IMPACT OF SELECTED MACROECONOMIC VARIABLES ON NON-OIL EXPORTS IN NIGERIA (1986 – 2015)

BY

Saleh ALIYU

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DECLARATION

I declare that this dissertation titled "**IMPACT OF SELECTED MACROECONOMIC VARIABLES ON NON-OIL EXPORTS IN NIGERIA**" has been carried out by me in the Department of Economics, Ahmadu Bello University Zaria, Nigeria. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for any degree or diploma at this or any other institution.

_____ _____

Saleh ALIYU Date

CERTIFICATION

This dissertation titled "**IMPACT OF SELECTED MACROECONOMIC VARIABLES ON NON-OIL EXPORTS IN NIGERIA**" by Saleh ALIYU meets the regulations governing the award of a Master of Science degree in Economics of the Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

_____ _____

Dr. Mohammed S. Jibril

(Chairman, Supervisory Committee) Date

_____ _____

Dr. IsahSalamatu

(Member, Supervisory Committee) Date

_____ _____

Dr. Aliyu R. Sanusi

(Head of Department) Date

_____ _____

Prof. S. Z Abubakar

(Dean, School of Postgraduate Studies) Date

DEDICATION

This work is dedicated to ALMIGHTY ALLAH for His infinite mercy and protection, my parents and my entire family for their courage and moral support during the programme.

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LIST OF ABBREVIATIONS

ANOE	Aggregate Non-Oil Exports
AGRE	Agricultural Exports
MNFE	Manufacturing Exports
SLME	Solid Mineral Exports
RGDP	Real Gross Domestic Product
EXR	Exchange Rate
INF	Inflation Rate
CPS	Credit to Private Sector
GDP	Gross Domestic Product
ADF	Augmented Dikey Fuller Test
ECT	Error Correction Term
CBN	Central Bank of Nigeria
NBS	National Bureau of Statistics
WTO	World Trade Organization
ECOWAS	Economic Community of West African States

SAP	Structural Adjustment Programme
NEPC	Nigerian Export Promotion Council
DDS	Duty Drawback Scheme
NIPC	Nigerian Investment Promotion Council
ARDL	Autoregressive Distributive Lag
VECM	Vector Error Correction Model
FEM	Foreign Exchange Market
BOP	Balance of Payment
IMF	International Monetary Fund
NEEDS	National Economic Empowerment and Development Strategy
GNP	Gross National Product
CPI	Consumer Price Index
PPP	Purchasing Power Parity
PBT	Portfolio Balance Theory
MEV	Macroeconomic Variables
IDCC	Industrial Development Coordinating Committee

ASYCUDA	Automatic System for Custom Data
VAT	Value Added Tax
JTB	Joint Tax Board
EPZ	Export Processing Zones
NEXIM	Nigerian Export-Import Bank
TLS	Trade Liberalization Scheme
SFEM	Second-Tier Foreign Exchange Market
RDAS	Retail Dutch Auction System
WDAS	Whole Sale Dutch Auction System
IFEM	Inter-Bank Foreign Exchange Market
CUSUM	Cumulative Sum of recursive residuals
CUSUMQ	Cumulative Sum of recursive residuals of square
OLS	Ordinary Least Square
H.O	Heckscher – Ohlin

TABLE OF CONTENTS

Title……i

Declaration……ii

Certification……iii

Dedication……iv

Acknowledgement……v

List of Abbreviations……vi

Table of Contents……viii

List of Tables……xi

List of Figures……xii

List of Appendices……xiii

Abstract……xv

1.0 INTRODUCTION

1.1 Background to the Study……1
1.2 Statement of the Problem……3
1.3 Research Questions……5
1.4 Objectives of the Study……5
1.5 Research Hypotheses ……5
1.6 Justification of the Study……6
1.7 The Scope and Limitations of the Study……7
1.8 Organization of the Study……8

2.0 LITERATURE REVIEW

2.1 Conceptual Literature……. ……......9
2.1.1 Non-oil Exports……...9
2.1.2 Macroeconomic Variables……10
2.1.2.1 Gross Domestic Product……....11
2.1.2.2 Foreign Exchange Rate……..12
2.1.2.3 Inflation……..…….14
2.1.2.4 Credit to Private Sector……..……..…15
2.2 Theoretical Literature……..….16
2.2.1 Theories of Exchange Rate…….…...16
2.2.1.1 Traditional Flow Theory……...16
2.2.1.2 Purchasing Power Parity Theory…….....17
2.2.1.3 Monetary Theory……18
2.2.1.4 Balance of Payment Theory……....19
2.2.1.5 Portfolio Balance Theory……19
2.2.1.6 Elasticity Theory……20
2.2.2 Growth Theories……..21
2.2.2.1 Classical Theory of Growth…….…...22
2.2.2.2 Neo-Classical Theory of Growth……23
2.2.3 Theories of Inflation……24
2.2.3.1 Quantity Theory of Inflation……...24
2.2.3.2 Demand Pull Theory of Inflation……...25
2.2.3.3 Cost Push Theory of Inflation……26
2.2.4 Trade Theories……27
2.2.4.1 Mercantilism……....27
2.2.4.2 Classical Theories of International Trade……....27
2.2.4.3 Modern Theory of International Trade……...28
2.2.4.4 New Theories of International Trade……..29
2.2.5 Theoretical Relationship Between Exports And Selected Macroeconomic Variables……..……....31
2.2.5.1 Exchange Rate Volatility and Exports……...31
2.2.5.2 Gross Domestic Products and Exports……32
2.2.5.3 Inflation Rate and Exports……..33
2.2.5.4 Credit to Private Sector and Exports……..34
2.3 Empirical Literature……...35

3.0 **METHODOLOGY**

3.1 Introduction…….…...39

3.2 Types and Sources of Data……....39
3.3 Theoretical Framework……..40
3.4 Model Specification.……..……40
3.5 Empirical Framework…….…..…43
3.6 Estimation Technique...…….....43
3.7 A priori Expectation.…….…...44

4.0 **DATA PRESENTATION, ANALYSIS AND DISCUSSION OF RESULTS**

4.1 Introduction.…….…….46
4.1.1 Unit Root Test.…….……....46

4.1.2 Analysis and Discussion of Results……....48

4.1.3 The Long-Run and Short-Run Dynamics of Aggregate Non-oil Exports…..49

4.1.4 The Long-Run and Short-Run Dynamics of Agricultural Exports…….…....51
4.1.5 The Long-Run and Short-Run Dynamics of Manufacturing Exports…….....54
4.1.6 The Long-Run and Short-Run Dynamics of Solid Minerals Exports…….....57
4.1.7 Summary of Results.....60

5.0 **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

5.1 Summary of Findings……...…..66
5.2 Conclusion.……..67
5.3 Recommendations…….....68

REFERENCES……...70

APPENDICES…….....81

LIST OF TABLES

Table 4.1 Results of Augmented Dickey Fuller Unit Root Test...……...47

Table 4.2 Results of Philip-Peron Unit Root Test……...…….47

Table 4.3 Bound Test Co-integration Analysis for the Models...……48

Table 4.4 Estimated Long-Run Coefficients for Aggregate Non-oil Exports…….49

Table 4.5 Estimated ECM for Aggregate Non-oil Exports……..50

Table 4.6 Diagnostic Test for Aggregate Non-oil Exports…...……51

Table 4.7 Estimated Long-Run Coefficients for Agricultural Exports…..…….….52

Table 4.8 Estimated ECM for Agricultural Exports…….…...53

Table 4.9 Diagnostic Test for Agricultural Exports…….54

Table 4.10 Estimated Long-Run Coefficients for Manufacturing Exports……...55

Table 4.11 Estimated ECM for Manufacturing Exports……...56

Table 4.12 Diagnostic Test for Manufacturing Exports……..…….…56

Table 4.13 Estimated Long-Run Coefficients for Solid Minerals Exports……...57

Table 4.14 Estimated ECM for Solid Minerals Exports…….……..58

Table 4.15 Diagnostic Test for Solid Minerals Exports…….…...59.

LIST OF FIGURES

Figure 4.1a CUSUM Test of Parameter Stability for Total Non-oil Exports…….....51

Figure 4.1b CUSUM Square Test of Parameter Stability for Total Non-oil Exports…….51

Figure 4.2a CUSUM Test of Parameter Stability for Agricultural Exports……...…54

Figure 4.2b CUSUM Square Test of Parameter Stability for Agricultural Exports…….…..54

Figure 4.3a CUSUM Test of Parameter Stability for Manufacturing Exports……..….57

Figure 4.3b CUSUM Square Test of Parameter Stability for Manufacturing Exports……..….57

Figure 4.4a CUSUM Test of Parameter Stability for Solid Minerals Exports…….…..59

Figure 4.4b CUSUM Square Test of Parameter Stability for Solid Minerals Exports……..….59

LIST OF APPENDICES

Appendix		Page
1	Structure of Nigeria's Non-oil Exports by Value in billions of Naira (1986-2015)	81
2	Data on Real GDP, Exchange Rate, Inflation Rate and CPS (1986-2015)	82
3	Augmented Dickey Fuller (ADF) Unit Root Tests for Aggregate Non-oil Exports	83
4	Augmented Dickey Fuller (ADF) Unit Root Tests for Agricultural Exports	83
5	Augmented Dickey Fuller (ADF) Unit Root Tests for Manufacturing Exports	84
6	Augmented Dickey Fuller (ADF) Unit Root Tests for Solid Minerals Exports	84
7	Augmented Dickey Fuller (ADF) Unit Root Tests for Real GDP	85
8	Augmented Dickey Fuller (ADF) Unit Root Tests for Exchange Rate	85
9	Augmented Dickey Fuller (ADF) Unit Root Tests for Inflation Rate	86
10	Augmented Dickey Fuller (ADF) Unit Root Tests for Credit to Private Sector	86
11	Phillips Perron (PP) Unit Root Tests for Aggregate Non-oil Exports	87
12	Phillips Perron (PP) Unit Root Tests for Agricultural exports	87
13	Phillips Perron (PP) Unit Root Tests for Manufacturing Exports	88
14	Phillips Perron (PP) Unit Root Tests for Solid Minerals Exports	88
15	Phillips Perron (PP) Unit Root Tests for Real GDP	89
16	Phillips Perron (PP) Unit Root Tests for Exchange Rate	89
17	Phillips Perron (PP) Unit Root Tests for Inflation Rate	90

18	Phillips Perron (PP) Unit Root Tests for Credit to Private Sector	90
19	ARDL Bounds Test for Aggregate Non-Oil Exports	91
20	Bounds Test for Agricultural Exports	91
21	Bounds Test for Manufacturing Exports	92
22	Bounds Test for Solid Minerals Exports	92
23	Long-Run and Short-Run Dynamics of Aggregate Non-Oil Exports	93
24	Long-Run and Short-Run Dynamics of Agricultural Exports	94
25	Long-Run and Short-Run Dynamics of Manufacturing Exports	95
26	Long-Run and Short-Run Dynamics of Solid Minerals Exports	96
27	Serial Correlation Test of Aggregate Non-Oil Exports	97
28	Serial Correlation Test of Agricultural Exports	98
29	Serial Correlation Test of Manufacturing Exports	99
30	Serial Correlation Test of Solid Minerals Exports	100
31	Heteroskedasticity Test of Aggregate Non-Oil Exports	101
32	Heteroskedasticity Test of Agricultural Exports	102
33	Heteroskedasticity Test of Manufacturing Exports	103
34	Heteroskedasticity Test of Solid Minerals Exports	104

35 Normality (JargueBera) Test of Aggregate Non-oil Exports 105

36 Normality (JargueBera) Test of Agricultural Exports 105

37 Normality (JargueBera) Test of Manufacturing Exports 106

38 Normality (JargueBera) Test of Solid Minerals Exports 106

39 Ramsey RESET Test of Aggregate Non-oil Exports 107

40 Ramsey RESET Test of Agricultural Exports 107

41 Ramsey RESET Test of Manufacturing Exports 108

42 Ramsey RESET Test of Solid Minerals Exports 108

ABSTRACT

This study investigated the 'Impact of Selected Macroeconomic Variables on Non-oil Exports in Nigeria' for both aggregate and disaggregates within the period 1986-2015.Time series secondary data were collected from CBN statistical bulletin for the period of thirty years (1986-2015). Auto-Regressive Distributed Lag (ARDL) bounds testing co-integration technique was used to investigate the long-run relationship between the selected macroeconomic variables (real GDP, exchange rate, inflation rate and credit to private sector) with aggregate and disaggregate non-oil exports (agricultural, manufacturing and solid minerals) in Nigeria.. The major findings of this study showed that the selected macroeconomic variables (real GDP, exchange rate fluctuations, inflation rate and credit to private sector had a long-run equilibrium relationship with both aggregate and disaggregate non-oil exports (agriculture, manufacturing and solid minerals) within the period of study at 5 percent level of significance. The findings of this study imply that economic activities and credit to private sector had impacted positively whereas exchange fluctuations and increase in prices of goods and services had impacted negatively on the volume of non-oil exports in Nigeria within the period of study. This study recommended that the government should enhance the productive capacity of the economy through human and capital development, a sound monetary policies to stabilize exchange fluctuations. A friendly and selective credit policy should be initiated by the government to enable the farmers, manufacturers and miners have access to loans.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

One major feature of the Nigerian economy following the oil boom in 1970s is the dominance of oil sector over non-oil sector that has led to its sluggishgrowth. The poor performance of the non-oil exports sector is largely attributable to the neglect of the agricultural, manufacturing and the solid minerals sectors following the oil boom coupled with the effects of some fiscal and monetary policies such as interest rate, exchange rate, misappropriation of government expenditures, foreign trade policies among others (Ilegbinosa*et al.*,2012).

The Nigerian economy has been adversely affected in recent times by external shocks particularly the fall in global price of crude oil. Also, the upward costs of naira from N197 to N350 (official rate) from 2015 to 2017 had significantly impacted on key macroeconomic variables such as inflation, federal revenue source and external reserves. Economic growth sharply declined from 6.2% in 2014 to about 3.0% in 2015,inflation rate alsoincreased from 7.8% to about 9.0% within the period (NBS, 2016). According to African Development Bank (2016), the sluggish growth in Nigerian economy is mainly attributable to a slowdown in economic activity due to the adverse impact of inadequate supply of foreign exchange and aggravated by foreign exchange restrictions targeted at some commodities among which are inputs to manufacturing and agro-allied industry. This situation has resulted in cuts in production and shedding of labour in some sectors of the economy.

The rapid increase in inflation rate over the years and high exchange rates has led to the escalation of the prices and costs of raw materials needed by local manufacturers in Nigeria.The credits to private sector and foreign capital inflow into the country have also declined due to high lending rate by banks, poor availability of infrastructural facilities and insecurity problem (Akeem, 2000). The volume of non-oil exports in the processed or manufactured products has witnessed fluctuations over the years due to shortage of raw materials, rising inflation that has led to high cost of manufacturing inputs and dearth of infrastructures (Adewuji, 2005).

The average growth rate of the volume of non-oil exports in Nigeria has been unimpressive and decreasing over the years; it decreased to 26.81% from 2001 to 2005 from 28.38% during the period (1991 to 1995). Thisfigure further decreased to 10.55% in 2006, -15.63% in 2014 and -30.71% in 2015 (CBN; 2010 and 2015). Similarly, the share of Agriculture to GDP decreased from an average of 30% from 1986 to 1990 to 19% from 2010 to 2014 (CBN; 1990 and 2014). The consequence of this phenomenon has been a decline in performance and competitiveness of non-oil sector which is obvious in the import of some agricultural products Nigeria formerly exported and other food crops it had been self-sufficient in (Ijirshar, 2015).

The return of Nigeria to democratic rule in 1999 coupled with the implementation of certain economic policiesincluding the National Economic Empowerment and Development Strategy(NEEDS), economic reforms (Telecommunications, Banking and Power) and high crude oilprice propelled the economy to a higher growth path. Consequently, this resulted to the achievement of an average growth rate of 6.4%from 2001 to 2004 and an increase in the average contribution of non-oil exports to GDP to 16.2% from 14.2% between 1996 and 2000 (OECD,1998).

1.2 Statement of the Problem

The performance of the non-oil sector in Nigeria over the past three decades leaves little or nothing to be desired (World Bank, 2014). This poor performance is attributable largely to the neglect of the agricultural and manufacturing sectors following the oil boom in 1970s (World Bank, 2014). The instability of some macroeconomic variables such as exchange rates, interest and inflation ratescoupled with misappropriation of government expenditures and collapse of export commodity prices in the world market as well as the country's inability to compete on prices at international market further compounded the problem (Ilegbinosa, *et al.*,2012).

The Nigerian government had initiated various policies, programmes and strategies by successive administrations since independence to boost the activities of the non-oil sector as well as its share to total exports and economic growth. However, the non-oil sector contributions have not increased substantially over the years as its average contribution to total exports decreased to 5.8% in 2012 from an average of 6.2% between 1986 and 1990(World Bank, 2014). The problem of fluctuations in the values of some of its macro-economic indicators like interest rate, exchange rates and inflation rate had affected Nigeria's economicperformance (World Bank, 2014). These fluctuations and misalignments have created high cost of doing business such as the costs of raw material inputs necessary for production activities as well as uncertainty and risks of doing business among business entrepreneurs that resulted to low investments and output in the economy (Ilegbinosa*et al.*, 2012). TheNigerian economy has witnessed a fluctuating and uncertain business environment in recent times as evidenced by the fluctuations of Naira exchange rate against the United States dollars; it depreciated to N133.50 in 2004 from N102.11 in 2000 and further to N148.88 in 2009, 157.31 in 2013 and up to N475 in September 2016

(CBN, 2005 and 2016). An assessment of the trend and patterns of the activities in the non-oil sector in Nigeria by some researchers like the World Bank (2014) and World Trade Organization (2011) revealed that despite the various policies, strategies and reforms programmes by the government, the contributions of the non-oil sector have been below its full potentials due to factors like structural rigidities, frequent changes of government policies as well as poor economic policy implementation that resulted in its slow output growth (Olurankinse and Bayo, 2012). The poor performance of the non-oil sector which also resulted to its low contributions to the Nigerian economy has made the country to derive its major revenue from the oil sector. The fall in theexport of agricultural and othernon-oil productsisdue to low performance of the agricultural sector as a result of small farm size with crude and outdated farm implements, inadequate access to credit facilities, inadequate production machinery and inputs by farmers and unfavorable weather conditions. Similarly, the manufacturing and solid minerals sectors were hampered by the rising inflation, high interest rate, poor infrastructural facilities, foreign exchange policies and insecurity among others (Ogunkola and Oyejide, 2001).According to CBN (2014), the manufacturing sector contribution to non-oil exports decreased from 13.10% in1960 to 0.07% in 2013. This situation has made CBN to paint a gloomy picture when it announced that Nigeria recorded a decline in its non-oil exports receipts from $10.53billion in 2014 to $4.39billion in 2015 (Leadership, 2016).

It is based on this background that this study was conducted to investigate the impact of some selected macroeconomic variables (real GDP, exchange rate, inflation rate and credit to private sector) on non-oil export (aggregate and disaggregate) in Nigeria from 1986 to 2015.

1.3 Research Questions

Based on the research problem stated, the following questions are pertinent to arise.

i. What is the impact of the selected macroeconomic variables (real GDP, exchange rate, inflation and credit to private sector) on aggregate non-oil exports in Nigeria?
ii. What is the impact of the selected macroeconomic variables (real GDP, exchange rate, inflation and credit to private sector)on disaggregate non-oil export in Nigeria?

1.4 Objectives of the Study

The main objective of this study is to investigate the impact of theselected macroeconomic variables on aggregate non-oil exports in Nigeria.

The specific objectives are:

i. todeterminethe impact of selected macroeconomic variables on agricultural exports in Nigeria;
ii. to determine the impact of selected macroeconomic variables on manufacturing exports in Nigeria; and
iii. to determine the impact of selected macroeconomic variables on solid minerals exports in Nigeria.

1.5 Research Hypotheses

The research hypotheses are drawn from the problem statement, research questions and research objectives of the study. Therefore, the research hypotheses are:

i. Ho: the selected macroeconomic variables do not have impact on aggregate non-oil exports in Nigeria.

ii. Ho: the selected macroeconomic variables do not have impact on agricultural exports in Nigeria..

iii. Ho: the selected macroeconomic variables do not have impact on manufacturing exports in Nigeria.

iv. Ho: the selected macroeconomic variables do not have impact on solid minerals exports in Nigeria.

1.6Justification of the Study

This study is prompted by the slow rate of growth in Nigeria's non-oil exports despite huge governmentallocations and policies towards the development of the non-oil sector. The volume of foreign exchange generated over the years is either not enough or has fallen below expectations due to the mono-cultural nature of the Nigerian economy.

The economic down turn from 2007 to 2008 as a result of global financial crises coupled with the downward fall in global oil prices since December 2014 has made many nations including Nigeria to look for other alternatives of generating new sources of foreign exchange. In recent times, Nigeria's oil sector is gradually becoming unreliable as a major source of revenue to the government and thus the need for diversification of the economy through non-oil exports promotions. The desire to find a realistic exchange rate for the domestic currency is an important macroeconomic policy objective for a developing country highly dependent on trade. Thus, this study is expected to provide insights into the potentials of non-oil exports to generate foreign exchange in the country.

Also, Yimka, *et al.*,(2014) used ordinary least square regression to evaluate the impact of

exchange rate regimes on non-oil exports in Nigeria from1986 to 2010 and found that the volume of non-oil export was affected by exchange rate, real gross domestic product, inflation rateand degree of economic openness. Again, Imoughele and Ismaila(2015) employed the techniques of OLS and Johansen Co-integration to study the impact of exchange rate, inflation rate, real GDP, trade openness, credit to private sector and money supply on non-oil exports in Nigeria from 1986 to 2013.The results and findings of their studies revealed that exchange rate had a negative sign with a coefficient of -0.2417 and was statistically significant at 5 percent level. The coefficient of the inflation rate is -0.0467 and was negative but insignificant at 5 percent level. The credit to private sector had a coefficient of 1.5324 which was positive and significant at 5 percent level. The gross domestic product had a coefficient of 1.0126 which was positive and significant at 5 percent level. Thus, Yimka*et al.*,(2014), Imoughele and Ismaila (2015) concluded that exchange rate, credit to private sector and economic performance had significant impact on the volume of aggregate non-oil exports in Nigeria from 1986 to 2013.

It is in view of the justification above, this study was carried out using the technique of Autoregressive Distributed Lag (ARDL) bounds testing approach to co-integration to investigate the long-run relationship of the selected macroeconomic variables (real GDP, exchange rate, inflation rate and credit to private sector) on both aggregate and disaggregate non-oil exports (agricultural, manufacturing and solid minerals) in Nigeria from 1986 to 2015.

1.7The Scope and Limitations of the Study

This research covers a period of thirty years (1986-2015), that is from the introduction of Structural Adjustment Policy (SAP) in Nigeria. The period under review is important to enable the study achieve a comprehensive analysis of the impact of selected macroeconomic variables

(real GDP, exchange rates, inflation rate and credit to private sector) on non-oil exports in Nigeria from 1986 to 2015.

The main limitation to this research is the inability to obtain a high frequency data for all the selected variables under investigation. The use of monthly or quarterly data would have produced a better result since the yearly data faces the problem of aggregation over time. Other limitations were the time and financial constraints available for the conduct of the research, limitations on the quality and accuracy of the data involved.

1.8 Organization of the Study

This study is organized into five chapters. Chapter one is the introduction to the study, statement of theproblem, research questions, objectives of the study,research hypotheses, significance of the study, scope and limitations of the study. Chapter two is literature review.Chapter three is the methodology applied in conducting the research. Chapter four is the results of the study, data analysisas well as the interpretation of the analyzed data. Chapter fiveis the summary of key findings.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual Literature

2.1.1 Non-oil Exports

Non-oil exports are products that are not identified as oil exports of a country. The non-oil sector comprises those groups of economic activities which are outside the petroleum and gas industry. It consists of sectors such as the agricultural, manufacturing, mining and services etc. Mostly agricultural products such as groundnuts, palm kernel, palm oil, cocoa, rubber, cotton, coffee, beans, hides, skin and cattle dominated Nigeria's exports trade in the 1960s (Okafor, *et al*.,2014). The Nigeria's non-oil exports are made up of everything Nigeria exports to other countries except petroleum products. (Anyanwu,*et al.*, 1997).Akeem (2011) defined non oil exports as those commodities excluding crude oil (petroleum products), which are sold in the international market for the purpose of revenue generation. Akeem noted that Nigeria's non exports sector is structured into four broad constituents which are the agricultural exports, manufactured exports, and solid mineral exports and services exports.He defined the non oil sector of the Nigerian economy as the whole of the economy less oil and gas sub-sector which covers agriculture, industry, solid minerals and the services sub-sector, including transport, communication, distributive trade, financial services, insurance, government, etc.Abogan, *et al.,* (2014) stated thatnon oil export products are unlimited as they include agricultural crops, manufacturing goods, solid minerals, entertainment and tourism services etc. Other Nigeria's non-oil exports of significant value then were tin ore, columbite, hides, skin and cattle. Over 66 percent of total exports on the average were accounted for by these commodities

(Okubor, 2014).The manufacturing exports from Nigeria to the international market comprises of agro-allied and manufactured products. The agro-allied products are cocoa butter, cocoa powder, cocoa cake, cocoa paste, groundnut cake and wood products including furniture and fixtures while the main manufactured items are textiles, chemical products, beer and beverages, urea-ammonia, insecticides, soap and detergents, plastic, processed skin, plastic and non-metallic mineral products etc.(Adewuji, 2005). The solid minerals exports on the other hand include the cassiterite, coal, columbite, charcoal, asbestos, processed iron ore and marble (Akeem, 2000).

2.1.2 Macroeconomic Variables

Macroeconomics is the study and analysis of the nation's economy as a whole. It scrutinizes the cyclical movements and trends in an economy such as gross domestic production, unemployment, inflation, money supply, budget deficits, international trade and exchange rate etc. (Gurloveleen and Bhatia, 2015). Macroeconomic variableson the other hand are those variables that are largely concerned with the behavior of economic aggregate such as Gross Domestic Product (GDP), inflation rates, interest rates, exchange rate, total exports of a country, employment and unemployment, population, government budget balance and finance, international trade balances and productivity etc. (John, *et al.*,, 2012).Macroeconomicvariables are such factors that are pertinent to a broad economy at the regional and national level and affect a large population rather than a few selected individuals. Oliver argued that the financial performance of a country is determined by some fundamental macroeconomic variables such as the interest rates, gross domestic product, exchange rates, inflation rates and money supply which are closely monitored by the government, businesses and consumers (Oliver, 2000). Macroeconomics variables are the key indicators that show the prevailing trends in the economy

(Hassan, 2015). This means that macroeconomic variables are those variables that are concerned with the behavior of the economy as a whole.

2.1.2.1 Gross Domestic Product (GDP)

Gross Domestic Product (GDP) has been viewed by different scholars as the monetary value of all the finished goods and services produced within a country's borders in a specific time period(Jhingan, 2012; Schiller 2003; Samuelson and Nordhaus 2001). GDP measures all the final goods and services produced by economic resources located in the country regardless of their ownership. It is commonly used as an indicator of the economic health as well as a gauge of a country's standard of living (Jhingan, 1997). When macroeconomic measure of the value of economic output is adjusted for price changes i.e. inflation or deflation then we have 'Real Gross Domestic Product'(Begg, *et al.*,2003).This adjustment transforms the money-value measure, nominal GDP, into an index for quantity of total output (Bhatia, 2003). It is also the aggregate measure of production which is equal to the sum of the gross values added of all resident institutional units engaged in production (plus any taxes, and minus any subsidies, on products not included in the value of their outputs). The sum of the final uses of goods and services (all uses except intermediate consumption) measured in purchasers' prices, less the value of imports of goods and services, or the sum of primary incomes distributed by resident producer units (Blanchard and Johnson, 2013).

This means that GDP is the monetary value of all the final goods and services produced within a country in a specific period of time.

2.1.2.2 Foreign Exchange Rate

Cushman (1983) viewed foreign exchange rate as the price of one currency in terms of another. It is usually expressed as the price of local currency to one unit of a foreign currency. Therefore, the exchange rate of Nigeria's naira to American dollar is the amount of naira needed to purchase one unit of dollar. The demand for foreign exchange is a derived demand; it arises from the demand for import of goods and services by Nigerians and from the flow of capital/investments into Nigeria.

For a better economic analysis, economists have conceptualized exchange rate in three (3) different ways; the nominal, the effective and the real exchange rates. The nominal exchange rate is the rate of exchange for any one currency as quoted against any other currency of any country in the world. The effective exchange rate is simply a measure which takes into account how a particular currency varies differently against each of the other currency of the world. The real exchange rate on the other hand, is designed to measure the rate at which home goods exchange for goods from other countries rather than the rate at which the currencies themselves are traded (Hodrick, 1978). Therefore, exchange rate as used in this study is the nominal exchange rate (the price of Naira in terms of foreign currency particularly the United States Dollar).

The appreciation of exchange rate results in increased imports and reduced export while depreciation would expand exports and discourage imports so also depreciation of exchange rate tends to cause a shift from the consumption of foreign goods to domestic goods and hence, it leads to diversion of income from importing countries to countries exporting through a shift in terms of trade, and this tends to have impact on the exporting and importing countries' economic

balance of payments (Aliyu, 2011).The demand for a country's currency is an important determinant of the exchange rate; if the demand for a country's currency is high, it will lead to exchange rate appreciation and vice versa (Mamta, 1999; Jhingan, 2012). Government fiscal policy can also influence the movement of the exchange rate; an expansionary fiscal policy that raises government consumption expenditure would lead to high domestic demand for both tradable and non-tradable. This in turn leads to increase in commodity prices and exchange rates appreciation. Also, technological improvement (measured by the growth of real GDP) is useful in explaining the exchange rate movement. Advancement in technology among other things raises the efficiency and productivity of factors of production, increases their competitiveness, reduces costs of production and prices of the tradable which leads to exchange rate appreciation (Aliyu, 2011). According to David and Konstantin (2008) as cited byStancik (2007) opined that, if a country has a positive net asset holding, it will enhance its capacity to import for some time and in addition it will raise the country's demand for domestically produced goods (both tradable and non-tradable) as well as their prices, thus leading to exchange rate appreciation. The degree of openness of the economy throughnon introduction of high tariffs, exchange controls and quotas on imports, domestic demand and commodity prices can lead to exchange rate appreciation. However, if the economy becomes more open and protection is reduced, the demand for domestic goods and their prices will fall, thus resulting to exchange rate depreciation (Stancik, 2007). Similarly, Yakub (2010) viewed floating exchange rates to be more volatile than the fixed exchange rate and the degree of volatility and the level of stability of exchange rate are greatly affected by some economic fundamentals. Mayowa and Olashola(2013) noted that there are many factors that contribute to exchange rate volatility: thelevel of output, inflation, the

openness of an economy, interest rates, domestic and foreign moneysupply, the exchange rate regime and central bank independence etc. The degree of theimpact of each of these factors varies and depends on a particular country's economic condition and thus, the countries that are in the transition process (such as Nigeria) are more vulnerable to being affected bythese factors, which in turn affect the monetary policy decisions (Mayowa and Olushola, 2013). Also, Hooper and Kohlhagen(1978) see fluctuations of exchange rates as the source of exchange rates risk and uncertainty and has certainimplications on the volume of international trade and consequently on the balance of payments.Machina and Rothschild (2006) argued that higher exchange-rate volatility leads to higher cost of risks and uncertainty for risk-averse traders and thus less foreign trade.

Given the various definitions and views about exchange rate by different scholars, exchange rate can be viewed as the price of one currency in terms of another. This means that exchange rate as a price of Nigeria's currency in terms of other currencies, is among the most important prices in an economy as it affects the flow of goods, services and exerts strong pressure on the B.O.P, inflation and other macroeconomic variables. Therefore, the choice and management of exchange rates is a critical aspect of economic management to safeguard competiveness, macroeconomic stability and growth.

2.1.2.3 Inflation

Although there are various schools of thoughts on inflation, the general consensus among scholars is that inflation is a continuous and sustained increase in the general price level of goods and services in an economy over a period of time (Fishers, 1993; De Gregorio, 1993; Brunno and

Easterly, 1995;Barro, 1995, 1996; Malla, 1997; Faria and Carneiro, 2001; Dewan and Husein, 2001; Jhingan, 2003; Umaru and Zubairu, 2012) as cited by Chude and Chude (2015). Izuchukwu and Patricia (2015) also viewedinflation as a continuous rise in prices as measured by an index such as the Consumer Price Index (CPI) or by the implicit price deflator for Gross National Product (GNP). When the price level rises, each unit of currency buys fewer goods and services. According to Lipsey and Chrystal, (1995), inflation reflects a reduction in the purchasing power per unit of money – a loss of real value in the medium of exchange and unit of account within the economy. Similarly,Chowdhury(1993) sees inflationas a state where "too much money is chasing too few goods". When there is inflation, the currency losses its purchasing power. A high level of inflation disrupts the smooth functioning of a market economy and at the individual level, inflation negatively affect those with fixed income and favors debtors at the expense of creditors, at the firm level, it affects output when firms have to incur costs as they adjust to the new price level.

This means that, inflation is an increase in the average level of prices of goods and services of a country over a given period of time which reduces the purchasing power of its currency and also affects negatively the costs and outputs of producing firms.

2.1.2.4 Credit to Private Sector (CPS)

According Emecheta and Ibe (2014), credit to private sector refers to the provision of financial resources like loans and non-equity securities to the private sector by financial institutions like banks and other financial corporations all measured as percentage with respect to GDP. The higher this measure is, the higher financial resources or financing is to private sector in a country and so the greater opportunity and space for the private sector to develop and grow. The better

the private sector the bigger role it gets in productive activities and national economy.Olowofeso(2015), viewed credit to private sector as financial resources given to the private sector, such as loans and advances, purchases of non-equity securities,trade credits and other accounts receivable, which establish a claim forrepayment. In this regard, Olowofeso viewed credit to private sector from two angles: trade or commercial credit and banking system credit. Trade credit refers to transactions which involve the supplier handingover goods or performing a service without receiving immediate payment whereas the banking system credit to private sector involves the direct provision of loans and overdrafts to the private sector by institutions, such as Deposit Money Banks, Non-interest banks in Nigeria with an established claim for repayment. However, this study focuses on banking system of credit to private sector.

This means that credit to private sector is the provision of financial resources like loans to the private sector by financial institutions which increase their opportunity, space to develop and grow.

2.2 Theoretical Literature

2.2.1 Theories of Exchange Rate

2.2.1.1 Traditional Flow Theory

The traditional flow theory of exchange rate determination is an essentialprinciple based on the interplay of demand and supply. Herberger (1950), stated that an equilibrium exchange rate can be achieved in foreign exchange market (FEM) when there is absence of excess demand and excess supply of foreign exchange. Similarly, disequilibrium in the rate of exchange occurs when either demand exceeds supply or vice versa in the exchange market. However, when there is

speculation or expectation of a change in the rate of exchange, this could lead to movement of the equilibrium even without any change in the initial determining factors (Azeez, Kolapo, and Ajayi, 2012). According to Hyung (1972) as cited byAzeez, et al. (2012),the economic players in the exchange market are the private and public sectors. While the private sector operates under a flexible exchange rate system, the public sector transacts under a pegged system of currency exchange. Based on this, the problem of excess or shortage of demand and supply only affects the private sector's currency exchange transactions. The above explanation follows from the classical theory of demand and supply analysis.

This means that an exchange rate isin equilibrium when the demand and supply of foreign exchange are equal in the foreign exchange market. When there is disequilibrium in the market (excess demand over supply), the market forces through increase in price will restore the market to its equilibrium position.

2.2.1.2 Purchasing Power Parity (PPP) Theory

The Purchasing Power Parity (PPP) theory was developed by Cassel (1918) and is in line with the classical theory of exchange rate determination. PPP theory states that exchange rates between currencies of two countries are in equilibrium when their purchasing power is the same with their respective price level of a fixed basket of goods and services. When a country's domestic price level is increasing (i.e. experiences inflation), that country's exchange rate must depreciate in order to return to PPP. Cassel (1918) stressed that exchange in the short-run would diverge from PPP and identified three (3) disturbances (actual and expected inflation, barriers to trade and shifts in international movements of capital) which might cause these deviations.

This means that a relatively high internal price level will tend to bring about a depreciation of the exchange rate and balance of payment just as a fall in price internally would tend to cause exchange rate to appreciate in order to be at equilibrium position.

2.2.1.3 Monetary Theory

The Monetary theory of exchange rate determination is linked to Frankel (1979), Bilson (1978), Hodrick (1978), Roper and Girton (1977). Frankel (1979) asserted that the relative demand and supply for money between two countries is the basis for the determination of exchange rate and not just the interplay of demand and supply of goods and services between two countries as the traditional flow model views it or the relative prices as the PPP theory stated. Roper and Girton (1977), viewed increase in the supply of money as the source of inflation and hence resulting in exchange rate depreciation. Frankel (1979) viewed a situation of falling prices with a given nominal money supply results in exchange rate appreciation while an increase in domestic interest rate with a given money stock, reduces the demand for money and raises prices and this increase in prices leads to exchange rate depreciation (Olisadebe, 1991). Similarly,Levacic and Rebmann (1982) pointed out that changes in economic variables affect the exchange rate through their impact on the demand for and supply of money balances. Levacic and Rebmann thus stress the view that the supply of and demand for money are strong forces in determining a country's external position.

This means money market is seen as a crucial factor in determining balance of payments equilibrium and any imbalances in the balance of payments will restore equality between the demand for and supply of money in the absence of official intervention.

2.2.1.4 Balance of Payment (BOP) Theory

The balance of payment theory states that exchange rate of a country depends upon its balance of payments; a favorable balance of payments raises the exchange rate, while an unfavorable balance of payments reduces the exchange rate (Jhingan, 1997). Dada and Oyeranti(2012) viewed balance of payments to be unfavorable when the demand for foreign currency is more than its supply which causes the external value of the domestic currency to fall in relation to the foreign currency and consequently the exchange rate falls. BOP is favorable when the demand for foreign currency is less than its supply at a given exchange rate which causes the external value of the domestic currency to rise in relation to the foreign currency and consequently, the exchange rate rises (Mamta, 1999).

This means that the balance of payment theory views exchange rate determination in a country through the demand and supply of foreign exchange. Also, a favourable balance of payment causes the external value of the domestic currency to rise and vice versa.

2.2.1.5 Portfolio Balance Theory

The Portfolio Balance Theory (PBT) towards determining exchange rate states that besides monetary factors, holding of financial assets (local and foreign bonds) also influences the exchange rate (Mckinnon, 1969). The relative supply and demand of money and bonds determine the equilibrium exchange rate between two countries (Krugman,*et al.*, 2012). Exchange rate establishes equilibrium in the investor portfolio (including the money, local and foreign bonds) in such a way that if there is a change in any one of these three assets, investor re-establishes the desired balance in his portfolio (Franke, 1991). If demand for local currency rises,

it appreciates the price of local currency while an increase in demand for local bonds positively affects local currency. Therefore, when demand for local bonds increases, local currency appreciates (Khan and Abbas, 2015).

This means the portfolio balance theory views equilibrium exchange rate to be determined in a country by the relative demand and supply of money, local and foreign financial assets.

2.2.1.6 Elasticity Theory

The elasticity theory sees exchange rate of a country to be determined by the responsiveness of imports and exports to changes in the exchange rate and the extent to which it depreciates improves the current account balance (Adjaye, 1998). The price of foreign exchange is determined by the demand for and supply of foreign currency which depends on domestic and foreign incomes and the relative price of domestic goods and in terms of foreign goods (Arize, 1995). Thus devaluation helps to improve Balance Of Payments (BOP) deficit of a country by increasing its exports and reducing its imports but the extent to which devaluation will succeed depends on the country's price elasticities of domestic demand for imports and foreign demand for exports (Baron, 1976). Thus, when the sum of price elasticities of demand for exports and imports in absolute terms is greater than unity, devaluation will improve the country's balance of payments, **i.e** $\mathbf{e_x + e_m > 1}$. Where $\mathbf{e_x}$ is the demand elasticity of exports and $\mathbf{e_m}$ is the demand elasticity for imports. On the contrary, if the sum of price elasticities of demand for exports and imports in absolute term is less than unity, $\mathbf{e_x + e_m < 1}$, devaluation will worsen (increase the deficit) of the BOP. If the sum of these elasticities in absolute terms is equal to unity, $\mathbf{e_x + e_m = 1}$, devaluation has no effect on the BOP situation which will remain unchanged. Therefore,

according to Marshall-Lerner (1934), devaluation reduces the domestic prices of exports in terms of the foreign currency. With low prices, exports increase but the extent to which they increase depends on the demand elasticity for exports and the nature of goods exported and the market conditions. If the country is the sole supplier and exports raw materials or perishable goods, the demand elasticity for its exports will be low. If it exports machinery, tools and industrial products in competition with other countries, the elasticity of demand for its products will be high, and devaluation will be successful in correcting a deficit (Bhatia, 2003). Similarly, Blanchard (2013) noted that devaluation has the effect of increasing the domestic price of imports which will reduce the import of goods. By how much the volume of imports will decline depends on the demand elasticity of imports. The demand elasticity of imports, in turn, depends on the nature of goods imported by the devaluing country. If it imports consumer goods, raw materials and inputs for industries, its elasticity of demand for imports will be low Thus it is only when the sum of the elasticity of demand for exports and the elasticity of demand for imports is greater than one (**e >1**) that devaluation will improve the balance of payments of a country devaluing its currency.

This means, devaluation helps to improve BOP deficits of a country by increasing its exports and reducing its imports. But the extent to which it will succeed depends on the country's price elasticities of domestic demand for imports and foreign demand for exports. .

2.2.2 Growth Theories

The modern theories of economic growth began with the critique of mercantilism by the physiocrats and the classical economists. The physiocrats stressed the importance of agriculture

as the source of productive capacity and saw urban industry as sterile (Machina and Rothschild, 2006).

2.2.2.1 Classical Theory of Growth

The classical theory of economic growth was a combination of economic work done by some economists like Adam Smith (1776), David Ricardo (1817), Robert Malthus (1827) and Solow (1956). The classical economists provided different types of definitions of production and sources of wealth creation. They saw manufacturing as one of the key elements in wealth creation and valued production for the market than the interest of national economy. David Ricardo viewed trade as a great benefit to a nation as one could buy a good more cheaply from abroad than his own country. This line of thinking by David Ricardo provided the building block of the "theory of comparative advantage" which is the central argument in favour of free trade as a component of economic growth. Adam smith also stressed the importance of trade as a vent for surplus production and as a means of widening the market, improving division of labour and the level of productivity (Schumacher, 2012)

The classical economists assert that capital accumulation is the major determinant of economic growth and view growth as a function of investment. The level of investment leads to higher profit which in turn leads to higher level of investment and economic growth. The classical theory asserts that every economy has a steady state GDP and any deviation from that steady state is temporary and will eventually return. This theory is based on the believe that when there is a growth in GDP, population would increase and the increase in population has an adverse

effect on GDP due to the higher demand on limited resources from a larger population. (Machina and Rothschild, 2006).

This means that the classical growth theory assigns the role of savings and investment as tools that would trigger economic growth andanincreasing population on limited resources as a hindrance to economic growth of a country. However, the classical theory was criticized because technology which is seen as the most critical factor in production was held constant and also economies of scale were ignored in production process.

2.2.2.2 Neo - Classical Theory of Growth

The Neo-classical theory of growth recognizes the work of Swan T.W and Robert Solow (1970). These authors made important contributions to economic growth theory in developing what is now known as the Solow-Swan growth model. The theory focuses on three factors that impact economic growth: labor, capital, and technology, or more specifically, technological advances. The theory views output per worker (growth per unit of labor) to increase with the output per capita (growth per unit of capital) but at a decreasing rate (Diminishing marginal returns). Therefore, there will be a point at which labor and capitalreach an equilibrium state. Solow-Swan asserts that'it is the amount of labor, capital and technological advances that really impact on the economic growth of a nation' (Marin, 1992). Thus, Solow-Swan model states that economic growth will not take place unless there are technological advances (Marin, 1992). The theory also assumes that in the long run, the constant-returns to scale apply, no technical progress takes place in the economy, the stock of capital can be adapted in capital intensive technology and that labor and capital are substitutes. (Krugman,*et al.*,2012).

This means that economic growth of a country could be determined by the amount of productive capacity of an economy;labor, capital and technological development. However, the neo-classical theory captures the importance of efficient markets and investment in economic growth and development but ignores more important factors and thus fails to provide a long-term solution to developing countries.

2.2.3 Theories of Inflation

Thetheories of inflation reviewed under this section include the quantity theory, the demand pull theory and cost push theory of inflation.

2.2.3.1 Quantity Theory of Inflation

The quantity theory formed the central core of 19th century classical monetary analysis and provided the dominant conceptual framework for interpreting contemporary financial events and formed the intellectual foundation of orthodox policy prescription designed to preserve the gold standard (Totonchi, 2011).The quantity theoryof inflation asserts that changes in the general level prices are determined primarily by changes in the quantity of money in circulation (Totonchi, 2011).David Hume (1711-1776) provided the first dynamic process analysis of how the impact of a monetary change spread from one sector of the economy to another, altering relative price and quantity in the process. Irving Fisher (1876-1947) in his famous equation of exchange(**MV=PT),** shows how increase in money supply leads to increase in price level. Fisher and other neo-classical economists, such as Arthur Cecil Pigou (1877- 1959) of Cambridge, demonstrated that monetary control could be achieved in a fractional reserve-banking regime through the control of an exogenously determined stock of high power money (Totonchi, 2011).

The monetarists on the other hand, viewed money supply as the "dominant, though not exclusive" determinant of both the level of output and prices in the short run and of the level of prices in the long run. The long- run level of output is not influenced by the money supply (Gokal, 2004). Modern quantity theory led by Milton Friedman (1912-2006) holds that "inflation is always and everywhere a monetary phenomenon that arises from a more rapid expansion in the quantity of money than in total output. The monetarists also employed the familiar identity of exchange equation of Fisher (Jalil, 2011).

This means that there is a direct relationship between the quantity of money in an economy and the level of prices of goods and services.

2.2.3.2 Demand Pull Theory of Inflation

John Maynard Keynes (1883-1946) and his followers view increase in aggregate demand as the source of inflation; when the value of aggregate demand exceeds the value of aggregate supply at the full employment level, the inflationary gap arises. The larger the gap between aggregate demand and aggregate supply, the more rapid is the inflation (Jalil, 2011). According to this theory, any policy that causes a decrease in each component of total demand is effective in reduction of pressure demand and inflation. The theory assertsthat a reduction in government expenditure and tax increase can help to control the volume of money alone or together which can be effective in reducing effective demand and inflation control. Also, in difficult conditions when a country is experiencing hyperinflation during war, the control of volume of money or decrease in general expenditure and increase in tax can get along with direct action for control on demand (Totonchi, 2011).

This means that inflation could be caused by the increase in aggregate demand over aggregate supply at full employment level in the economy which could explain one of the causes of inflation in most developing countries.

2.2.3.3 Cost Push Theory of Inflation

The cost-push theory views inflation to be caused by wage increase enforce by unions and increase in profit by employers (Essien, Akpan and Etim, 2011; Jalil, 2011). This theory asserts that the basic cause of inflation is the rise in money wages more rapidly than the productivity of labor and that labor unions press employers to grant wage increases considerably, thereby raising the cost of production of commodities which forces employers to raise the prices of their products (Jalil, 2011). The increase in pricesinduces unions to demand higher wage thereby leading to cost-push or wage-push inflation (Piana, 2001). Cost-push inflation may be further aggravated by upwardadjustment of wages to compensate for rise in cost of living because few sectors of the economy may be affected by increase in money wages and prices of their products may be rising. This result to increase in cost of production of other sectors and thereby pushing up the prices of their products (Essein et al. (2011). Increase in the price of imported raw materials may lead to cost-push inflation. Also, oligopolistic and monopolistic firms raise the price of their products to offset the rise in labor and cost of production to earn higher profits (Blanchard, 2013).

This means that inflation could be caused by an increase in prices of inputs such as labour, raw materials etc. The increase in price of these factors of production leads to an increase in the

prices of goods and services by producers.This also explains one of the causes of inflation of developing countries like Nigeria.

2.2.4 TradeTheories

2.2.4.1 Mercantilism

Theories of trade could be first traced to the era of mercantilism which was popularized by Adam Smith (1776) in his book titled "The Wealth of Nations". The theory of mercantilism holds that countries should encourage exports and discourage imports. Mercantilism asserts that a country's wealth depends on the balance of export minus import. According to this theory, government should play an important role in the economy towards encouraging export and discouraging imports by using subsidies and taxes, respectively. Thus, exports was treated as good as it helped in earning gold, whereas, imports was treated as bad as it led to the outflow of gold. Thus, if a nation has abundant gold, it is considered to be a wealthy nation (Blaug, 1978).

This means that exports through trade could serve as a source of wealth to a nation. However, mercantilism only emphasized the importance of a favourable balance of trade and thus sees imports as bad and exports as good. But it is difficult to understand how all nations could be exporters only without being importers.

2.2.4.2 Classical Theories of International Trade

The classical theory of trade began with the 'absolute advantage theory' by Adam Smith in 1776. The theory asserts that a country should specialize in those products, which it can produce efficiently and stressed that under mercantilism, it was impossible for nations to become rich

simultaneously. Adam Smith therefore, stated that wealth of the countries does not depend upon the gold reserves, but upon the goods and services available to their citizens and he therefore concluded that trade would be beneficial for both the countries if country A exports the goods, which it can produce with lower cost than country B and import the goods, which country B can produce with lower cost than country A (Brander, 1981).

Another classical trade theory isthe 'comparative advantage theory' by David Ricardo in his theory of comparative advantage in his book titled 'Principles of Political Economy and Taxation' in 1817. The theory views trade to be beneficial for two countries if one country has absolute advantage in all the products and the other country has no absolute advantage in any of the products.According to Ricardo (1817), "a nation, like a person, gains from the trade by exporting the goods or services in which it has its greatest comparative advantage in productivity and importing those in which it has the least comparative advantage" (Krugman, 1984).

This theory views that a country can benefit from trade if it specializes in the production of goods and services it can produce efficiently at a lower cost and export it to other countries that have least comparative advantage. However, the theory is highly unrealistic because it is based on the labour theory of value which takes only labour cost and neglect non-labour cost involved in the production process.

2.2.4.3 Modern Theory of International Trade

The Heckscher –Ohlin theory is another trade theory based on most of the assumptions of the classical theories of international trade and leads to the development of two important theorems; 'Heckscher –Ohlin theorem' and 'Factor price equalization theorem'.Heckscherand Ohlin have

explained the basis of international trade in terms of factor endowments. This theory asserts that regions or countries have different factor endowments and that some countries are rich in capitalwhile some are rich in labor.The theory therefore, sees factor endowment or factor abundance in terms of two criteria; Price and Physical criterions. Based on these criterion the Heckscher –Ohlintheorem asserts that "A nation should export the commodity whose production requires the intensive use of the nation's relatively abundant and cheap factor and importthe commodity whose production requires the intensive use of the nation's relatively scarce and expensivefactor"In other words, the countries in which capital is cheap and abundant shouldexport capital-intensive goods and import labour-intensive goods.On the contrary, the countries in which labour is cheap and abundant should export labor-intensive goods and import capital-intensive goods. Thus, the differences in factor intensities in the production of goods along with actual differences in factor endowments of the countries explain international differences in comparative costs of production. (Lanre, 2013).

This means that differences in factor intensities and factor endowment and international differences in comparative cost of production is the basis for trade among nations. However, Ohlin's theory only sees difference of relative factor endowments as the reason for international trade. But differences in production techniques, factor qualities, consumer's demands etc. are also important.

2.2.4.4 New Theories of International Trade

The new theories believe that the traditional trade theories (i.e. Ricardian theory and H-O theory) failed to provide a complete explanation of the structure of the world trade because empirical

evidences appear to be inconsistent with the traditional theories. Thus, the assumptions of H-O theory like perfect competition, constant returns to scale, and same technology are invalid in today's context of world trade. Hence, new theories have modified H-O theory by relaxing most of its assumptions and developed new trade theories or complementary trade theories that are based on economies of scale, imperfect competition, and differences in technology among nations (Krugman, 1979).

The new theories can bebroadly categorized into three types: Neo –technological trade theories, Intra-industry trade models and Strategic trade policy models. The neo-technological trade theories emphasize on the importance of technological innovation and the technological gap across firms and countries as a major source of international trade. Intra –industry trade refers to trade between identical countries which are exporting and importing similar but differentiated products. The intra-industry trade models developed after 1970s take into account firm level internal economies of scale and product differentiation in explaining trade between identical economies. The strategic trade policy models provide certain theoretical justification for policy intervention such as home market protection and export subsidies towards increasing exports and national welfare. These models are developed in a partial equilibrium framework by assuming oligopolistic competition. The basis of these models lies in the trade war between industrialized countries such as United States, Japan, and the European Community (Krugman and Obstfeld, 2009). This means that economies of scale, imperfect competition and differences in technology among nations as the basis for trade.

2.2.5 Theoretical Relationship between Exports and Selected Macroeconomic Variables

2.2.5.1 Exchange Rate Volatilityand Exports

The theoretical literature on the effect ofexchange rates on trade has long been a highly debated topic among economists (Mocceno and Winograd, 2006). Traditional models have examined theexchange rate volatility effect on trade based on the producer theory of the firm under uncertainty,where firm profitability is related to exchange rate fluctuations. However, some theoretical models point to apositive relationship. Baron (1976) shows how an increase in exchange rate volatility may notnecessarily lead to an adverse effect on the level of trade when hedging opportunities exist. In addition, scholars such as De Grauwe (1988) and Franke (1988) have shown that an increase in exchange rate volatility may be beneficialfor trade. Also, De Grauwe (1988) viewsthat, when exporters are sufficiently risk-averse, apositive relationship may still arise as very risk-averse firms will worry about the worst possiblescenario. When risk increases, the way to avoid a drastic decline in export revenues is by increasing the export volume. Franke (1988) stresses that volatility may increase exports if it is associatedwith an increase in the real exchange rate level.However, the most commonly held belief among scholars(see for example Akhtar and Hilton (1984), Coes (1981), Cushman (1988, 1983),Kenen and Rodrick (1986), Koray and Lastrapes (1989), Thursby and Thursby(1987), Chowdhury (1993), Arize (1995, 1999), Peree and Steinherr (1988), andAdjaye (1998)).is that higher exchange rate volatility generates uncertainty thereby increasing the level of riskiness of trading activity and this will eventually depress trade (oil and non-oil exports).Studiesconducted by Hooper and Kohlhagen (1978) revealed that higher exchange-rate volatility can lead to higher cost for risk-averse traders and less foreign trade. This is because according to the authors, there is an agreed exchange rateat the time of the trade contract, but payment is not made until the

future delivery actually takes place. Thus, if changes in exchange rates become unpredictable, this could create uncertainty about the profits to be made and, hence, reduces the benefits of international trade. However, a vast majority of economic literature contains highly ambiguous and inconsistent theoretical and empirical results on this issue (Todani and Munyama, 2005). On the contrary, other theoretical models show that higher risk presents greater opportunity for profits and thus exchange rate volatility increases risk and should therefore increase trade. The ambiguity of theoretical predictions has made the debate to become a fundamentally empirical one. Unfortunately, much of the results from empirical literature are also fraught with the same ambiguity and inconsistencies (Todani and Munyama, 2005).

2.2.5.2 Gross Domestic Products (GDP) and Exports

There are a large number of literaturesthat examined the relationship between exports and economic growth in different countries of the world. Four different hypotheses emerge from this literature. The first is the well-known export-led growth hypothesis that identifies exports as a driver of economic growth. Therefore, export-oriented strategy is relevant and countries with more trade openness will grow faster than less opened economies.According to export-led growth hypothesis, exports contributes to economic growth through different ways: It relaxes foreign exchange constraints allowing importation of capital and intermediate goods for domestic production, itallows countries to benefit from economies of scale and improve efficiency in resource allocation owing to competition in world markets, exports also gives access to advanced technologies and better management practices that lead to technological improvement in the economy. The second view posits a causality running from economic growth to exports, which is known as the growth-led exports hypothesis. Under this hypothesis, inward-

looking development strategy is appropriate to enhance economic growth. The third view suggests a bidirectional causal relationship between exports and economic. Lastly, the fourth view posits that there is no causal relationship between the two variables.The empirical evidence from this literature is however mixed and controversial across countries and methodologies (Yahaya, 2017).

However, studies conducted by Kaldor (1967)and Krugman (1984) established a one-way causality fromoutput to export. They concluded that output growth leads to increased productivity which leads to a higher growth in exports. Marin (1992), stresses that an "outward-looking" regime enhances the productivity of developed nations which in turn leads to higher economic growth.Alsoa study by Kristjanpoller and Olsonon(2014) on the relationship between non-oil exports and GDP in Latin America proves that a higher growth in exports lead to a higher growth inGDP of those nations.

2.2.5.3Inflation Rate and Exports

A higher inflation rate has a negative effect on exports as it increases the inputs costs. The availability of high cost of inputs affects indigenous producers and exporters and their global competitiveness (Cesaratto, 1999). Also, a significant increase in exports leads to increase in demand for domestic currency in international foreign exchange market since exporters are to be paid in domestic currency by foreign importers (Cesaratto, 1999). Similarly,Gokal (2004) views that inflation reduces a country's international competitiveness by making exports relatively more expensive, thus impacting on the country's balance of payment. High inflation slows down the process of economic growth while moderate inflation increases return to savers, enhances

investment, and therefore, speeds up the economic growth and exports of a country(Cesaratto, 1999).Balassa (1978) stresses that inflationary pressure influences exchange rate in a country through the increase in both domestic and external demand which lead to the rise of prices of goods and services. Thus, a rise in total demand may lead to a rise in the prices of goods and services consume within a country and exported to other countries which invariably affect the demand of its currency at the international market (Balassa, 1978).

2.2.5.4Credit to Private Sector (CPS) and Exports

The ability of a country to boost its competitiveness and grow through exports is linked to certain characteristics among whicha prominent role has been linked to the access to financial instruments that may help firms to overcome the liquidity problems associated with exporting asforeign transactions are usually characterized by higher payment, uncertainty and long cash cyclesactivities (Buono and Formai, 2013).Moreover, a vast theoretical and empirical literature has documented the need for exporters to engage in relevant fixed costs in order to enter and maintain a presence in foreign markets (see for instance Roberts and Tybout (1997), Bernard and Jensen (2004) and Melitz (2003) as cited by Buono and Formai (2013)). Similarly, Greenaway, Guariglia and Kneller (2005) stress that 'one of the most important determinants of firms' investment and participation in the export market is finance'. Therefore, Greenaway,*et al.*, (2005) concluded that firms that have better access to financial resources are capable to meeting expenses and costs associated with the export business and are more likely to increase their involvement in the exports market. Thus, access to financial credit is believed to be significant for firms, especially in developing countries where equity markets are underdeveloped. Similarly, other empirical literature on trade that established the link between exports and

financial constraints before the financial crisis of 2008, generally found evidence of a positive effect and supported the idea that exports are credit intensive compared to overall firm activity (see Minetti e Zhu (2011), Secchi et al. (2012) and Manova (2013) as cited by Buono and Formai (2013)). This literature suggests that countries with better financial institutions are able to export more. However, some recent contributions (see Paravisini et al. (2011) and DelPrete e Federico (2013)) that used highly disaggregated data did not find any evidence that exports responded more than general production to the negative credit supply shock induced by the financial crisis. They therefore, concluded that the effect found on exports is simply driven by the negative effect on firms' working capital (Buono and Formai, 2013).

2.3 Empirical Literature

There has been a growing literature on the relationship between exports (oil and non-oil) with some macroeconomic variables such as exchange rate, inflation rate, Openness etc. in different countries of the world with varied submissions and conclusions. A summary of empirical studies of the effect of some selected macroeconomic variables on non-oil exports in Nigeria and foreign countries are stated below.

Imoughele and Ismaila(2015) employed the technique of ordinary least square to investigate the impact of exchange rate on Nigeria's non-oil exports from1986 to 2013 and concluded that exchange rate, money supply and economic performance had significant impact while inflation rate was not significant at 5 percent level.

Akinlo and Adejumo (2014) investigated the impact of exchange rate volatility on non-oil exports in Nigeria from 1986 to 2008 using the technique of Error Correction Model (ECM) and

found out that there was a significant and positive relationship between non-oil exports and exchange rate volatility in Nigeria in the long-run.

Emecheta and Ibe (2014) studied the relationship between bank credit and economic growth in Nigeria from 1960 to 2011 using the technique of 'Reduced Vector Autoregression Method' and concluded that there was a significant and positive relationship between bank credit and economic growth.

Mwakanemela (2014) employed the technique of Ordinary Least Square (OLS) to investigate the 'impact of Foreign Direct Investment (FDI), Trade Openness and Inflation in the Manufacturing exports performance of Tanzania from 1980 to 2012 and found that FDI and Trade Openness had positive impact on manufacturing exports whereas Inflation rate negatively affected manufacturing exports performance in Tanzania.

Okafor(2014) used Ordinary Least Square (OLS) to study the 'Non-Oil Exports – Growth Nexus in Nigeria' from 1980 to 2014 and concluded that there is a positive and significant relationship between Non- Oil exports and economic growth in Nigeria.

Yimka, *et tal.*, (2014) employed the technique of Ordinary Least Square (OLS) to investigate the 'Effect of Foreign Exchange Regimes and some Macroeconomic Variables on Non- Oil Exports in Nigeria from 1986 to 2010 and concluded that the volume of non-oil exports in Nigeria was negatively affected by exchange rate regimes.

Buono andFormai (2013) used the technique of structural OLS to investigate the 'Impact of Bank Credit on Firm Exports in Italy from 1997 to 2009 and found that Bank credit is positively and significantly correlated with exports revenues.

Essein*et al.,* (2011) investigated the effect of price and exchange rate fluctuations on agricultural exports (cocoa) in Nigeria using Ordinary Least Square (OLS) regression method and concluded that exchange rate fluctuations positively and significantly affected cocoa exportation in Nigeria.

Mishra, P.K (2011). Used the technique of co-integration and vector error correction to investigate the causality from growth in exports using time series data from 1970 to 2009. Their study concluded that there is evidence for the existence of a long-run relationship between the two variables.

Opaluwa*et.al.,* (2010)employed the technique of Ordinary Least Square to investigate the Effect of Exchange Rate Fluctuation on Nigeria's Manufacturing Sector from 1986 to 2005 and concluded that fluctuations in exchange rates adversely affected the output of Nigeria's manufacturing sector within the period of study.

Yakub(2010) investigated the 'Effect of Exchange Rate on Output of Different Sectors of Nigerian Economy' from 1970 to 2007 using the technique of modified IS-LM frame work and concluded that exchange rate instability had a significant and contractionary effect on agricultural and manufacturing outputs in Nigeria.

Mohamad*et al.,*(2009) studied 'The Role of Exchange Rate and Other Economic Fundamentals on the Exports Performance of Indonesia, Malaysia, Singapore and Thailand' using panel data

estimation and pooled mean group and concluded that real exchange rate misalignment and its volatility had strong and negative impact on exports performance of those countries.

Adama (2008) used the technique of granger causality to investigate the 'Causal Relationship between Exports and Economic Growth in Nigeria' from 1975 to 1985 and concluded that there is a feedback causality between economic growth and exports .

Masoud and Rastegari (2008) studied 'The Effect of Real Exchange Rate and Certain Factors on Non-Oil Exports in Iran' from 1985 to 2005 using the technique of static ordinary least square and fixed effect based on two stage least square and concluded that Iran's non-oil exports is negatively related to appreciation of real exchange rates.

Dhawan and Biswal (1999). Employed the technique of Johansen's co-integration to study the exports - led growth hypothesis in India using real GDP, real exports and terms of trade from 1961 to 1993. Their findings indicated that causality runs from growth in GDP and terms of trade to growth in exports.

Mallick (1996). Used the technique of Engle Granger co-integration and vector error correction model to investigate the direction of causality from growth in income to growth in exports in India from 1950 to 1992. The findings provide evidence that the direction of causality is from growth in income to growth in exports.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction

This section contains the type and source of data, theoretical framework, empirical framework, model specification and estimation technique.

The methodology used in this study includes bothdescriptive and econometric analyses. The descriptiveanalysis employs the use of line plots, averages, and percentages. The econometric analysis includes Autoregressive Distributed Lag (ARDL)bounds testing modelto investigate the impact of selected macroeconomic variables (real GDP, exchange rate, inflation rate, and credit to private sector) on non-oil export in Nigeria within the period (1986-2015). In order to establish an acceptable result, the study examinedthe time series characteristics of the variables by the use of the Augmented Dickey Fuller (ADF) unit root test, Philip and Peron test, Co-integration and Error correction model tests.

3.2 Types and Sources of Data

This study usedsecondary and annual time seriesdata covering the period of 30 years (1986-2015). This period is chosen because it corresponds to the period when liberalization policies were introduced and also witnessed tremendous reforms to enhance diversification of Nigeria's Non-oil exports. The data for this study was sourced from Central Bank of Nigeria (CBN) statistical bulletin,annual reports and statement of accounts of2016. 2015, 2014, 2013,2010, 2009, 2005 and 1990.

3.3 Theoretical Framework

This study is linked to the classical theory of trade liberalization arguments postulated by both Adam Smith (1776) and David Ricardo (1817). The classical are of the view that the practice of opening up the economy facilitates trade and cooperation amongst countries in the world. Adam Smith (1776) stressed the importance of trade as a ventfor surplus production and as a means of widening the market thereby improving division oflabour and the level of productivity (Schumacher, 2012). David Ricardo (1817) also developed the theory of comparative advantageand showed rigorously in his 'Principles of Political Economy and Taxation'that on the assumptions of perfect competition and full employment of resources, countries can reap welfare gains by specializing in the production of those goods with thelowest opportunity cost and trading the surplus of production over domestic demand (David, 2011).

Another theoretical basis for this study is the model of trade risks developed by Hooper and Kohlhagen (1978) and used by Machina and Rothschild (2006). The model predicts a negative relationship between exchange rate uncertainty-risk and trade for all risk-averse firms. It presents the classical view on the issue of exchange rate risk. The model can be used to explain both a positive and a negative relationship, depending on the degree of risk-aversion of firms. This theoretical model predicts a negative relationship between exchange rate fluctuation and the volume of trade when economic agents are risk-averse.

3.4Model Specification

In order to achieve the stated objectives, this study developeda functional relationship using Autoregressive Distributed Lag (ARDL) model so as to determine their theoretical validity.

This study assumes that variations in the selected macroeconomic variables have implications for non-oil exports (aggregate and disaggregate). In other words changes in non-oil exports are a function of changes in real GDP, exchange rate, inflation rate and credit to private sector. This can be stated in a functional relationship as:

ANOE = f (MEV +K)…….. ..(3.1)

AGRE = f (MEV +K)……...(3.1.1)

MNFE = f (MEV +K)…… (3.1.2)

SLME = f (MEV + K)……... (3.1.3)

Where

ANOE = Aggregate non-oil exports.

AGRE = Agricultural exports

MNFE = Manufacturing exports

SLME = Solid minerals exports

MEV= Macroeconomic variables (real GDP, exchange rate, inflation rate and credit to private sector), and K = other factors that determine non-oil exports

Thus:

ANOE = f (RGDP+EXR+INF+CPS)……. …..... (3.1.4)

AGRE = f (RGDP+EXR+INF+CPS)……. (3.1.5)

MNFE = f(RGDP+EXR+INF+CPS)…….. (3.1.6)

SLME = f (RGDP+EXR+INF+CPS)……. (3.1.7)

Where: ANOE= aggregate non-oil exports, AGRE = agricultural exports, MNFE = manufacturing exports, SLME = solid mineral exports, RGDP= real GDP, EXR=exchange rate, INF= inflation rate, CPS = credit to private sector. The ARDL representations of equations (3.1.4), (3.1.5), (3.1.6) and (3.1.7) are formulated as follows:

$$\Delta ANOE_t=a_0+\sum a_1\Delta ANOE_{t-i}+\sum a_2\Delta RGDP_{t-i}+\sum a_3\Delta EXR_{t-i}+\sum a_4\Delta INF_{t-i}+\sum a_5\Delta CPS_{t-i}+a_6ANOE_{t-1}+a_7RGDP_{t-1}+a_8EXR_{t-1}+a_9INF_{t-1}+a_{10}CPS_{t-1}+U_1 \quad (3.1.8)$$

$$\Delta AGREt=b_0+\sum b_1\Delta AGRE_{t-i}+\sum b_2\Delta RGDP_{t-i}+\sum b_3\Delta EXR_{t-i}+\sum b_4\Delta INF_{t-i}+\sum b_5\Delta CPS_{t-i}+b_6AGRE_{t-1}+b_7RGDP_{t-1}+b_8EXR_{t-1}+b_9INF_{t-1}+b_{10}CPS_{t-1}+U_2 \quad (3.1.9)$$

$$\Delta MNFEt=d_0+\sum d_1\Delta MNFE_{t-i}+\sum d_2\Delta RGDP_{t-i}+\sum d_3\Delta EXR_{t-i}+\sum d_4\Delta INF_{t-i}+\sum d_5\Delta CPS_{t-i}+d_6MNFE_{t-1}+d_7RGDP_{t-1}+d_8EXR_{t-1}+d_9INF_{t-1}+d_{10}CPS_{t-1}+U_3 \quad (3.1.10)$$

$$\Delta SLMEt=e_0+\sum e_1\Delta SLME_{t-i}+\sum e_2\Delta RGDP_{t-i}+\sum e_3\Delta EXR_{t-i}+\sum e_4\Delta INF_{t-i}+\sum e_5\Delta CPS_{t-i}+e_6SLME_{t-1}+e_7RGDP_{t-1}+e_8EXR_{t-1}+e_9INF_{t-1}+e_{10}CPS_{t-1}+U_4 \quad (3.1.11)$$

Where:

Δ denotes the first difference operator; α0 is the drift component, Ut is the white noise residuals.

The first until fifth expressions (β1–β5) on the right-hand side correspond to the long-run relationship. The remaining expressions with the summation sign (α1– α5) represent the short-run dynamics of the models.

3.5Empirical Framework

Theempirical investigation carried out in this study estimated the impact of selected macro-economic variables (real GDP, exchange rate, inflation rate and credit to private sector) on non-oil exports (aggregate and disaggregate) in Nigeria within the period (1986-2015). This study adopts the work of Musibau and Muhammad (2011) who employed the technique of Autoregressive Distributed Lag (ARDL) bounds testing model to investigate the relationship between money supply, capital stock, inflation and economic growth in Nigeria within the period (1975-2008). The rationale for the adoption of this technique isbased on the advantages of the ARDL bounds testing for testing the existence of a co-integrating relationship of variables either in the short-run or long-run and it also overcomes the inadequacies associated with the presence of a mixture of I(0) and I(1) regressors in Johansen's type framework (Narayan, 2005).

3.6Estimation Technique

The estimation technique used in this study is the Autoregressive Distributed Lag (ARDL) bounds testing. The ARDL bounds testing co -integration technique is used to determine the long-run relationship between series with different order of integration (Pesaran and Shin, 1999). The technique gives both short-run dynamics and long-run relationship of the considered variables and it yields consistent estimates of the long-run co-efficient that are asymptotically normal irrespective of whether the underlying regressors are integrated of order one I(1) or of order zero I(0) or fractionally integrated (Pesaran and Shin, 1999). In its basic form ARDL bounds testing regression model is specified as follows:

$$\mathbf{Y_t = \alpha_0 + \alpha_1 y_{t-1} + \ldots\ldots + \alpha_p y_{t-p} + \beta_0 x_t + \beta_1 x_{t-1} + \beta_2 x_{t-2} + \ldots\ldots + \beta_q x_{t-q} + e_t \ldots\ldots\ldots \quad (3.1.12)}$$

The ARDL model as represented in equation (3.1.12) is "autoregressive" in the sense that the dependent variable (**Yt**) is explained (in part) by lag values of itself. It also has a 'distributed lag' component in the form of successive lags of the explanatory variables (**x**) where **et** is a random distributed term. The long-run relationship of the underlying variables is detected through the F-statistics (Wald test). Long-run relationship is said to be established when the F-statistics exceeds the critical value band (Pesaran and Shin, 1999).

The F-test is a test of hypothesis of no co-integration among the variables against the existence or presence of co-integration among the variables, denoted as:

Ho: $\beta 1 = \beta 2 = \beta 3 = 0$ i.e., there is no co-integration among the variables against

H_1: $\beta 1 \neq \beta 2 \neq \beta 3 \neq 0$ i.e., there is co-integration among the variables.

Short run parameters are estimated using the error correction mechanism (ECM). Under ECM technique, the long-run relationship is supported by the negative and significant value of the error correction term (Pesaran and Shin, 1999).

3.7 A priori Expectations

Apriori expectations are X_2, X5> 0; X_3, X_4< 0 .Where:X2, X3, X4 and X5 are the coefficients of real GDP, exchange rates, inflation rates and credit to private sector respectively.

Theoretically, it is expected that exchange rate fluctuation depress trade. A number of studieshave argued that exchange rate volatility hinders exports (see for example Akhtar and Hilton (1984), Coes (1981), Cushman (1988, 1983),Kenen and Rodrick (1986), Koray and Lastrapes (1989), Thursby and Thursby(1987), Chowdhury (1993), Arize (1995, 1999), Peree

and Steinherr (1988), andAdjaye (1998)).If traders are risk-averse, uncertainty in the exchange rate fluctuation causes them to trim down their activities to reduce their exposure to the effects of the fluctuation. This view is based on the notion that if exchange rate volatility increases, profit risk increases, which in turn reduces trade benefits and consequently the volume of exports(Aurangzeb et.al; 2005).In contrast, scholars like Asseery and Peel (1991), Franke (1991), Giovannini (1988), Kroner and Lastrapes (1993), and Sercu and Vanhulle (1992) have found contrary evidence: that there has been a positive significant relationship between trade flows and exchange rate volatility.

The level of economic activity in the economy, measured through Gross Domestic Product (GDP), is expected to have a positive impact on the volume of non-oil exports. An increase in GDP will lead to an increase in domestic production, increase in national income and thus trade(Olowofeso, *et al.*,2015).

The Inflation Rate (INF) is expected to have a negative relation with non-oil exports. Inflation is an increase in the general price level. An increase in the general price level will lead to an increase in the prices of non-oil products, through the multiplier effect. According to the law of demand, an increase in price reduces demand. The increase in price will reduce the demand of non-oil exports and eventually output (Mwakanemela, 2014).

Credit to Private Sector (CPS) is expected to impacts positively on Real Growth Domestic Product (RGDP) which would have a positive effect on non-oil export. The increase in credit to Private sector is expected to enhance investment in economic activities (Olowofeso, *et al.*,2015).

CHAPTER FOUR

4.0 DATA PRESENTATION, ANALYSIS AND DISCUSSION OF RESULTS

4.1 Introduction

This chapter presents the results of the dataanalysis and discussion of results. Annual time series data were used and summary of results from the E-views were presented in a tabular form from which analysisand discussion of the results were carried out.

4.1.1Unit Root Test

Engle and Granger (1987) have demonstrated that if time series variables are non - stationary, all regression results will differ from the conventional theory of regression coefficient and will therefore be spurious and misleading, but a linear combination of two or more non-stationary series may be stationary. If such a stationary linear combination exists, the non-stationary time series are said to be co-integrated and therefore a long-run equilibrium relationship among the variables is said to exit. Thus, in order to avoid spurious results, a test of stationary of the time series data was carried out via Augmented Dickey Fuller (ADF) and Philip-Peron tests to investigate whether variables used in this study have a unit root or not. The hypotheses tested with ADF were: Null hypothesis: Variables contain unit root and hence non – stationary, against Alternative hypothesis: Variables do not contain unit root and hence stationary.

The result of Augmented Dickey Fuller (ADF) unit root test in Table 4.1 showsthatinflation rateis stationary at levels I(0), because the ADF value of the variable at level is greater than the McKinnon 5 percent critical value, whereas aggregate non-oil, agricultural,manufacturing, solid

minerals, credit to private sector, exchange rates and real GDP are stationary at first difference I(1) because the ADF values of each of the variables at first difference is greater than its respective McKinnon 5 percent critical values.

Table 4.1Results of Augmented Dickey Fuller (ADF) Unit Root Test

Variable	ADF calculated value in level	ADF calculated value at 1st difference	McKinnon 5% critical value	Order of integration
ANOE	-	-3.822520	-3.580623	I(1)
AGRE	-	-6.989691	-3.580623	I(1)
MNFE	-	-3.224248	-2.986225	I(1)
SLME	-	- 7.292928	--3.580623	I(1)
CPS	-	-4.610552	-3.580623	I(1)
EXR	-	-4.768344	-3.580623	I(1)
INFL	-4.630893	-	-3.580623	I(0)
RGDP	-	-7.118117	-3.580623	I(1)

Source: Eviews Results Output, 2017

Table 4.2also presents the results of the Philip-Peron unit root test of the variables under study which also supported the results in ADF test.

Table 4.2Results of Philip-Peron (PP) Unit Root Test

Variable	ADF calculated value in level	ADF calculated value at 1st difference	McKinnon 5% critical value	Order of integration
ANOE	-	-3.819957	-3.580623	I(1)
AGRE	-	-7.017836	-3.580623	I(1)
MNFE	-	-2.343052	-1.953381	I(1)
SLME	-	-7.665248	-3.580623	I(1)
CPS		-4.583860	-3.580623	I(1)
EXR		-4.767534	-3.580623	I(1)
INFL	-3.639359	-	-3.574244	I(0)
RGDP		-7.062631	-3.580623	I(1)

Source: Eviews Results Output, 2017

4.1.2 Analysis and Discussion of Results

The results of the ADF and PP unit root tests in Tables 4.1 and 4.2 show that the variables under investigation are stationary at level 1(0) and first order difference 1(1). The F-statistic bound test for co-integration was conducted in order to ascertain the existence of a long-run relationship among the variables. The results of critical bound test of co-integration among these variables for the models are shown in Table 4.3.

Table 4.3 Bound TestCo-integration Analysis for the Models

Variable	F-Statistics	Critical Bounds At 5%		Decision Rule
		Lower Bound	Upper Bound	
ANOE	5.347141	3.47	4.57	Null hypothesis Rejected
AGRE	9.617395	3.47	4.57	Null hypothesis Rejected
MNFE	6.652180	3.47	4.57	Null hypothesis Rejected
SLME	12.60253	3.47	4.57	Null hypothesis Rejected

Source: Eviews Results Output, 2017

As indicated in Table 4.3 the calculated F-statistics of 5.347141, 9.617395, 6.652180 and 12.60253 for Aggregate Non-Oil Exports (ANOE), Agricultural Exports (AGRE), Manufacturing Exports (MNFE) and Solid Mineral Exports (SLME) are higher than their respective lower and upper bound critical valuesof 3.47 and 4.57respectively at 5 percentsignificance level. This result shows that the null hypotheses of no co-integration among the variables are rejected and the alternative hypotheses of co-integration are accepted at 5 percent level of significance. Thistherefore, indicates that there is a long-run co-integrating equilibrium relationship among the variables.

4.1.3The Long- Run and Short-Run Dynamics of Aggregate Non-Oil Exports

The long run coefficients for aggregate non-oil exports are presented in Table 4.4. The estimated long-run coefficients for real GDP, exchange rate, inflation rate, and credit to private sector are 0.048059, -0.014446, -0.036619 and 0.211549 respectively. The results show that a 1 percent increase in real GDP leads to 0.05 percent increase in aggregate non-oil exports, whereas a 1 percent increase in exchange rate fluctuation induces a 0.01 percentdecrease in the volume of aggregate non-oil exports.Similarly, a 1 percent increase ininflation leads to a 0.04 percentdecrease in aggregate non-oil exports. Also, a 1 percent increase in credit to private sectorpositively influences theaggregate non-oil exportsby 0.21 percent.

4.4 Estimated Long Run Coefficients for Aggregate Non-Oil Exports

Regressor	Coefficient	Standard Error	t. statistics	Probability
Constant	0.470706	0.498968	0.943357	0.3568
RGDP	0.048059	0.058716	0.818499	0.4227
EXR	-0.014446	0.005893	-2.451531	0.0235
INF	-0.036619	0.131532	-0.278403	0.7836
CPS	0.211549	0.337552	0.626716	0.5379

Source: Eviews Results Output, 2017

Theestimated resultsin Table 4.4show that the coefficients of real GDP, exchange rate, inflation rateand credit to private sector have the expected signs (positive) but only the coefficient of exchange rate that is significant at 5 percent level.

Similarly, the resultspresented in Table 4.5 indicatethattheshort-run dynamics of aggregate non-oil exports is in conjunction with the long-run relationships as shown by the value and sign of lagged error correction term (ECT). As required ECT has a negative sign and it is significant at 5 percent. This indicates that there exist a long run relationship between the dependent variables and the regressors implying thatreal GDP, exchange rate fluctuations,

inflation rate and credit to private sector have a long run equilibrium relationship with the aggregate non-oil exports which also supports the results of ARDL bound testing. The value of ECT is -0.9997 which shows a strong speed of adjustment to equilibrium. Thus 100%of the disturbance/disequilibrium converge back to the long term equilibrium within one period.

Table 4.5Estimated ECM for Aggregate Non-oil Export Model

Regressor	Coefficient	Standard Error	t. statistics	Probability
RGDP	0.048046	0.059950	0.801445	0.4323
EXR	-0.014442	0.004836	-2.986226	0.0073
INF	-0.036610	0.129085	-0.283608	0.7796
CPS	-0.395963	0.275306	-1.438265	0.1658
ECT-1	-0.999744	0.178780	-5.592037	0.0000

Source: Eviews Results Output, 2017

R^2 = 0.467807 **D.W – Statistics = 2.077669**

Adjusted R^2 =0.281540 **F-statistics = 2.511483**

S.E of Regression = 0.357392 **Prob(F-statistics) = 0.050182**

From Table 4.5 it can be seen that the independent variables; real GDP,exchange rate, and inflation rate have the expected signs but only exchange rate that is statistically significant at 5 percent level. However, credit to private sector hasthe unexpected sign (negative) but is statistically insignificant at 5 percent level.

The diagnostic checks for the aggregate non-oil exports model showan R square value of0.467807 which means that 47 percent variations of the dependent variable was explained by the model and the remaining53 percent by other explanatory variables not explained in the model which was taken care off by the error term. The Durbin Watson (DW) statistic is 2.077669which shows that the model is not spurious. The modelalsopasses the testsof serial correlation of

Breusch-Godfrey, normality (jarqueberatest), Ramsey RESET and heteroscedasticity as shown in Table 4.6.

Table 4.6 Diagnostic Test for Aggregate Non-Oil Exports

Diagnostic	F-statistics	Probability
Serial Correlation	0.083249	0.7761
Heteroskedasticity	1.002723	0.4581
JargueBera	2.817038	0.2445
Ramsey RESET	4.39770	0.0496

Source: Eviews Results Output, 2017

The stability of the parameters was tested through the CUSUM (cumulative sum of recursive residuals) and the CUSUMSQ (cumulative sum of recursive residuals of square). These tests are suggested by Pesaran and Pesaran (1997) for measuring the parameter stability. The following Figures 4.1a and 4.1b show the CUSUM and the CUSUM square testof parameterstabilityfor aggregate non-oil exports and indicate that the parameters were stable within the study period.

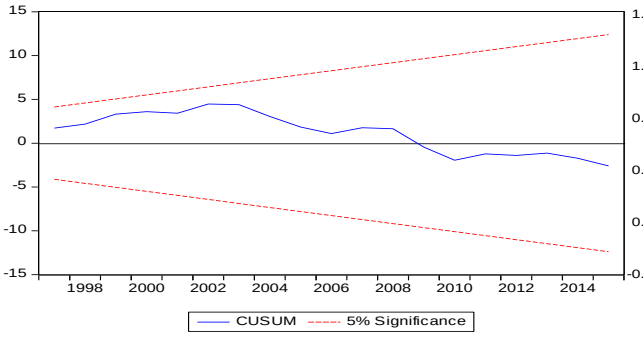


Figure 4.1a

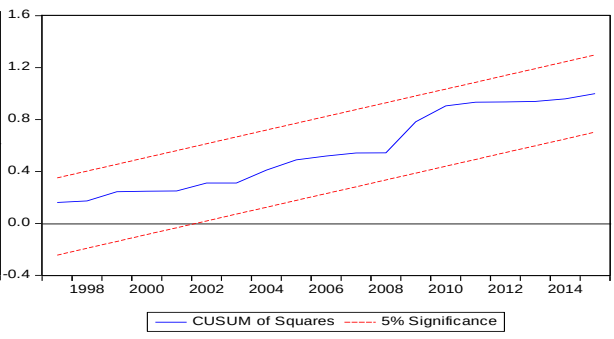


Figure 4.1b

Source: Eviews Results Output, 2017

4.1.4The Long-Run and Short-Run Dynamics of Agricultural Exports

The long-run coefficients for agricultural exports are presented in Table 4.7. The estimated long-run coefficients for real GDP, exchange rate, inflation rate, and credit to private sector are 0.102773, -0.995595, 0.0066732 and 0.000149 respectively. The results show that a 1 percentincrease in real GDP leads to 0.10 percent increase in agricultural exports. Similarly, a 1 percent increase in exchange rate fluctuation induces a 0.99 percent decrease in the volume of agricultural exportsin the long run while a 1 per cent increase ininflation led to a 0.007percentincrease in agricultural exports. Also, a 1 percent increase in credit to private sector positively influenced agricultural exports in the long run by 0.0001 percent. However, only the coefficient of exchange rate that is significant at 5 percent level.

Table 4.7 Estimated Long Run Coefficients for Agricultural Exports

Regressor	Coefficient	Standard Error	t. statistics	Probability
Constant	0.310591	0.502454	0.618148	0.5435
RGDP	0.102773	0.066769	1.539246	0.1394
EXR	-0.995595	0.379777	-2.621527	0.0163
INF	0.066732	0.120495	0.553816	0.5858
CPS	0.000149	0.001262	0.117942	0.9073

Source: Eviews Results Output, 2017

From the results in Table 4.7, real GDPand credit to private sector havethe expected signs in the long-run, inflation rate also has the unexpected sign (positive) but arestatistically insignificant at 5 percent level.

Similarly, the results presented in Table 4.8show that the short-run dynamics of agricultural exports is in support of the long-run relationships as shown by the value and sign of lagged error correction term (ECT). As required ECT has a negative sign and highly

significant.Thismeans that there exist a long run relationship between agricultural exports and the regressorsimplying that real GDP, exchange rate fluctuations, inflation rate and credit to private sector have a long run relationship with agricultural exports which also supported the results of ARDL bound testing. However, only the coefficient of exchange rate that is statistically significant at 5 percentlevel. The value of ECT is -1.31748 which shows a strong speed of adjustment to equilibrium. Thus 132 percent of the disturbance/disequilibrium converges back to the long term equilibrium within one period.

Table 4.8 Estimated ECM for Agricultural Export Model

Regressor	Coefficient	Standard Error	t. statistics	Probability
RGDP	0.135402	0.091178	1.485025	0.1531
EXR	-0.583846	0.326565	-1.787843	0.0890
INF	0.087918	0.160034	0.549368	0.5888
CPS	0.000196	0.001668	0.117523	0.9076
ECT (-1)	-1.317477	0.190491	-6.916215	0.0000

Source: Eviews Results Output, 2017

R^2 = 0.327668 D.W – Statistics = 2.376282

Adjusted R^2 = 0.092351 F-statistics = 1.392455

S.E of Regression = 0.458654Prob(F-statistics) = 0.262377

The diagnostic checks for the agricultural exports show an R square value of 0.327668 which reveals that 33 percent variations of the dependent variableis explained by the model and 67 percent by the error term. The Durbin Watson (DW) statistics is 2.376282 which indicate that the model is not spurious. The modelalso passes the testsof serial correlation of Breusch-Godfrey test), normality (jarqueberatest), Ramsey RESET and heteroscedasticity as shown in Table 4.9.

Table 4.9 Diagnostic Test for Agricultural Exports

	F-statistics	Probability
Serial Correlation	2.220328	0.1526
Heteroskedasticity	0.707819	0.6659
JargueBera	3.794183	0.1500
Ramsey RESET	2.36763	0.1404

Source: Eviews Results Output, 2017

The stability of the parameters was tested through the CUSUM (cumulative sum of recursive residuals) and the CUSUMSQ (cumulative sum of recursive residuals of square). The following figures 4.2a and 4.2b show the CUSUM and the CUSUM of square test of parameter stability for agricultural exports and indicate that the parameters are stable within the study period.However, there is structural break in CUSUM of squares in some periods.

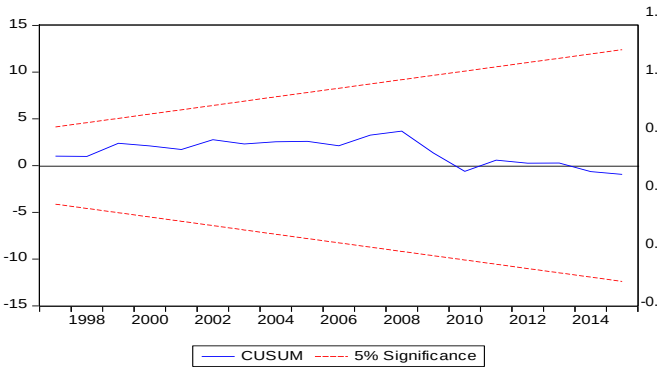


Figure 4.2a

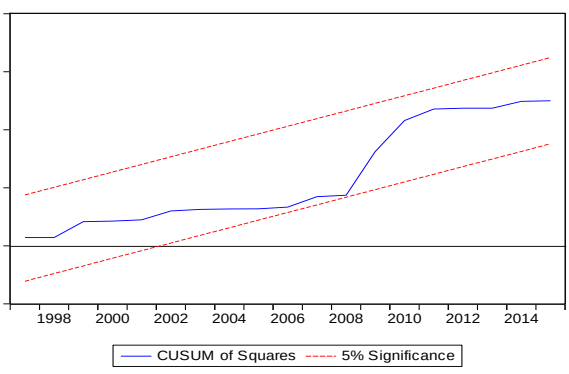


Figure 4.2b

Source: Eviews Results Output, 2017

4.1.5The Long-Run and short-Run Dynamics of Manufacturing Exports

The long-run coefficients of manufacturing exports are presented in Table 4.10. The estimated long-run coefficient for real GDP, exchange rate, inflation rate, and credit to private sector are -

0.024353, -0.016425, -0.193935 and 0.000300 respectively. The results show that real GDP has an unexpected sign (negative) but statistically insignificant at 5 percent level. Exchange rate, inflation rate and credit to private sector have the expected signs but only exchange rate that is statistically significant at 5 percent level.

Table 4.10Estimated Long Run Coefficients for Manufacturing Exports

Regressor	Coefficient	Standard Error	t. statistics	Probability
Constant	1.366757	0.637344	2.144456	0.0445
RGDP	-0.024353	0.025404	-0.958633	0.3492
EXR	-0.016425	0.006878	-2.387859	0.0269
INF	-0.193935	0.164118	-1.181681	0.2512
CPS	0.000300	0.002117	0.141810	0.8886

Source: Eviews Results Output, 2017

The results presented in Table 4.10 indicate that a 1 percent increase in exchange rate fluctuations leads to 0.02 percent decrease in manufacturing exports in the long run. Similarly, a 1 percent increase in inflation influences manufacturing exports to reduce by 0.19 percent and a 1 percent increase in credit to private sector leads to 0.0003 percent increase in manufacturing exports in the long run. Also, results in Table 4.11shows that the short-run dynamics of manufacturing exports is in conjunction with the long-run relationships as shown by the value and sign of lagged error correction term (ECT). As required ECT has a negative sign and it is significant at 5 percent. This shows that there exist a long run relationship between the manufacturing exports and the regressorsimplying that real GDP, exchange rate fluctuations, inflation rate and credit to private sector had a long run relationship with manufacturing exports which also supported the ARDL bound testing results. The value of ECT is -1.165472 which indicates a strong speed of adjustment to equilibrium. Thus 117 percent of the disturbance/disequilibrium converges back to the long term equilibrium within one period.

Table 4.11Estimated ECM for Manufacturing Export

Regressor	Coefficient	Standard Error	t. statistics	Probability
RGDP	-0.028383	0.029775	-0.953241	0.3518
EXR	-0.019143	0.007060	-2.711587	0.0134
INF	-0.226025	0.180707	-1.250786	0.2254
CPS	-0.002190	0.001912	-1.145426	0.2656
ECT-1	-1.165472	0.189591	-6.147293	-0.0000

Source: Eviews Results Output, 2017

R^2 = 0.394647 **D.W – Statistics = 2.169100**

Adjusted R^2 = 0.182772 **F-statistics = 1.862652**

S.E of Regression = 0.539254 **Prob(F-statistics) = 0.130152**

The diagnostic checks for the manufacturing exports show that the model has an R^2 value of 0.39 which means that 39 percent variations of the dependent variables are represented by the model and the remaining61 percent by the error term. The DW statistics is 2.169indicates that the model is not spurious. The model also passesthrough the serial correlation tests (Breusch-Godfrey test), normality (jarqueberatest), Ramsey RESET and heteroscedasticity as shown in Table 4.12.

Table 4.12 Diagnostic Test for Manufacturing Exports

Diagnostic	F-statistics	Probability
Serial Correlation	0.929756	0.3470
Heteroskedasticity	0.734463	0.6456
JargueBera	0.190909	0.9090
Ramsy RESET	0.581420	0.4551

Source: Eviews Results Output, 2017

The stability of the parameters was tested through the CUSUM (cumulative sum of recursive residuals) and the CUSUMSQ (cumulative sum of recursive residuals of square). The

followingFigures 4.3a and 4.3b show the CUSUM and the CUSUM square test of parameter stability for the manufacturing exports which indicate that the parameters are stable within the study period.

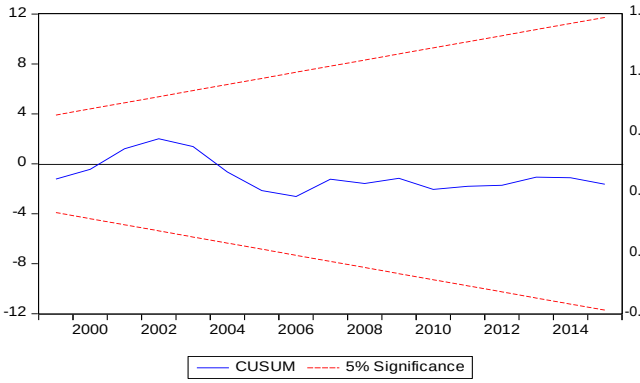


Figure 4.3a

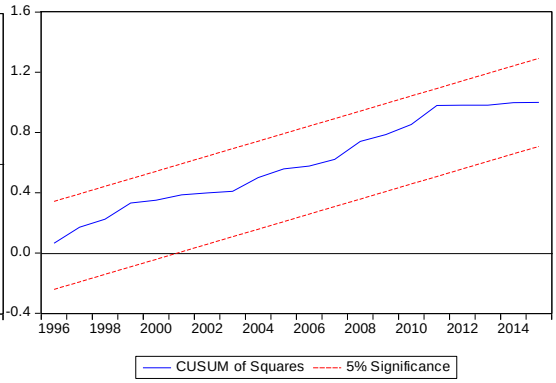


Figure 4.3b

Source: Eviews Results Output, 2017

4.1.6The Long-Run and short-Run Dynamics of Solid Minerals Exports

The long run coefficients of solid minerals export are presented in Table 4.13. The estimated long-run coefficient ofreal GDP, exchange rate, inflation rateand credit to private sector are 0.009274, -1.199506, -0.007160 and 1.515245 respectively. The results show that real GDP, exchange rate, inflation rate and credit to private sector have the expected signs but are statistically insignificant at 5 percent level.

Table 4.13 Estimated Long Run Coefficients for Solid minerals Exports

Regressor	Coefficient	Standard Error	t. statistics	Probability
Constant	0.828473	1.596499	0.518931	0.6105
RGDP	0.009274	0.230504	0.040232	0.9684
EXR	-1.199506	0.973495	-1.232164	0.2347
INF	-0.007160	0.369549	-0.019374	0.9848
CPS	1.515245	0.784356	1.931833	0.0702

Source: Eviews Results Output, 2017

Results from Table 4.13 reveal that a 1 percent increase in real GDP leads to a 0.009 percent increase in solid minerals exports while a 1 percent increase inexchange rate fluctuation causes solid mineral exports to decrease by 1.20percent. Also, a 1 percent increase in inflation rate leads to a 0.007 percent decrease in solid mineral exports. Similarly, a 1 percent increase in credit to private sector leads to a 1.52 percent increase in solid minerals exports. However, all the coefficients are not statistically significant at 5 percent level.

Table 4.14 reveals the short-run dynamics of solid mineral exports is in conjunction with the long-run relationships as shown by the value and sign of lagged error correction term (ECT). As required ECT has a negative sign and is significant at 5 percent. This shows that there is a long run relationship between the dependent variable and the regressors implying that real GDP, exchange rate, inflation rate and credit to private sector have a long-run equilibrium relationship with solid minerals exports which also supported the ARDL bound testing results. The value of ECT is -1.424222 which shows that 142 percent of the disturbance/disequilibrium converges back to the equilibrium within one period.

Table 4.14Estimated ECM for Solid Minerals Export

Regressor	Coefficient	Standard Error	t. statistics	Probability
RGDP	0.123054	0.252802	0.486759	0.6326
EXR	-0.817675	0.842581	-0.970441	0.3454
INF	-0.216446	0.432321	-0.500661	0.6230
CPS	0.045327	0.876027	0.051742	0.9593
ECT-1	-1.424222	0.182632	-7.798310	0.0000

Source: Eviews Results Output, 2017

R^2 = 0.436291 **D.W – Statistics = 2.038832**

Adjusted R^2 =0.104698 **F-statistics = 1.315741**

S.E of Regression =1.050833 **Prob(F-statistics) = 0.297412**

The diagnostic checks for the solid minerals exportsshows an R^2 value of 0.436291 whichindicates that 44 percent variations of the dependent variables is represented by the model and remaining56percent by the error term. The DW statistics is 2.04 which indicate that the model is not spurious. The model also passesthrough the serial correlation tests, normality (jarqueberatest) and heteroscedasticity as presented in Table 4.15.

Table4.15Diagnostic Tests for Solid Minerals Exports

Diagnostic	F-statistics	Probability
Serial Correlation	0.606219	0.5582
Heteroskedasticity	0.414065	0.9209
JargueBera	1.432673	0.488539
Ramsey RESET	0.119238	0.7344

Source: Eviews Results Output, 2017

The stability of the parameters was tested through the CUSUM (cumulative sum of recursive residuals) and the CUSUMSQ (cumulative sum of recursive residuals of square). The following Figures 4.4a and 4.4b show the CUSUM and the CUSUM square test of parameter stability for solid mineralsexports. As indicated the CUSUMand the CUSUM of squares are stablewithin the study period.

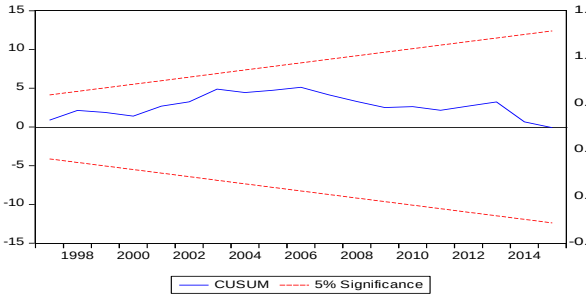


Figure 4.4a

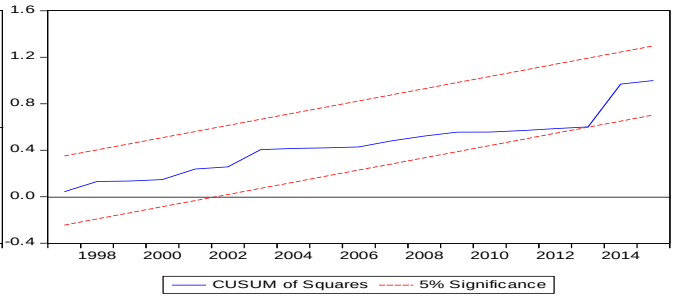


Figure 4.4b

Source: Eviews Results Output, 2017

4.1.7 Summary of Results

In order to ascertain the impact of the selected macro-economic variables (real GDP, exchange rate, inflation rate and credit to private sector) on aggregate non-oil exports and disaggregate (agricultural, manufacturing and solid minerals exports)in Nigeria from 1986 to 2015, the F-statistics of the bounds testingco-integration technique was employed. The F-statistics and critical bounds values for testing the null hypothesis of no co-integrating relationship were presented in Table 4.3. The computed F-Statisticsfor Aggregate Non-Oil Exports (ANOE), Agricultural Exports (AGRE), Manufacturing Exports (MNFE) and Solid Mineral Exports (SLME)were 5.347141, 9.617395, 6.652180 and 12.60253 respectively. The F statisticsof each of the variablewas found to exceed their respective lower and upper bounds critical values of 3.47 and 4.57 at5 percent level of significance using the Pesaranet al (2001) critical values. Therefore, the null hypotheses (H_0) of no co-integration among the variables were rejected and the alternative hypotheses (H_1) of the existence of co-integration were accepted. This implies that real GDP, exchange rate; inflation rate and credit to private sector wereco-integratedwith Aggregate non-oil, agricultural, manufacturing and solid minerals exports within the period under study which also revealed that there was a long-run equilibrium relationship among the variables.

The long run coefficientsof real GDP, exchange rate, inflation rate and credit to private sectorfor aggregate non-oil exports were 0.048059, -0.014446, -0.0236619 and 0.211549respectively. Estimated coefficients had the expected signs but only exchange rate that was statistically significant at 5 percent level. The estimated results revealed that a 1 per cent increase in real GDP led to a 0.048 percent increase in aggregate non-oil exports. Similarly, a 1 percent increase

in exchange rate fluctuation induced a 0.014percent decrease in aggregate non-oil exports, while a 1 per cent increase in inflation led to a 0.024 per cent decrease inaggregate non-oil exports and a 1 percent increase in credit to private sector positively influencedthe aggregate non-oil exports in the long run by 0.212 percent. The short run dynamics of the aggregate non-oil exports were presented in Table 4.5 and the results of the long run estimates were supported by the error correction model. The results indicated that the coefficients of real GDP, exchange rate, inflation rate and credit to private sector were 0.048046, -0.014442, -0.036610 and -0.395963 respectively. The coefficients of real GDP, exchange rate and inflation rate had the expected signs, credit to private sector (CPS) had an unexpected sign (negative) but was statistically insignificant at 5 percent level. The error correction term (ECT) was -0.9997 which is negative and statistically significant at 5 percent level.The negative value of the error term supported the results of the co-integration tests of the existence of a long-run relationship between the variables. The error correction term indicated that 100 per cent of the previous year's deviation from long-run equilibrium was restored within one period.

The diagnostic tests of the aggregate non-oil exports model presented in Table.4.6showed no evidence of autocorrelation in the disturbance or error term. The model also passed the Jaque-Bera normality tests suggesting that the errors were normally distributed. The RESET test indicated that the model was correctly specified. The R-square of 0.47 indicates that 47 per cent of the variation in aggregate non-oil exports was explained by the explanatory variables in the model. The cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) tests of structural stability as shown in Figures 4.1a and 4.1b indicated that the parameters were stable during the sample period.

The economic implication of the results of aggregate non-oil exports indicated that economic activitiescontributed positively but not significantly, exchange rate fluctuations contributed negatively but significantly, increase in prices of goods and services contributed negatively but not significantly and credit to private sector contributed positively but not significantlyto the volume of aggregate non-oil exports in Nigeria within the period of study.

For the agricultural exports, the estimated long-run coefficients of real GDP, exchange rate, inflation rate and credit to private sector were 0.102773, -0.995595, 0.066732 and 0.000149respectively. The estimated coefficients of real GDP, exchange rate and credit to private sector had the expected signs butthat of inflation rate had the unexpected sign (positive) butis statistically insignificant at 5 percent level.In order to see the short-run dynamics of the model the estimated short-run error correction model was presented in Table 4.8. The results of the long run estimates were supported by the negative value of error correction term (ECT). The error correction term (ECT) was -1.317, which is negative andstatistically significantand thus supported the results of the co-integration tests of the existence of a long-run relationship between the variables. The error correction term indicates that 132 per cent of the previous year's deviation from long-run equilibrium was restored within one period. The diagnostic tests of the agricultural exports model were computed and presented in Table. 4.9. The results showed no evidence of strong autocorrelation in the disturbance term. The model also passed the Jaque-Bera normality tests suggesting that the errors were normally distributed. The RESET test indicated that the model was correctly specified. The R-square was 0.328which indicated that 33 per cent of the variation in agricultural exports was explained by the explanatory variables and the remaining 67% by the error term. The model also passed the cumulative sum of recursive

residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) tests of structural stability as shown in Figures 4.2a and 4.2b. This indicated that the parameters were stable within the sample period.

The economic implication of the results of agricultural exports indicated that economic activities contributed positively but not significantly, exchange rate fluctuations contributed negatively and significantly, increase in prices of goods and services contributed positively but not significantly, credit to private sector contributed positively but not significantly to the volume of agricultural exports in Nigeria within the period of study.

The estimated long-run coefficientsfor the manufacturing exports of real GDP, exchange rate, inflation rate and credit to private sector were -0.024353, -0.016425, -0.193935 and 0.000300respectively. Estimated coefficientsof exchange rate, inflation rate and credit to private sector had the expected signs but real GDP had the unexpected sign (negative) but it was statistically insignificant at 5 percent. The short run dynamics of the manufacturing exports wasalso presented in Table 4.11. The short run coefficients of real GDP, exchange rate, inflation rate and credit to private sector were -0.028383, -0.019143, -0.226025 and -0.002190 respectively. The error correction term (ECT) was -1.16547 whichwas negative and statistically significant and also supported the results of the co-integration tests of the existence of a long-run relationship between the variables. The error correction term indicated that 117 per cent of the previous year's deviation from long-run equilibrium was restored within one period. The diagnostic tests of the manufacturing exports presented in Table 4.12showed no evidence of autocorrelation in the disturbance term. The model also passed the Jaque-Bera normality tests suggesting that the errors were normally distributed. The RESET test indicated that the model

was correctly specified and the R-square of 0.39 indicated that 39 percent ofthe variation in manufacturing exports was explained by the explanatory variables and the remaining 61 percent by the error term. The model also passedthe cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) tests of structural stability as shown in Figures 4.3a and 4.3b respectively. This indicated that the parameters were stable within the sample period.

The economic implication of the results for manufacturing exports indicatedthat economic activities contributed negatively but insignificantly, exchange rate fluctuations contributed negatively and significantly, increase in prices of goods and services contributed negatively but insignificantly, credit to private sector contributed positively but insignificantlyto the volume of manufacturing exports in Nigeria within the period of study at 5 percent level.

For the solid minerals exports, the estimated long-run coefficients of real GDP, exchange rate, inflation rate and credit to private sector were 0.009274, -1.199506, -0.007160 and 1.515245 respectively. The estimated coefficients of real GDP, exchange rate, inflation rate and credit to private sector had the expected signs but none of them was statistically significant at 5 percent level.In order to examine the short run dynamics of the solid minerals exports, the estimates of the error correction model were presented in Table 4.14 and the results of the long run statistics were supported. The short run coefficients of real GDP, exchange rate, inflation rate and credit to private sector were 0.123054, -0.817675, -0.216446 and 0.045327 respectively. All the coefficients had the expected signs but are statistically insignificant at 5 percent level. The error correction term (ECT) was -1.424, whichis negative and statistically significant at 5 percent level which thus supported the results of the co-integration tests of a long-run relationship between the

variables. The error correction term indicated that 142 per cent of the previous year's deviation from long-run equilibrium was restored within one period. Similarly, the diagnostic tests of the solid minerals exports model showed no evidence of autocorrelation in the disturbance or the error term. The model also passed the Jaque-Bera normality tests suggesting that the errors were normally distributed. The RESET test indicated that the model was correctly specified. The R-square of 0.436 indicated that 44 per cent of the variation in solid minerals exports was explained by the explanatory variables and the remaining by the error term. The model also passedthe cumulative sum of recursive residuals (CUSUM) test and the cumulative sum of squares of recursive residuals (CUSUMSQ) tests of structural stability within the period as shown in Figures 4.4a and 4.4b respectively.

The economic implication of the results of solid minerals indicated that economic activities contributed positively butinsignificantly, exchange rate fluctuations contributed negatively butinsignificantly, increase in prices of goods and services contributed negatively butinsignificantlyand credit to private sector contributed positively but insignificantlyto the volume of solid minerals exports in Nigeria within the period of study.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

The main objective of this study is to investigate the impact of theselected macroeconomic variables (real GDP, exchange rate, inflation rate and credit to private sector) on aggregate non-oil exports in Nigeria and the specific objectives is to investigate the impact of the selected macroeconomic variables on disaggregate non-oil exports (agricultural, manufacturing and solid minerals) from 1986 to 2015. The Bounds testing co-integration technique proposed by Pesaran and Shin (1999) was used to investigate the relationship among the variables.

The following findings were made:

i. There was a long run co-integrating relationship between the selected macro-economic variables (real GDP, exchange rate, inflation rate and credit to private sector) with both the aggregate non-oil exports and disaggregate non-oil exports (agricultural, manufacturing and solid minerals)as indicated by the rejection of their respective null hypotheses (Ho) and the acceptance of alternative hypotheses (H_1).This means that real GDP, exchange rate fluctuations, inflation rate and credit to private sector had a long-run equilibrium relationship with both aggregate and disaggregate non-oil exports (agricultural, manufacturing and solid minerals) at 5 percent level of significance. This mean that real GDP, exchange rate fluctuations, increase in prices of goods and services had impacted on both the aggregate and disaggregate non-oil exports in Nigeria within the period of study.

ii. Real GDP had impacted positively but insignificantly on aggregate non-oil exports, agricultural and solid minerals exports at 5 percent level of significance. This mean that economic activities had contributed positively to aggregate non-oil exports, agricultural and solid minerals exports in Nigeria within the period of study.

iii. Exchange rate fluctuations had negatively and significantly impacted on the aggregate non-oil export, agricultural and manufacturing exports whereas no significant relationship existed with solid minerals exports at 5 percent level of significance. This mean that fluctuations in exchange rate had contributed negatively on aggregate non-oil exports, agricultural and manufacturing exports in Nigeria within the period of study.

iv. Inflation rate had impacted negatively but insignificantlyon the aggregate non-oil exports, manufacturing and solid minerals exports whereas a positive relationship existed with agricultural exports at 5 percent level of significance. This mean that increase in prices of goods and services had contributed negatively on aggregate non-oil exports, manufacturing and solid minerals exports in Nigeria within the period of study.

v. Credit to private sector had impacted positively but insignificantly on both aggregate and disaggregate(agricultural, manufacturing and solid minerals) exports within the period of study at 5 percent level of significance. This means that credit to private sector by banks in form of loans have contributed positively on aggregate non-oil exports, agricultural, manufacturing and solid minerals exports in Nigeria within the period of study.

5.2 Conclusion

This study concludes that there is a long-run co-integrating relationship between the selected macroeconomic variables (real GDP, exchange rate, inflation rate and credit to private sector)

with both the aggregate and disaggregate non-oil exports(agricultural, manufacturing and solid minerals)in Nigeria within the period under study. This conclusionwas drawn from the results of the bound testing co-integration test of the ARDL model which suggested for the rejection of null hypotheses (Ho) of no co-integration and the acceptance of the alternative hypotheses (H_1) of the existence of co-integrating equilibrium relationship among the variables. It therefore means that real GDP had impacted positively but not significantly. Similarly, Exchange rate fluctuations had adversely and significantly impacted onthe agricultural, manufacturing and solid minerals exportsAlso, the rising prices of goods and services and cost of production, had impacted negatively on the manufacturing and solid minerals exports. Credit to private sector by banks and other financial institutions hadalso impactedpositively but insignificantly to agricultural exports, manufacturing exportsand solid minerals exports in Nigeriawithin the period under study.

5.3 Recommendations

In view of the findings and conclusion drawn, this study therefore puts forward the following recommendations:

i. In order to boost Gross Domestic Product (GDP) and thus agricultural, manufacturing and solid minerals exports in Nigeria, the productive capacity of the economy should be enhanced through human capital development, capital accumulation and technological development by the government.

ii. The government should through the monetary authority initiate and implement sound macroeconomic policies that would stabilize the exchange rate fluctuations and also reduce rising inflation rates in the economy.

iii. Local production of raw materials and factor inputs should also be encouraged by the government in order to avoid high cost of inputs cause by imported inflation.

iv. The government should promote friendly credit policies through financial institutions with lower interest rate and selective credit policy to those who engage in non-oil sector/exports activities.

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APPENDIX 1

Structure of Nigeria's Non-oil Exports by Value in billions of Naira (1986-2015)

YEAR	AGRICULTURE	MANUFACTURING	SOLID MINERALS	OTHERS	TOTAL NON-OIL
1986	0.44	0.06	0.12	0.01	0.60
1987	1.63	0.07	0.02	0.48	2.20
1988	2.27	0.06	0.01	0.48	2.80
1989	2.37	0.09	0.01	0.53	3.00
1990	2.90	0.17	0.02	0.21	3.30
1991	3.62	0.97	0.01	0.14	4.70
1992	3.01	1.00	0.07	0.13	4.20
1993	3.42	0.91	0.03	0.65	5.00
1994	3.78	1.19	0.12	0.16	5.30
1995	15.45	6.98	0.44	0.23	23.10
1996	18.36	4.47	0.09	0.37	23.30
1997	19.56	8.76	0.23	0.64	29.20
1998	16.37	15.92	0.41	1.40	34.10
1999	12.21	5.97	0.27	1.05	19.50
2000	9.32	14.04	0.27	1.17	24.80
2001	7.95	17.33	0.42	2.30	28.00
2002	26.89	58.05	1.52	8.24	94.70
2003	20.57	62.0	2.37	9.86	94.80
2004	37.39	60.96	2.27	12.69	113.30
2005	44.31	53.32	4.24	4.13	106.00
2006	50.50	65.46	11.36	6.28	133.60
2007	79.12	99.05	12.56	8.57	199.30
2008	306.60	135.16	40.49	43.65	525.90
2009	234.92	191.84	33.56	40.57	500.90
2010	253.83	307.86	79.63	69.68	711.00
2011	494.20	380.93	5.48	32.89	913.50
2012	414.0	395.6	33.40	36.30	879.30
2013	531.19	519.89	42.95	36.17	1130.20
2014	369.0	444.33	4.77	135.40	953.50
2015	323.08	283.44	4.62	49.55	660.70

Source: CBN Annual Reports and Statement of Accounts for 2016, 2015, 2014, 2013, 2010, 2009, 2005 and 1990.

APPENDIX 2

Data on Real GDP, Exchange Rate, Inflation Rate and Credit to Private Sector (1986-2015)

YEAR	REAL GDP (%)	EXCHANGE RATES (%)	INFLATION RATES (%)	PRIVATE SECTOR CREDIT (# BILLION)
1986	1.9	1.8	5.7	20.0
1987	0.17	4.0	11.3	14.4
1988	6.23	4.5	54.5	12.9
1989	6.66	7.4	50.5	9.2
1990	11.63	8.0	7.4	8.7
1991	0.55	9.9	13.0	9.4
1992	2.19	17.3	44.6	13.4
1993	1.57	22.1	57.2	12.3
1994	0.26	22.0	57.0	15.0
1995	1.87	21.9	72.8	10.0
1996	4.05	21.9	29.3	9.0
1997	2.89	21.9	8.5	10.7
1998	2.5	21.9	10.0	13.0
1999	0.52	92.3	6.6	13.5
2000	5.52	101.7	6.9	12.4
2001	6.67	111.2	18.9	16.6
2002	14.6	120.6	12.9	13.0
2003	10.3	129.2	14.0	13.8
2004	10.6	132.9	15.0	13.1
2005	7.3	131.3	17.0	13.2
2006	8.8	128.7	8.2	13.2
2007	9.6	125.8	5.4	25.2
2008	8.6	118.5	11.6	33.8
2009	9.6	148.9	11.5	38.4
2010	10.6	150.3	13.7	15.4
2011	4.9	153.9	10.8	12.5
2012	4.3	157.5	12.2	11.8
2013	5.4	157.3	8.5	12.6
2014	6.22	158.6	8.1	14.5
2015	3.02	196.9	9.0	14.2

Source: CBN Annual Reports and Statement of Accounts for for2016, 2015, 2014, 2013, 2010, 2009, 2005 and 1990.

APPENDIX 3

Augmented Dickey Fuller (ADF) Unit Root Tests for Aggregate Non-oil Exports

Null Hypothesis: D(ANOE) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.083228	0.0002
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

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

APPENDIX 4

Augmented Dickey Fuller (ADF) Unit Root Tests for Agricultural Exports

Null Hypothesis: D(AGRE) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.948360	0.0002
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

APPENDIX 5

Augmented Dickey Fuller (ADF) Unit Root Tests for Manufacturing Exports

Null Hypothesis: D(MNFE) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.413935	0.0001
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

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

APPENDIX 6

Augmented Dickey Fuller (ADF) Unit Root Tests for Solid Minerals Exports

Null Hypothesis: D(SLME) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.292928	0.0000
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

APPENDIX 7

Augmented Dickey Fuller (ADF) Unit Root Tests for Real GDP

Null Hypothesis: RGDP has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 0.415 (Andrews automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.261239	0.0112
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

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

APPENDIX 8

Augmented Dickey Fuller (ADF) Unit Root Tests for Exchange Rate

Null Hypothesis: D(EXR) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.809065	0.0003
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

APPENDIX 9

Augmented Dickey Fuller (ADF) Unit Root Tests for Inflation Rate

Null Hypothesis: INF has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.630893	0.0049
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

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

APPENDIX 10

Augmented Dickey Fuller (ADF) Unit Root Tests for Credit to Private Sector

Null Hypothesis: D(CPS) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.561654	0.0058
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

APPENDIX 11

Phillips Perron(PP) Unit Root Tests for Aggregate Non-oil Exports

Null Hypothesis: D(ANOE) has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 0.427 (Andrews automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.083228	0.0002
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

APPENDIX 12

Phillips Perron(PP) Unit Root Tests for Agricultural exports

Null Hypothesis: D(AGRE) has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 0.655 (Andrews automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.948360	0.0002
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

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

APPENDIX 13

Phillips Perron(PP) Unit Root Tests for Manufacturing Exports

Null Hypothesis: D(MNFE) has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 1.13 (Andrews automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.482657	0.0001
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

APPENDIX 14

Phillips Perron(PP) Unit Root Tests for Solid Minerals Exports

Null Hypothesis: D(SLME) has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 1.69 (Andrews automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.631591	0.0000
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

APPENDIX 15

Phillips Perron (PP) Unit Root Tests for Real GDP

Null Hypothesis: RGDP has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 0.415 (Andrews automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.261239	0.0112
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

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

APPENDIX 16

Phillips Perron (PP) Unit Root Tests for Exchange Rate

Null Hypothesis: D(EXR) has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 0.344 (Andrews automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.809065	0.0003
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

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

APPENDIX 17

Phillips Perron (PP) Unit Root Tests for Inflation Rate

Null Hypothesis: INF has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 1.65 (Andrews automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.759133	0.0340
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

APPENDIX 18

Phillips Perron (PP) Unit Root Tests for Credit to Private Sector

Null Hypothesis: D(CPS) has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 0.176 (Andrews automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.561654	0.0058
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

APPENDIX 19

ARDL Bounds Test for Aggregate Non-Oil Exports

ARDL Bounds Test
Date: 07/23/17 Time: 15:23
Sample: 1988 2015
Included observations: 28
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	5.347141	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	3.03	4.06
5%	3.47	4.57
2.5%	3.89	5.07
1%	4.4	5.72

APPENDIX 20

Bounds Test for Agricultural Exports

ARDL Bounds Test
Date: 07/23/17 Time: 17:48
Sample: 1988 2015
Included observations: 28
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	9.617395	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	3.03	4.06
5%	3.47	4.57
2.5%	3.89	5.07
1%	4.4	5.72

APPENDIX 21

Bounds Test for Manufacturing Exports

ARDL Bounds Test
Date: 07/23/17 Time: 19:28
Sample: 1988 2015
Included observations: 28
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	6.652180	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
5%	3.47	4.57
2.5%	3.89	5.07
1%	4.4	5.72

APPENDIX 22

Bounds Test for Solid Minerals Exports

ARDL Bounds Test
Date: 11/01/17 Time: 06:51
Sample: 1988 2015
Included observations: 28
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	12.60253	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	3.03	4.06
5%	3.47	4.57
2.5%	3.89	5.07
1%	4.4	5.72

APPENDIX 23

Long-Run and Short-Run Dynamics of Aggregate Non-Oil Exports

ARDL Cointegrating And Long Run Form
Dependent Variable: D(NOE)
Selected Model: ARDL(1, 0, 0, 0, 1)
Date: 07/23/17 Time: 15:24
Sample: 1986 2015
Included observations: 28

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP, 2)	0.048046	0.059950	0.801445	0.4323
D(EXR, 2)	-0.014442	0.004836	-2.986226	0.0073
D(INF)	-0.036610	0.129085	-0.283608	0.7796
D(CPS, 2)	-0.395963	0.275306	-1.438265	0.1658
D(@TREND())	-0.004228	0.010719	-0.394414	0.6974
CointEq(-1)	-0.999744	0.178780	-5.592037	0.0000

Cointeq = D(NOE) - (0.0481*D(RGDP) -0.0144*D(EXR) -0.0366*INF +
0.2115*D(CPS) + 0.4707 -0.0042*@TREND)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP)	0.048059	0.058716	0.818499	0.4227
D(EXR)	-0.014446	0.005893	-2.451531	0.0235
INF	-0.036619	0.131532	-0.278403	0.7836
D(CPS)	0.211549	0.337552	0.626716	0.5379
C	0.470706	0.498968	0.943357	0.3568
@TREND	-0.004229	0.010844	-0.389974	0.7007

APPENDIX 24

Long-Run and Short-Run Dynamics of Agricultural Exports

ARDL Cointegrating And Long Run Form
Dependent Variable: D(AGRE)
Selected Model: ARDL(1, 0, 1, 0, 0)
Date: 07/23/17 Time: 17:49
Sample: 1986 2015
Included observations: 28

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP, 2)	0.135402	0.091178	1.485025	0.1531
D(EXR, 2)	-0.583846	0.326565	-1.787843	0.0890
D(INF)	0.087918	0.160034	0.549368	0.5888
D(CPS, 2)	0.000196	0.001668	0.117523	0.9076
D(@TREND())	-0.012947	0.015956	-0.811409	0.4267
CointEq(-1)	-1.317477	0.190491	-6.916215	0.0000

Cointeq = D(AGRE) - (0.1028*D(RGDP) -0.9956*D(EXR) + 0.0667*INF + 0.0001*D(CPS) + 0.3106 -0.0098*@TREND)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP)	0.102773	0.066769	1.539246	0.1394
D(EXR)	-0.995595	0.379777	-2.621527	0.0163
INF	0.066732	0.120495	0.553816	0.5858
D(CPS)	0.000149	0.001262	0.117942	0.9073
C	0.310591	0.502454	0.618148	0.5435
@TREND	-0.009827	0.012072	-0.814024	0.4252

APPENDIX 25

Long-Run and Short-Run Dynamics of Manufacturing Exports

ARDL Cointegrating And Long Run Form
Dependent Variable: D(MNFE)
Selected Model: ARDL(1, 0, 0, 0, 1)
Date: 07/23/17 Time: 19:29
Sample: 1986 2015
Included observations: 28

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP, 2)	-0.028383	0.029775	-0.953241	0.3518
D(EXR, 2)	-0.019143	0.007060	-2.711587	0.0134
D(INF)	-0.226025	0.180707	-1.250786	0.2254
D(CPS, 2)	-0.002190	0.001912	-1.145426	0.2656
D(@TREND())	-0.031341	0.016047	-1.953025	0.0650
CointEq(-1)	-1.165472	0.189591	-6.147293	0.0000

Cointeq = D(MNFE) - (-0.0244*D(RGDP) -0.0164*D(EXR) -0.1939*INF + 0.0003*D(CPS) + 1.3668 -0.0269*@TREND)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP)	-0.024353	0.025404	-0.958633	0.3492
D(EXR)	-0.016425	0.006878	-2.387859	0.0269
INF	-0.193935	0.164118	-1.181681	0.2512
D(CPS)	0.000300	0.002117	0.141810	0.8886
C	1.366757	0.637344	2.144456	0.0445
@TREND	-0.026891	0.014310	-1.879134	0.0749

APPENDIX 26

Long-Run and Short-Run Dynamics of Solid Minerals Exports

ARDL Cointegrating And Long Run Form
Dependent Variable: D(SLME)
Selected Model: ARDL(1, 1, 1, 1, 1)
Date: 11/01/17 Time: 06:52
Sample: 1986 2015
Included observations: 28

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP)	0.123054	0.252802	0.486759	0.6326
D(EXR, 2)	-0.817675	0.842581	-0.970441	0.3454
D(INF)	-0.216446	0.432321	-0.500661	0.6230
D(CPS, 2)	0.045327	0.876027	0.051742	0.9593
D(@TREND())	-0.042192	0.041696	-1.011895	0.3258
CointEq(-1)	-1.424222	0.182632	-7.798310	0.0000

Cointeq = D(SLME) - (0.0093*RGDP -1.1995*D(EXR) -0.0072*INF + 1.5152 *D(CPS) + 0.8285 -0.0296*@TREND)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP	0.009274	0.230504	0.040232	0.9684
D(EXR)	-1.199506	0.973495	-1.232164	0.2347
INF	-0.007160	0.369549	-0.019374	0.9848
D(CPS)	1.515245	0.784356	1.931833	0.0702
C	0.828473	1.596499	0.518931	0.6105
@TREND	-0.029625	0.029343	-1.009609	0.3268

APPENDIX 27

Serial Correlation Test of Aggregate Non-Oil Exports

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.083249	Prob. F(1,19)	0.7761
Obs*R-squared	0.122148	Prob. Chi-Square(1)	0.7267

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 07/23/17 Time: 15:26
Sample: 1988 2015
Included observations: 28
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NOE(-1))	0.052890	0.259036	0.204179	0.8404
D(RGDP)	0.002007	0.061766	0.032497	0.9744
D(EXR)	-0.000348	0.005096	-0.068366	0.9462
INF	-0.007282	0.134538	-0.054126	0.9574
D(CPS)	-0.013291	0.285581	-0.046540	0.9634
D(CPS(-1))	0.030427	0.296302	0.102689	0.9193
C	0.005797	0.485002	0.011952	0.9906
@TREND	0.000209	0.010997	0.019007	0.9850
RESID(-1)	-0.098283	0.340635	-0.288529	0.7761

R-squared	0.004362	Mean dependent var	1.27E-16
Adjusted R-squared	-0.414853	S.D. dependent var	0.307594
S.E. of regression	0.365875	Akaike info criterion	1.082044
Sum squared resid	2.543433	Schwarz criterion	1.510253
Log likelihood	-6.148620	Hannan-Quinn criter.	1.212952
F-statistic	0.010406	Durbin-Watson stat	1.993929
Prob(F-statistic)	1.000000		

APPENDIX 28

Serial Correlation Test of Agricultural Exports

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.220328	Prob. F(1,19)	0.1526
Obs*R-squared	2.929700	Prob. Chi-Square(1)	0.0870

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 07/23/17 Time: 17:51
Sample: 1988 2015
Included observations: 28
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(AGRE(-1))	0.318279	0.282533	1.126522	0.2740
D(RGDP)	-0.023277	0.089885	-0.258967	0.7984
D(EXR)	-0.037296	0.318022	-0.117274	0.9079
D(EXR(-1))	0.166448	0.382171	0.435533	0.6681
INF	0.020608	0.155979	0.132122	0.8963
D(CPS)	0.000138	0.001622	0.085209	0.9330
C	-0.244597	0.662729	-0.369076	0.7162
@TREND	0.006275	0.016052	0.390911	0.7002
RESID(-1)	-0.525861	0.352909	-1.490077	0.1526

R-squared	0.104632	Mean dependent var	-5.75E-17
Adjusted R-squared	-0.272365	S.D. dependent var	0.394746
S.E. of regression	0.445271	Akaike info criterion	1.474823
Sum squared resid	3.767054	Schwarz criterion	1.903031
Log likelihood	-11.64752	Hannan-Quinn criter.	1.605730
F-statistic	0.277541	Durbin-Watson stat	1.972391
Prob(F-statistic)	0.965543		

APPENDIX 29

Serial Correlation Test of Manufacturing Exports

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.929756	Prob. F(1,19)	0.3470
Obs*R-squared	1.306246	Prob. Chi-Square(1)	0.2531

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 07/22/17 Time: 10:33
Sample: 1988 2015
Included observations: 28
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MNFE(-1))	0.318050	0.380618	0.835616	0.4138
D(RGDP)	0.009457	0.031399	0.301183	0.7665
D(EXR)	-0.000732	0.007113	-0.102940	0.9191
INF	0.008172	0.181223	0.045095	0.9645
D(CPS)	-0.009422	0.021500	-0.438232	0.6662
D(CPS(-1))	0.003605	0.019308	0.186700	0.8539
C	-0.194441	0.714088	-0.272292	0.7883
@TREND	0.004958	0.016878	0.293761	0.7721
RESID(-1)	-0.450286	0.466986	-0.964239	0.3470

R-squared	0.046652	Mean dependent var	6.15E-17
Adjusted R-squared	-0.354758	S.D. dependent var	0.464116
S.E. of regression	0.540204	Akaike info criterion	1.861350
Sum squared resid	5.544578	Schwarz criterion	2.289559
Log likelihood	-17.05890	Hannan-Quinn criter.	1.992258
F-statistic	0.116220	Durbin-Watson stat	2.009514
Prob(F-statistic)	0.997948		

APPENDIX 30

Serial Correlation Test of Solid Minerals Exports

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.606219	Prob. F(2,15)	0.5582
Obs*R-squared	2.093965	Prob. Chi-Square(2)	0.3510

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 11/01/17 Time: 06:53
Sample: 1988 2015
Included observations: 28
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SLME(-1))	-0.041171	0.350820	-0.117356	0.9081
RGDP	0.016601	0.260187	0.063804	0.9500
RGDP(-1)	0.065271	0.292561	0.223103	0.8265
D(EXR)	0.023953	0.873019	0.027437	0.9785
D(EXR(-1))	0.276118	0.985017	0.280317	0.7831
INF	0.283263	0.512965	0.552208	0.5889
INF(-1)	0.110081	0.454019	0.242459	0.8117
D(CPS)	0.672334	1.118410	0.601152	0.5567
D(CPS(-1))	-0.009963	0.800011	-0.012454	0.9902
C	-1.683238	2.869998	-0.586495	0.5663
@TREND	0.033112	0.052930	0.625579	0.5410
RESID(-1)	-0.171375	0.429956	-0.398586	0.6958
RESID(-2)	-0.483142	0.497230	-0.971667	0.3466

R-squared	0.074784	Mean dependent var	-2.89E-16
Adjusted R-squared	-0.665388	S.D. dependent var	0.833828
S.E. of regression	1.076054	Akaike info criterion	3.288895
Sum squared resid	17.36838	Schwarz criterion	3.907419
Log likelihood	-33.04453	Hannan-Quinn criter.	3.477984
F-statistic	0.101037	Durbin-Watson stat	1.857942
Prob(F-statistic)	0.999855		

APPENDIX 31

Heteroskedasticity Test of Aggregate Non-Oil Exports

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.002723	Prob. F(7,20)	0.4581
Obs*R-squared	7.273893	Prob. Chi-Square(7)	0.4009
Scaled explained SS	5.451235	Prob. Chi-Square(7)	0.6051

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 07/23/17 Time: 15:27
Sample: 1988 2015
Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.096516	0.210838	-0.457773	0.6521
D(NOE(-1))	-0.054387	0.079632	-0.682988	0.5025
D(RGDP)	0.019300	0.026703	0.722764	0.4782
D(EXR)	-0.000872	0.002154	-0.404892	0.6899
INF	0.056249	0.057497	0.978300	0.3396
D(CPS)	-0.159567	0.122626	-1.301246	0.2080
D(CPS(-1))	0.064889	0.120476	0.538606	0.5961
@TREND	0.003412	0.004774	0.714662	0.4831

R-squared	0.259782	Mean dependent var	0.091235
Adjusted R-squared	0.000706	S.D. dependent var	0.159245
S.E. of regression	0.159189	Akaike info criterion	-0.602499
Sum squared resid	0.506820	Schwarz criterion	-0.221869
Log likelihood	16.43498	Hannan-Quinn criter.	-0.486136
F-statistic	1.002723	Durbin-Watson stat	2.380027
Prob(F-statistic)	0.458144		

APPENDIX 32

Heteroskedasticity Test of Agricultural Exports

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.707819	Prob. F(7,20)	0.6659
Obs*R-squared	5.559370	Prob. Chi-Square(7)	0.5920
Scaled explained SS	3.999715	Prob. Chi-Square(7)	0.7798

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 07/23/17 Time: 17:51
Sample: 1988 2015
Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.138661	0.385437	0.359750	0.7228
D(AGRE(-1))	-0.131430	0.111014	-1.183905	0.2503
D(RGDP)	0.051449	0.053137	0.968248	0.3445
D(EXR)	-0.086457	0.190315	-0.454282	0.6545
D(EXR(-1))	-0.264307	0.219397	-1.204696	0.2424
INF	0.025004	0.093265	0.268101	0.7914
D(CPS)	0.001343	0.000972	1.381298	0.1824
@TREND	0.001543	0.009299	0.165964	0.8699

R-squared	0.198549	Mean dependent var	0.150260
Adjusted R-squared	-0.081959	S.D. dependent var	0.256971
S.E. of regression	0.267294	Akaike info criterion	0.434023
Sum squared resid	1.428924	Schwarz criterion	0.814653
Log likelihood	1.923679	Hannan-Quinn criter.	0.550385
F-statistic	0.707819	Durbin-Watson stat	2.361738
Prob(F-statistic)	0.665913		

APPENDIX 33

Heteroskedasticity Test of Manufacturing Exports

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.734463	Prob. F(7,20)	0.6456
Obs*R-squared	5.725843	Prob. Chi-Square(7)	0.5721
Scaled explained SS	4.479453	Prob. Chi-Square(7)	0.7232

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 07/22/17 Time: 10:34
Sample: 1988 2015
Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.293941	0.486775	-0.603852	0.5527
D(MNFE(-1))	-0.031104	0.134960	-0.230467	0.8201
D(RGDP)	0.000117	0.021196	0.005539	0.9956
D(EXR)	0.000777	0.005025	0.154694	0.8786
INF	0.185442	0.128636	1.441609	0.1649
D(CPS)	-0.010248	0.013609	-0.753073	0.4602
D(CPS(-1))	0.009417	0.013460	0.699626	0.4922
@TREND	4.39E-05	0.011423	0.003841	0.9970

R-squared	0.204494	Mean dependent var	0.207711
Adjusted R-squared	-0.073933	S.D. dependent var	0.370418
S.E. of regression	0.383867	Akaike info criterion	1.157913
Sum squared resid	2.947071	Schwarz criterion	1.538543
Log likelihood	-8.210781	Hannan-Quinn criter.	1.274275
F-statistic	0.734463	Durbin-Watson stat	2.499692
Prob(F-statistic)	0.645632		

APPENDIX 34

Heteroskedasticity Test of Solid Minerals Exports

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.414065	Prob. F(10,17)	0.9209
Obs*R-squared	5.484137	Prob. Chi-Square(10)	0.8566
Scaled explained SS	2.199917	Prob. Chi-Square(10)	0.9946

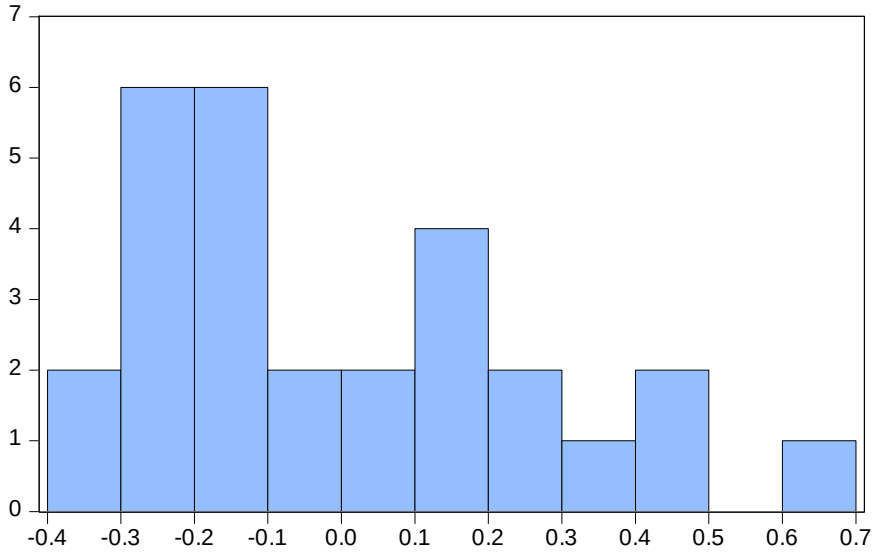
Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/01/17 Time: 06:55
Sample: 1988 2015
Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.546878	2.450711	-0.631196	0.5363
D(SLME(-1))	-0.032950	0.197831	-0.166555	0.8697
RGDP	0.055626	0.273840	0.203132	0.8414
RGDP(-1)	-0.202430	0.289451	-0.699357	0.4938
D(EXR)	0.245147	0.912703	0.268594	0.7915
D(EXR(-1))	0.008580	1.007626	0.008515	0.9933
INF	0.377797	0.468300	0.806742	0.4310
INF(-1)	0.102179	0.433212	0.235863	0.8164
D(CPS)	0.792515	0.948932	0.835165	0.4152
D(CPS(-1))	-0.544642	0.819098	-0.664929	0.5150
@TREND	0.068330	0.045166	1.512854	0.1487

R-squared	0.195862	Mean dependent var	0.670438
Adjusted R-squared	-0.277160	S.D. dependent var	1.007230
S.E. of regression	1.138286	Akaike info criterion	3.383647
Sum squared resid	22.02681	Schwarz criterion	3.907013
Log likelihood	-36.37106	Hannan-Quinn criter.	3.543646
F-statistic	0.414065	Durbin-Watson stat	1.995283
Prob(F-statistic)	0.920864		

APPENDIX 35

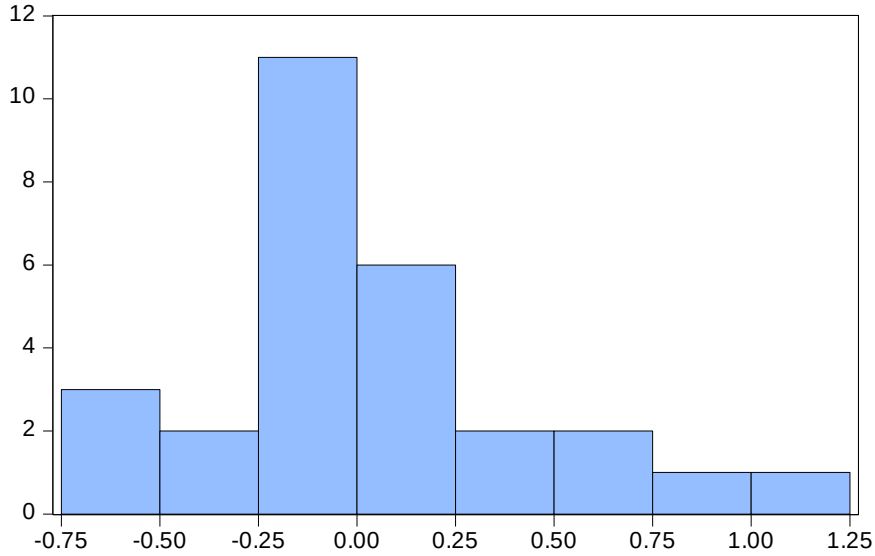
Normality (JargueBera) Test of Aggregate Non-oil Exports



Series: Residuals	
Sample 1988 2015	
Observations 28	
Mean	1.94e-16
Median	-0.073218
Maximum	0.663385
Minimum	-0.329854
Std. Dev.	0.273474
Skewness	0.751654
Kurtosis	2.606722
Jarque-Bera	2.817038
Probability	0.244505

APPENDIX 36

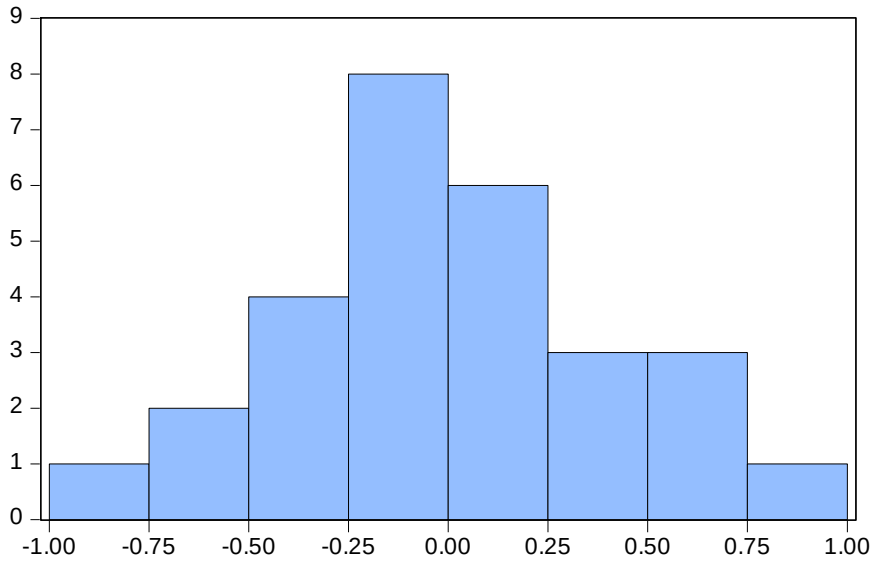
Normality (JargueBera) Test of Agricultural Exports



Series: Residuals	
Sample 1988 2015	
Observations 28	
Mean	-5.75e-17
Median	-0.067112
Maximum	1.103810
Minimum	-0.629271
Std. Dev.	0.394746
Skewness	0.803014
Kurtosis	3.820263
Jarque-Bera	3.794183
Probability	0.150004

APPENDIX 37

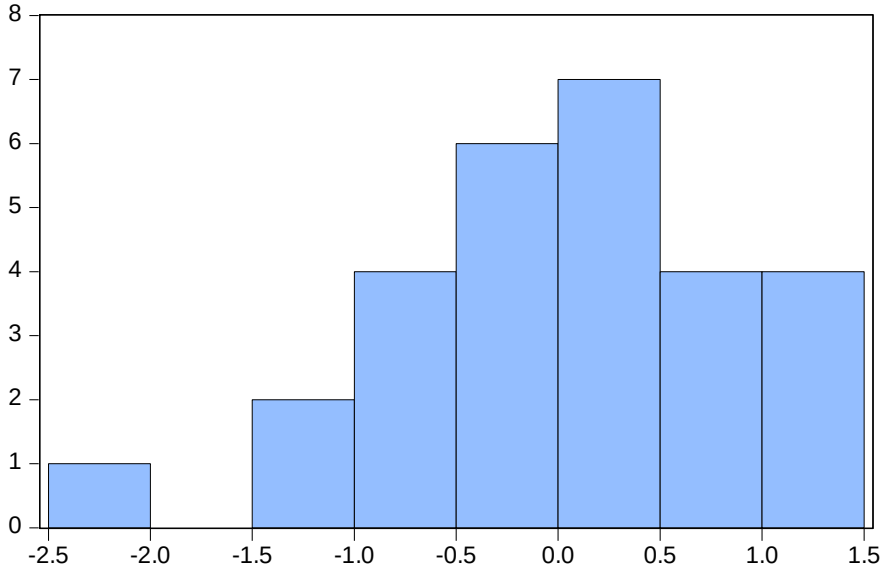
Normality (JargueBera) Test of Manufacturing Exports



Series: Residuals	
Sample 1988 2015	
Observations 28	
Mean	5.73e-16
Median	-0.035664
Maximum	0.959544
Minimum	-0.936336
Std. Dev.	0.406650
Skewness	0.188274
Kurtosis	3.147809
Jarque-Bera	0.190909
Probability	0.908960

APPENDIX 38

Normality (JargueBera) Test of Solid Minerals Exports



Series: Residuals	
Sample 1988 2015	
Observations 28	
Mean	-2.89e-16
Median	0.062199
Maximum	1.322576
Minimum	-2.257499
Std. Dev.	0.833828
Skewness	-0.547009
Kurtosis	3.176438
Jarque-Bera	1.432673
Probability	0.488539

APPENDIX 39

Ramsey RESET Test of Aggregate Non-oil Exports

Ramsey RESET Test
Equation: UNTITLED
Specification: D(NOE) D(NOE(-1)) D(RGDP) D(EXR) INF D(CPS) D(CPS(-1)) C @TREND
Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	2.097070	19	0.0496
F-statistic	4.397704	(1, 19)	0.0496

F-test summary:

	Sum of Sq.	Df	Mean Squares
Test SSR	0.480144	1	0.480144
Restricted SSR	2.554577	20	0.127729
Unrestricted SSR	2.074432	19	0.109181

APPENDIX 40

Ramsey RESET Test of Agricultural Exports

Ramsey RESET Test
Equation: UNTITLED
Specification: D(AGRE) D(AGRE(-1)) D(RGDP) D(EXR) D(EXR(-1)) INF D(CPS) C @TREND
Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	1.538710	19	0.1404
F-statistic	2.367627	(1, 19)	0.1404

F-test summary:

	Sum of Sq.	Df	Mean Squares
Test SSR	0.466184	1	0.466184
Restricted SSR	4.207269	20	0.210363
Unrestricted SSR	3.741085	19	0.196899

APPENDIX 41

Ramsey RESET Test of Manufacturing Exports

Ramsey RESET Test
Equation: UNTITLED
Specification: D(MNFE) D(MNFE(-1)) D(RGDP) D(EXR) INF D(CPS) D(CPS(-1)) C @TREND
Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	0.762509	19	0.4551
F-statistic	0.581420	(1, 19)	0.4551

F-test summary:

	Sum of Sq.	Df	Mean Squares
Test SSR	0.172688	1	0.172688
Restricted SSR	5.815900	20	0.290795
Unrestricted SSR	5.643212	19	0.297011

APPENDIX 42

Ramsey RESET Test of Solid Minerals Exports

Ramsey RESET Test
Equation: UNTITLED
Specification: D(SLME) D(SLME(-1)) RGDP RGDP(-1) D(EXR) D(EXR(-1)) INF INF(-1) D(CPS) D(CPS(-1)) C @TREND
Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	0.345309	16	0.7344
F-statistic	0.119238	(1, 16)	0.7344

F-test summary:

	Sum of Sq.	Df	Mean Squares
Test SSR	0.138863	1	0.138863
Restricted SSR	18.77225	17	1.104250
Unrestricted SSR	18.63339	16	1.164587