, but broadly money supply and growth rate are positively affected savings.

The coefficient of ECM_1 is statistically significant and has a negative and an expected sign. The speed of adjustment indicates a discrepancy will occur in the long-run equilibrium that will be corrected or converged to the equilibrium's by 89 percent within a year.

5.2 Future Study and Policy Implication

In conclusion, the findings show that Ethiopia faces the challenge of financial constraints through recent years, which has been financing by foreign debits. This threat is associated with lower national savings. Inside challenges, capital immovable and high barriers for foreign financial private sectors are also other challenges to encourage savings. In the short and long-terms, the negative effect of the budget deficit and macroeconomic instability are the main risks for ensuring sustainable national savings. Therefore, based on these finding, the following police suggestions are forwarded:

The government should have ascertained stable macroeconomic environments to reduce unstable inflation rates and maintain the single-digit inflation to promote sustained growth of national savings. The policies expected to have hard work on financial deepening by eliminate financial sector barriers and liberate interest rates to capture the long and short-term monetary shocks. In both cases, the budget deficit was a negative and significant impact on national savings. Therefore, the government must use prudential fiscal policy through well-managed expenditure policies and expanding revenue sources to reduce its budget deficit.

Ethiopia has more than 100 million people; about 65% of people are young or working-age populations. As a result, an age dependency ratio has a negative and significant impact on savings for both terms. Therefore, the adjustment social policy is expected from the government to build the capacity of households to come out from the baby boom to productivity generation.

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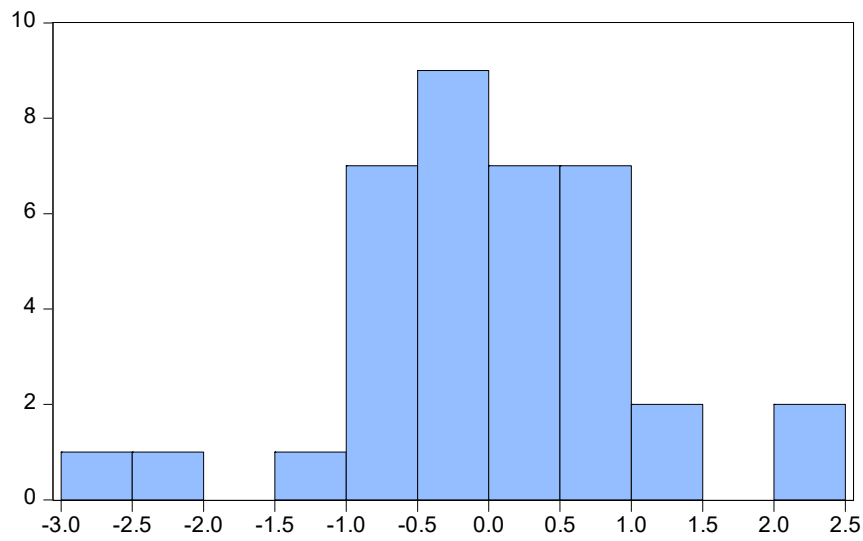
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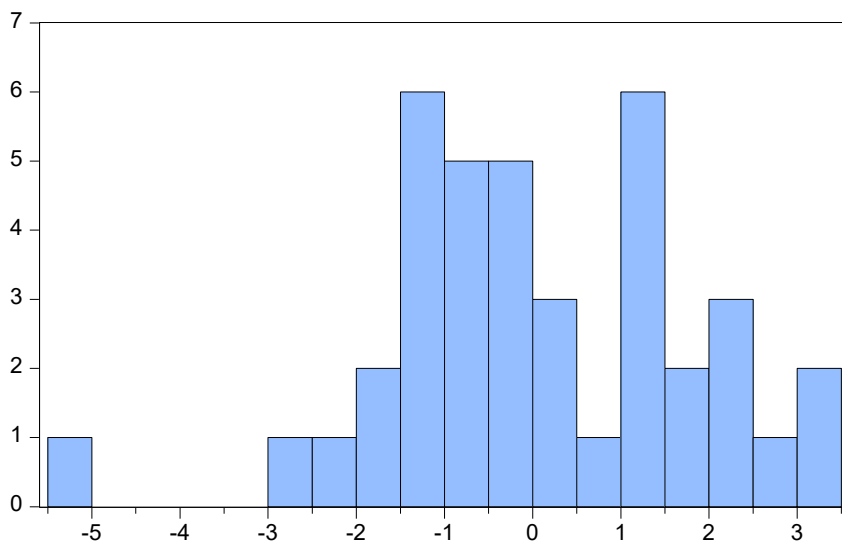Todaro, M. P. (2009). *Economic Development*. London: Anim Publishing, 2011.

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Appendix I

Histogram Normality Test Result (Long Run)

Series: Residuals	
Sample 1983 2019	
Observations 37	
Mean	-4.52e-14
Median	-0.021850
Maximum	2.426379
Minimum	-2.680010
Std. Dev.	0.983862
Skewness	-0.170849
Kurtosis	4.130633
Jarque-Bera	2.150763
Probability	0.341168

Histogram Normality Test Result (Short Run)

Series: Residuals	
Sample 1981 2019	
Observations 39	
Mean	0.091548
Median	-0.150895
Maximum	3.305514
Minimum	-5.191944
Std. Dev.	1.762401
Skewness	-0.354467
Kurtosis	3.520596
Jarque-Bera	1.257111
Probability	0.533362

Appendix   II

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.513113	Prob. F(1,7)	0.4970
Obs*R-squared	2.526942	Prob. Chi-Square(1)	0.1119

Breusch-Godfrey Serial Correlation LM Test: Short Run Result

F-statistic	0.446646	Prob. F(2,29)	0.6441
Obs*R-squared	1.060650	Prob. Chi-Square(2)	0.5884

Appendix III

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.780496	Prob. F(28,8)	0.2002
Obs*R-squared	31.88366	Prob. Chi-Square(28)	0.2793
Scaled explained SS	2.333173	Prob. Chi-Square(28)	1.0000

Heteroskedasticity Test: Breusch-Pagan-Godfrey: Short Run Result

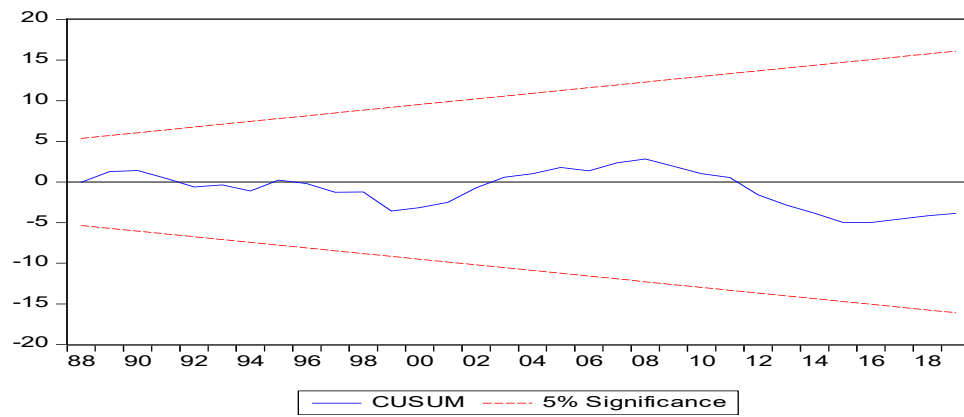|			
F-statistic	1.005184	Prob. F(8,30)	0.1528
Obs*R-squared	8.244095	Prob. Chi-Square(8)	0.4100
Scaled explained SS	6.363863	Prob. Chi-Square(8)	0.6065

Appendix IV

Long Run Model Stability Result (CUSUM Test)

Short Run Model Stability (CUSUM Test) Result