THE IMPACT OF DEFENCE EXPENDITURE ON ECONOMIC GROWTH IN NIGERIA 1970 – 2008: A SIMULATION APPROACH

BY

ANFOFUM ABRAHAM ALEXANDER
PH.D/SOC.SCI/31549/2001-2002

BEING A DISSERTATION SUBMITTED TO THE DEPARTMENT OF ECONOMICS, FACULTY OF SOCIAL SCIENCES, AHMADU BELLO UNIVERSITY, ZARIA, AS PART OF THE REQUIREMENT FOR THE AWARD OF DOCTOR OF PHILOSOPHY (PH.D) DEGREE IN ECONOMICS

JULY, 2011

DECLARATION

I hereby declare that this dissertation titled the impact of defence expenditure on economic growth in Nigeria (1970-2008): a simulation approach is a record of my own original research work and has not been presented anywhere for the award of a degree or publication. All references cited in this study have been duly acknowledged.

_____

Alexander, Abraham Anfofum Date: .....

CERTIFICATION

This dissertation titled the impact of defence expenditure on economic growth in Nigeria (1970-2008): a simulation approach meets the regulation governing the award of the degree of Doctor of Philosophy (Economics) of Ahmadu Bello University, Zaria and is hereby approved for its contribution to knowledge and literary presentation.

_____

Prof. GD Olowononi. Date: .....
Chairman, supervisory committee

_____

Prof. M Kwanashie Date: .....
Member, supervisory committee

_____

Dr. MC Duru Date: .....
Member, supervisory committee

_____

Dr. Isaya Audu Date: .....
Head of Department

_____

Prof. Joshua Adebayo Abiodun Date: .....
Dean, Post graduate Studies

DEDICATION

This work is dedicated to my niece Bethel Yakubu Akpa.

ACKNOWLEDGEMENT

At every stage of this work, a number of individuals have contributed immensely in one way or the other. First among them is my major supervisor Prof. G.D. Olowononi whose deep insights into the area of study and his rich library made available to me facilitated this dissertation. In the same vein, I am sincerely grateful to other supervisors Prof. Mike Kwanashie and Dr. -M.C. Duru for their immeasurable assistance and encouragement.

Similarly, I am grateful to Prof. (Mrs) P.S. Aku and Prof. A.G. Garba for their advice and comments on the draft of this dissertation. Also included in the list of individuals to whom I owe sincere debt of gratitude is Dr. S.A. Abdulsalam for his critical but useful comments and guidance, Dr. M. Muttaka Usman, Dr. Audu Ishaya and Dr. Rafindadi. Sanusi, Mrs. Salamatu Isa Jibril. To other lecturers in the department I have benefitted in no small measure from discussions, wonderful association, cooperation and understanding throughout these years, I thank them all.

I am also thankful to the Nigerian Defence Academy (NDA) for the patience and the series of challenges that gave the impetus to complete the study. To my colleagues in the department of economics and management science in NDA and in particular Dr. Sa ‘ad my HOD, Dr. Chris I. Egwaikhide, Mrs. B.K.U. Farouk, Mrs. H. A. Andow, Mallam Tauhid, Mr. S.G. Joshua, Mr. Ahmed, Dr. Nyor, Dr. Joshua Okpanachi, others include Mr. Bello and Mrs. Agada. I am quite appreciative of your supports and assistance.

I am highly obliged to the families of Mr. Christopher Ogwueri and Mr. Mathias Kasa who provided financial, moral and secretarial supports throughout the period of study,

To my pastor and other prayer meeting members who keep praying and encouraging me to complete the work, I am very grateful to you all.

Of course, to my wife and other members of my family, I remain thankful for their understanding, endurance and prayer.

Finally, I am most grateful to the Lord Almighty, the King of Glory that made it possible from the beginning to the end. Lord Jesus, thank you for the final word.

TABLE OF CONTENTS

PRELIMINARY PAGES Pages
Title page i
Declaration ii
Certification iii
Dedication iv
Acknowledgement v
Table of contents vii
List of tables..... xi
List of figures..... xii
List of Appendices..... xiii
Abstract..... xiv
CHAPTER ONE: GENERAL INTRODUCTION
1.1 Background to the study 1
1.2 Statement of the research problem 7
1.3 Objective of the study 9
1.4 Hypothesis for the study 10
1.5 Justification for the study..... 10
1.6 Scope and limitation for the study 11
1.7 Organization of the study 12
CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL FRAMEWORK
2.0 Introduction 13
2.1 Conceptual literature 13
2.1.1 Personnel costs for the armed forces 16

2.1.2 Personnel costs for the civilian staff 17
2.1.3 Overhead cost 17
2.1.4 Combat readiness 19
2.2 Economic growth and development 20
2.3 Growth theories 31
2.3.1 The Solow's Neoclassical Growth Model 32
2.3.2. The new growth theory: endogenous growth theory 34

2.3.3 Romer's model of endogenous growth 37

2.4 Models of public expenditure growth 41

2.5 Macroeconomic impact of defence expenditure 46

2.7 Empirical Literature on Defence Expenditure and Economic Growth 64

2.7.1 Implications of the Literature for this study 80

2.8 Theoretical framework of the study 85

CHAPTER THREE: RESEARCH METHODOLOGY

3.0 Introduction 96

3.1 Explanation of the macroeconomic model of defence expenditure..... 97

3.2 Empirical Framework 99

3.2 Output Block 99

3.2.2. Income-Expenditure Block 103

3.2.3 Monetary Block 105

3.2.4 Export-Import Block 107

3.2.5 Fiscal Block 110

3.3. Technique of data analysis 113

3.3.1. Simulation experiment 114

3.3.2. Assumption for Simulation 115

3.2.3. Source of Data and Limitations 116

CHAPTER FOUR: PRESENTATION OF RESULT AND DISCUSSION

4.0. Introduction 118

4.2 Structure of Nigeria's defence expenditure 118

4.2.1 Share of defence expenditure to gross domestic product and total federal expenditure 122

4.3 Estimation of results and analysis 124

4.3.1 Output – employment block..... 124

4.3.2 Income – expenditure block 128

4.3.3 Monetary block 130

4.3.4 Export – import block 131

4.3.5 Fiscal block 136

4.4 Model appraisal and validation 143

4.5 Results and analysis of the simulation experiments of the impact of 10% and 15%increase in defence expenditure 149

4.5.1 Impact of 20% and 25% increase in defence expenditure. 152

4.6. Policy Simulation 153

CHAPTER FIVE: SUMMARY, CONCCLUSION AND RECOMMENDATION

5.1 Summary 156

5.2 Conclusion 159

5.3 Recommendation..... 160

Bibliography..... 162

LIST OF TABLES

Table 2.1 Empirical studies of the impact of defence expenditure on economic growth ...82

Table 4.1 Structure of defence expenditure 121
Table 4.2 Defence expenditure as percentage of GDP.....123
Table 4.3: Summary of significance of variables in the output - employment block 128
Table 4.4: summary of significance of variables in the income – expenditure block.....130
Table 4.5: summary of significance of variables in the monetary block 131
Table 4.6: summary of significance of variables in the export - import block.....136
Table 4.7: summary of significance variables in the fiscal block.....142
Table 4.8.Criteria for goodness of fit of simulation model. 144

Table 4.2. Impact of a 10%, 15%, 20% and 25% rise in defence expenditure 152

LIST OF FIGURES

Figure 3.1. A Model of macroeconomic impact of defence expenditure. 97

Figure 4.1.Presentation of graphs of the stochastic dynamic baseline simulation.....155

LIST OF APPENDIX

Appendix A1: Summary of Regression Result.....179
Appendix A2: Baseline simulation: deterministic – dynamic simulation 181
Appendix A3: Baseline simulation stochastic – dynamic simulation: actual and simulated at 10 percent.....182
Appendix A4: Baseline simulation stochastic – dynamic simulation: actual and simulated at 15 percent.....183
Appendix A5: Baseline simulation stochastic – dynamic simulation: actual and simulated at 20 percent.....184
Appendix A6: Baseline simulation stochastic – dynamic simulation: actual and simulated at 25 percent.....185
Appendix A7: Summary of the effects of increased defence expenditure on the endogenous variables 186
Appendix A8: Data for the study continued 187

ABSTRACT.

This study was undertaken to examine the existing link between defence outlays and economic growth in Nigeria with a view to recommending the appropriate expenditure reform to be embarked upon. This is because, in Nigeria, like other developing nations the productiveness of defence expenditure has not been seriously considered. Some cuts in some components of public expenditure can result in unacceptable economic and social costs. Therefore, a large scale empirical analysis of the relationship between defence expenditure and economic growth is imperative. Available evidence from literature has shown that the impact of defence expenditure on economic growth is mixed or inconclusive. But, there was consensus that defence sector engulf large amount of economic resources in the presence of agitation for a reduction, thus implying that other sectors are stifle of the limited resources. The rapid expansion of the public sector, in particular, defence sector, in the face of limited access to revenue generation has created fiscal deficits. Defence expenditure is increasing owing to the changing nature of crisis, the need to modernize the military sector as well as the urge to provide a working and conducive environment for the growth of the Nigerian economy. Thus, this study was an attempt to investigate the macroeconomic impact of defence expenditure on economic growth in Nigeria using a simulation approach. Previous studies have made some remarkable efforts in this direction but were limited in terms of macroeconomic wide model and simulation experiment. This study was an attempt to close this gap. The study collates data from a secondary source and investigated defence expenditure and economic growth nexus, some key economic sectors and variables such as oil and gas, agriculture, manufacture and social service sectors and gross fixed capital formation, total private consumption, domestic credit, import of capital goods, import of consumer goods, oil export, non oil export, exchange rate, oil and gas revenue, non oil and gas revenue, recurrent defence expenditure, capital defence expenditure, budget deficit finance and gross domestic product were investigated by employing the two stage least square method of system estimation. A macroeconomic wide model was developed in five blocks namely, output employment block, income expenditure block, monetary block, import export block and fiscal block, consisting of 18 endogenous equations. The building of these blocks showed macroeconomic variables that are interdependent which makes it convenient for the application of two stage least square technique. The analysis of the estimated macroeconometric model showed that defence expenditure had a significant positive impact on output of oil and gas, agriculture and social services sectors, but a negative effect on manufacture output. Obviously, the case of security of life and property cannot be ignored in any society and defence expenditure has a significant impact on production and economic growth. Also, defence expenditure had a significant positive effect on public investment, oil export, non oil export and economic growth in Nigeria. Prior to the *ex post* simulation experiment, the macroeconomic model was solved and the Theil inefficient coefficient criteria for assessing the goodness of fit for a macroeconomic model was carried out.

The simulation experiment showed that the endogenous variables tracked closely their historical path as the actual values are close to their baseline simulation which was an indication of the ability of the model to forecast and replicate most critical turning points of the historical data. A counterfactual policy simulation of increase in aggregate defence expenditure by 10% 15%, 20% and 25% was conducted. The result of the counterfactual policy simulation showed that the effect of defence expenditure on the endogenous variables was similar. For example, oil and gas output, agricultural output, output of social service and

economic growth were significantly positive. Whereas, manufacture output remained negative. Owing to the significant positive effect of defence expenditure on economic growth, this study recommends the need for innovations in defence research and development in technology, construction and electronics which will spill over to the civil society. Thus, an increase in defence spending will add to economic growth.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Nigeria has continued to experience serious fiscal imbalance since early 1970. This has manifested in large scale public spending which always overshoot public revenues. The fiscal crisis is considered unsustainable. Therefore, various fiscal measures have been used to address the problems. The first measure has been to generate more revenue to reduce fiscal deficits but there are political and economic challenges in increasing tax revenues. The second measure is expenditure reduction to address fiscal deficits. In this respect many people have advocated reduction in defence expenditure without considering the growth implication of such important component of public expenditure. Indeed, economic performance in Nigeria has not been impressive despite the large oil revenue. There are problems of inflation, low investment, high exchange rates of naira to dollars, debt overhang and unemployment to mention a few. All these have been attributed to poor expenditure management and corruption.

Musgrave and Musgrave (2005) highlighted three roles of public expenditure. First, is the allocation function which is made to balance the provision of private and social goods. Second, the stabilization function concerns the attainment of full employment and stable prices. Income distribution is the focus of the third function. At the end of World War II, economists began to apply economic theory to defence related issues with research focusing on the activities of cold war, super power, arms race, military alliances, terrorism and nuclear weapons. The end of the cold war witnessed several analyses on disarmament, conversion and peace dividend. Yet, the World up till now remain a dangerous place with increasing regional and ethnic conflicts, threats from international terrorism, weapons of mass destruction and various forms of national crises.

With the end of the Cold War, global military expenditure has been decreasing and it was expected that this reduction in military expenditure (or military burden) will lead to peace dividends for developing countries (Na Huo, 2009). However, many developing countries still spend a large amount of scarce resources on defence. Defence spending has increased because of the need to ensure peace and economic growth Luca (2008).

Defence expenditure is certainly not without effect on resource allocation and economic growth. The effects are multiple and often offset each other. The world defence expenditure in 2001 was estimated at $839 billion. This estimate accounted for 2.6 percent of world Gross Domestic Product (GDP) and a world average of $137 per capita. This was contained in Stockholm International Peace Research Institute yearbook (SIPRI yearbook 2002). Countries with high income - the industrialized nations had the highest defence spending whereas, developing countries particularly those in Africa had the heaviest debt burden and the lowest defence spending (Brempong, 2002).

Defence spending has assumed a great significance, for example, the world defence expenditure in 2003 was $956 billion (in current dollars) which was an increase of about 11% in real terms from the previous year. This remarkable rate of increase was primarily due to the massive spending on war in Iraq by United States of America (USA). The United States of America accounted for almost half of world defence spending. After reductions in defence spending in 1987–1988 and moderate increases in 1998–2001, a series of supplementary appropriations for the wars in Afghanistan and Iraq following the terrorist attacks of 11 September 2001 resulted in a massive increase in US defence spending in 2002 and 2003. This was 6 percent lower in real terms than the periods of cold war defence expenditure peak

1987 - 1988. In 2004, defence expenditure was about $162 per capita and 2.8 percent of world GDP (SIPRI yearbook 2005). World military expenditure is estimated to have been $1339 billion in 2007 - a real-term increase of 6 percent over 2006 and 45 percent since 1998. This corresponds to 2.5 percent of world GDP and $202 for each person in the world. In 2008, global defence expenditure was estimated to be $1464 billion. This represents an increase of 4 percent in real terms compared to 2007 and 45 percent since 1999. Defence expenditure comprised approximately 2.4 percent of global gross domestic product (GDP) in 2008. World military expenditure increased by 5.9 percent to hit a new record high of $1.53 trillion in 2009 (SIPRI, 2010). The increase was due to the increased capital outlays on weapons by the United States, China and France. The above statistics clearly showed that defence consumes a lot of economic resources and has been increasing persistently.

The performance of Nigerian economy over the past four decades has been unsatisfactory. Domestic saving and investment have been fluctuating thereby contributing to unsustainable external payment position (Adam, 2001). Various measures have been used to correct internal and external imbalances. Over the years, expenditure growth rate has been higher than revenue increase. This has reflected in persistent fiscal deficits, besides revenue has been generally unstable and depends largely on oil revenue in the face of fluctuations in the world oil market. In order to get out of low equilibrium trap, Structural Adjustment Programme (SAP) was introduced and implemented with great emphasis on medium term growth.

There have been several attempts empirically to investigate the relationship between government spending and economic growth in Nigeria. The findings were that certain government expenditures crowd out investment and retard growth while others crowd in

investment and add to economic growth (Adegbite, Ayadi and Ayadi, 2006). Debate on whether or not defence expenditure is growth retarding has continued unabated.

The Nigerian society mirrors some level of threats to peace and security even after the end of civil war in 1970. Recently, we had the boko haram sect which is a religious group threatening the peace and security of some states in the north. In the west, south and eastern states of Nigeria, the problem of kidnapping for which the kidnappers demanded huge amount of money from their victims before releasing them was a major threat to lives and property, investment and economic growth. There were also serious conflicts between Christians and Muslims in Kaduna and Plateau states leading to heavy loss of lives and property. These challenges were beyond the police. The Nigerian military have been drafted and involved in intense crime control and maintenance of peace and security for a long time in Nigeria. All these have led to sharp increase in defence expenditure. Nigeria is a regional military power which is engaged in peace support operations not only in Africa but the whole world. Nigeria and United Nations are looked upon to maintain peace in West Africa. Nigeria has been playing this role effectively and huge human and financial resources have been committed. It is not clear whether defence retards economic growth or not. Economic growth is often defined as the steady process by which the productive capacity of an economy is increased overtime to bring about rising level of national income. It is measured by percentage change in gross real national income. Several factors are responsible for economic growth. Among them are government policy (fiscal, monetary and exchange rate), trade and income policies. Others are advancement in technology, degree of openness of the economy, good governance and a stable political entity and so on.

Defence expenditure is important in public budgets of all countries because defence sector is a major user of scarce resources. Although, there have been agitations for reduction in defence spending in recent years, most developed and developing countries in the last decade have high defence expenditures, implying the sacrifice of civil expenditures. In the views of Akpan (2005), developing economies are faced with increase size of government operations. This is particularly true of defence sector. Certainly, the past three decades have witnessed an alarming increase in defence expenditures in Nigerian. This situation has reduced the developmental needs of other sectors. Budgeting for defence in terms of the desire to adequately equip the defence sector and ensure a sustainable economic growth in Nigeria is of paramount interest to the government. Through defence expenditure, government protects the economy against external aggression and enhances the stability required for economic growth and development. Besides, defence expenditure adds to societal welfare.

Statistically, defence expenditure in Nigeria which was ₦538.2 million in 1970 (in nominal terms) increased rapidly to ₦3.206 million in 1980 and later rose to ₦3.939 million and 12.169 million in 1994 respectively. In 1998, the expenditure on defence was about ₦23.08 million and rose to ₦111, 868 in 2005. The structure of defence expenditure which comprises of recurrent and capital expenditures has been sustained. For example, defence recurrent expenditure was ₦88, 053 million while capital expenditure was ₦22, 093 million in 2002. In 2006, both defence recurrent and capital expenditures fell to ₦83,674.0 million and ₦14,636.0 but rose to ₦102,597.27 million and ₦144,17.24 million for 2007 respectively (CBN statistical bulletin, 2007). Although defence expenditure has been fluctuating there has been a rapid upward swing. High military expenditure would cause 'developmental failure' and have a negative effect on economic growth (Na Huo,2009).

There are considerable literatures on the cost of defence expenditure, resulting from its adverse effect on economic performance of the overall economy. There is diversion of resources that would have been used for other developmental needs. Opportunity cost is conceptualized as the forgone alternative use of resources. The money used for military equipment cannot be used for building hospitals, schools and construction of roads and dams or for providing civilian goods. These foregone projects are regarded as the opportunity cost to the extent to which the economy foregoes the opportunity to commit these resources for alternative peaceful uses. This position gained much recognition when (Michael, 1999) argued that defence expenditure displaces other components of aggregate demand (consumption, investment and exports) especially in a situation of supply constrained economy or increase output if the economy is demand constrained.

Defence spending is an unproductive type of government spending, more so, it crowds out investment and civilian consumption. However, it cannot be denied that defence spending increases national security and therefore improves the environment within which growth and development prosper. This was the reason why Odusola (1996), submitted that military spending enhances economic growth through spin-offs. The acquisition of technical skills resulting from military expenditure can be transferred to the civil society and which could increase GDP (Benoit, 1973, 1978). All these depict the conflicting views of the impact of defence expenditure which constitute a major reason for the inability of previous studies to arrive at a consensus on the impact of defence expenditure on economic growth.

1.2 Statement of the Research Problem

Nigeria has adopted stabilization policy which requires considerable change in fiscal policy efforts aimed at reducing unsustainable fiscal deficits and enhancing economic growth which has not achieved much success. Given the rapid expansion of the public sector in the face of limited success in revenue generation, the government has focused on expenditure reduction to redress fiscal deficits. According to Williams and Hemming (1987), an apparently less productive expenditure is defence. But defence provides social and political stability that is required for growth. This means that reducing expenditure on defence could be counterproductive. Diamond (1990), argued that defence expenditure in the provision of security and public order, may be vital precondition for healthy investment environment. Arora and Bayoumi (1994) were of the view that reduction in world defence expenditure would offer significant long-term benefits for private investment and private consumption, especially for developing countries. Depending on the structure of a country's economy and the composition of her military expenditure, a reduction in military spending may have positive welfare effects on the populace through the primary impact of the reductions on national security (Olaniyi and Adam, 2003).

In general, therefore, the defence sector may enhance the supply of skilled labour, thereby alleviating an important growth constraint. Conversely, it may compete for scarce human and financial resources with the more productive civilian economy, thereby compromising the overall productivity and efficiency of the economy. Besides, the recent spate of large scale econometric models have probed into many corners of the Nigerian economy. But there is one sector of the economy still relatively but not adequately treated by model builders and strange enough, it is a sector which has continued to generate heated political and economic controversy. That sector is defence in Nigeria. The question to answer is whether defence

expenditure contributes to economic growth even as it absorbs large resources at the expense of the civilian sector. The above views are indications that the impact of defence expenditure could be positive or negative. In other words, is defence expenditure growth inducing, growth retarding or ambiguous? This cannot be properly articulated except through a thorough understanding of its macroeconomic impact (Olaniyi, 2000). History, colonialism, internal dissension, regional dimensions, intervention by the military power, high inflation, distressed domestic financial sector, fiscal deficits, balance of payments disequilibrium, poverty and the weakness of domestic democratic institutions create macroeconomic instability. The prevalence of these problems particularly, those of civil unrest necessitate change in the military might and attitude, which increases defence expenditure in the presence of scarce or limited economic resources. This has been the reason for the call for a reduction in unproductive expenditure (Odusola, 1996).

In Nigeria, it is obvious that with the end of civil war in 1970, there has been no major crisis that threatened the sovereignty of the nation. But, the various forms of internal crises (religious, ethnic, coup d'état, political and economic instability) around the country are enormous and detrimental to production and economic growth. More worrisome is that defence expenditure has been on the increase in the face of limited resources for other economic activities. The above macroeconomic constraints must be overcome in order to achieve rapid economic growth and development. As such this study concentrates on macroeconomic impact of defence expenditure on economic growth. Thus, a macroeconomic model for Nigeria was developed in blocks. Previous studies have used macroeconomic models but were brief in scope and analysis. The absence of an orderly system in Nigeria due largely to various forms of unrest and tensions is a great challenge to the operations of an effective fiscal system needed to support economic growth. This challenge is formidable because it affects pattern and direction of fiscal engineering.

Given the discussion above, this dissertation has the following research questions:

(i) What is the pattern and structure of defence expenditure in Nigeria?

(ii) What is the relationship between defence expenditure and economic growth?

(iii) What is the crowding out effect of defence spending on public investment?

1.3 Objectives of the Study.

The broad objective of this study is to analyze the impact of defence expenditure on economic growth. The specific objectives are:

(i) To determine the pattern and structure of defence expenditure in Nigeria.

(ii) To estimate the impact of defence expenditure on ecoonomic growth and some macroeconomic variables such as oil and gas, agriculture, manufacture and social service sectors and gross fixed capital formation, total private consumption, domestic credit, import of capital goods, import of

consumer goods, oil export, non oil export, exchange rate, oil and gas revenue, non oil and gas revenue, and budget deficit finance.

(iii) To identify the crowding out effect of defence expenditure on public investment in Nigeria.

(iv) To test the validity of the simulation series, provide a historical simulation and a counter factual policy simulation arising from a 10%, 15%, 20% and 25% increase in defence expenditure covering the period 1970 – 2008.

(v) To make policy recommendations.

1.4 Hypotheses for the study

The following hypotheses were tested in this study

(i) The null hypothesis state that defence expenditure has no significant impact on economic growth in Nigeria as against the alternative that defence expenditure has a significant impact on economic growth.

(ii) that defence expenditure has no significant impact on some endogenous variables such as oil and gas, agriculture, manufacture and social service sectors and gross fixed capital formation, total private consumption, domestic credit, import of capital goods, import of consumer goods, oil export, non oil export, exchange rate, oil and gas revenue, non oil and gas revenue and budget deficit finance.

(iii) scenario I: a 10% increase in defence expenditure has no significant impact on economic growth and some endogenous variables.

(iv) scenario II: a 15% increase in defence expenditure has no significant impact on economic growth and some endogenous variables.

(v) scenario III: a 20% increase in defence expenditure has no significant impact on economic growth and some endogenous variables.

(vi) scenario IV: a 25% increase in defence expenditure has no significant impact on economic growth and some endogenous variables.

1.5 Justification for the Study

Economic growth thrives under atmosphere of security, freedom and peace among other variables. Defence spending enhances security, freedom and peace under which an economy can flourish better. Defence spending posses the potential to balance power and the adequacy of defence spending is a necessary ingredient for peace. This position anticipates that defence is a physical activity which involves the commitment of resources to the fulfillment of a particular purpose. The purpose could be the attainment of victory or at least avoidance of defeat in war period (Jonah, 2005). Defence deters aggression and protects the territorial sovereignty of a nation. Defence spending provides employment that empowers people creating purchasing power that has a multiplier effect. The impact of defence expenditure on national income and the end product is the provision and sustenance of peace for the attainment of economic growth. This study is significant because one of the greatest challenges facing the public authorities in Nigeria is fiscal deficits and the mode of financing it. Public pressure has been rising for a reduced defence spending. Has there been policy slippage in Nigeria resulting in increase deficit budgets? Will curtailment of expenditure through reduction in defence spending enhance basic social services and access by vulnerable group in Nigeria?

An empirical investigation of the macroeconomic impact of the defence expenditure on economic growth will to a large extent create an understanding of how public expenditure components can effectively impact on rapid economic growth. This present study aimed at making a modest contribution to this polemics given a broader scope of macroeconomic variables and multi-sectoral approach which previous studies avoided. In terms of methodology, very few researchers have conducted policy simulation experiment in this area. This model provided a unique exercise were the macroeconomic model was solved before an *ex post* simulation forecast of the impact of defence expenditure was conducted for Nigeria. This was expected to serve as a guidepost to policy makers on issues of defence expenditure and other forms of public spending in Nigeria.

1.6 Scope and limitation for the Study

This study focused on macroeconomic impact of defence expenditure on economic growth in Nigeria. The time frame of investigation for the study covers the period spanning 1970 to 2008. The choice of this period was due to the fact that the period provides the requirement to meet statistical and econometric criteria for analyzing results that will help to determine the relationship between defence expenditure and economic growth in Nigeria. The study is a macro – level study however, it was limited to output of some key productive sectors like oil and gas, manufacturing, agriculture, social services and some major macroeconomic variables. The literature on defence showed the sector as a unique and peculiar type of which the data concerning defence expenditure activity is not easily accessible especially in Nigeria. There exist separate data on expenditure to navy, air force and army. Access to these data is limited and not adequate for this study. More so, the understanding and application of defence sub sector expenditure might reveal military strength of Nigeria defence sector. The major source of data for this study is central bank statistical bulletin and Stockholm international peace research institute yearbook.

1.7 Organization of Work.

The study has five chapters. Chapter one includes the general introduction which consists of the statement of the research problem, research questions, objectives, hypotheses, justification of the study, the scope and limitation for the study and the dissertation structure. Chapter two dwells on the literature review which includes the conceptual, theoretical and empirical studies as well as theoretical framework. In chapter three the methodology of the study, the theoretical and empirical macro econometric models as well as the explanation of the variables and expectations of the study are presented. Chapter four covers the presentation and analysis of the empirical results. Chapter five provides the summary, conclusions and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.0 Introduction.

The literature review for this dissertation was on relevant studies of defence expenditure and economic growth. The level of research on defence expenditure and economic growth study is rapidly growing. The components of the literature review include conceptual and theoretical literature, empirical and theoretical framework for the study.

2.1 Conceptual Literature

Economists tend to categorise public expenditure as productive and unproductive. They argued that productive expenditure are essential for economic growth. Three types of public expenditure are considered as being very productive. They are expenditures on physical infrastructural programmes, human capital programmes and government funded research programmes. Expenditures in these areas are called public investment. It has also been argued that such public investment in large scale could lead to faster growth than the promotion of private investment alone. Public expenditures are the engine of growth in the development process (Lansing, 1995). Following this line of reasoning it can be understood that some public expenditure are obviously wasteful and unproductive. They include military expenditure projects and white elephant projects which do not add to productive capacity of the economy. Therefore, Military expenditure is defined as the total financial resources applied by governments to create and maintain the national military (defence) establishment, peace and war. A major purpose of expenditure data, whatever the source, is to make provisions for easy identifiable measures over time, of the scale of resources absorbed by the

sector. Some basic definitions of defence expenditure as given by International Monetary Fund (IMF) and North Atlantic Treaty Organization (NATO) are provided below.

> *"The IMF definition covers all expenditures, whether by defence or other departments, for the maintenance of military forces, including the purchase of military supplies and equipment (including the stockpiling of finished items but not the industrial raw materials required for their production), military construction, recruiting, training, equipping, moving, feeding, clothing and housing members of the armed forces, and providing remuneration, medical care and other services for them. Also included are capital expenditures for the provision of quarters to families of military personnel, outlays or military schools, and research and development (R&D) serving clearly and foremost the purpose of defence. Military force also include paramilitary organizations such as gendarmerie, constabulary, security forces border and customs guards, and others trained, equipped and available for use as military personnel. Also falling under this category are expenditures for purposes of strengthening the public services to meet wartime emergencies training civil defence personnel, and acquiring materials and equipment for these purposes. Included also are expenditures for foreign military organizations and alliances. This category excludes expenditure for non military purposes, though incurred by a ministry or department of defence, and payments or services provided to war veterans and retired military personnel."*

The NATO definition includes:

> *All current and capital expenditure on the armed forces, in the running of defence departments and other government agencies engaged in defence projects as well as space projects, the cost of paramilitary forces and police when judge to be trained and equipped for military operations, military R&D, tests and evaluation costs, and costs of retirement, pensions of service personnel, including pensions of civilian employees. Military aid is included in the expenditure of the donor countries. Excluded are items on civil defence, interest on war debts and veterans payment.*

The definition given by IMF appeared to be more explicit and more importantly it gives a description of what defence covers. However, the status of foreign military aid received is rather unclear in the IMF definition, and it may be included in country submissions to the fund. More so, the IMF definition, based on national income account practices, excluded

military pensions, since this is a transfer payment. Yet when one calculates the burden of defence spending, the weight of military pensions is borne by the civilian economy. The same problem arises regarding some war-related expenditure for veterans' payments and interest on war debt. Both definitions exclude these and have the merit of consistency in terms of current costs in an aggregative framework. However, in a two-sector model trade-off between military and civilian sectors, such expenditures by the military do have real costs (Deger, 1992). This is particularly true given a developing country like Nigeria where crises and major conflicts rages on. The definitions given by IMF and NATO clearly showed that in an economy like that of the developing world, defence expenditure data will be difficult to capture especially by institutions or by the sub-units of the defence sector. This inadequacy is made realistic following the loopholes in statistical data. However, the need for disaggregation to understand the defence sector is very important.

This must have been the stirring point when United Nations Organization (UNO) in 1986, gave the most detailed aggregated categorization in terms of three major groups namely: operating costs, procurement and construction and research and development. From the categorization of the UNO, the operation costs which harbours military personnel, operations and maintenance including civilian pay is concern with operating or consumption expenditure, whereas procurement and construction and research and development is associated with investment expenditure. Of the three definitions given, that of UNO stands out since it clearly distinguishes among the three functional categories that have specific opportunity costs: man power and operational items, investment in weapons and current assets, and investment for the future. The categorization suggests the structure of defence

expenditure. In Nigerian context, there have been several modifications in the presentation of the Ministry of Defence's breakdown of expenditure. For example; the departments that makes up defence sector includes ministry of defence, defence head quarters, Nigerian army, Nigerian navy, the Nigerian air force, Nigerian defence academy, national defence college, armed forces staff college, Nigerian armed forces rehabilitation centre, defence intelligence agency, military pension board, defence intelligence military school and defence industry corporation of Nigeria (Federal Ministry of Finance (FMF), 1996). The breakdown of the Nigerian defence sector showed that both IMF and NATO definitions of defence expenditure exclude some unique features. While defence in IMF excludes military pension personnel, that of NATO excluded civilian personnel on pension. These excludes, are taken into consideration for the defence sector in Nigeria. The definition of what constitute military expenditure is unique and relative from one country to another.

2.1.1 Personnel Costs for the Armed Forces

This category includes the army, the navy, and air force staff as well as Nigerian Defence Academy (NDA) cadets, defence advisers, defence operations, staff of Nigerian armed forces resettlement centre, Armed Forces Staff College and the C.130 crash victims' scholarship, staff of national defence college.

2.1.2 Personnel Costs for the Civilian Staff

This section includes the civilian academic and non academic staff of NDA, civilian staff of the national defence college and civilian medical and paramedical personnel, other civilians both senior and junior staff under the various departments of the ministry in which they serve

the minister's officer, finance and supplies, personnel management, services departments, inter- services departments, planning, research and statistics departments and armed forces school management board.

2.1.3 Overhead Cost.

This category includes the costs of operations and maintenance and it is not yet disaggregated for public information. Operation costs are approximately the same as under the corresponding category in the UNO definition except for the exclusion of terms relating to pensions and benefits - which is handed by the directorate of military pensions in Nigeria while the civilian staff of the ministry of defence are grouped with the civil servants of other ministries. Hitherto, according to Nigeria' budget procedures, the pensions and benefits of all public servants, are charged to the consolidated revenue fund. Pensions and benefits for military personnel are not budgeted under the minister instead the benefits and pensions of ex-servicemen comes under a separate expenditure category.

Under The capital expenditure budget of the ministry of defence, there are numbers of defence related items or components which includes.

* capital project on defence
* defence industrial corporations
* purchases of vehicles and equipment for all the armed services
* the construction of military infrastructure such as barracks

  -care and maintenance of projects

  -Provision of roads, electricity, hospital and water of barracks and bases.

* development of training institutions
* equipment assemblies
* naval dockyard projects and
* air beetle simulation projects
* outstanding bills on equipment procurement and other capital projects.

Thus, the capital expenditure section of the ministry of defence budget corresponds to UNO's section on procurement and construction. Research and Development (R&d) does not exist as a separate expenditure category in the Nigeria defence budget. Institutions directed toward advanced research in Military matters include, the NDA- the university of the armed forces, the national defence college and Defence Industrial Corporation (DICON).

The Nigerian defence expenditure is structured according to the United Nations organization (UNO) and Stockholm International Peace Research Institute (SIPRI) classifications. However, in the approved budget of the Federal Government, The budget office approved two different sections of the defence expenditure namely: (a) recurrent expenditure; and (b) capital expenditure. The recurrent expenditure involves personnel costs for the armed forces (the army, the navy and air force). Added to this category is the costs of operations and/ barrack rehabilitation. These operation costs are approximately the same as under the corresponding UNO categorization. On the other hand, capital defence expenditure consist of funds allocated for the purchase of fixed assets such as military hardware and vehicles, the construction of barracks, and other infrastructure; care and maintenance projects, the provision of roads, electricity, hospitals and water for barracks, the provision of projects like air beetle simulation. Thus, the capital expenditure section of the defence expenditure

corresponds to the procurement, construction section of the UNO. R&D is also captured in capital defence expenditure. Depending on the nature of society's social welfare function, as reflected in government preference and in terms of public choice, there may be a tendency to overstate or under-report on defence expenditure. In addition, is the issue of corruption in the military and the society at large, and the contamination of economic data by the political framework within which defence decisions are taken.

2.1.4 Combat Readiness

Combat readiness is generally regarded as the state of preparedness for war or conflict by the armed forces. The state of preparedness depends upon manpower, the quality of trainning, availability and serviceability of vehicles and equipment, and the maintenance of the forces. According to the United States department of defence, combat readiness is "the capability of a unit/formation, ship, weapon system or equipment to perform the mission or function for which it is organized and designed." Combat readiness as the state of preparedness for war which includes the personnel, moral, level of training, esprit-de corps, commitment and the quality and quantity of equipment and vehicles. He stressed that a unit is considered combat needy if it has fulfilled 75 percent of its requirement. In essence, combat readiness mean the ability of the armed forces to keep the troops training on ground, the planes flying on the air and the ships steaming over the sea. The success of combat readiness of the military requires huge financial resources.

2.2 Economic Growth and Development.

The search for a satisfactory definition of economic growth by many economists has actually continued without an end. However, It is important to conveniently adhere to the convention that real per capita national income or output represents the most reliable indicator of a system's economic achievement at any point in time and that any change in real per capita income signifies welfare. Economic growth is an indication of society's welfare. It reflects the changes in its ability to attain any socially agreed upon set of goals, whether consumption, capital formation expenditure or national defence etc. Generally, growth can be defined as sustained increase in macroeconomic aggregates particularly real gross domestic product (RGDP). According to Bello (1995), developing countries resources are concentrated in the hands of a few powerful capitalist and because of this; the success of the above definition must take into cognizance the issue of proper income distribution devoid of all forms of manipulation and exploitations. A further weakness of the above definition is the fact that a number of national output indicators such as housewife services, smuggling etc are not recorded or adjusted for in national income accounting. Perhaps, a more detailed effort at defining and explaining economic growth is that of Kuznets (1955) which is: "modern economic growth of nations have two distinctive features: in all cases, it involves a sustained and substantial rise in produce per capita and in almost all cases it involves a sustained and sustained rise in population"

For the purpose of measuring economic growth particularly that of least developed countries (LDCs) Kuznets maintain that:

> *"Modern economic growth implies major structural changes and correspondingly large social and institutional conditions under which the greatly increased product per capita is attained. Yet for purposes of measurement, the changing components must be reduced to a common denominator, otherwise it would be impossible to compare the product of*

the united state with that of china or the product of an advanced country today with its output a century ago".

Economic Development on the other hand is used to imply a movement from a lower equilibrium condition to a higher one. Neo-classical economics however, assumes that economic development could be achieved if a country whose original economic condition is static is able to generate aid sustained an annual increase in its GDP at rates more than 5 percent or at least higher than its population growth rate. Economic development is presumed to have taken place in such a situation since it implies an increase in per capita income. The neoclassical concept relates to economic growth rather than economic development. However, this idea is applied to development, given the experience of developed economies. It is expected that the benefits of growth would spread to all facets of the economy through pecuniary and technological externalities (Krugman, 1992).

The levels and rates of growth of "real" per capita GDP was normally used to measure the overall economic wellbeing of the people as it indicates the amount of goods and services that are available to the average citizen for consumption and investment. The conclusion from the Neo-classical economic growth is that their strategies of development focused on the achievement of economic growth. GDP in itself is not an end but a means to an end. Unlike previous experiences in developed countries, linkages did not develop between the growth centres and the periphery. Instead, dualistic structures emerged. Both agricultural export and import substitution industrialization- led growth did not spread to the periphery. More so, domestic economic structures became dislocated as the fulcrum of growth was moved from the domestic economies to the external sector. Hence, the developing economies became strategically dependent on the external sector. Both employment and consumption were

dependent on imported goods like raw materials, capital, spare parts and food stuff. In fact, the agricultural export also relied on demand from the external sector. This process dislocates the resource use pattern. Also the expected linkage which should create the transmission channel was not established. Developing countries therefore resort to importation of goods that could have been produced domestically. Thus both taste and production became externally oriented. Therefore the high rates of growth of GDP achieved by developing nations in the 1960s and 1970s through enclave based growth did not reverse the miserable conditions of the masses. Large gaps were observed between the haves and the have nots and between the urban and rural sector (Ekpo, 1994). Poverty and unemployment continued unabated.

Goulet (1971) argued that the goals of development should include life sustenance, self-esteem and freedom. Life sustenance is the basic need provision, esteem is the feeling of self respect and independence while freedom implies freedom from the three evils of want, ignorance and squalor. Development in this sense suggests the movement from a lower level of self-sustenance, self-esteem and freedom to a higher one. It has also been stressed that one limitation in the concept of GDP is that it measures market value and not used value of the goods and services and it does nothing about distribution. Also that absence of extreme poverty is a goal that would have much greater appeal to ordinary men and women than a target for rate of economic growth or domestic savings (Hammarskjold, 1975). Economic development therefore is economic growth including a more efficient structural and functional arrangement; improved structural and functional efficiency is expected to facilitate a more socially desired distribution and resource use pattern. The basic need approach was operationalised by the world bank which maintain that no country can fully developed if it

cannot provide all its people with basic needs of housing, clothing, food and minimal education (Thirwall, 1983). Thus the focus of economics became the reduction or elimination of poverty, inequality and unemployment within the context of a growing economy.

This view regards development as endogenous and self dependent. The theory maintain that if development is the development of man, as an individual and as a social being, aiming at his liberation and at his accomplishment, then it must stem from the inner core of society. It relies on what a human group has, its natural environment, its cultural heritage, the creativity of men and women who constitute it, becoming richer through exchange between then and with other groups. This approach to development stimulates creativity and leads to better use of resources (Hammarskjold, 1975). Other commentators like Kayode, Oyejide and Soyode (1994) maintain that economic development is a process that comprises of a host of economic activities whose ultimate goal is the enhancement of human welfare. These include the objective of reducing poverty, raising people's standard of living and expanding the living and expanding the range of choice available to them. The success of these goals was attained through raising incomes, increase in health, nutrition, education and other material consumption. The authors argued further, that the prerequisites for the attainment are sound economic policies, strong infrastructure and a sustained build-up of human and institutional capabilities.

Generally, development can be viewed as a multi-dimensional process involving major changes in social structures popular attitudes and national institutions that are capable of propelling a nation to achieve and sustain accelerated economic growth, reduction of inequality and eradication of absolute poverty. Development is a transformation of society, a

society wide shift to new ways of thinking that cannot be achieved through enclave based growth in a dualistic economy" it should involve all aspect of the economy providing new ways of achieving known goals, maximizing the social welfare functions and sustaining it at its optimal level. Like many other concepts, there is no consensus on what development is. According to Kalu (1980), development should be viewed as the process of emancipation of man from poverty, fear, exploitation and dirty environment, dependence on foreign money, experts and pries.

Todaro (2008) defined development as "the process of improving the quality of all human lives," Todaro suggests three important aspects of development which are (1) raising people living levels - that is their incomes and consumption levels of food, medical services, education etc. through relevant economic growth process. (2) creating conditions conducive to growth of people's self esteem through the establishment of social, political and economic system and institutions which promotes respect and (3) increasing people's freedom to choose by enlarging the range of their choice viables e,g increasing varieties of consumable goods and services. This definition shows that the use of group, GDP or per capital income which dominate theory in the 1950s and 1960s is no longer relevant since some counties with high GNP, GDP or per capita income did not show any sign of development. For a nation that is willngling to develop, there is the need to accept and adopt the conditions given by Todaro, Hammarskjold, Kayode, Oyejide and Soyode and Kalu. Development requires property and adequate practiced, it will reduce or eliminate political, social, and economic instability in a country. It would be the bane upon which a country flourishes in all aspects of her endeavours. Above all, the issue of corruption, exploitation and ignorance of the law must be

wiped out or reduced to its barest minimum to encourage development and in a nation like Nigeria.

2.3 Growth Theories

The modern conception of economic growth theories began with the critique of Mercantilism, especially by the physiocrats and with the Scottish enlightenment thinkers such as David Hume and Adam Smith and the foundation of the discipline of modern political economy. The theory of the physiocrats was that productive capacity, itself, allowed for economic growth and that improving and increasing capital to enhance that capacity was "the wealth of nations". The theory further stressed the importance of agriculture and saw urban industry as "sterile", Adam Smith extended the notion that manufacturing was central to the entire process of the economy. This study explains some theories of economic growth ranging from the classical to neo-classical and endogenous theories. These theories were propounded to identify and explain some variables that influence economic growth. Though these theories are complementary, however, each is very unique. According to the classical theory which hinge on capital accumulation as the major determinant of economic growth, put differently, the theory assigns the responsibility of growth enhancement to the rate of investment. The level of investment in turn leads to higher profit such that the higher the level of profits, the higher the level of investment. The classical economist, Adam Smith (1776), David Ricardo (1817) and John Stuart Mill provided various forms of definition for production. They included manufacturing as one of the elements in the creation of wealth and introduced the concept of vendibility – production for the market rather than in accordance with the dictates of a national economy. Nevertheless they reserved the term production for the description of

such activities as resulted from the agricultural and the extractive processes and from the manufacture of useful material object. David Ricard argued that trade was a benefit to a country; because if one could buy a good more cheaply from abroad, it means that there was more profitable work to be done. This theory of "comparative advantage" was the central basis for arguments in favour of free trade as an essential component of economic growth.

Smith posited a supply-side driven model of growth. Succinctly we can lay out the story via a simple production functions:

$Y = f(L, K, T)$ …….2.1

where

Y is output

L is labour

K is capital and

T is land.

So output is related to labor and capital and land inputs. Consequently output growth (g_Y) was driven by population growth (Pg), investment (I), growth of labour (Lg) and land growth (T_T) *and* increases in overall productivity (g_y). Succinctly:

$g_Y = f(P_g, I, L_g, T_T)$ ……2.2

Population growth, Smith proposed in the traditional manner of the time, was endogenous: it depends on the sustenance available to accommodate the increasing workforce. Investment was also endogenous: determined by the rate of savings (mostly by capitalists); land growth was dependent on conquest of new lands (e.g. colonization) or technological improvements of

fertility of old lands. Technological progress could also increase growth overall: Smith's famous thesis that the division of labor (specialization) improves growth was a fundamental argument. Smith also saw improvements in machinery and international trade as engines of growth as they facilitate further specialization.

Smith believed that "division of labor is limited by the extent of the market" - thus positing an economies of scale argument. As division of labour increases output increases (the extent of the market") it then induces the possibility of further division and labour and thus further growth. Thus, Smith argued, growth was self-reinforcing as it exhibited increasing returns to scale.

Finally, because savings of capitalists is what creates investment and hence growth, he saw income distribution as being one of the most important determinants of how fast (or slow) a nation would grow. However, savings is in part determined by the profits of stock: as the capital stock of a country increases, Smith posited, profit declines - not because of decreasing marginal productivity, but rather because the competition of capitalists for workers will bid wages up. So lowering the living standards of workers was another way to maintain or improve growth (although the counter-effect would be to reduce labor supply growth).

Smith's model of economic growth remained the predominant model of Classical Growth. David Richardo (1817) modified it by including diminishing returns to land. Output growth requires growth of factor inputs, but, unlike labour, land is "variable in quality and fixed in supply". This means that as growth proceeds, more land must be taken into cultivation, but land cannot be "created". This has two effects for growth: firstly, increasing landowner's rents over time (due to the limited supply of land) cut into the profits of capitalists from

above; secondly, wage goods (from agriculture) will be rising in price over time and this then cuts into profits from below as workers require higher wages. This, then, introduces a quicker limit to growth than Smith allowed, but Ricardo also claimed (at first) that this decline can be happily checked by technological improvement in machinery (albeit, also with diminishing productivity) and the specialization brought by trade, although he also had stationary states. However, Ricardo modified his position on machinery. He claimed that, in fact, machinery displaces labour and that the labour "set free" might not be reabsorbed elsewhere (because capital is not simultaneously "set free") and thus merely create downward pressure on wages and thus lower labour income. In order to reabsorb this extra labour without this effect, then the rate of capital accumulation must be increased. But there is no obvious mechanism for this to happen -- particularly given the tendency described above for profits and thus savings to decline over time.

The economic mechanism by which more investment leads to more growth has been described in terms of the Harrod – Domar model growth in one form or another; which has affected policy issues facing developing countries. The classical economists hold the view that the relationship between productivity and technical efficiency is a one-way relationship that goes from the input of labour and output. The classical growth theory, as reflected in the aggregate production (mostly a variant of Cobb-Douglas production function) derived essentially from the technical relations that make the level of output a function of production inputs such as labour, capital, land and technology. In the classical models of steady state conditions (where the growth rate of capital stock and output are equal), the approach showed that the rate of growth of labour force and technical progress ultimately determine the growth rate of output. This, however, does not preclude the classical economist belief in the

attainment of full employment equilibrium. In this framework, the supply of labour is positively related to the level of real wage, while the demand side exhibits a negative relationship with real wage, but a positive relationship with productivity (Obadan and Odusola, 2000).

Since the theory emphasized the limits of growth, it is often described as a self-limitng theory. A variant of this theory include the famous Harrod-Domar model which asserts that, in the absence of government, the growth rate of the economy will be directly related to the economy capital output ratio. This model is a closed economy and that there is no government, no depreciation of existing capital so that all investment is net investment, and that all investment (I) comes from savings (S).

Assume that there is a relationship between the total capital stock, K, and total GDP, Y.

The model yields a steady state growth, given as:

$$-\frac{\Delta Y}{Y}=\frac{s}{k} \quad \text{.....2.3}$$

Where:

k = the capital output ratio

s = the savings ratio

ΔY = denotes change in National income

Y = the National income.

The key modification of Harrod-Domar model is expressed by a simple aggregate production income

$$Y = F(A, K) \quad \text{.....2.4}$$

Where, Y= Gross Domestic Product.

A= Productivity of capital

K = Stock of capital.

There is only one commodity output as a whole, whose rate of production is designated by (Y). Output is produced with the help of two factors of production, capital and labour, whose rate of input is (A). The 'tricks' of economic growth, according to this model, are simply a matter of increasing savings and investment. The main obstacle to or constraint on development then is the relatively low level of new capital formation or investment in most LDCs. Therefore, the 'savings gap' or what is later referred to as the 'Financing Gap' can be filled either through foreign aid or private foreign direct investment. There are other considerations to be taken into account because this model in the 1960s up to the 1990s did not work, though the Harrod-Domar Equation and investment capital output ratio are still employed today for quantifying AID to LDCs. The Harrod-Domar model is still applied today to calculate short-run investment requirements for a target growth rate. Development economists calculate a 'Financing Gap' between the required investment and available resources and often fill the 'Financing Gap' with foreign aid. 'Financing Gap' equals difference between the required investment and the LDC's savings. This model promised LDCs growth in the short-run through aid and investment.

The model does not allow substitution between capital and labour. A remarkable characteristic of the Harrod -Domar model is that, it consistently studies long-run problems with the usual short-run tools. The major pitfall in the classical theory of economic growth lies in its failure to recognize the role of technical progress in the growth process.

2.3.1 The Solow's Neoclassical Growth Model

The neoclassical growth model was an extension to the Harrod–Domar model that included a new term: productivity growth. The neoclassical economic theory outlines how a steady economic growth rate can be accomplished with the proper amount of the three driving forces: labour, capital and technology. The theory states that by varying the amounts of labour and capital in the production function, an equilibrium state can be accomplished. When a new technology becomes available, the labour and capital need to be adjusted to maintain growth equilibrium. The important contributors of this model Solow and Swan (1956), they developed a relatively simple growth model which fit available data on US economic growth with some success. Economists use Solow's sources-of-growth accounting to estimate the separate effects on economic growth of technological change, capital, and labor. The model postulated that at any given point in time the aggregate output of the economy is determined by the quality and quantity of physical capital employed, the quantity of labour employed and the level of technical progress. The model is based on an aggregate production of the form;

$Y = f(K, L)$ ……..2.5

While the generalize model is described by the formula

$$Y_1 = A_1 K_1^{\alpha} L_1^{1-\alpha}$$ ……..2.6

Where:

Y = Aggregate output of the economy in years (t)

A = An index for the level of technical progress

K = Stock of capital in the economy

L = Amount of labour in the economy

α = Contribution of capital to aggregate output

1 - α = Share of output per work

According to the neoclassical model, once the economy reaches the full equilibrium level, additional growth in the stock of capital per worker will only take place if productivity increases, either through enhanced capital stock or improvement in the quality or the labour force. In the long-term, output per capital and labour productivity grow at an exogenously determined rate of technical progress. Technical progress in the neo-classical model is assumed to be exogenously determined i.e. it is determined outside the model hence it is called an exogenously growth model.

The model predicts a convergence, that is, a tendency for poor economies to catch up with the rich ones. The model extended the Harrod-Domar formulation with the inclusion of labour and the introduction of a third independent variable, technology, to the growth equation. It assumed diminishing returns to labour separately and constant returns to scale to both factors jointly. If for simplicity we assume that A and L are constants, then growth in output will occur only if there is capital accumulation. Net investment is given as:

$$\frac{\Delta Y}{\Delta t} = sY - \delta Y \qquad \text{...2.7}$$

Where δ is depreciation

Since capital accumulation is assumed to equal total saving sY, the above equation implies that there will be a state in which output and capital are no longer changing, this is referred to as steady state. However, if there is increase in labour, the model implies that output grows' in the same proportion, thus output per worker is constant. But if there is technology growth, there will be a rise in marginal product of capital and this transmits directly to a positive level of output per worker growth. Thus the model postulated that without growth in technology,

economic growth will ultimately cease.

The implications of the neoclassical model of growth are straightforward. The first major implication is that sustained increases in per-capita income can be supported only by sustained increases in total factor productivity. In this model, output per worker can rise only if (a) the ratio of capital per worker increases or (b) total factor productivity increases. Since this model assumes diminishing returns to capital, there is a limit to how much capital accumulation can add to output per capita. Hence, the only way to increase output per worker in the long run is to have sustained productivity growth. This is a major weakness of the neoclassical growth model, since long-run growth is exogenous, i.e. determined by an element that is entirely outside of the model.

The second major implication of this model is the "conditional convergence thesis," which states that economies with lower initial levels of real output per worker relative to the long-run level should experience faster economic growth. This property follows from the assumption of diminishing returns to capital: the lower the ratio of capital per worker, the higher the return to investing in capital. Hence, the lower the ratio of capital per worker, the faster the rate of capital accumulation and the faster the growth rate of output per worker. This implies long-run convergence in output per capita. Convergence is said to be conditional here since the long-run level of capital per worker and output per worker depend on the saving rate, the growth rate of the population, and the existing technology--factors that are unlikely to be identical across countries. The convergence thesis is strengthened by the assumption that all countries can acquire technological progress at no cost.

2.3.2. The New Growth Theory: Endogenous Growth Theory

The New Growth Theory or what is known as the Endogenous Growth Models were developed as a response to the criticisms of the neo-classical growth model and to offer better explanation of the process of long-run economic growth. The concept endogenously as employed by the new growth theory implies that long-run growth is determined within the model rather than by some exogenously increasing variables. This new line of theory was propelled by the seminal work of Romer (1986) which modeled technology growth as the outcome of competitive firms that invested in knowledge generation. Innovation here is seen as the driving force of long term economic growth. These innovations are basically a function of ideas that are often generated by investment in Research and Development.

Though endogenous growth models share certain similarities with the neoclassical models, they differ in the underlying assumptions and conclusions. The new growth models assume constant marginal product of capital at the aggregate level or at least that the limit of marginal product of capital does not tends towards zero. It assumes that public and private investments in human capital generates external economies and productivity improvement that offset the natural tendency for diminishing returns. The model also relaxes the assumption of perfect competition on the basis of the existence of some degree of monopoly resulting from the holding of patents. But Romer (1986) observed that investment in knowledge possess a natural externality because it is impossible in knowledge to be perfectly patented or kept secret permanently. It is often copied and duplicated and by implication, it generates positive externalities on the production possibilities of other firms.

This model brought about a resurgence of interest in economic growth theory. This is evident by the existence of numerous modifications, tests and extra-interpretations of the model by

several authors. For instance, Mulligan, Richard and Sala-i-Martin (2004) and Lucas (1988) modified the model to include the role of human capital. Aghion and Howitt (1992) and Grossman and Helpman (1991) included imperfect competition and creativity in the model. Other modifications are found in Fisher (2001), Barro and Sala-i-Martin (1995).

Based on the emphasis of the sources of economic growth, endogenous models can be divided into two strands of theoretical literature. The first strand of models, much more similar to the neoclassical growth model, emphasized the accumulation of private capital as the fundamental source of economic growth. This class of models however contrasts the neoclassical model in that it does not require exogenous elements. The simplest functional form of the model is written as

$Y = AK$ ……2.8

and as such it is called the AK model.

The second class of the new growth model stresses that endogenous development of knowledge is the engine of growth. On a general note however, endogenous growth models demonstrates that policy measures can have impact on the long-run growth rate of an economy. Some of the variants of endogenous growth model within the framework of the two classes include.

a. AK models of Rebelo (1991)
b. Jones and Manuelli (1990) model
c. Lucas (1988) model which focuses attention on the accumulation of human capital
d. Barro (1990) Model which emphasizes the relevance of policy variables such as

public expenditure, taxation, Research and Development, corruption among others, on economic growth.

e. Romer (1986) model emphasizes on the generation of knowledge through research and development. This model· provides the theoretical underpinning for this research. This is due to the fact that R&D will improve the military sector and spill over to the civil economy.

It is important to mention here that endogenous growth models are not without their weaknesses. Basically two important criticisms have been identified in the literature. First, the models are attributed to have "scale effects" which implies that the size of the long run growth rate of an economy is affected by the size or scale of the economy, measured by say, population. But there is no empirical evidence to support the existence of scale effects.

The second criticisms is based on the condition which states that to generate an equilibrium of an on-going growth, all production functions must generally exhibit constant return to scale in the factors of production that are being accumulated endogenously. This condition imposes a strict knife-edge restriction on the production structure. The model underpinning the link between productivity and economic growth is not a new phenomenon in economic literature. However, Romer endogenous growth theory serves as the theoretical framework for the study.

2.3.3 Romer's Model of Endogenous Growth

The Endogenous growth models having demonstrated that policy variables can have significant impact on long - run economic growth, provides theoretical underpinning for this

research. However, Romer (1986) model is adopted because it addresses technological spill overs that may be present in the process of industrialization. This study use a simplified version of Romer's model that keeps his main innovation - in modeling technology spillover - without presenting unnecessary details of savings determination and other general equilibrium issues. The model begins by assuming that growth processes derive from the firm or industry level. Each industry individually produces with constant returns to scale, so the model is consistent with perfect competition; and up to this point, it matches assumptions of the Solow model.

But, Romer departed from Solow by assuming that the economy wide capital stock, K, positively affects output at the industry level, so that there may be increasing returns to scale at the economy wide level. It is very important to think of each firm's capital stock as including its knowledge. The knowledge part of the firm's capital stock is essentially a public good that is, spilling over instantly to other firms in the economy. As a result, this model treats learning by doing as "learning by investing". Romer's model is spelling out - endogenizing - the reason why growth might depend on the rate of investment (as in the Harrod - Domar model). The Romer model was adopted for this study because of its emphasise on spillover effects.

Formally, an important feature of the original model is assumed using Cobb - Douglas production function:

$$Y_1 = AK_1^{\alpha} L_1^{1-\alpha} \bar{K}^{\beta} \quad \text{.....2.8}$$

We assume symmetry across industries for simplicity, so each industry will use the same level of capital and labour. Then, we have the aggregate production function:

$$Y = AK_1^{\alpha+\beta}L^{1-\alpha} \quad \text{.....2.9}$$

To make endogenous growth stand out clearly, this study assume that A is constant rather than rising over time, that is, i assume for now that there is no technological progress. With a little calculus, (as shown below),

By the chain rule,

$$Y = \frac{dY}{dt} = \frac{\partial Y}{\partial K}\frac{\partial K}{\partial t} + \frac{\partial Y}{\partial L}\frac{\partial L}{\partial t} \quad \text{.....2.10}$$

By the exponent rule, than

$$\frac{\partial Y}{\partial K} = A(\alpha+\beta)K^{\alpha+\beta-1}L^{1-\alpha}$$

$$\frac{\partial Y}{\partial K} = AK^{\alpha+\beta}(1-\alpha)L^{1-\alpha-1}$$

Combining these three equations gives

$$Y = \frac{dY}{dt} = \left[AK^{\alpha-\beta}L^{1-\alpha}\right]\left[(\alpha+\beta)\frac{\dot{K}}{K} + (1-\alpha)\frac{\dot{L}}{L}\right] \quad \text{.....2.11}$$

The first term in brackets in the preceding expression is the output Y. For a steady state, $\dot{K}/K$, $\dot{L}/L$ and $\dot{Y}/$ Yare all constant. From earlier discussion of the Harrod - Domar and Solow models

$$K = 1 - \partial\dot{K} = sY - \partial K$$

Dividing this expression through by K gives

$$\frac{\dot{K}}{K} = \frac{sY}{K} - \partial$$

For $\dot{K}/K$ constant in the preceding expression, we must have Y/K constant. If this ratio is

constant, then

$\frac{\dot{K}}{K} = \frac{\dot{Y}}{Y} = g$, g = constant growth rate.

So from the expression for dy/dt in the preceding expression, for the aggregate roduction function, with $\dot{L}/L$ = n, which is also a constant, we have

$$\frac{\dot{Y}}{Y} = (\alpha - \beta)\left(\frac{\dot{K}}{K}\right) + (1-\alpha)\frac{\dot{L}}{L} \rightarrow g(\alpha+\beta)g + (1-\alpha)n$$

$$\rightarrow g - n = \left[\frac{(1-\alpha)+(\alpha+\beta)-1}{[1-(\alpha+\beta)]}\right]n$$

It may be shown that the resulting growth rate for per capita income in the economy would be:

$$g - n = \frac{\beta}{1-\alpha+\beta} \quad \text{.....2.12}$$

Where g is the output growth rate and n is the population growth rate. Without spillovers, as in the Solow model with constant returns to scale, β = 0, and so per capita growth would be zero (without technological progress).

Romer assumes, however, that taking the three factors together, including the capital externality, β > (); thus g - *n* > 0, and $\frac{Y}{L}$ is growing investment undertaken in the model, not driven exogenously by increases in productivity. The interesting property of the Romer model is that with an investment (or technology) spillover, the model avoids diminishing returns to capital. In one way or another, endogenous growth models introduce assumptions that ward off such diminishing returns. One of the main shortcomings of endogenous growth theories is the collective failure to explain conditional convergence reported in the empirical literature. Another frequent critique concerns the cornerstone assumption of diminishing returns to

capital. Some contend that *new growth theory* has proven no more successful than exogenous growth theory in explaining the income divergence between the developing and developed worlds.

2.4 Models of Public Expenditure Growth.

One of the first attempts to explain the growth of government size was the approach to "Law of increasing state activities" by Adolph Wagner, (1890). Within this approach government size is expected to grow more than proportional to domestic income. Wagner, a famous German economist was of the view that inherent tendencies for the activities of different layers of government can increase intensively and extensively. There is a functional relationship between the growth of an economy and government activities with the result that the governmental sector grows faster than the economy. Wagner provided some reasons to support his thesis. First, that an expansion in the traditional functions of a state would emerge with respect to the administration and defence. Second, new needs for public regulative and protective activity would emerged as a result of the increased complexity of legal relationships and communication that inevitably accompanied the greater division of labour characterized by industrialization process all through history. Third, the state activities would be increasing in their cultural and welfare expenditures. The need to enrich cultural life of the society and provision of social security to the people as well as the provision of subsidies in the oil and agricultural sectors of the Nigerian economy and the distribution of fair justice by reducing income and wealth inequalities is a factor that increased government participation in the economy. Four, Wagner maintained that the inevitable changes in technology and the increasing scale of investment in many of the activities would create an increasing number of

monopolies whose effect would have to be offset, or the monopolies taken over by the state in the interest of economic efficiency. Some investment like defence, hydro electricity etc. due to the huge resources required, suggests that only the state through the tax payers contributions can provide that investment.

Wagner's law was based upon historical facts and the theory defined a long term trend and not short term changes in public expenditures. According to Bhatia (2008) Wagner's law was not concerned with the mechanism of increase in public expenditure which translates into the inability of the theory to provide a precise quantitative relationship between the extent of increase in public expenditure and time taken by it was not fixed in any logical or functional manner. Given both the technical and environment specification of Wagner's law, the necessary condition under which the law holds are: (i) rising per capita income (ii) technological and institutional change of a particular sort and (iii) democratization of the polity in the sense of wider political participation (Abubakar, 2001).

Nitti (1903) and Williamson (1961) supported Wagner's law. For example Nitti, concluded with empirical evidence that the law was not only applicable to Germany but various governments whether in developed or under developed economy. Bhatia (2008) also highlighted five other factors that were responsible for increase in government expenditures. These included increased population, increased urbanization, increased tendency of prices to go up, the size and nature of public services which required increase specialization, better qualified personnel; and the need for the government to protect itself from the evils of market mechanism.

Another important theory concerning the growth of public expenditure was put forth by Wiseman and Peacock (1961). The study argued that public expenditure does not increase in a smooth and continuous manner, but in jerks or step like fashion. Essentially, Wiseman and Peacock found that government expenditure grew in a discrete or step-wise fashion as opposed to continuous growth profile. In their submission, these authors were of the view that at times; some social or other disturbances take place, creating a need for increase public expenditure of which the existing public revenue couldn't meet. Initially, an insufficient pressure for public expenditure, appear to exist which contributed to revenue constraints dominating and restraining an expansion in public expenditure, now under changed requirements such restrain gives way. This clearly shows that with increase in public expenditure, the initial revenue will no longer be enough hence the need to move from the former level of revenue and taxation to a new and higher level, when this happens there a displacement effect. The new level suggests that the government and the people review the initial revenue position and the need to find a solution to the important problems that have come up and agree to the required adjustment to finance the required expenditure, thus, a new level of tax tolerance and the willingness to bear a greater burden of taxation is initiated. This will help to stabilize public expenditure and revenue at a new level until another disturbance occurs to cause a displacement effect. Wiseman and Peacock also maintain that there is the apparent tendency for the central government economic activity to grow faster than that of the state and local governments which they refer to as the concentration effect. This thesis argued that government will invariably inherit some expenditure obligations during the disturbance period and after which it will find it difficult to transfer into other bodies – state and local

governments. This cannot alone explain the increase in public expenditure and in which the process of growth carries with it certain influences tending to change the size of the government unit upon which responsibility for public economic activities rests, which is usually the central government. The concentration effect appear to have a permanent influence on public expenditure, once the change towards centralization has been made, it is easier to render it permanent.

Wiseman and Peacock consider as well, within their analysis, the "inspection effect", which operates from the demand-side: a war brings into focus problems which were not identified before and which require further government spending. Bhatia, opined that it is the inadequacy of the revenue as compared with the required public expenditure that creates an inspection effect. In periods of war, the government and the people will have to review the revenue position and the need to find a solution of the important problems that have come up and agree to the required adjustments to finance the increased expenditure. Basically, each and every major disturbance leads to the government assuming a larger proportion of the total national economic activity. The Wiseman-Peacock hypothesis was very convincing but we must know that they are emphasizing the occurrence of abnormal situations which cause sizeable jumps in public expenditure and revenue. Gupta (1976) devised a rigorous statistical test of the Wiseman-Peacock displacement effect and concluded that the displacement effect hypothesis was deduced from their (Wiseman and Peacock) statistical observations of the time-pattern of growth of public expenditure in their United Kingdom only, hence, the need to generalize will require a test of other countries. But, quantitative measurement and test of significance of the effect of displacement was not done and as such the study did not provide

good empirical literature in respect of the problems associated with the displacement effect of Wiseman-Peacock. Gupta was able to carry out a research on five countries. One of his findings provided an evidence for the occurrence of displacement or a shift in the level of government spending after both the first and second world wars in four out of the five countries included in his study. According to Gabriella (2005), the increase in public expenditure following the Wiseman-Peacock hypothesis, that expenditure rises stepwise during war times due to the higher military spending which after the war period the increase in public expenditure is sustained and likely not to return to its previous levels, although it decreases after the war, nevertheless it stabilizes at an higher value compared with the pre-war period.

Musgrave and Musgrave (2005) provided some variables as the possible factors responsible for the public expenditure growth. These are the growth of per capita income, technical change, population change, urbanization, availability of tax handles, war finance cost of public services, political factors like the democratic set up etc. From the aforementioned, it is certain that the authors have proffer various means through which expenditure can increase in any economy. Although different techniques were used in their research especially on displacement effect, there appear to be a converging point which is the fact that the various authors upheld the place of the possible tendency of defence expenditure to be on the increase and hence the place of opportunity cost in defence expenditure study cannot be overemphasized.

2.5 Macroeconomic Impact of Defence Expenditure.

In most developed and developing countries defence spending is a major claim on public resources. There are different opinions, theories and evidences regarding the consequences of defence expenditures. Adam Smith (1776) in his popular work "An Inquiry into the wealth of nations" opined that defence expenditures should be the first duty of any government as it seeks to protect and preserve its society from violence and invasion of other independent societies. He further maintained that defence sector expenditure is a remarkable one, such that it does not necessarily require considered opinion by the majority of the citizens as to what level of defence expenditure is needed in a particular situation. However, he was quick to conclude that defence expenditure does not yield any productive resources.

Defence expenditure gained much prominence when Benoit (1973) conducted a study on defence expenditure and economic growth covering 44 countries. Beniot had identified a number of positive and negative channels through which defence expenditure impacted on economic growth .The study suggests the transfer of massive resources away from investment to defence sector. He showed that defence expenditure contributed to the civilian economics by feeding, clothing and housing a number of people who would otherwise have to be fed, housed and clothed by the civil economy, provision of education and medical care as well as vocational and technical training, engaging in a variety of communication network that serves the civilian uses, engaging in scientific and technical specialties such as hydrographic studies, mapping, aerial survey, dredging, meteorology, border guard and disaster relief which would otherwise have to be performed by civilian personal. Military forces also engaged in certain research and development (R&D) and production activities which diffuse skills to the civilian economy and engage in or finance self help projects producing certain manufactured items for

combined civilian and military use which might not be economically produced solely for civilian demand (Benoit, 1978). This exposure has not only suggested that defence expenditure is a viable economic injector for growth but has opened an avenue for a series of debatable works.

Mathur and Islamia (2001), argued that the reorganization of defence expenditure expansion has not only denied other sectors the opportunity to expand production that is more impact creative on the society but has been a foremost obstacle to development in this interdependent and contemporary world. However, it has made some little impact on development studies. Collier and Hoeffler (2002), sought to identify the demand for military expenditure in a study. They observed that the nature of defence expenditure adopted by a country is as a result of the reaction of neighbouring countries. This situation further creates multiplier effects for other influences on military expenditure notably, war and threat of war. The conclusion arrived at by these authors did not give military expenditure any positive impact in stimulating national growth process as military expenditure on the basis of the reaction of neighbour is a regional public 'bad'. This submission did not tally with the views of Quan sun and Qiao Yu (1999) in their study "Determinant of China military expenditure". They maintained that the association between China and U.S. is not significant and U.S. military expenditure had no explanatory power for China's military expenditure. This position suggests a rather independent military expenditure of a country irrespective of whatsoever reactions of a neighbouring country.

Defence expenditure is relatively large in developing countries. Brempong (2002), in a study titled "Research on military expenditures in Africa: Findings and lessons for researchers"

observed that the sub-Saharan African countries spent an average of $8.8 billion annually on the military between 1990 and 1999. He observed further that the absolute amount spent on military in African countries was low compared to those of developed countries. The military burden averaging about 2.3% of GDP is much higher in developing countries than the world average. High military burden no doubt created and aggravated the poverty level of the sub-Saharan countries. Crespo and Gerhard (2003), in a research conducted on "Guns or Butters?" Revisited: Robustness and Non linearity issues in the defence growth nexus", argued that defence expenditure had the potential externality effects that played a great role in terms of contribution to GDP growth. Countries aspiring democratic governance and strong economies require capable administrative and political structures of which a key element to the attainment of a well governed environment is the defence sector which is an institution responsible for protecting the state and the communities (Dylan and Karkoszka, (2004)).

According to Elisabeth (2000), the end of the cold war brought with it a reduction in defence expenditure and international arms transfers, both in terms of world total and in most regions and countries. Oleg (2002) lent support to Elisabeth when he argued that the overall challenge lay on how to reduce defence expenditure and international arms transfers and channeled the released resources into economically and socially more beneficial uses while at the same time not reducing, but rather enhancing the security of the world population. In spite of these reductions, the amount of economic resources used for military activities is still significant both in a global perspective, regional and individual countries. In any case defence expenditure posses that basic objective of fostering economic security that leads to growth, however the impact could be negative.

Abu - Barde and Abu – Qarn (2003) were of the opinion that the Middle East is characterized by large fiscal imbalances due to high expenditures and the vulnerability of government revenues to external shocks, moreover, due to the long-standing Israeli-Arab conflict, defence burden as a proxy of the share of government spending devoted to military expenditure was very high by international standards. Most countries of the Middle East have undertaken series of some fiscal adjustments by reducing expenditures with the ever growing dimensions in crises in the region; defence expenditure occupied a prominent place in the allocation of resources.

Nadir (1999) in his work on "Civil wars and military expenditure" wrote that in most of the developing countries, defence expenditure had become an important component of government expenditures. He maintained that between 1985 and 1990, military expenditure in developing countries constituted about 5% of their combined GDP and 17% of their combined government spending. This period saw many regions of the world experiencing a decline in military expenditure, probably due to the end of the cold war which involved increase spending on additional recruitment of soldiers and more importantly buying very expensive arms and ammunitions. Fortunately, this period has positioned Nigeria as a strong military might within the West African sub-region following its involvement in peace support operations. This has come to add to the increasing cost of maintaining the Nigerian armed forces. One of the reasons for increase defence expenditure since 1991 is the civil war that in Liberia. While it was obvious that the breakout of civil wars inevitably led to increase in defense expenditure levels, emerging evidence suggests that the relationship between military

expenditure and armed conflicts is causal such that increased defence spending are also believe to be a cause for civil wars (Nadir, 1999). This situation simply suggests that a reduction in military spending could be one of the pivotal areas that could assist in conflict reduction if not prevention which will automatically release some services and in turn reduce both micro and macro insecurity.

Aizenman and Glick (2003, 2006) provide a theoretical framework for the interaction between military expenditure and threats to account for the impact of military expenditure on economic growth. They attempt to explain that due to the non-linearity and omitted variable biases, the impact of military expenditure on growth is frequently found to be insignificant or negative. Joshua and Reuven (2003) made some attempts at clarifications of the puzzles that surround military expenditure and economic growth. The authors argued that military – expenditure and growth depends on and is highly fungible to corruption. In particular, by acting as a tax on fiscal expenditure, threat and growth, they argued that military-expenditure and growth depend on corruption which has hampered or retard economic growth. Corruption raises the desired level of defence spending. Defence expenditure in the face of corruption definitely will reduce growth.

Tanzi and Davoodi (1997), showed an indirect evidence when they conducted a research on defence expenditure and corruption which one of the variables showed a decreasing effect by reducing government revenue and the productivity of public investment. In fact, countries with high rate of corruption account for high defence expenditure. In Nigeria, defence sector is a sub sector of the macro economy that mirrors corruption in all facets; hence the sector

cannot be excluded from national corruption. Military expenditure induce by external threats is expected to create an increase in economic growth while military expenditure induced by corruption reduce economic growth (Davoodi, Clements, Schiff and Debaere, 2001 and Mauro, 1995). Corruption is a multifaceted phenomenon, it affects defence spending through a variety of channels, both supply and demand sides considerations affect corruption in the sense that arms producers may resort to giving bribes or inappropriate commissions to win contracts (supply side) and/or certain aspects of defence provision are particularly susceptible to corruption, for example the confer of power on the officials in charge of authorizing contracts (demand side). Bribes are actually paid in both developed and less developed countries in arms trade and in the form of campaign financing in return for favorable legislation for continued spending on defence Research and Development (R &D) and for lifting bans on exports of arms, when seeking the involvement of government officials to actively promote such trade. Corruption increase military spending without a corresponding economic growth.

The Nigerian defence sector is not an exception as corruption is exhibited in virtually all aspect of the sectors of the economy. The combination of cost negligence on the part of arms importers and the monopolistic nature of the military procurement process creates opportunity for over invoicing in procurement contracts and as a result the country paying bribes and commissions can subsequently recover the costs, at least in part, by over pricing arms and ammunition, over charging for spare parts and obtaining lucrative contracts to train the officers of the armed forces in the use of the weapons purchased. This concludes that the

general secrecy that surround defence outlays gave rise to corruption, thus, reducing the expected impact defence expenditures create on economic growth.

The relationship which defence sector has with other sectors in any economy is mixed. For example, it is argued that there is trade-off among health, education and defene expenditures. An increase in defence expenditure will crowd out an equivalent amount of all other spending. Thus, education and health expenditures will be reduced proportionately. However, there are numerous feedbacks of the change in defence spending which make the final effects quite complex. According to Deger (1991) there exists a large number of simultaneous channels by which these effects and counter effects operates and which has made the causality not to be a clear cut hence a mixed evidence. The main argument is that education and health are among the major sources of economic growth, especially in LDCs and defence spending is believed to lower economic growth in these sectors by reducing public expenditure. ((Dabelko and McCornick, (1977); Peroff and Podolak-Warren, (1999); Apostolakis, (1992)).

On the other hand, it has been argued that defence spending contributes to human capital formation and development in education and health because defence personnel and conscripts receive good physical training and various skills, especially in developing countries (Ram, 1993; Benoit, 1978, 1973). While the study by Caputo (1975), Russett (1972), Domke, Richard, Eichenberg and Melliher (1983), Eichenberg (1984), Hess and Mullan (1988), Mintz and Stevenson (1989), Davis and Chan (1990) and Frederisksen and Looney 1994, 1982) reported no trade off between defence and welfare spending, Verner (1983) and Harris, Kelly and Pranowo 1998) reported mixed results (negative, positive and no trade –off). Yildirim

and Sezgin (2002) sought to know the relationship that exists between defence and welfare in Turkey; they observed that a trade-off between defense and welfare spending exist. They argued that while the trade-off between defence and health is negative, a positive trade off exist for education. They concluded that government may allocate funds for defence expenditure irrespective of other government expenditures. This submission provided a subtle criticism of Gross Domestic Product (GDP) as it is argued that some of the goods valued in GDP do not really generate intrinsic utility and a mildly protesting term "regrettable necessities" is usually used (Robert and Heston, 1995). However, it must be agreed that this view can only hold water when the population is perfect, honest and that the neighbouring countries assume the same status, hence defence expenditure is a required necessities. A universal agreement on what really constitutes a regrettable necessity is rare since what people are willing to pay for is worth it to the society. The satisfaction derived from public goods is as a result of the contributions (tax) made by the society .What is certainly regrettable for a country like Nigeria is the series of mismanagement, corruption, attitudinal irresponsibility and opened absence of adequate transparency in the usage of tax payers money by the government. Nigeria's experience in public expenditure management has not been quite inspiring.

The current economic crisis, with the attendant macroeconomic volatility, high inflation, exchange rate distortions and balance of payments disequilibrium and high unemployment have been attributed largely to reckless and poor management of public expenditure, coupled with widespread corruption and inefficiency in the public sectors (Akpan, 2005). Given these problems, government decision to participate less in economic operations and for the

concentration on the provision of an enabling environment for the direction of economic activities in all the sectors of the economy cannot be overemphasize. This obviously presents the need for privatization of public utilities in Nigeria. However, a good like defence will definitely leave the economy in more heaps of crises if privatization is considered. Presently, a good like defence does not require the withdrawal of tax payers' resources and government operations from the sector. Dunne, Smith and Willenbockel (2004), purposed that economic theories does not adequately provide avenues through which the interaction between defence expenditures and output of other sectors are adequately captured. They further argued that since the effect of defence expenditure on growth of other sectors is an issue of keen concern, adequate theories and suggestions relating to econometric models should be evolved to ease the puzzles.

The effects of defence expenditure have both costs and benefits to the economy. The costs of defence expenditures are mainly emphasized as opportunity cost; as it entails reduction in public and private spending on investment on one hand. On the other hand, defence spending may have growth potential benefits, as a rise in defence spending may result in a higher aggregate demand, production and employment (Yildirim and Sezgin 2002 and Nadir and Yildirim, 2004). Spending much more on importation and procurement of munitions abroad is a major deficiency to the home defence industry. This accounted for a reduction or downsizing and restructuring of the South African defence – related industry (Dunne, Nikolaidou, and Roux, (2000). The development of military power is directly related to the level of reduction and increase in its defence budget, more importantly if the equipments are produce locally, it helps to increase economic activity in the home economy, and a rise in the

military expenditure can affect private investment through budget crowd out effect. Where an increase in defence expenditure reduces government spending on core infrastructure, it can lower production of private output and thus decrease available resources for investment purposes (Xia Jiren, (2000) and Khilji and Akhtar (1997)). Athanassiou, Nikolaidou and Zografakis (2002) opined that Greece yearly allocates a substantial share of its national income to defence, and that this share of GDP of defence expenditure is about twice as high as the European Union (EU) and North Atlantic Treaties Organization (NATO). Brempong (1989), Dunne, Nikolaidou and Vougas (1998) have all investigated the effect of defence spending on economic growth in Africa. These studies generally found that defence spending have a negative impact on the growth of GDP in African countries. They found that military spending affect economic growth through reductions in the acquisition of productive resources as well as through reduction in the productivity of existing resources for lack of complementary inputs. These studies were based on aggregate national income data.

Using stylized facts, theoretical models and empirical results Deger and Sen, (2005), discusses some core aspects of the interrelationship between defence and development. The study emphasizes two major issues in the field: economic growth and defence spending and security and development. Although the issues are placed in a broad framework, the focus of the chapter was on economic aspects of the interaction of military expenditures with growth and developmental factors. They maintained that defence spending affects macroeconomic variables

Alesina, Spolare and Wacziarg (2008) were of the view that "there are economies of scale in the production of public goods. The per capita cost of many public goods is lower in larger countries, where taxpayers pay for them." They maintain further that safety is a public good that increases with country size. Thus, a large country may derive economies of scale from expenditures which protects itself and provides security. This may be one explanatory factor behind the recent growth successes of large developing countries (often termed BRICS, Brazil, Russia, India, China, and South Africa). High levels of defence spending are widely assumed to retard long-run economic growth. In an insecure region, the argument is that countries must devote a disproportionate share of their resources to "unproductive" defence spending. As each country tries to outspend its neighbors to ensure its own security, military spending rises higher and higher, yielding no increase—and perhaps even a decrease—in overall security. High defence spending is thought to slow long-run growth. For example Paul Kennedy (1987) argued that:

> "*If the United State continues to devote 7% or more of its GNP to defence spending while its major economic rivals especially, Japan, allocate a far smaller proportion, then ipso facto the later have potentially more funds free for civilian investment, if the Unite States continues to invest a massive amount of its R & D activities into military related production while Japanese and West Germany concentrate upon commercial R & D and if the Pentagon's spending drains off the majority of the country's scientists and engineers from the design and production of good for the World market. It seems inevitable that the American share of World manufacturing will steadily decline and also likely that its economic growth rate will be slower than in those countries dedicated to the market place less eager to channel resources into defence*".

Obviously, this author was concerned with the fact that defence expenditures was largely associated with unproductive endeavour. The emergence of Beniot's work actually heralded the birth of the peace dividend versus peace penalty debate among empirical economists. The

positive outcome of the defence expenditure is regarded as peace dividends whereas the contrary suggests the peace penalty. Gleditsch, Capparen and Bjerkholt (1994) identified the reasons why high defence spending retards economic growth. This argument was contained in his book wages of peace 1994. First and foremost is that defence spending can reduce growth through the investment mechanism. They were of the view that defence expenditure may decrease the level of economic- boosting investment and thus compromise the renewal and expansion of the civilian industry. Similarly, DeGrasse (1984) and Smith (2000) found that those countries with high defence burden tend to have lesser investment and slower economic growth. The crowd-out-effect was close to one in the works of Ron Smith. Other commentators maintained that the negative spending competes with investment or consumption. Under-consumptionists, as proponent of this contention are called, take into account the possibility that, financing for the military sector does not necessarily compete with investment and consumption, rather its proportion to national spending may only be taking advantage of those resources not otherwise devoted to investment or consumption.

The second argument for the mechanisms of peace dividend by which defence burden reduce growth according to Gleditsch, Cappelen and Bjerkholt is through the efficient utilization of labour resources resulting from defence sector's employment of skilled labour which then causes scarcity of labour in the civilian sector. Nevertheless, Bloomberg, Gregory and Sidharth (2000) were of the view that only when average level of male educational attainment is relatively high will the military's use of labour creates a negative effect on the economy. Otherwise, if the military's use of labour provides it with enduring human capital training not available in the civilian sector, them defence spending will positively influence economic

growth by teaching military personnel valuable skills. Weede (1983) upheld this view when he opined that defence contributes to growth through what he term "military participation". According to him, military service enhances the country's pool of human capital by teaching social discipline which has a twofold positive influence: (a) it stimulates growth and (b) it even improve income distribution.

The third reason for peace dividend is captured by defence R & D versus Civilian R & D. Gleditsch and others maintained that defence expenditures may end up impeding growth when it diverts resources away from civilian R & D resources, thereby retarding non-defence innovation and growth. In the same vein DeGrasse (1984), his investigation for a number of countries between 1970 – 1979 showed that countries with higher defence R&D like – USA, USSR and UK, etc also recorded a slower growth in productivity. Conversely, those with lower defence R & D like Japan, France and West Germany had higher productivity growth. On the other hand, there exists an argument that military expenditure is conducive to economic growth. Again Gleditsch *et al*. (1984) gave two prominent arguments: (a) the underconsumptionists view and (b) the military spin off effect argument. The underconsumptionist opined that if military expansion leads to a fuller use of national resources, then it will support economic growth even if the basic purpose of the military establishment is unproductive. According to Dunne, Nikolaidu and Smith (2002), they claimed that defence expenditure is beneficial provided it can jumpstart the economy by stimulating demand during stagnant conditions. This suggests that any spending not on defence sector might bleed the resources away from the defence sector and therefore stunts

growth. With respect to the military spin offs argument, Dinneen and Frick (1977) made a statement in their paper published in the journal of science:

> *Missile guidance systems were an early source of support for integrated circuit development, satellite tracking radars have supported the development of surface acoustic-wave technology and charge-coupled devices, as well as modern signal processing techniques ... Finally, we should mention such significant second order developments as radio and radar astronomy, microwave spectroscopy, and instrumentation of earth resources satellite and for modern health care, all of which are heavily dependent on concept and components derived from military electronics.*

This statement suggests that research in the military field like the design of the B-47 bomber yields civilian applications e.g. the development of the Boeing 707 as by products, which have growth inducing effects on the economy. On the contrary, the British government in 1987 criticized the spin off arguments:

> *"Britain's resources of qualified scientists and engineers and the skilled manpower supporting them are not enough. Defence and civil work are in competition for the same skills, and it would be regrettable if defence work becomes such an irresistible magnet for the manpower available to compete in the international market for civil high technology products become seriously impaired".*

Arne Magnus (1986) supported the view above when in a report for the International Peace Research Institute, Oslo (PRIO) she argued that there are probably more spin off effects coming from civilian sector R & D which is regarded more economically productive mode of R & D. than defence R&D. Another important argument for defence expenditure was given by Ram (1995). In his contribution to the Handbook of defence economics, he said;

> *Military expenditure is usually incurred for external defence, which is an important intrinsic objective. National defence is expected to provide external security; and should thus enhance economic growth in the long run. However, its immediate objective is not directly related to economic growth. Therefore, even if defence expenditure does have an adverse effect is no necessary implication that such expenditures are harmful or too high.*

Knight, Loayza and Villanueva (1996), concord to the above statement. They maintained that defence expenditures can be unambiguously economically productive by enhancing the state of national security, improving the enforcement of property rights, which then encourages investment and growth. The understanding of military expenditure could assume variant possibility.

In combating terrorism, public spending on homeland security and military operations have been raised significantly for countries like America, Britain, Spain and other members of Organization for Economic Cooperation and Development (OECD) countries. Also, private sector spending has increase in order to improve the security of premises, employers and information. This expenditure crowd out the accumulation of directly productive capacity, increase the cost of capital, raise wages and divert research and development (R &D) activities towards military projects. According to Benoit (1978) newly formed military capital has supplementary civilian uses, which may contribute to economic growth. Benoit maintained that military roads, schools, employment, education, training, welfare services and increase productivity of capital add to societal or civilian economy. Computer and semi-conductor are often cited as examples of technological spin-offs from military research. However, the possibility of defence capital expenditure to impact on the civilian economy depends on factors like the relative crowd-out effect, the marginal efficiency of capital in the military vis-à-vis the civilian sector and the cyclical conditions in the economy among others. In contrast to Benoit's view, Deger (1988) argued that military expenditure has a higher

crowd-out effect on the civilian sector in all economies and the productivity of military capital is low.

The relevance and applicability of military training and infrastructures depends on the degree of specialization and the level of high technology involved. Kaldor (1991) thinks otherwise, when he opined that in United Kingdom (UK), less than 20 per cent of defence capital expenditure is likely to have any beneficial effect on the economy. He further argued that there is issue of exorbitant cost and inappropriate focus of defence research, infrastructure and training investment from a civilian perspective. It is observed that military education and discipline does not provide efficient means of running a civil society. In resource constrained developing countries, defence spending reduces government expenditure on socio-economic services like education, housing, social security, welfare, transport and economic services, thus, defence spending retard economic development. The spin off effect of defence expenditure on industrialization is said to be generally insignificant for third world countries.

Rothchild (1977) while using the assumption of export-led growth theory argued that defence spending has an additional growth reduction effect since it competes with high technological export sector for resources. Countries with high capacity for production in high technology exports would have a higher export capacity. Since it is obvious that modern military make high demand on engineering and transport sector, the availability of these goods for export will be reduced by rapid increase in defence spending. This will reduce the ability of the economy to compete in international trade. In the long run it will degenerate into unfavourable balance of payment and currency devaluation. This submission is for the

advanced countries. However, in the developing countries, particularly in non arms producing countries, military competes with the industrial and agricultural sectors for the available foreign exchange to import essential capital goods and raw materials. The Nigerian debt crisis worserned in the 1980s and 1990s Following the over 95 per cent of defence hardware importation (Olaniyi, 2000).

Another benefit of defence spending is what is called the resource mobilization and modernisaton effect (Benoit, 1973, 1978). Benoit was of the view that the military is conservative in nature. In periods of military regimes, the strength of the state dismantles organizations of popular expression, to restraint real wages, hold down social reforms and mass consumption. Looney (1992) argued that military regime have greater control on the process of rent appropriation. This has led to switching expenditure from the rural poor to the upper class in the interest of capital accumulation. The perception of threat by a country mighty lead to a higher rate of monetary and fiscal expansion in peace time. This process can promote more intensive utilization of available resources and thus growth. This hypothesis reflect the position of less developing countries, particularly in West African countries where military regimes ruled various countries more than there democratic counterparts. However, the military is still yet to prove itself as a modernization force in Nigeria. This is because of dictatorship and series of corruption encouraged during military regime. Furthermore, military spending reduce national savings ratio mobilization effect. As households continue consumption of public service at the desired level, their expenditure rise when services are cut back to finance military expansion. This may reduce private savings rate. Government savings ratio may also decline if the additional defence spending is not compensated for by tax rise

and foreign savings is eroded through arms imports. Also, expenditure switching may lead to inefficiency if economies of scale associated with large scale production are lost because the scale of private production is lower than what obtains in the public sector. Periods of wars and rising military can have some useful short and long term fiscal effects. The long term effect occurs when a government raised taxation level to finance additional defence expenditure, maintains the higher rate of taxation while defence spending declines. The short term effects are the ability of the government to take some of the extra revenue collected for the military effort and use it for non-military development purpose. The ability of defence sector modernization effect on the national economy of Nigeria is very low, even in terms of contribution to road and bridge construction, engineering (Olaniyi, 2000).

2.7. Empirical Literature on Defence Expenditure and Economic Growth.

In the empirical literature, Benoit (1973, 1978) used the Spearman rank order correlation and regression analysis which shows that defence spending positively influence growth in a sample of 44 LDCs between 1950 – 1965. Variables like employment, GDP, had positive impact due to defence expenditure. On the contrary, Knight, Loayza and Villanueva (1996) discovered that the military spending had an insignificant effect on growth in a cross-section data over 1971 – 1985 periods. Kim (2003) used three separate models. model 1 contains external factors, model 2 contain internal factors while model 3 deals with the combine models. The estimated result tested for the causal relationship between USA and Russia. The study showed a strong positive relationship between USA and Russia which simply indicates that the amount of defence expenditure committed to military by USA depends on the reaction of USSR between 1963 – 1997 cold war periods. Brempong (1989) and Dunne,

Nikolaidou and Vougas (1998) investigated the effect of military spending on economic growth in Africa. These studies generally found that military spending had a negative impact on the growth of GDP in African countries. They found that military spending affected economic growth through reductions in the acquisition of productive resources as well as through reduction in the productivity of existing resources for lack of complementary inputs, the outcome stressed that defence acquisition was statistically insignificant. All of these studies were based on aggregate national income data. Gupta, Mello and Sharma (2000) estimated the association between defence spending and corruption using panel regression techniques. The result suggests that corruption was indeed associated with higher military spending as a share of both GDP and total spending.

Dean Baker (2007) carried out a study on the economic impact of Iraq war and higher military spending. The study showed that military spending drains resources from the productive economy. For this reason, it typically leads to slower economic growth, less investment, higher trade deficits and fewer jobs.

Deger (1986) provided a comprehensive econometric model of the form:

$$g = a_o + a_1S + a_2S + a_3M + a_4B + a_5Z_1 \quad \text{2.13}$$

$$S = b_o + b_1m + b_2g + b_3B + b_4Z_2 \quad \text{2.14}$$

$$B = c_o + c_1m + c_2g + c_3Z_3 \quad \text{2.15}$$

$$M = d_o + d_1Z_4 \quad \text{2.16}$$

Where

g = growth rate of GDP

S = saving- income ratio

m = is the military burden –the ratio of dexp/gdp

b = trade balance (as a ratio of GDP) to identify foreign saving

z_i = are a set of exogenous variables chosen through data specification.

This model was a three stage least square (3TSLS) equation which emphasizes the structural simultaneity of all the relationships and it is a cross section empirical model with four equations. Considering M as an autonomous variable, the three interdependent equations were solved simultaneously to get the impact of military burden on growth, the saving ratio and the trade balance. In each case, negative effects were found to be predominant and significantly high. Generally, the result showed that military spending was strongly detrimental to growth, investment (saving) and the trade balance when all direct and indirect effects were taken together.

Faini, Annez and Taylor (1984) emerged with an important structural model of the form:

$$X = a_o + a_1(\log y) + a_2(\log y)^2 + a_3 (\log N) + a_4 (\log N)^2$$

$$+ a_5 (KI) + a_6 m \quad \ldots\ldots 2.17$$

Where,

X = ratio of GDP of (in turn) investment, imports, industrial production, agricultural output and tax receipts

y = per capita income

N = population

KI = capital inflow and

m = military burden dexp/gdp

log = natural logarithm

The log was introduced to linearize the economic variables. Using time series/cross section data for a large sample the result lent more support to Deger's findings. In a similar direction Deger and Sen (1990) estimated the growth effects of defence spending in the context of arms-race model for India and Pakistan. The implicit assumption of the economic model was that military spending affects growth in two ways. The first is the direct effect embodying the whole host of spin-off effects, including that of security on the economy. The second is indirect which works through defence spending affecting investment. As long as defence spending affects aggregate demand components, it is bound to play a major role in the investment process. The authors used two equations for growth and investment which are:

$g = a_o + a_1 m + a_2 i\,(-1) + a_3\,(P/P)$ 2.18

$i = b_o + b_1\, m + b_2 g$ 2.19

Where

g = growth

m = military burden

i = investment share in GDP

P/P = rate of inflation

The empirical results indicated that the two countries vary quite significantly in terms of the economic effects of the military burden on growth. While the multiplier effect for India was positive though not highly significant, that of Pakistan was potentially negative given the negative crowd out effect on investment. Joshua and Reuven (2003) extended Barro's model

and assumed zero population growth, they found that output per worker impacted positively on infrastructures supplied by the public sector and negatively by the magnitude of the external threat. Their model is given as:

$$Y = A\,(k)^{1-\alpha}(g)^{\alpha} f \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2.20$$

Where

Y=output

A = an exogenous productive factor

k = the capital/labour ratio

g = the ratio of government (non military) spending on infrastructure relative to labour and α = measures the share of non military expenditure to output

f = measures the output cost of the threat posed by foreign rivals actual hostile actions.

The model was specifically designed to measure the impact of military spending and threats on growth for a number of countries.

The model presented by Barro suggests that capital does not depreciate. This is unconventional with economic principle. However, the final result arrived at by Joshua and Reuven (2003) proved that good government is associated with reduction in the defence expenditure and on the contrary defence expenditure rises with corruption.

Dunne, Smith and Willenbockel (2004) revisited the Feder-Ram model basically for its inability to explicitly treat externality of the military on the nonmilitary sector. The model was a two-sector version which distinguishes between military output and civilian output. Both sectors employ homogenous labour and capital and the set-up allows for external effects of military production on civilian production activity.

The Feder-Ram model extension just like the Barro's model itself suffer the presence of multicolinerity given the fact that it was used for a cross sectional data to estimate equations, such estimate was bound to emerge with insignificant coefficients being computed for the externality effect (Woodridge,2006). Although the Feder-Ram model is a supply side model which has been widely used in the defence – growth literature. Sandler and Hartley (1995) noted that the models either found a small positive defence impact on growth or no-impact at all. Dunne, Nikolaidou and Smith (2002) argued that, if there is not enough independent exogenous variation in data, it would be impossible to measure the effect of military expenditure growth, even if the model is formally identified. Murdoch, Chung-Ron and Sandler (1997) used a simple pooled OLS regression. The authors assumed that all the parameters are the same for the sampled countries. The findings of his study lent support to Joshua and Reuven (2003) and Pesaran, Shin and Smith (2001). Hamid and James (2003) attempted an explanation of defence expenditures and inequality with evidence from global data and a panel regression. The result showed that, inequality which is one of the variables demonstrated a positive and significant relationship with military expenditure. Furthermore their findings supported the hypothesis that expenditure on militarization drain resources from public spending on agricultural research, development of infrastructure and other social programs that may tend to promote development and reduce economic inequality. Dunne, Nikolaidou and Vouga (2001) explore the relationship between defence expenditure and economic growth in the case of Turkey and Greece using cointegration and error correction mechanisms. Turkey and Greece military burden are the highest in NATO. However, the empirical findings of this study showed that their high defence burden does not seem to harm,

rather it helps their economic growth both in the long run and short run. The evidence showed that there is positive and significant relationship between defence spending and economic growth for Turkey and Greece both in the long run and short run.

Durmus and Ali (2006) developed a Computable General Equilibrium (CGE) and simulation experiment to determine the impact of Sectoral demand for military expenditure on peace dividend for Turkey and Greece. They examined three preliminary scenarios. The first scenario was that a cut in military expenditures by 50%. The result show that a 50% cut in military expenditure improve education, increase labour productivity and improves infrastructures which increased the Total Factor Productivity (TFP). Overall positive impact of this scenario analysis show that both countries experienced growth rate increase. Khilji and Akhtar (1997) explored the impacts of defence expenditures on economic growth and other major economic variables in the Pakistan economy over the period 1972-1995. The results of Granger-causality tests show that there is bi-directional feedback between the defence burden and GDP growth. They also test four different single equation models and three other equation models to explain GDP growth, average propensity to save, and the defence ratio. The savings ratio was affected positively by the defence ratio, and negatively by the inflation rate. The Pakistani defence burden impacted negatively by the Indian defence burden and positively by the government budget.

Sungsup and Bipul (2005) measured the economic costs of conflict, focusing particularly on the impact of continued decline in development expenditures on gross domestic product (GDP) growth. The study used macroeconometric model to estimate GDP growth under

different conflict and no-conflict scenarios of development expenditures. The scenario analysis indicates that if development expenditures decline at the current rate (4.2%), the total GDP growth loss is 8.3% for the period between the fiscal years 2005 and 2009 in Nepal, an average loss of 1.7% of growth per annum. If the conflict intensifies and development expenditures decline at twice the current rate (8.4%), total GDP growth lost is 10.3%, an average loss of 2.1% of growth per annum. Dotan Persitz (2007) evaluates the effect of Palestinian terror on the Israeli economy by using counterfactual methodology and quarterly data for the macroeconomic aggregates of OECD countries and Israel from 1980 to 2003. Had there been no terror in Israel since 1994, the country's per-capita GDP in 2003:3 would have been 8.6% higher than it was. Predictions based on low future levels of terror and the absence of a peace process produced good out-of-sample fit for 2003:4-2005:3. Palestinian terror increased the shares of consumption and government expenditures and decreased the shares of investment and trade balance in GDP. Weak evidence of a structural change at the aggregate level was observed. Alex and Randolph (2007) used multisectoral regression model to resolve defence expenditure – growth – trade – off that is grounded in the neoclassical theory of growth. The application of time series data on 103 countries show that, regardless of the specification of the models, and contrary to most cross – national studies, military expenditure have a significant positive effect on growth in only about 10% of the cases.

Dunne, Nikolaidou and Smith (2005) use firm level employment data from South African countries, they found that defence spending decreased employment and efficiency in the South African industrial sector of the economy. Nadir (1993) investigated the determinants of defence expenditure in 40 African countries for the period 1960 – 1990, using both time series and cross sectional analysis. The results of both analyses confirmed that the differences in the

defence burden of African economies reflected a complex of economic, political and strategic factors at the national and regional levels.

Bello (1995) used a simple income elasticity regression analysis to determine the structure of Federal government expenditure by function for the period 1960 – 1985. The model was adopted from Phillips (1971), Enweze (1973) and Longe (1986). However, Bello made some extension when he used both aggregated and disaggregated functions to examine government expenditure and economic growth in Nigeria. He concluded that the estimates with respect to defence expenditure variables apparently yielded no meaningful impact on economic growth hence the need to drop it from the analysis. This suggests that both recurrent and capita1 defence expenditure were not viable to growth of Nigeria between 1960 – 1985. On the contrary, Oduso1a (1996) used a two stage least square (TSLS) to estimate the impact of defence spending on economic growth for the period 1970 – 1994. The outcome of the result showed that unlike Bello's work, capital defence expenditure was viable only for recurrent expenditure which the author suggests the need for a shift of the resources to more viable sector. In a related study, Olaniyi (2000) used the two stage least square technique to determine the macro economic impact of military spending in Nigeria. The findings show that expenditure on military capital had no significant effect on productivity in the Nigerian economy and military capital is less productive than civilian capital in the economy. Olaniyi (2000) concluded that military spending cannot be used as counter cyclical instrument in Nigeria.

In a related development, Gaiya (2008) conducted a study on the analysis of defence expenditure and economic growth in Nigeria between 1970 and 2008. The study set out to identify the structure, trends and to examine the causal relationship between defence expenditure and economic growth in Nigeria using Wargner's hypothesis as the framework for the study. Also the study analyzed the budgetary trade - offs between defence expenditure and non - defence government expenditure taking into consideration the series of threats that emanates from Nigerian security environment. The author adopted a single line regression equation and Granger causality test to determine the impact of defence expenditure on economic growth and the causal relationship between defence expenditure and economic growth in Nigeria. The ARIMA model was used to take care of likely serial correlation. The findings of the study showed that defence expenditure respond to the increase in GDP in the pre and post SAP era in Nigeria. The study showed absence of trade - offs between defence and education and defence and health. Also, defence expenditure impacted positively on economic growth in Nigeria.

While it's obvious from the series of literature reviewed in this study that a handful of works have been done on the impact of defence expenditure and economic growth, the outcome was inconclusive as there is no limit to researchers' ability in the formulation and use of econometric models. However, a large number of the studies concentrated on the use of cross-country regression and partial equilibrium analysis. Only a few study attempt a macroeconomic impact that eventually transcend to simulation analysis. For example, a simultaneous equations model was used by Antonakis (1996). He finds that a one percentage point increase in Greek military expenditure/GDP reduces its economic growth rate by 1.1

percentage points. In an expanded model Antonakis (1997), find a reduced negative effect. A comparative structural model was used by Sezgin (2000), the findings showed that the coefficient of the level of military expenditure on economic growth was positive.

Dunne and Nikolaidou (1999) also used a simultaneous-equations model and find a negative net effect but of rather modest size: increased military/GDP by one percentage point reduced the inflation-adjusted GDP growth rate by 0.026 percentage points. Hirnissa, Muzarfa and Baharom (2009) employed the bounds testing procedure suggested by Pesaran, Shin and Smith (2001) and dynamic OLS (DOLS) proposed by Stock and Watson (1993) to test the robustness of the causal effect of long-run relationship between military expenditure and economic growth in ASEAN- 5 countries from 1965 to 2006. The result suggests that Indonesia, Thailand and Singapore had a long-run relationship between military expenditure and economic growth, while the causality in the case of Singapore was bidirectional that of Thailand and Indonesia was found to be unidirectional. For the remaining countries (Malaysia and Philippines) there was no meaningful relationship that was dictated. The authors maintained that the results of the study were robust given the auto regressive distributed lag (ARDL) and the dynamic ordinary least square (DOLS).

Yildrim and Ocal (2006), examined the issue of arms race between India and Pakistan and its relation to each country's economic growth. They found that a unidirectional causal relationship exist between output and military expenditure in India and Pakistan. In another sphere, Frederiksen and LaCivita (1987), explored the causality between defence spending and economic growth for Philippines for the period 1956 to 1982. They found that causality ran from economic growth to defence spending and not the other way around that had been

suggested by Benoit (1978). Collier and Hoeffler (2007) conducted a research on military spending and the risks of coups d'etat. The empirical investigation showed that countries with low coup risk react to it by cutting military spending which increase the prospect of economic growth. However, when coup risk is high, as in Africa, governments respond by increasing spending. Gerace (2002) considered whether or not defence expenditure had a positive impact on economic growth and analyzes the relation between the growth rates of US defence expenditure and the growth rate of GDP. The result showed a countercyclical interaction between the growth rates of GDP and government expenditure not including defense expenditure. This interaction doesn't exist between the growth rates of GDP and defense expenditure. In other words, the growth rate of defence expenditure doesn't have a negative relation to that of GDP. The negative effect of defense expenditure on economic growth is different in each country and he says it may be more pronounced in developing economies.

Landau (1994), presents a study on empirical research on the economic impact of military expenditure — milex — on the less developed countries. Three separate hypotheses was made on (1) increased security — positive impact; (2) diversion of resources from productive investment — negative impact; and (3) pressure for more efficient government policies in response to the external threat — positive impact. The combination of these effects produce a non-linear relationship with the growth rate at first increasing as defence expenditure increased and then decreased. For the full sample of 71 countries, Landau, found the predicted relationship, however, it was not robust to changes in the sample. The robust conclusion is that there was no evidence of a negative impact of military spending on economic growth. Galvin (2003) analyzed the defence-growth relationship for 64 developing economies using

cross-section data. The study analyzes the impact of military expenditure on economic growth with a demand and supply side model using simultaneous equation methodologies (2SLS and 3SLS). The empirical results, bearing in mind the possible inaccuracies of the data set and given the chosen model, suggest that defence spending has a negative impact on both the rate of economic growth and the savings-income ratio. Yet it also indicates that the effect is greater for middle-income nations which may have less to gain from defence sector spill-overs. The results also indicated that strategic factors, as much as economic constraints, determine defence spending in developing countries. Chung and Sandler (1997) applied a three sector Feder-Ram framework given a time-series and cross-sectional estimates for Asian and Latin American countries. The result indicated that private investment, defence and non-defence public spending are growth promoting for alternative error components representations.

In Nigeria, most of the studies on defence expenditure and economic growth have been largely devoted to describing the evolution, causes, magnitude of defence spending and sustainability of defence expenditure. The complex relationship that exist between macroeconomic variables and economic growth demand a multi-equations model that is solved simultaneously (Abdulsalam, (2008) Adam, (2001), Mjema, (1996) and Soludo, (1995)). This dissertation has used a multi-sectoral equations model that is solve simultaneously. Defence spending on infrastructure, building and renovation of military barracks, employment generation and the acquisition of ammunition has the potential to retards national income. For example, defence spending may divert away resources from the public and private sector investment which may be more favourable than defence spending. Also, adverse balance of payment impacts through imports of arms and resources that affect

the external sector. Defence spending particularly, defence research and development (R & D) might divert resources (physical and human capital) from private sector R & D affecting both technologies and spin- offs (Hartley, 2006). On the other hand, in periods of unemployment, defence spending can have a stimulative effect on the multiplier of an economy. Defence spending improves the aggregate demand in the economy. Where defence provides technology benefits and spin-offs and if the spin offs applied to civil sector, growth is promoted. When defence spending is done to provide social infrastructures it can increase growth and where it support human capital by providing the armed forces with nutrition, education, training and discipline, with some of these benefits spilling over into the civil sector labour thus increasing productivity and economic growth. Defence expenditure provides protection to nation citizens where the internal and external security promotes market exchange. Keynes was of the view that an inefficient public spending will reduce productive efficiency, and hence output per worker, reducing the growth rate of labour force, lowering savings rate as well as investment.

Over the years, the thrust of policy has been to limit defence expenditure by reducing the purchase of ammunition and military hardware to available foreign exchange resources while putting in place supply – side measure like agricultural and manufacturing production to boost exports. This was intended to strengthen the current account and ultimately the balance of payment which will in turn reduce debt burden and enhance the external reserve. Ball (1992) argued that in developing countries external issues are not the main concern for defence, but it should be well know that internal security considerations are as important as external and defence sector major goal is to deter external aggression. The variables that create impact of defence expenditure on economic growth are both internal and external factors, hence external

sector is valid for this study. Also, trade can spur innovation by enhancing defence industrial learning since it facilitates international exchange of technical information; can improve growth by bringing resources into research and development. The problem posed by defence expenditure to economic activity and to the functioning of economic structure requires a comprehensive and systematic analysis. This would in turn require a broad model using multi-sectoral simultaneous equations and a simulation or counter factual analysis. Thus far, much of the studies of defence expenditure and economic growth nexus in Nigeria focused on descriptive and econometric analysis that is devoid of large macroeconomic variables hence accounting for some of the reasons in misspecification of models and misinterpretation of results and analysis.

Other empirical analysis of the impact of defence expenditure on economic growth like Feder (1983), Ram (1993, 1986), Grier and Tullock (1989), Romer (1986), Barro (1990 and 1991), Levine and Renelt (1992), Devarajan et-al (1996), Knight, Loayza, and Villanueva (1996) and Sala-i- Martin (1997) used cross –section analysis to link measures of defence expenditure to long run economic growth. The cross country growth regressions does not capture the dynamics of the relationship between these variables and at the same time it disregard country specific factors (Abu-Bader and Abu-Qarn, 2003). Also, the cross sectional data as used by Benoit (1973), Roberts (1992) was based on random sampling which is bedeviled by selection of data as against the time series data which offers a chronological ordering of observations that conveys potential important information Wooldridge (2006). Abu-Bader and Abu-Qarn, (2003) and Dakurah et-al (2001) used the multivariate Johansen (1998) cointegration test and Granger causality test analysis instrument and vector error correction (VEC) model to show the relationship between defence expenditure and economic

growth. Their studies like previous ones showed mixed outcome. This work investigates the macro economic impact of defence expenditure and policy effect hence the need to use a macroeconomic framework that explore multiple approaches to macroeconomic theory and policy simulation. Studies on defence expenditure and economic growth in Nigeria have ignored this aspect of empirical investigation

2.7.1. Implications of the Literature for this Study.

The empirical literature reviewed in this study suggests that the impact of defence expenditure is extensive and largely negative on economic growth. However, some studies found a positive impact of defence expenditure on economic growth while others were inconclusive. The series of review on defence expenditure can be classified into the cross country case studies /or pooled cross sectional and time series studies. For instance, Benoit (1973), (1978); Babin (1989); Jung and Marshall (1985) Chowdhury (1991); Galvin (2003) and Wikins (2004) used cross country data in their studies. Jung and Marshall (1985) argued that cross country and pool cross sectional tests assumes strong similarity among different countries and this suffers spurious structural stability coefficients across countries. Other studies concentrated on individual nations with time series data for econometric models. Few studies were on equilibrium model using both aggregate and disaggregated data. The bottom line common in the literature is that they demonstrated the various channels of defence expenditure impact on economic growth. Moll and Luebbert (1980) reviewed a host of articles on military expenditures and express their dismay at the inability of scholars to determine which of the many different models best describe the data. The authors maintained that the conventional statistic techniques have not proved how adequate and sophisticated technique resolved the problem of defence expenditure growth nexus. The common failure of statistical test to discriminate among various models indicates that there are fundamental problems with either the explanatory power or the discriminating ability of the tests. However, it must be well understood that defence expenditures are inherently complex and are the byproduct of many different influences. In uncovering the variance structure of time series, the macroeconomic analysis reveals the manifold influences on the variables.

In Nigeria the works of Gaiya (2011), Adebiyi (2004), Olaniyi (2000) and Odusola (1996) used time series data. These studies followed the line of macroeconomic approach but were narrow in scope. The study of macroeconomics shows number of channels through which defence expenditure influence economic activity. Single line regression, Granger causality test as well as simultaneous equation model with few variables cannot capture and provide better explanation for defence studies. Such model would either be dramatically overemphasized or totally confounded by collinearity (Moll and Luebbert, 1980). From the various unresolved arguments on defence expenditure growth nexus, this study used a wide macroeconomic model with simulation experiment to test the impact of defence expenditure and to evolve a better policy guide which is an improvement over previous defence studies in Nigeria.

Table 2.1 Summary of the empirical studies of the impact of defence expenditure on economic growth.

Authors	Model	Countries	Result: Impact of defence spending on growth
Alexander 1995	Feder production function	OECD 1966 – 88	Negative but small effect of defence expenditure on balance of payments
Madden and Haslehurst, 1995	Granger Causality	Australia	No causal relationship in either directions
Stroup and Heckleman (2001)	Panel estimation (fixed effect model)	44 African and Latin American countries	Non-linear impacts of defence burden and military labour use on economic growth. Low levels of military spending and labour use enhance economic growth.
Kollias 1997	Granger Causality	Turkey 1954 – 93	No causal ordering
Kollias and Makrydakis 2000	Granger Causality	Greece 1955 – 93	No causal ordering between Military Expenditure and growth.
Aizenman and Glick (2003)	Cross-section estimation	90 countries, 1989-1999	Military expenditure and hostile external threats had adverse impacts on growth, while military expenditure in the presence of threats increased growth
Beenstock 1998	Simulation	Israel 1950 – 94	To 1968 = defence was growth promoting. 1969 – 79 = defence spending reduce growth. 1976 – 1986 = defence benefit growth
Kim 2003	Three separate regression models	USA/Russia 1963-1997	Increase in defence expenditure of USA is as a result of the reaction of Russia.
Habib and Stephen 1999 Table 2.1 contd	Fixed and Random effect	Developing countries	Investment is affected negatively as a result of increase in defence spending.
Gupta, Mello and Sharma 2000	Cross sectional/panel regression method	120 countries 1985 – 98	Increase in defence expenditure is affected by corruption.

Table 2.1 contd

Authors	**Model**	**Countries**	**Result: Impact of defence spending on growth**
Hamid and James 2003	Simultaneous regression model	Controlling for the size of armed forces; GDP and per capita income 1987 -1997	Reduction in equality could result from reduction in military expenditure.
Dunne, Nikolaidou and Vougas 2001	Granger causality test	Greece and Turkey 1960 – 1999	Greece = no evidence of Granger causality. Turkey = negative impact
Lai 2001	Production function	Great Britain 1830 – 1980	19th century = no impact on economic performance 20th century = tradeoffs emerged.
Yakovlev (2007)	Panel estimation (fixed effects, random effects and GMM)	28 countries, 1965-2000	Military spending and net arms exports have negative impacts on economic growth but their interaction has a positive impact on growth.
Athanassiou, Kollias and Zografakis 2002	Simulation using computable general equilibrium model	Greece	Cuts in defence spending gains in GDP and investment but, losses in exports (depends on composition of new public spending).
Murdoch and Sandler 2002	Solo growth model	Africa, Asia and Latin America	Civil wars have strong negative impact on growth of income per capita.
Deger 1992	Three stage simultaneous equation (TSLS)	Developed and developing countries	Military spending crowd out investment, savings and trade balance.
Faini, Annez and Taylor 1984	Loglinear structural model	Gross section of countries	Negative impact of defence expenditure on growth.
Deger and Sen 1990	Simultaneous equation	Pakistan and India	The result showed separate effect of defence expenditure on growth positive multiplier effect was associated with India while crowed out was found for Pakistan

Table 2.1 contd

Authors	**Model**	**Countries**	**Result: Impact of defence spending on growth**
Joshua Renven 2003	Production Growth Model	Cross section of countries 1970 – 1998	Military expenditure induce by threats increase growth while corruption and rent seeking reduce growth.
Galvin 2003	Demnd supply model	64 developing countries	Negative impact on growth and savings ratio but effects greater for middle – income nations.
Klein 2004	Demand supply model	Peru 1970 – 1996	Negative impact
Bello 1995	Simple regression equation	Nigeria 1960-1995	Defence expenditure is insignificant to economic growth
Adebiyi 2004	VAR.	Nigeria 1970 - 2003	
Odusola 1996	Two stage least square simultaneous equation	Nigeria 1970-1995	Capital defence expenditure is significant while recurrent was insignificant
Brempong, 1989.	Simultaneous equation model	39 Sub-saharan African countries 1973 - 1983	Negative effect of defence expenditure on growth
Yildirim, Sezgin and Ocal (2005)	Two sector: civilian and defence, Dynamic panel estimations (fixed effect model and GMM model).	Middle Eastern countries and Turkey, 1989-1999	Military expenditure enhances economic growth and defence sector is more productive than the civilian sector.
Reitschuler and Loening (2004)	Two sector: civilian and defence, Time series estimation involving threshold model.	Guatemala, 1951-2001	For relatively low level, Military expenditure has significant and positive effect on economic growth. For higher level, the effect becomes negative, albeit insignificant.
Batchelor Dunne and Saal (2000)	Two sector: civilian and defence; manufacturing and defence, Time series estimations and ARDL	South Africa, 1964-1995	Military spending has no significant impact on aggregate growth, but there is a significant negative impact for the manufacturing sector.

Table 2.1 contd

Authors	Model	Countries	Result: Impact of defence spending on growth
Dunne, Nikolaidou and Roux (2000)	Four equation model, Time series estimation (3SLS)	South Africa, 1961-1997	Negative and indirect effect of military expenditure on economic growth.
Ando Shio 2009	Feder model	109 countries including 30 OECD 1995 - 2003	Positive impact on the rate of economic growth in all 109 countries.
Dunne, Vougas Nikolaidou (1999)	AutoregressionVector Model VECM	South Africa 1964-1996	Defence growth nexus was negative
Jeffrey and Edwards 2006	panel regression models	1995 - 2003	Positive impact on economic growth
Karagianni and Pempetzoglu (2009)	Linear and Non-linear Granger Causality test	Turkey, 1949-2004	Growth → defence Defence → growth
Harnissa, Muzarfa and Baharom 2009	ARDL-RECM	Malaysia and Sri Lanka 1975 – 2005	Result is mixed
Afsin and Murat 2010	OLS, granger causality, cointegration and VAR	Turkey 2004 – 2008	Positive effect between industrial production and defence spending
Gaiya 2011	Simple linear regression and Granger causality test	Nigeria 1970 - 2008	Defence expenditure does not retard growth in Nigeria

Source: computed by the researcher. July, 2011

2.8 Theoretical Framework of the Study.

Stable security is conducive to permanent peace. Security can mitigate mutual military competition and, ultimately, eliminate international anarchy. Stable peace can be achieved by the mutual commitment to defend each other against any aggression (Raimo, 2000). The distinction between materialist and societal thinking goes to the very heart of security studies.

The materialist approach sees security as a result of the specific configuration of observable factors; e.g., the distribution of economic and military power or the nature of political systems. The societal approach is not oblivious of these structural factors, but puts more emphasis on the political participation and social transformations and, in that sense, the social construction of security.

The primacy of the "external" reality in materialist models leads to the view that security has to be maintained by the threat of and resort to enforcement actions, while the "internal" nature of reality in societal models stresses more the relevance of mutual norms and their self enforcement. What guarantees that a security arrangement is durable and credible is the restraint due to deterrence the main source of security or other internalized guarantees of stable peace hinging on predictability and trust. Deterrence add to predictability but it does not, per se, create trust. The existence of trust requires at least some identification with the other because without such association actors would be self-contained and devoid of any common basis. Identity can, thus, become a positive, although inadequate factor of peace; too much identification and trust without appropriate safeguards can lead to a moral hazard. The societal approach is accepted by those who see anarchy permitting not only self-help, stressed by the materialists, but also other-help in which purely egoistic interests are transcended (Raimo, 2000). However, once trust is placed there are incentives to convert the asymmetric relationship into one of symmetric trust (Coleman 1990). Over time, the relationships of mutual confidence may develop into "a culture of trust" that becomes a contextual property shaping the behavior of actors (Kegley and Raymond 1990). Classical realism prioritizes national interest and security over ideology, moral concerns and social reconstructions. This

term is often synonymous with power politics. Realism is of the view that world politics is driven by competitive self-interest. The classical realists believe that mankind is not inherently benevolent but rather self-centered and competitive. This perspective, which is shared by theorists such as (Thomas Hobbes, 1651), views human nature as egocentric (not necessarily selfish) and conflictual unless there exist conditions under which humans may coexist. This view contrasts with the approach of liberalism to international relations.

The classical realist theory of peace and security believe that states are inherently aggressive (offensive realism) and/or obsessed with security (defensive realism), and that territorial expansion is only constrained by opposing power(s). This aggressive build-up, however, leads to a security dilemma whereby increasing one's security may bring along even greater instability as an opposing power builds up its own arms in response (an arms race). Thus, security becomes a zero-sum game where only *relative gains* can be made. Realists believe that there are no universal principles with which all states may guide their actions. Instead, a state must always be aware of the actions of the states around it and must use a pragmatic approach to resolve security problems as they arise. Democratic peace theory advocates also that classical realism theory of peace and security is not applicable to democratic states' relations with each another, as their studies claim that such states do not go to war with one another. However, Realists and proponents of other schools have critiqued both this claim and the studies which appear to support it, claiming that its definitions of 'war' and 'democracy' must be tweaked in order to achieve the desired result.

Neoliberalism, the theory guiding economic liberalization, assumes that individuals are autonomous and independent. The theory champions the private sector as the provider of

security. Neoliberalism advocates slashed public spending as a measure to lower inflation. It is guided by the belief that people can purchase education, defence and healthcare in the market Neoliberalism, as an approach to political economy, is unfit to handle the security crisis of a nation, private sector is not able to absorb the numbers of need of care.

The Neoliberal peace has promoted transformation through macro-economic stability, reduction of the role of the state, the squeezing of collective and public space, a quest for private affluence, and reliance on privatisation and on exports and foreign investment to stimulate economic growth. In its most modern manifestation, the liberal project has gained enormous strength, less perhaps from the economics of profiteering and driving down costs of production than from the rationale of globalisation. The future vision has been constructed as economics without borders. State and international regulation should survive mainly to preserve fair competition and guard against fraudulence or the worst excesses of environmental degradation – less to ensure that people make a living (Michael, 2005). Neoliberal globalization is blamed for increasing the gap between rich and poor inside and across countries and overall increases in poverty; both relative and absolute (Benatar, 2001). Economies have been opened up to liberalisation; public goods have been poor quality; and budget deficits have deprived governments of resources (Carbonnier, 2004; Hilary, 2005).

The constructivists argued that the focus on "objective" military capabilities and threats reflect the victory of positivist and instrumentalist thinking. It transforms social facts, such as military capabilities, into "objects of knowledge, control and management" (Williams 1998). For them peace and war are constructed meanings and social practices, not analytical concepts

or properties of social systems (Buzan, Wæver,and de Wilde 1998). According to Ayoob (1997), a comprehensive security can be best achieved when "territorial satiation, societal cohesion, and political stability" prevail within states as is the case in most industrialized countries. The absence of these internal traits, i.e., effective statehood, often leads, in turn, also to inter-state violence. This view tends to lead to the conclusion that the inter-state security dilemma is less due to the uncertainty of the state actors about the defensive versus offensive intentions by the others. Rather, it is related to the prevalence of malign and predatory motives of the governments trying to stabilize their internal and external security position.

In another development, the series of arguments that surround the need for defence budgeting pave way for the development of several approaches to defence studies. The neoclassical approach to defence spending was based upon the notion of a state reflecting some form of social democratic consensus, recognizing some well-defined national interest and threatened by some real or apparent potential enemy or threats. The neoclassical believe that external potential enemy is necessary to deter aggression and this is done by developing a particular level of capability. High spending is the result of changes in technology, rising costs and arms races. On the contrary, the Marxist approach starts from the premise that defence spending has a necessary, though contradictory, role in the maintenance of the capitalist system. The Marxist approach suggests that defence spending imposes substantial burden on the economy. Smith, (1977) supported this view when he argued that defence spending in advanced countries is associated with lower investment, lower growth and higher rates of unemployment. An alternative view however, treats defence spending as a source of aggregate demand for goods and services and therefore a source of economic stimulation.

This can be tied to market failure argument. This is known as the "Military Keynesianism". Keynes argued that even in extreme situations where the government spends on anything, it would stimulate aggregate demand. The total demand effect is based on Keynesian argument that increase in government spending will affect economic growth positively if the economy has excess production capacity or unemployed resources. Benoit (1973, 1978), Deger (1988), Al -Yousif (2002), Jonah (2005) and Gold (2005) have all yield to this position. This is because increase in defence spending will increase disposable income and lead to demand pull inflation that mobilizes hitherto unused resources into productive uses. High price increase the profit rate which in turn increases employment, investment and economic growth progress. This is the argument that defence spending can be used as counter-cyclical instrument.

Fiscal expansion can have some inflationary impact; which depends on the source of financing the fiscal expansion. Fiscal expansion can result from taxation, monetary expansion or by increasing public sector debt. Monetary expansion can be inflationary while taxation and debt are the result of expenditure switching from civilian investment or consumption to the military through the allocation process. Also, the effect of inflation on growth depends on whether it is mid or high, short or persistent. Where inflation is low and short lived, unutilized resources may be mobilized and used to expand productive capacity. Where human constraints exist, expansion of military personnel and industrial systems would worsen resource constraints. Thus mobilization of scarce resources like highly skilled administrative, scientific and technological manpower for military purposes may worsen supply rigidities.

High defence spending, when supply is constrained will lead to cost push inflation and this will reduce investment and economic growth in the long run. Although, developing countries

are characterized by unemployment and underemployment, absorptive capacity constraints limit the rapid expansion of non-tradable factors. Consequently, the ability of inflationary financing to generate counter cyclical effects is limited. Where demand shortages and excess capacity exist in the industries, domestic production of defence hardware would lead to demand and employment creation. Benoit (1978) supported this view when he argued that moderate inflation increases growth in developing countries. Finally, to the extent that public expenditure help people in attaining higher efficiency and productivity, their capacity to work, save and invest will increase economic progress.

Market failure remains one of the most influential arguments for government intervention. Throughout the twentieth century, most of the market failure arguments were based on theories of public goods and externalities. These theories suggest that market participants will fail to produce certain mutually beneficial goods and services. Although aspects of these theories can be traced back to the beginnings of economics, the modern formulations were laid down by Samuelson (1954), Meade (1952), Bator (1952) and others in the 1950s. Since that time and despite some significant differences a consensus developed that governments should provide at least a few basic public goods, such as national defence (Cowen 1988).

Stiglitz (1981) suggests that market failure will occur whenever the price system is used. Market failures are thought to occur when the market fails to produce public goods, or inadvertently produce externalities, or gives rise to natural monopolies, or disenfranchises parties through information asymmetries, or creates undesirable income distributions. The traditional theory of public economics (the economic role of the state) was best summarized by Baumol's (1952) Welfare Economics and the Theory of the State. According to this

theory, market failures, such as positive or negative externalities, would be identified and government officials would create the appropriate tax and subsidy scheme to bring social marginal cost and private marginal cost into alignment. In short, government was the corrective to market failures identified by the economist. Keynesian macroeconomics argued along similar lines. As aggregate demand failure was identified, appropriate fiscal policy would be followed to ensure that aggregate demand would meet aggregate supply at the full employment level of output.

The prime example of a public good in traditional public finance theory is national defence. If government does produce national defence in order to protect its source of income, it will want to protect its income at the lowest cost possible. When considering national defence, this means protecting its income from foreign aggressors, but governments find threats at home as well as abroad. The government will also want to minimize the costs it incurs in gaining compliance of its own citizens with its policies.

The name public goods suggest public-sector production. Samuelson (1954) argued the merits of public-sector production when he first formalized the theory of public goods. Samuelson was of the view that there is no good revealed-preference mechanism for public goods, so they will not be produced efficiently, if at all, in the private sector. A public good is a kind of extreme positive externality situation.

Technically, a public good is characterized by two feature non-excludability - non-payers cannot be excluded from consuming it. (e.g., once the nation's borders are protected, no one inside those borders can be excluded from that protection.) Non-rivalry - one person's consumption of the good/service does not diminish anyone else's consumption of it. (e.g.,

adding one more person inside the nation's borders does not cause the rest of us to get less protection). The prime example of a public good in traditional public finance theory is national defence. An eternality is an activity that affects others for better or worse without others paying or being compensated for the activity. It occurs when private costs or benefits do not equal social costs or benefits.

The unregulated market or free market may produce too much air pollution and too little investment. The government may use its influence to control harmful externalities. A market power reflects the degree of control that a firm or groups of firms have over the price and production decisions in an industry. When monopolies or oligopolies collude to reduce rivalry or drive firm out of business, government may apply antitrust policies or regulation to enhance economic efficiency. Similarly, the manner in which the wealth of a nation and income is unfairly and unequally distributed among individuals necessitates government intervention. The government can achieve equitable distribution of economic well being through public policies such as income tax and the welfare system. One might argue that government coerces taxpayers to contribute to redistribution programmes because redistribution is a public good. The market can produce public goods efficiently, both in theory and in practice.

Whenever it is legitimate for government to intervene in private affairs, it is usually been based on the concept of market failure - a circumstance where the pursuit of private interest does not lead to an efficient use of society's resources or a fair distribution of society's goods. Accordingly, policy analysts argued that the existence of a market failure “provides a necessary, not a sufficient justification for public policy interventions" (Wolf 1979).

Sufficiency is established when the gains from government intervention outweigh the dangers of government intervention. For a public like defence the purpose could be the attainment of victory or at least avoidance of defeat in war period (Jonah, 2005). Defence deters aggression and protects the territorial sovereignty of a nation and in Nigeria defence spending creates internal security that is conducive for production which leads to the production of goods and services, provision of employment that empowers people creating purchasing power that has a multiplier effect on the economy as a whole.

Internal violence in Nigeria is locally grown and home directed with large consequences on the nation's production activity, policies, property, institutions and individuals in the country. The magnitude of the violence at any point in time cannot be estimated. Violence change population, reduce capital formation, technology, total productivity and market efficiency. To curb violence in Nigeria the military is engage in peace security. The nature of domestic violence in Nigeria is highly volatile. The absence of the military will certainly halt production and reduced the nation economic growth. To avoid this defence expenditure becomes very imperative.

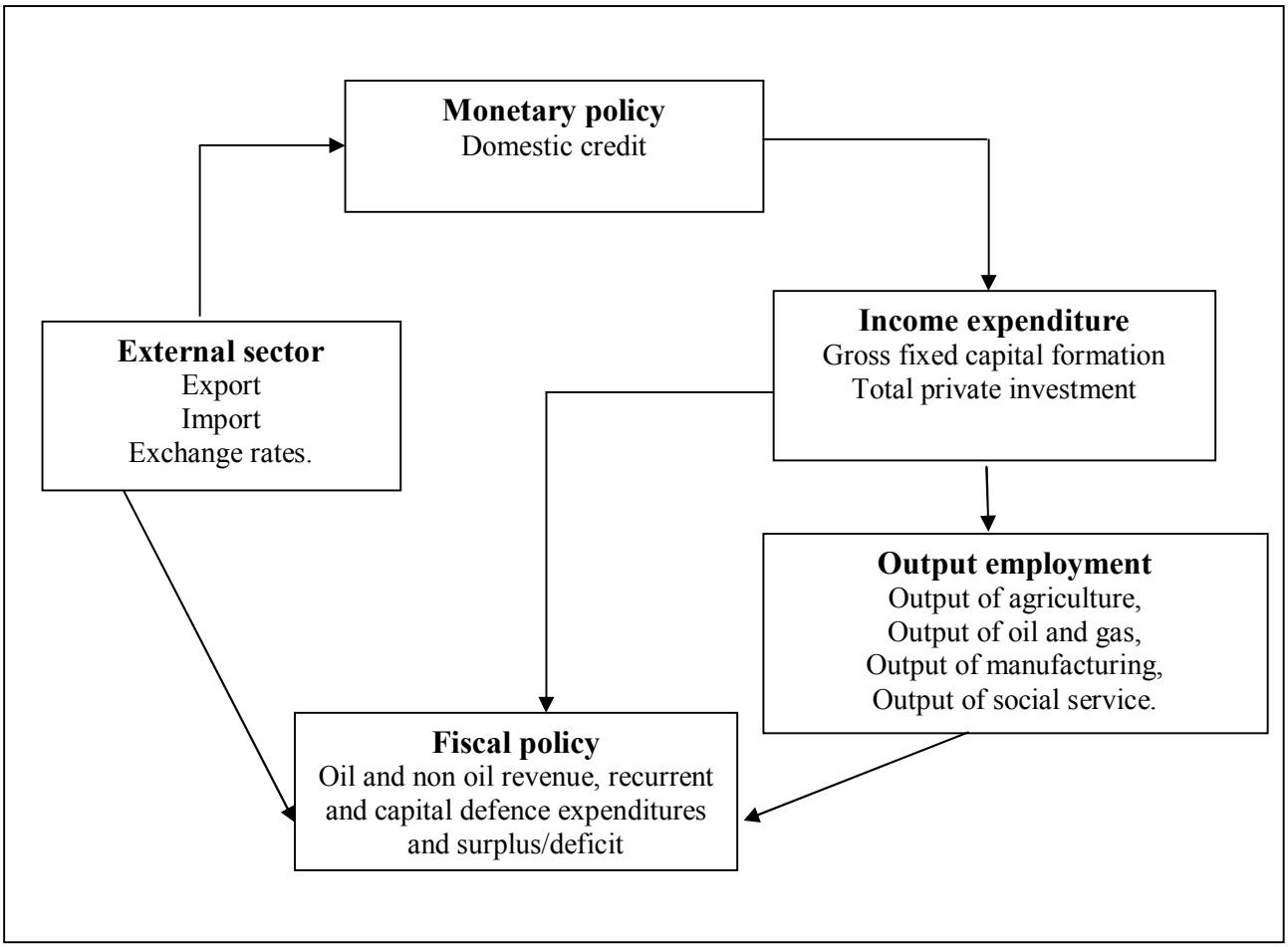
CHAPTER THREE

RESEARCH METHODOLOGY.

3.0 Introduction.

The methodology that has been employed in the analysis of this study arises from the problem statement, objectives, theoretical and empirical findings of the relationship between defence expenditure, growth and macroeconomic variables. The models used in this study represent the economy in a way that is consistent with Keynesians and neoclassical macroeconomic frameworks. In order to explain the macroeconomic effect of defence expenditure in Nigeria, a macroeconometric model has been specified for the study. In the macroeconometric model, some right hand side variables are however, normally correlated with the disturbance terms of the equations in which they appear. This suggests interdependence of the variables in the model. To this end, the ordinary least square (OLS) technique would therefore not be suitable in this study, to resolve this problem the simultaneous equation estimate technique or the two stage least square technique was used in the estimation of all the 18 behavioural equations for the study. This was followed by a simulation exercise. The macroeconometric model, as constructed for Nigeria, is a block of system comprising groups of simultaneous and recursive equations.

Figure 3.1. A Model of Macroeconomic Impact of Defence Expenditure.



Source: Computed by the researcher, August, 2010.

3.1 Explanation of Macroeconomic Model of Defence Expenditure.

From figure 3.1 above, first, it is assumed that increase in defence expenditure can result from monetary authority activity that triggers up inflation and inflation is a determinant of defence expenditure and second, threat perception (both internal and external threats) can account for increase supply of money which in turn triggers up inflation, thus, threat perceptions can led to increase demand for money. This exercise increases inflation which impact on defence expenditure and defence expenditure in turn add to aggregate demand. Both private investment and total private consumption increase aggregate demand function as a result of

defence expenditure. The activity of private investment remit income in the form of profit tax and value added tax to government. On the other hand, private consumption investment add to the growth of output employment block which in turn produced goods and services that create surplus for export and this in turn generate revenue to the economy. The relationship between export and import is vital for revenue generation and the availability of revenue necessitates the level of expenditure. The relationship between revenue and expenditure creates surplus or deficit budget. Also, the monetary policy authority activity can lead to the increase in the demand for foreign exchange which creates shortage in supply of foreign exchange rate currency that impact on import of goods and service and in turn impact on revenue generation that affect defence expenditure and defence expenditure in turn impact on output employment and private investment and consumption expenditure.

The reserve position will suggest that an increase in oil and gas revenue and foreign financial inflow from the external sector may result in demand for increase in defence expenditure. In Nigeria, the fall in defence expenditure can result from a fall in the federally collected revenue. The impact of defence expenditure or the application of defence expenditure to the demand for goods and services may add to or increase total private investment and total private consumption which in turn increase the total output production of oil and gas, agriculture, manufacturing and social services as well as other sectors of the economy and in turn generate revenue for the economy.

3.2 Empirical Framework.

Model Specification.

The macro econometric model specification for this study takes the following order; output-employment block, income-expenditure block, monetary block, external block and fiscal block. The model has been adopted from Abdulsalam (2008), Muhammed (2008), Olofin and Afangideh (2007), Soumya and Murty (2006), Adam (2001) and Ikhide, (1988) works on macroeconomic variables and economic growth in Nigeria. A major improvement in this present study is the inclusion of defence expenditure variable to determine the 18 endogenous variables specified for this study. More so, the 18 endogenous equations built in five blocks system where modified to accommodate some suitable variables for this present study which were ignored in the above previous works.

3.2.1 Output Block.

In the classical model, output and employment is simultaneously determined. The output and employment block is determined by the availability of real resources - labour and capital resources. A major feature of the classical model is that factors operating on the supply side determine the level of employment and output. The classical economists' argued that defence expenditure that hinge on threat, political tension, and sudden war can increase demand for labour and where peace is sustained, the demand for defence labour will increase aggregate demand and the multiplier effects of income and consumption. A key relationship in the neoclassical analysis is the "aggregate production function", which relates potential output to the levels of capital and labour inputs and to multi-factor productivity. In this framework, the growth of potential output is the result of the growth of capital and labour and improvements in factor productivity. Basically, this suggests that the output employment block concentrate on production function variables. Since it is obvious that the production process in Nigeria

depends on the availability of revenue from export and efficient use of expenditure, this study includes government expenditures and exports in the output employment block. Like Adam, (2001), this study used wages and salaries as a proxy for labour. The relationship which defence expenditure establishes with other sectors in the economy is very crucial, thus, in order to have a good understanding of the impact of defence expenditure in some key sectors of the economy, the output employment block has been disaggregated into four major sectors. In each of these sectors defence expenditure play an important role. The inclusion of defence expenditure was to determine its respective influences on the various sectors. The sectoral decomposition includes oil and gas, agriculture, manufacturing, social services of the Nigerian economy. The aggregated output function has been provided in equation 3.1 and 3.2 below:

$$Y = YOG + YMAN + YAG + YOS + YOT \quad \ldots\ldots 3.1$$

Where Y is the gross domestic product, YOG is the output of oil and gas, YMAN represent output of manufactured goods, YAG is the output of agricultural sector, YOS is the output of social service and YOT is the output of other sectors. For convenience the above equation Is rewritten as:

$$GDP = GDPog + GDPman + GDPag + GDPot \quad \ldots\ldots 3.2$$

The sectoral specification is of the form:

$$GDPog = b_0 + b_1 OXPT_t + b_2 DCON_t + b_3 DEFEX_t + b_4 GWR_t + b_5 GDPog(-1)_t + b_6 AWR_t + u_t \quad \ldots\ldots 3.3$$

$$GDPag = b_0 + b_1 ACE_t + b_2 GFCF_t + b_3 DEFEX_t + b_4 RGDP_t + b_5 DC_t + b_6 GDPss_t + u_t \quad \ldots\ldots 3.4$$

$$GDPman_t = b_0 + b_1 GFCF(-2) + b_2 GDPss + b_3 INT(-2) + b_4 DEFEX + b_5 MCE + u_t \quad \ldots\ldots 3.5$$

$$GDPss = b_0 + b_1 SSCE_t + b_2 SSRE_t + b_3 GFCF_t + b_4 DEFEX_t + b_5 GDPss(-1)_t \; u_t \quad \ldots\ldots 3.6$$

$$GDPot = GDP - GDPog + GDPman + GDPag + GDPSS \quad \ldots\ldots 3.7$$

Where

ACE = agriculture recurrent expenditure

AWR = average wage rate

ARE = agriculture recurrent expenditure

DC = domestic credit

DCON = domestic consumption of oil

DEFEX = defence expenditure

GDP = gross domestic product

GDPag = gdp of agriculture sector

GDPog = gdp of oil and gas sector

GDP man = gdp of manufacture sector

GDPss = gdp of social service

GDP ss(-1) = lagged gdp of social service

GDP ot = gdp of other sectors

GDP ag(-1) = lagged gross domestic product of agriculture sector

GFCF = gross fixed capital formation which was a proxy for public investment

GFCF(-2) = lagged gross fixed capital formation

GWR = growth rate of gdp.

GDP og(-1) = lagged gdp of oil and gas sector

INT(-2) = lagged interest rates

MCE = manufacture capital expenditure

OXPT = oil export

RGDP = real gdp

SSCE = social service capital expenditure

SSRE = social service sector recurrent expenditure

Y = national income

YOG = gross domestic product of oil and gas sector

YMAN = gross domestic product of manufacture sector

YAG = gross domestic product of agriculture sector

YOT = gross domestic product of other sectors

YOS = gross domestic product of social service

b_0 = the autonomous estimates of the endogenous functions.

$b_1 = b_5$ are the estimates of the linear coefficients of the behavioural equations

u = is the error term for the model.

t = subscript t signifies time series data.

The output block provides an identity and four behavioural equations. Equation 3.3 indicated that the oil and gas sector output (*GDPog*) is determined by oil export (OXPT), domestic consumption of oil (DCON), defence expenditure (DEFEX), growth rate of gross domestic product (GRW), lagged value of gross domestic product of oil and gas sector (GDPog(-1)) and average wage rate which was computed as average of the range of annual wages and salaries. Equation 3.4 showed that output of agricultural sector comprises of agricultural capital expenditure (*ACE*), gross fixed capital formation (GFCF), DEFEX, real gross domestic product (RGDP), domestic credit (DC), and gross domestic product of social service sector (GDPss). On the other hand, manufacture capital expenditure (MCE), lagged gross fixed capital formation (GFCF(-1)), DEFEX, lagged interest rates (INT(-2)) and gGDPss are the factors that affects manufacturing output in equation 3.5. While equation 3.6 shows the

output of social service sectors. Independent factors like social service capital expenditure (SSCE), social service recurrent expenditure (SSRE), DEFEX, GFCF and lagged gross domestic product of social service (GDPss(-1)) determined GDPss. Output of other sectors on the hand, is determined by outputs of agriculture (*GDPag*), manufacturing GDPman, oil and gas GDP, social service minors the output of the economy (GDP) in equation 3.7. Equation 3.7 is an identity.

3.2.2 Income-Expenditure Block.

The determination of income - expenditure block is based on aggregate demand function. This means that output is determined in a Keynesian perspective. The aggregate demand is the sum of expenditures of households (Consumers), business firms (investment), government and the rest of the world (net export). The income expenditure block for this study takes the lead from Soludo (1995), Spanos (1990) and Adam (2001) model on income and expenditure. The Keynesian aggregate demand function in equation 3.8 is the starting point. The system of equations suggest that the income expenditure block is made up of two identities and three behavioural equations.

$$Y = C + I + G + (X - M) \quad \ldots\ldots 3.8$$

Where Y is the income, C represents the total private consumption expenditure, I stand for total investment expenditure, G is total government expenditure and X and M represents export and import expenditure respectively. Equation 3.8 can be rewritten as

$$IN = TPC + GFCF + (XPT - MPT) \quad \ldots\ldots 3.9$$

Where *IN* represents income, *TPC* is total private consumption expenditure, whereas GFCF is gross fixed capital formation. GFCF was used as a proxy for public investment in this study. XPT and MPT represent export and import expenditures respectively.

The disaggregated part of TPC and GFCF form the stochastic aspect of the income expenditure block.

$$TPC = d_0 + d_1DIN_t + d_2MPC_t + d_3INFR_t + d_4DEFEX_t + d_5\Delta MS_t + d_6TPC(-1)_t \quad \text{.....3.10}$$

$$DIN = IN - PIT \quad \text{.....3.11}$$

$$GFCF = d_0 + d_1RGDP + d_2GDPSS + d_3DC_t + d_4\,DEFEX + u_t \quad \text{.....3.12}$$

Where
C = consumption expenditure

I = investment expenditure

G = government expenditure

DIN = disposable income

IN = national income

INFR = inflation rates

M = import expenditiure

MPT = import

PIT = personal income tax

TFE = total federal expenditure

TPC = total private consumption

TPC(-1) = lagged total private consumption

X = export expenditure

XPT = export

ΔMS = change in money supply

d_0 = the autonomous estimates of the endogenous functions.

$d_1 = d_6$ are the estimates of the linear coefficients of the behavioural equations

u = is the error term for the model while

t = subscript t signifies time series data

Equation 3.10 above showed that private consumption expenditure depends on disposable income (DIN), change in money supply (ΔMS), inflation rate (INFR), (DEFEX) and lagged private consumption expenditure (TPC(-1)). Equation 3.12 was for the gross fixed capital formation (GFCF). GFCF is assumed to be determined by macroeconomic variables like RGDP, GDPss, DC and DEFEX.

3.2.3 Monetary Block.

While the classical economists contend that changes in money supply, ultimately results in changes in the price level, the Keynesians on the other hand postulated that the changes in money supply eventually leads to changes in output under conditions of less than full employment. In Nigeria, the monetary policy is one of the traditional macroeconomic tools by which the government attempts to control aggregate economy. The money sector model contains one money behavioural equations with one equation as identity. The monetary block takes the lead from Abdulsalam (2008), Muhammed (2008) and Adam, (2001).

$MS = NFA + DC$ …….....3.13

$DC = c_0 + c_1INT_t + c_2\,GFCF_t + c_3BD_t + c_4DEFEX_t + c_5RGDP_t + u_t$ …….3.14

Where

BD = bank deposits

INT = interest rates

MS = money supply

NFA = net foreign assets

c_0 = the autonomous estimates of the endogenous functions.

$c_1 = c_5$ are the estimates of the linear coefficients of the behavioural equations

u = is the error term for the model.

t = subscript t signifies time series data

The monetary policy block indicates that the money supply equation in 3.13 is an identity. The equation suggest that money supply (MS) depends on net foreign assets (NFA) and domestic credit (DC). While domestic credit (DC) is based on need for defence expenditure. Basically, domestic credit may result from unknown threat and combatant readiness and sudden crises in the country. The DC equation in 3.14 shows a behavioural equation that depends on interest rate (INT), GFCF, DEFEX, RGDP and bank deposits (BD) which was obtained from the sum of demand, time and savings deposits.

3.2.4 Export-Import Block.

Modeling the external sector is necessitated by the relevance of Nigeria's trade with the rest of the world and its links with the monetary, fiscal and output blocks. The percentage of Nigeria's oil export is high and the nation is import dependent on manufactured goods, military hard wears and ammunitions. As export price of oil and exchange rate changes, the terms of trade changes and this could have some important consequences for international trade and in particular inflation, fiscal policy and growth of the Nigerian domestic economy. Economic growth from exports is linked to demand since an increase in income results directly from a rise in demand for a wide range of products. Increase in demand for import

adds to the expansion of domestic production. In essence, there is an overall output increase in response to the export-induced rise in demand. This linkage to demand represents the "cyclical" effect of export growth on real output.

The standard specification of import model is provided in this study. For example, Aruna (2005) Goldstien and Khan (1985) maintained that the import demand function includes import prices and GDP which are very crucial given the fact that the effectiveness of trade policy is highly dependent upon the size of their elasticities. Econometric investigation postulated that the quantity demand of import is a function of relative prices and domestic income (Hooper and Marquez (1993) and Corone (1996)). In other studies import is assumed to comprise of raw material, foods, capital goods and manufacture goods, domestic credit level, exchange rate, foreign reserves and measure of openness. Hence, import is directly related to gross domestic product (Abdulsalam, (2008) and Mohammed, (2008)). The role of exchange rate in facilitating external trade and growth cannot be ignored in this study

$$MPT = MPK + MPC \quad \text{.....3.15}$$

$$XPT = OXPT + NOXPT \quad \text{.....3.16}$$

$$MPK = m_0 + m_1RGDP_t + m_2TFE_t + m_3DEFEX_t + m_4MPK(-1)_t + m_5MCE_t + u_t \quad \text{.....3.17}$$

$$MPC = m_0 + m_1NER_t + m_2FRS_t + m_3DEFEX_t + m_4TPC_t + u_t \quad \text{.....3.18}$$

$$OXPT = m_0 + m_1NER_t + m_2OPQ_t + m_3DEFEX_t + m_4VOXPT_t + m_5OXPT(-1)_t + u_t \quad \text{.....3.19}$$

$$NOXPT = m_0 + m_1NER_t + m_2OPS_t + m_3DEFEX_t + m_4BOP_t + m_5NGDP_t + u_t \quad \text{.....3.20}$$

$$NER = m_0 + m_1KFLG_1 + m_2BOP_t + m_3FPINV_t + m_4DEFEX_t + m_5OXPT_t + m_6NER(-1)_t \quad \text{.....3.21}$$

Where

BOP = balance of payments

FPINV = foreign private investment

FRS = foreign reserves

KFLG = capital flight

MPC = import of consumption goods

MPK = import of capital goods

MPK(-1) = import of capital goods

NER = foreign exchange

NER(-1) = lagged foreign exchange

NGDP = non oil gdp

NOXPT = non oil export

OPQ = oil production quarter

OPS = openness

OXPT(-1) = lagged oil export

VOXPT = value of oil export

m_0 = the autonomous estimates of the endogenous functions.

$m_1 = m_6$ are the estimates of the linear coefficients of the behavioural equations

u = is the error term for the model.

t = subscript t signifies time series data

The external sector shows two identities and five behavioural equations. Equations 3.15 and 3.16 were decomposed. Equations 3.17 to 3.20 represent import and export behavioural equations while equation 3.21 is the exchange rate function. Export comprises of oil export and non oil export while import is made up of import of capital goods (MPK) and import of consumer goods (MPC). Equations 3.17 indicates that import of capital goods (MPK) depends

on real gross domestic product (RGDp), total federal expenditure (TFE), DEFEX, MCE, and lagged import of capital goods (MPK(-1)). Equation 3.18 which is import of consumption goods is determined by NER, foreign reserves (FRS), DEFEX and TPC. The relationship in equation 3.19 indicates that oil export (OXPT) is assumed to be affected by variables like NER, organization of petroleum export countries oil production quota (OPQ) for Nigeria, value of oil export (VOXPT), DEFEX and lagged oil export (OXPT(-1)), Equation 3.20 suggests that non oil export is assumed to be determined by NER, NGDP, openness of the economy (OPS) which is the ratio of the difference between export and import and gross domestic product. The exchange rates equation in 3.21 is made up of capital flight (KFLG), balance of payments (BOP), foreign private investment (FPINV), DEFEX, OXPT and lagged NER, current accounts balance (CAB), output of oil and gas export ($OXPT$) respectively.

3.2.5. Fiscal Block.

The choice of the variables in the fiscal block was informed by previous empirical studies and economic theory. The fiscal policy effects was modeled from both revenue and expenditure sides. The framework for financing Nigeria fiscal federalism shows that both federal retained revenue and internal loans determines aggregate federal expenditure and its components as well. Also in the fiscal block the study determine the demand for defence expenditure and the relationship between defence expenditure and economic growth rate. The fiscal block is specified below:

$TFR = RNOGS + ROGS$ ……....3.22

$DEFEX = F(CEXD, REXD)$ ……..……..3.24

$ROGS = a_0 + a_1 OXPT_t + a_2\, DCON_t + a_3 DEFEX_t + a_4 GDPog(-1)_t + u_t$ …….....3.25

$$RNOGS = a_0 + a_1NGDP_t + a_2NOXPT_t + a_3DEFEX_t + a_4RNOGS(-1)_t + u_t \quad \text{.....3.26}$$

$$REXD = a_0 + a_1\Delta GDP_t + a_2MCR_t + a_3TFE_t + a_4REXD(-1)_t + a_5TFR_t + u_t \quad \text{.....3.27}$$

$$CEXD = a_0 + a_1TFR_t + a_2NER_t + a_3INFR_t + a_4TRT_t + a_5CEXD(-1)_t + a_6TFEa_6 + u_t \quad \text{.....3.28}$$

$$BDF = a_0 + a_1ROGS_t + a_2RNOGS_t + a_3TFE_t\ a_4DEFEX_t + a_5BDF(-1)_t + u_t \quad \text{.....3.29}$$

$$GDP = a_0 + a_1TFE_t + a_2GFCF_t + a_3FPINV_t + a_4GDPag_t + a_5GDPss_t + a_6DEFEX_t + a_7TSAV_t \quad \text{.....3.30}$$

Where

BDF = budget deficit finance

BDF(-1) = lagged budget deficit finance

CEXD = capital defence expenditure

CEXD(-1) = lagged capital defence expenditure

GCM = government total consumption

INFR = inflation rates

MCR = military civilian regime

NIFD = net inflow of foreign debt

REXD = recurrent defence expenditure

REXD(-1) = lagged recurrent defence expenditure

RNOGS = revenue of non oil and gas sector

ROGS = revenue of oil and gas sector

TRT = threats

TSAV = total national savings

ΔGDP = change in gdp

a_0 = the autonomous estimates of the endogenous functions.

$a_1 = a_5$ are the estimates of the linear coefficients of the behavioural equations

u = is the error term for the model.

t = subscript t signifies time series data

In the fiscal block, the study presents three identities and six behavioural equations. Equation 3.25 shows that revenue from oil and gas is assumed to be determined by macroeconomic aggregate variables like OXPT, DCON, DEFEX and lagged GDPog. The variables in equation 3.26 represents the aggregate factors that are assumed to influence revenue from non oil and gas sector (RNOGS). RNOGS is dependent on import NGDP, NOXPT, DEFEX and lagged non oil revenue (RNOGS(-1)). In equation 3.27, this study assumed that recurrent defence expenditure (REXD) depends on change in gross domestic product (ΔGDP), military civilian regime (MCR), TFE, and recurrent defence expenditure lagged value (REXD(-1)). Where the estimated value of the MCR is negative, this study shall conclude that the civilian regime provide more recurrent defence expenditure than their military counterpart. The reverse shall be the case where the estimated value is positive. Equation 3.28 was used to determine capital defence expenditure (CEXD). Revenue from oil and gas sector (ROGS), non oil and gas sector (RNOGS), TFE, DEFEX and lagged budget deficit (BDF(-1)) are the assumed factors that influence budget deficits in equation 3.29. The model in equation 3.30 shall be used to presents gross domestic product performance in the economy. Equation 3.30 show that GDP is assumed to be influenced by macroeconomic variables like TFE, GFCF, FPINV, GDPss, GDPAG, DEFEX and TSAV. The military civilian regime (MCR) and threat (TRT) from domestic and external sources were assigned dummy variables. Where there are evidences of threats and military civilian regime, the study assigned the value of one to it. On

the contrary, the absence of threat and military regime takes the value zero. This concludes that the variables of TRT and MCR are dummy variables.

The Nigerian economy has suffered some internal and perceived external crises and the documentation of this variable can only be attained via dummy variable application. The researcher therefore, will depend on discussion with the appropriate military authorities to furnish the actual period of threat for the period under study. With respect to the military civilian regime variable, both the military and civilians have governed this country for a considerable number of years.

In this study, the researcher is of the view that the period under review has witnessed increase provision of defence expenditure in civilian regimes than in periods of military regimes. This is as a result of fear of civilian regimes not being toppled for not meeting the needs of the civilians in kaki. Also the present Nigeria situation particularly, in the last two decades suggests that civilian regimes are more susceptible to crisis than the military regimes. Above all, the current democratic system of governance and period of election have shown increase consumption of resources than in periods of military regimes. Given the present wave of crises in Nigeria, defence expenditure can impact on all the individual endogenous variables in the various block systems.

3.3. Technique of Data Analysis.

The macroeconometric model for this study contains 30 equations with 12 equations as identities and 18 equations as behavioural. The behavioural equations was be solved or estimated simultaneously using system of equations in two stage least square (2SLS)

procedure. This is based on the interdependence of the variables. The application of the 2SLS becomes more glaring when several dependent variables are determined simultaneously, therefore appearing both as dependent and independent variables in a set of different equations (Dimitrios, 2003) and (Thad 1990). Empirical studies suggests that the 2SLS method gives the best unbiased estimator of the parameter provided the standard assumptions about the error terms are valid namely zero mean, constant variance, zero covariance and the error term independent of all explanatory variables included in the regression equations.

This study has used the result obtained from the estimation techniques to evaluate the reliability of the estimates. The study evaluation was based on statistical theory in order to determine the statistical reliability of the estimates of the parameters. The most widely used are the adjusted coefficient of determination (R^{-2}), and t- statistics test. While the t – statistics test is the test of significance that allows us to determine whether the estimates of the parameters are significantly different from zero, the value of R^{-2} on the other hand, is the coefficient of determination which helps to ascertain the influence of explanatory variables on the behavior of dependent variable. The macroeconomic model would be estimated using the econometric views (e-views 4) software package.

3.3.1. Simulation Experiment.

In order to appraise the model, this study performed the historical simulation test. In other words, the simulation experiment was used to assess the empirical adequacy of the model in describing the historical data. This exercise allows the researcher to observe the closeness of each endogenous variable in tracking the historical path. The expectation here is that the result

of the historical simulation should match the behaviour of the real world. Basically, the simulation test was carried out to determine the extent to which the estimated model tracks the economy and to make prediction. The simulation experiment solved the 18 endogenous relations together iteratively with dynamic solving options for the entire sample period 1970-2008. The dynamic forecast technique was employed for the computation of Theil inefficient coefficients (TIC) and the statistics summary was used to appraise the predictive performance of the simulation model.

The TIC or the U statistics was rescaled or decomposed into three proportions of inequality namely the (i) bias proportion (BP) (ii), variance proportion (VP) and covariance proportion (CP). BP indicates a systematic error and it is hoped that bias is close to zero. A large bias proportion suggests a systematic over or under prediction. VP is an indication of the ability of the forecasts to replicate the degree of variability in the variable to be forecasted. If the variance proportion is large, then the actual series has fluctuated considerably whereas the forecast has not. CP on the other hand, is the proportion that measures unsystematic error. It is expected that the CP should have the highest proportion of inequality. The total value of the decomposed TIC or U statistics is expected to be less than one for a good forecast and this suggest goodness of fit for the simulation model. The forecast for the validation of the simulation model was for an *ex post*. The simulation experiment for scenarios involves defence expenditure policy. Four scenarios were considered in this study, (a) the experiment for the effect of increase in aggregate defence expenditures (a) by a 10 percent increase (b) 15 percent increase in defence expenditure, (c) the experiment for an increase of defence

expenditure by 20 percent and (d) the experiment for an increase of defence expenditure by 25 percent.

3.2.2. Assumption for Simulation

(a) Defence expenditure imposes costs on the society as a whole; this is in the form of personal income tax, company profit tax and import tax which generally impact on fiscal policy of the nation.

(b) The rate at which defence expenditure increases depends on government revenue collection, government defence policy and political instability, social, ethnic crises, period of election and the availability of borrowed funds. Given the resource constraints of the economy, defence expenditure impacted on the structure of government expenditure and the economy as well. Thus the simulation exercise forecasted the historical path of defence expenditure on the key sectors and macroeconomic variables.

3.2.3. Source of Data and Limitations.

The source of data for this study was obtained from secondary information like text books on public finance, defence journals and statistical bulletin from central bank of Nigeria, publication of ministry of defence, national defence college and the bureau of statistic publication. Others include SIPRI etc. Macroeconomic data in Nigeria are normally compiled by the Central Bank of Nigeria (CBN) and National Bureau of Statistic (NBS). The economic and financial data compilation for this study involves the aggregation of the financial system's accounts to the level at which general macroeconomic tendencies are discernible.

The level of defence expenditures is determined by both internal and external factors. Source of financing defence expenditure is divided into domestic and foreign sources. Debt (domestic and external) is a stock of liabilities with different tenure accumulated by government operations in the past and scheduled to be fully repaid by government in the future. Debt increases the volume of expenditure. Data for gross domestic product, gross private consumption expenditure, government consumption expenditure, gross consumption expenditure and gross national savings were obtained directly from CBN statistical bulletin 2009, 2008 and 2007. The concept of the gross domestic product (GDP) is the money value of goods and services produced in an economy during a period of time irrespective of the nationality of the people who produce the goods and services. It is calculated without making deductions for depreciation. But a more serious limitation of the index is the absence of a composite consumer price index to measure average change in the price of goods and services purchased by consumers. However, because of the problems of imprecise definitions, improper classification and inaccuracies in additions, irregular valuation procedures and errors in the compilation of data, this work relied more on CBN convention of assuming that the system of national accounts (SNA) is a consistent, coherent and integrated set of macroeconomic accounts; balance sheets and based on a set of internationally agreed concepts, definitions, conventions, classifications and accounting rules. The study use specific sources for different kinds of data in order to ensure consistency. Thus, the major concern of this study was to obtain congruent models which were interpretable in terms of economic theory justification and which also describes the characteristics of the data in a statistically vigorous comportment.

CHAPTER FOUR.

4.0 PRESENTATION OF RESULTS AND DISCUSSION.

4.1. Introduction

In this chapter, the structure of defence expenditure and results of the estimated two stage least square are presented. The 18 stochastic equations of the model which specify the behaviours of output employment block, income expenditure block, monetary block, export - import block and fiscal policy block were estimated. The coefficients of the stochastic equations of the macroeconomic model are presented before the performance of the dynamic simulation experiments to determine the dynamic effect of a 10%, 15% 20% and 25% increase of the exogenous variable (defence expenditure) on endogenous variables. The analysis of the results was based on the significance of the explanatory variables and their conformity to a prior expectation. The study commences the analysis with the description of the structure of defence expenditure in Nigeria.

4.2 Structure of Nigeria Defence Expenditure.

In this section, the study discussed the growth profile and composition of Nigerian government defence spending between 1970 and 2008. This entailed a statistical review of the consumption or recurrent expenditure and investment or capital expenditure of defence sector in Nigeria. Table 4.1 revealed the composition of defence expenditure in Nigeria between 1970 and 2008. Nigeria is a developing nation and conflict has assumed different dimension accounting for the volume of defence expenditure. Aggregate defence expenditure within this period demonstrated a consistent increase but with some few years of fall in defence expenditure due largely to fall in federally collected revenue. Also, the level of oscillation between recurrent and capital defence expenditures was not consistent. Aggregate defence

expenditure had a total of ₦820 million in 1975 out of which ₦ 754.6 million was for recurrent defence expenditure and ₦65.24 million was allocated to capital defence expenditure. This represents a total 92. 02% and 07. 98% for recurrent and capital defence expenditures respectively. The total defence expenditure declined from ₦780 million in 1980 to ₦607.6 million in 1984 but was consistent in its composition as recurrent defence expenditure led with over 93% against 6.32% for capital defence expenditure. Both capital and recurrent defence expenditures increased tremendously from 1989 to 1998. The total defence expenditure was ₦1081.4 million and ₦21278.6 in 1998 but the composition of this expenditure showed that the share of recurrent defence expenditure declined from 88.52% in 1989 to 71.11% in 1998 while capital defence expenditure rose from 11.48% in 1989 to its highest point of 28.89% in 1998. Aggregate defence expenditure continued to rise steadily especially between 2000 and 2008. The total defence expenditure was ₦40074.3 in the year 2000 but rose to ₦151940 in 2008. Although, the share of recurrent defence expenditure in aggregate defence expenditure within the reviewed period continued to be higher than that of capital defence expenditure, but the percentage increase in capital defence expenditure was remarkable.

The persistent rise in aggregate defence expenditure must have been motivated by the need to sustain peace, security of lives and property, peaceful electoral process. For example, in the year 1981 (the maitatsine crisis in Maiduguri and Kano), military coup d'état (1983), electoral process (1999), 2004 and 2007, religious crisis in Kaduna between 2000 and 2002, incessant destruction of oil pipelines and kidnapping and the agitation for control of oil resources between 2002 and 2008 as well as other forms of threats that permeates between 1970 and

2008 must have increased consistently the need for defence spending in Nigeria. Also, the steady increase in federally collected revenue oil revenue has continued to account for the increase in aggregate defence expenditure in Nigeria.

Table 4.1 Structure of defence expenditure

	Defence expenditure in millions			% of defence expenditure		
Year	Capital	recurrent	total	% of capital	% of recurrent	total
1970	135.6	402.6	38.2	25.20	74.80	100
1971	63.2	338.4	401.6	15.73	84.27	100
1972	108.8	498.6	607.4	17.91	82.09	100
1973	133.8	454.2	588.4	22.73	77.27	100
1974	268.3	555.4	823.7	32.57	67.42	100
1975	65.4	754.6	820	7.98	92.02	100
1976	69.1	821.3	890.4	7.76	92.24	100
1977	97.7	817.7	915.4	10.67	89.33	100
1978	39.8	596.1	635.9	6.26	93.74	100
1979	44.4	724.2	768.6	5.78	94.22	100
1980	127.5	652.5	780	16.35	83.65	100
1981	96.6	725.1	821.3	11.76	88.24	100
1982	84.2	660.8	745	11.30	88.70	100
1983	200.8	535.4	736.2	27.28	72.72	100
1984	38.4	569.2	607.6	6.32	93.68	100
1985	30.6	656.6	687.2	13.18	86.82	100
1986	209	742.4	951.4	22.83	77.17	100
1987	18.5	717.7	736.2	2.51	97.51	100
1988	271.3	830	1101.3	24.64	75.36	100
1989	124.1	957.3	1081.4	11.48	88.52	100
1990	196.4	1410.5	1606.9	12.22	87.78	100
1991	411.1	1834.2	2245.3	18.31	81.69	100
1992	683.2	2023.4	2706.6	25.24	74.76	100
1993	1085.6	3085.4	4171	26.03	73.97	100
1994	1286.8	4205.1	5491.9	23.43	76.57	100
1995	2031.2	5344.4	7375.6	27.53	72.47	100
1996	2670.1	11425.7	14095.6	18.94	81.06	100
1997	3820.8	11607.2	15428	24.77	75.23	100
1998	6147.7	15130.8	21278.6	28.89	71.11	100
1999	4856.3	28091.4	32947.7	14.74	85.26	100
2000	6954.9	33119.4	40074.3	17.36	82.64	100
2001	16400	47071.6	63471.6	25.84	74.16	100
2002	22093.6	86053.8	108147.4	20.43	79.57	100
2003	10679.7	51043.6	61723.3	17.30	82.70	100

2004	10657.1	65400.2	76057.3	14.01	85.99	100
2005	21535.2	90333.8	111869	19.25	80.75	100
2006	14686	83674	98360	14.93	85.07	100
2007	14717	102597	117315	12.55	87.45	100
2008	20054	131887	151940	13.20	86.80	100

Source: computed from statistical bulletin 2009 and the work of Odusola (1996).

4.2.1 Share of Defence Expenditure to Gross Domestic Product and Total Federal Expenditure.

Table 4.2 depicts the share of defence expenditure to gross domestic product and total federal expenditure in Nigeria within the period under study. It indicated that as total federal revenue increases defence expenditure also increase. In 1983 the total revenue was ₦10508.7million and total federal expenditure was ₦9636.5 million. The total defence expenditure within this period was ₦736.2million but its percentage share to total federal expenditure and gdp stood at 7.64% and 1.31% respectively. The total revenue in 1989 was ₦275, 96.7 million but rose steadily to ₦463, 608.8 in 1998 and ₦786, 659.0 in 2008 respectively. In absolute terms, this increase in revenue was consistent with the rise in total federal expenditure and aggregate defence expenditure within the same period. However, the ratio of defence expenditure to total expenditure declined consistently from 10.37% in 1979 to 3.60% in 1997 and 4.68% in 2008 respectively. In like manners the share of defence expenditure to gdp consistently declined within the period under review. In 1977 the percentage share of defence expenditure to gdp stood at 2.90% but it declined to 1.44% in 1982 and to its lowest point of 0.38 in 1995 but increased significantly to 1.78% in 2004 and further rose to 2.40% in 2008.

Table 4.2 Defence Expenditure as percentage of GDP.

year	Defex	Tfe	tfr	gdp	defex as % of tfe	defex as % of gdp
1970	538.2	903.90	634.00	4219.0	59.54	12.76
1971	401.6	997.20	1168.80	4715.5	40.27	8.52
1972	607.4	1463.60	1405.10	4892.8	41.51	12.41
1973	588.4	1529.20	1695.30	5310.0	38.48	11.08
1974	823.7	2740.60	4537.40	85919.7	30.30	0.96
1975	820	5942.6	5514.7	20957	13.80	3.91
1976	890.4	7856.7	6765.9	26656.3	11.33	3.34
1977	915.4	8823.8	8042.4	31520.3	10.37	2.90
1978	635.9	8000.0	7371	34540.1	7.95	1.84
1979	768.6	7406.7	10912.4	41947.7	10.37	1.83
1980	780	14968.5	15233.5	49632.3	5.21	1.57
1981	821.3	11413.7	13290.5	50456.1	7.20	1.63
1982	745	11923.2	11433.7	51653.4	6.25	1.44
1983	736.2	9636.5	10508.7	56312.9	7.64	1.31
1984	607.6	9927.6	11253.3	62474.2	6.12	0.97
1985	687.2	13041.1	15050.4	70633.2	5.27	0.97
1986	951.4	16223.7	12595.8	71859	5.86	1.32
1987	736.2	22018.7	25380.6	108183	3.34	0.68
1988	1101.3	27749.5	25380.6	142618	3.97	0.77
1989	1081.4	41028.3	27596.7	220200	2.64	0.50
1990	1606.9	60268.2	53870.4	271908	2.67	0.59
1991	2245.3	66584.4	98102.4	316670	3.37	0.71
1992	2706.6	92797.4	100991.6	536305.1	2.92	0.51
1993	4171	191228.9	192769.4	688136.6	2.18	0.61
1994	5491.9	160893.2	201910.8	904004.7	3.41	0.61
1995	7375.6	248758.1	459987.3	1934831	2.97	0.38
1996	14095.6	337217.6	523597	2703809	4.18	0.52
1997	15428	428215.2	582811.	2801973	3.60	0.55
1998	21278.6	487113.4	463608.8	2721178	4.37	0.78
1999	32947.7	947690.0	949187.9	3313563	3.48	0.99
2000	40074.3	701059.4	190616	4727523	5.72	0.85
2001	63471.6	1018025.6	2231600	5374335	6.25	1.18
2002	108147.4	1018155.8	1731838	6232244	10.62	1.74
2003	61723.3	1225965.9	2575096	6161700	5.04	1.00
2004	76057.3	1426201.3	3920500	6455110	5.33	1.78
2005	111869	1822100.0	5547500	6455110	6.14	1.73
2006	98360	1938002.5	5965102	6455110	5.08	1.52
2007	117315	2450896.7	5715600	6341000	4.79	1.85
2008	151940	3246818.5	7866590	6341000	4.68	2.40

Source: computed from statistical bulletin 2009 and the work of Odusola (1996).

Note: Defex = defence expenditure, Tfe = total federal expenditure, Tfr = total federal revenue and gdp = gross domestic product.

4.3. Estimation of Result and Analysis

4.3.1 Output – employment block

In the various equations that constitute the output employment block, this study assumed that variables like oil export (OXPT), domestic oil consumption (DCON), defence expenditure (DEFEX), growth rate of the economy (GWR), lagged value of oil and gas output (GDPog(-1)), average wage rate (AWR), agriculture capital expenditure (ACE), gross fixed capital formation (GFCF), real gross domestic product (RGDP), domestic credit (DC) gross domestic product of social service sector (GDPss), social service capital expenditure (SSCE), social service recurrent expenditure (SSRE), gross domestic product of manufacturing sector (GDPman), lagged value of gross domestic product of social service sector (GDPss (-1)) manufacture capital expenditure (MCE), lagged values of GCFC (-2) and interest rate (-2) are the inputs variables that influence the various equations.

The estimated equation 4.1 showed a good fit as the adjusted coefficient of determination (R^{-2}) is high. The R^{-2} value of 0.98 showed that over 98 percent of the variability in the dependent variable is explained by the joint independent variables in the model. This is a representation of goodness of fit for the regression line. The estimated coefficients of the variables in equation 4.1 were also very impressive as they fall within a-priori expectation of the study. All the coefficients were having positive signs. The defence expenditure variable showed a positive coefficient (24.85). This is an indication that defence expenditure impacted positively on the output of oil and gas. A one percent increase in defence expenditure will impact positively on GDPog by 24.85 percent. This relationship was expected in this study since increase in defence expenditure can result from the need to protect natural resources like oil and gas production in Nigeria (Olaniyi, 2000). This has ensured constant production of oil

and gas for domestic consumption and export. This result indicates that defence expenditure add to the growth of the oil and gas sector in Nigeria. This is expected to increase revenue of oil and gas sector. Other variables that showed positive signs include OXPT (2.50), DCON (14.19), GWR (62.74), AWR (0.031) and lagged GDPog (0.06). The values in parenthesis showed that DEFEX, DCON, AWR and GWR were statistically significant at 5% level whereas OXPT and GDPog(-1) were statistically insignificant at 5 percent level.

Equation 4.2 is the estimated result for agriculture output (GDPag). The adjusted coefficient of determination which measure the goodness of fit is very high (0.85 percent), this implies that the function explains 85 percent linear movements in the dependent variable of GDPag. The estimated coefficients of GCFC, AWR and DEFEX exert a high positive influence on macroeconomic aggregate of agriculture output (GDPag). The positive influence of DEFEX was expected in this study. The positive sign of DEFEX suggests that defence expenditure provides some incentives, demand and income for the growth of GDPag. The coefficient of DEFEX (0.59) implied that a 100 percent increase in defence spending will positively increase the output of agriculture by 59 percent. According to Douglason (2004), public expenditure increases macroeconomic aggregate variables performance. Similarly, ACE, GFCF, AWR, RGDP and GDPss showed positive influence on GDPag. For instance a 100 percent increase in agriculture capital expenditure (ACE) will increase GDPag by 7 percent. On the other hand, domestic credit showed a significant negative impact on agricultural output. This was not expected in this study. Although, DC negatively impacted on GDPag, it was statistically significant at 5 percent. Also, GFCF, RGDP and GDPss were statistically

significant at 5 percent level. But DEFEX, ACE and AWR were statistically insignificant at 5 percent level.

Equation 4.3 represents the output of manufacture (GDPman) sector in Nigeria. The estimated result in equation 4.3 showed that R^{-2} adjusted was 0.29 and this is not an indication of goodness of fit for the regression line. As expected, some of the coefficients exerted high positive significance impact on macroeconomic aggregate of GDPman. The coefficients of GFCG(-2), DEFEX and GDpss exert positive influence on the output of GDPman. The lagged value of interest rate INT(-2) and manufacture capital expenditure MCE exert negative influence on the performance of GDPman. The estimated result showed that DEFEX provides some desired protection needed to safeguard the manufacturing sector. Unfortunately, the series of crises in the country has led to the declining performance of the manufacture sector. This vulnerability has affected the manufacture sector output through the relocation of production firms from Nigeria to neighbouring countries. In spite of this the positive relationship between DEFEX and manufacture sector was expected for this study. An increase of 10 percent in DEFEX will exert a positive influence of 30.2 percent on GDPman. Also, the value of DEFEX coefficient in parenthesis (0.77) was compared with 1.83 t – table value for level of significance. It was found that DEFEX was statistically insignificant at 5 percent level.

In equation 4.4, the adjusted R^{-2} of 0.96 discloses a positive and strong relationship between the dependent and independent variables in the model. The adjusted R^{-2} suggests that the independent variables in the model have a 96% variability influence on the dependent

variable. This suggests a good fit and a good specification of equation 4.4. Equation 4.4 reveals that all the estimated variables are positive. The coefficient of DEFEX (0.04) positively influence GDPss but statistically insignificant at 5 percent level. Also SSCE, SSRE, GDPss(-1) and GFCF exhibit a positive influence on GDPss. SSCE, SSRE, GFCF and GDPss(-1) are statistically significant at 5 percent level. This outcome was anticipated in this study since defence expenditure on acquisition of education, technology and construction was expected to spill over to the civil sector. More so defence sector provide security for conducive learning process in Nigeria. This empirical finding supports the work of Benoit (1973) and (1978).

GDPog = 21064.83 + 2.50OXPT + 14.19DCON + 24.85DEFEX + 62.74GWR + 0.06GDPog(-1)
(0.88) (2.06) (1.86) (7.66) (0.11)
+ 0.031AWR.....4.1
(1.89)
$R^2 = 0.98$, $R^{-2} = 0.98$. DW = 0.98

GDPag = 51591.85 + 0.07ACE + 0.59GFCF + 0.59DEFEX + 1.021AWR + 0.15RGDP - 0.05DC
(0.48) (1.90) (1.51) (0.63) (1.96) (-5.29)
+ 0.05GDPS.....4.2
(2.20)
$R^2 = 0.87$, $R^{-2} = 0.85$. DW = 1.94

GDPman = 279013.2 + 5.69GFCF(-2) + 4.61GDPss – 23.04INT(-2) - 3.05DEFEX – 16.28M 4.3
(1.72) (1.37) (-1.58) (-0.77) (-1.00)
$R^2 = 0.34$, $R^{-2} = 0.29$. DW = 2.09.

GDPss = 1248.42 + 0.02SSCE + 0.09SSRE + 0.03GFCF + 0.04DEFEX + 1.10GDPss(-1) 4.4
(2.67) (6.44) (3.41) (0.93) (4.46)
$R^2 = 0.99$, $R^{-2} = 0.96$. DW. =2.26

Table 4.3: Summary of Significance Variables in the Output - Employment block.

Equation 4.1 GDP of oil and gas	Significant variable at 5%	Insignificant variable
Oil export (OXPT)		Insignificant
Domestic oil consumption (DCON)	significant	

Defence expenditure (DEFEX)	significant	
Growth rate of GDP (GWR)	significant	
Oil and gas GDP in the previous year (GDPog-1)		Insignificant
Average wage rate (AWR)	significant	
Equation 4.2 GDP of agriculture		
Agriculture capital expenditure (ACE)		Insignificant
Gross fixed capital formation (GFCF)	significant	
Defence expenditure (DEFEX)		Insignificant
Average wage rate (AWR)		Insignificant
Real GDP (RGDP)		
Domestic credit (DC)	significant	
GDP social services (GDPss)	significant	
Equation 4.3GDP of manufacture (GDPman)		
Gross fixed capital formation previous year (GFCF-2)		Insignificant
GDP social services (GDPss)		Insignificant
Interest rates previous year (INT-2)		Insignificant
Defence expenditure (DEFEX)		Insignificant
Manufacture capital expenditure (MCE)		Insignificant
Equation 4.4 GDP of social services (GDPss)		
Social service capital expenditure (SSCE)	significant	
Social service recurrent expenditure (SSCE)	significant	
Gross fixed capital formation (GFCF)	significant	
Defence expenditure (DEFEX)		Insignificant
GDP of social services previous year (GDPss -1)	significant	

Source: from equations 4.1- 4.4

4.3.2 Income Expenditure Block

Equations 4.5 and 4.6 are estimates for the income expenditure block. The two equations represent that of gross fixed capital formation (GFCF) and total private consumption (TPC). GFCF is a proxy for public investment in this study. In GFCF, this study suppose that RGDP, GDPss, DC and DEFEX have significant effect on the gross fixed capital formation. The equation showed that the adjusted R^{-2} which is 0.97 explains that the goodness of fit of the regression line is very high. The R^{-2} implies that the function explains 97 percent linear

movements in the dependent variable of GFCF. The coefficients of RGDP, DEFEX and DC exert significant positive influence on GFCF. But GDPss exert a negative significant effect on GFCF. A 100 percent increase in DEFEX will exert about 4 percent increase in GFCF. The result is a representation of DEFEX crowd in effect on public investment. This result does not tally with Olaniyi (2000). The outcome conforms to a- prior expectation. But DEFEX was statistically insignificance at 5% level. The general specification of the equation is influenced more by RGDP, DC and DEFEX than GDPss. This outcome coincides with the work of Benoit (1973).

Equation 4.6 revealed that disposable income (DIN), change in money supply (ΔMS) inflation (INFR), import of consumer goods (MPC) and TPC(-1) DEFEX and lagged total private consumption expenditure TPC (-1) are the variables that determine total private consumption (TPC) in Nigeria. The Durbin-Watson statistics test showed no presence of autocorrelation. The adjusted R^{-2} which measure the goodness of fit was high (0.73 percent). This implies that the function explains 73 percent variability in the dependent variable. The estimated coefficients of equation 4.6 indicates that DIN, INFR and TPC(-1) have a positive influence on the TPC. The coefficients of DEFEX, MPC and ΔMS have significant negative influence on TPC. The result indicated that a one percent increase in DEFEX will decrease TPC by -24.19. This outcome was not anticipated as defence expenditure in recurrent spending has been increasing consistently. The values in parenthesis indicated that DIN, MPC and TPC (-1) were statistically significant at 5 percent level.

GFCF = 2566.48 + 0.35RGDP – 2.87GDPSS + 0.06DC + 0.04DEFEX 4.5
(2.37) (--3.02) (0.55) (0.42)
$R^2 = 0.98$, $R^{-2} = 0.97$. DW. = 1.76

TPC = 69380.62 + 0.66DIN – 3.22MPC + 24.39INFR – 24.19DEFEX – 0.46ΔMS + 0.59TPC(-1) 4.6
(2.50) (-3.41) (0.28) (1.40) (-0.41) (2.70)
$R^2 = 0.77$, $R^{-2} = 0.73$. DW = 2.00.

Table 4.4: Summary of Significance Variables in the Income - Expenditure block.

Equation 4.5 Gross fixed capital formation (GFCF)	Significant variable at 5%	Insignificant variable
Real GDP (RGDP)	significant	
GDP of social services (GDPss)	significant	
Domestic credit		Insignificant
Defence expenditure (DEFEX)		Insignificant
Equation 4.6 Total private consumption (TPC)		
Disposable income (DIN)	significant	
Import of consumer goods (MPC)	significant	
Inflation rates (INFR)		Insignificant
Defence expenditure (DEFEX)		Insignificant
Change in money supply (ΔMS)		Insignificant
Total private consumption previous year (TPC-1)	significant	

Source: from equations 4.5- 4.6

4.3.3 Monetary Block

Equation 4.7 is the estimated result for the monetary block. The domestic credit (DC) equation in 4.7 reveals that INT, RGDP, DEFEX, bank deposit (BD) and GFCF are the variables that contribute to DC. The coefficients of DEFEX showed a positive sign which indicates that defence spending positively impact on domestic credit. Other coefficients that were positive include GFCF, RGDP and BD. These variables exhibit a significant positive influence on DC. INT exert a negative impact on DC. DEFEX, INT and RGDP are statistically significant at 5 percent level while GFCF and BD were statistically insignificant. The adjusted R^{-2} for goodness of fit measure indicated that the independent variables explain the variation in the dependent variable to about 0.91 percent. Generally, the performance of the coefficients suggests a positive and significant effect on macroeconomic aggregate of DC.

DC = 58162.27 -0.03INT +1.71GFCF + 0.05BD + 9.79DEFEX + 1.34RGDP 4.7

(-3.48) (0.32) (1.75) (3.60) (2.68)
$R^2 = 0.93$, $R^{-2} = 0.91$. DW = 1.65.

Table 4.5: Summary of Significance Variables in the Monetary block.

Equation 4.7 domestic credit (DC)	Significant variable at 5%	Insignificant variable
Interest rates (INT)	significant	
Gross fixed capital formation(GFCF)		Insignificant
Bank deposits (BD)		Insignificant
Defence expenditure (DEFEX)	significant	
Real GDP (RGDP)	significant	

Source: from equations 4.7

4.3.4 Export - Import Block

The next block is the external block (export-import block). The external block comprises of five estimated behavioural equations. The five estimated equations are for import of capital goods (MPK), imports of consumer goods (MPC), oil export (OXPT), non oil export (NOXPT) and nominal exchange rates (NER). The equations range from 4.8 – 4.12. In equation 4.8 the estimated result for MPK was presented. The goodness of fit measure (adjusted R^{-2}) for equations 4.8 reveals that the joint independent variables have a controllable or explanatory power of 72 percent in the variation of the dependent variable. The DW statistic value of 2.02 does not suggest any serious presence of autocorrelation. The independent variables in equation 4.8 include RGDP, total federal expenditure (TFE), manufacturing capital expenditure (MCE) DEFEX and lagged MPK(-1). The coefficients of all the variables in equation 4.8 reveals positive influence on MPK. A one percent increase in DEFEX will increase MPK by 35.04 percent. This relationship was anticipated since defence sector in Nigeria largely import its capital goods. The defence sector in Nigeria import large percentage of its weapon, ammunition and hard ware, this has continued to increase the import bills and deteriorating the level of trade balance and balance of payment for Nigeria. All the coefficients are significant at 5 percent level and conform to a prior expectation. The

general performance of the estimated coefficients suggests a positive and significant effect on macroeconomic aggregate of MPK.

Equation 4.9 is the estimated result of import of consumer goods (MPC). The independent variable NER, FRS, DEFEX and TPC, the dependent variable is MPC. The regression line showed that the adjusted R^{-2} value of 0.96 is high and had a strong explanatory power over the variation in the dependent variable. The coefficients of the estimated result indicated that DEFEX is negatively signed. This means that DEFEX had a significant negative influence on the imports of consumer goods but was statistically significance at 5 per cent level. The negative sign of defence expenditure indicates that a 100 percent increase in DEFEX will reduce import of consumer goods by 81 percent. The military sector exhibit low demand for imports of consumable goods like military uniforms and some perishable goods. This outcome was anticipated in this study. The foreign reserves (FRS), foreign exchange (NER) and total private consumption (TPC) were all positively signed. All the coefficients apart from NER are significant at 5 percent level and conform to a prior expectation. The general specification of the equation is influenced more by NER, FRS, TPC than DEFEX.

Equation 4.10 is the estimated result of export of oil. The oil export (OXPT) is the dependent variable whereas the value of oil export (VOXPT), NER, DEFEX, oil production quota (OPQ) and lagged value of OXPT(-1) are the independent variables. The result depicts an adjusted R^{-2} of 0.58 which suggests that the variables in the model have 58 percent explanatory power of the variation in OXPT. This represents a good fit for the linear regression line. The DW value of 2.04 does not indicate any serious autocorrelation. The

coefficient of DEFEX was positively signed. This means that DEFEX positively influence on OXPT. A one percent increase in DEFEX will increase OXPT by 3.63 percent. Also, the value of oil production quota OPQ, VOXPT and OXPT(-1) demonstrated a positive impact on OXPT. The outcome of this result was expected especially for the estimated result which shows DEFEX to have a significant positive effect on the oil and gas sector output in this study. All the signs of the coefficients conform to a prior expectation. However, only OPQ and DEFEX are significant at 5 percent level.

Equation 4.11 represents the estimated result for non oil export (NOXPT). The non oil export (NOXPT) is the dependent variable. The non oil gross domestic product (NGDP), NER DEFEX balance of payments (BOP) and openness (OPS) are the independent variables. The coefficients of adjusted R^{-2} value of 0.97 indicated the presence of positive explanatory power of the independent variables over the variation in the dependent variable. The coefficients of equation 4.11 show that DEFEX is positively signed. This is an indication that defence expenditure is significantly positive to NOXPT. The positive coefficient of DEFEX (0.64) suggests that a 100 percent increase in defence expenditure will lead to an increase of 64 percent on NOXPT. NGDP, NER and OPS are positively signed. These variables have a significant positive effect on NOXPT. The coefficient of BOP showed a negative sign which is an indication of negative effect on NOXPT. The result indicated that DEFEX and NER are statistically significant at 5 percent level. The coefficients of BOP, NGDP and OPS were statistically insignificant at 5 percent level. The general specification of the equation is influence more by NER, OPS and DEFEX.

Equation 4.12 establishes the relationship between exchange rate (NER) and other variables like OXPT, capital flight (KFLG), DEFEX, foreign private investment (PINV) and lagged NER. The goodness of fit measure (the adjusted coefficient of determination - R^{-2}) is 0.93 indicating that the independent variable explains the variations in the dependent variable to about 93 percent. The general specification of the equation showed that while some variables are negatively signed others are positive. For example, DEFEX coefficient (7.52) is positively signed to NER. This means that the military sector which depend largely on imports of military hardware and ammunition increase the demand for NER. This relationship was anticipated. The high import bills associated with defence goods is one of the reasons for high demand of foreign exchange currencies. This has translated into shortage of supply of foreign exchange currencies thereby inflating the prices of defence imported goods and other manufacturing goods. A 10 percent rise in DEFEX will increase NER by 75.2 percent. Similarly, OXPT, KFLG and lagged NER positively influence NER. But the coefficients of PINV and BOP are negatively signed and significantly have a negative influence on NER. The coefficient of DEFEX showed that an increase in defence expenditure will result in an increase of NER, but was not statistically significant at 5 per cent level. The variables of KFLG and PINV variables were negatively signed and statistically insignificant at 5 per cent level but the value of lagged NER in parenthesis is statistically significant at 5 per cent level. The result however, indicated a high performance of the coefficients which showed a positive and significant effect on macroeconomic aggregate of NER.

MPK = 28111.19 + 26.71RGDP + 1.22TFE + 35.04DEFEX + 0.69MPK(-1) + 0.98MCE 4.8
(26.11) (3.86) (4.20) (5.51) (2.69)
$R^2 = 0.75$, $R^{-2} = 0.72$. DW. =2.02.

MPC = 4187.08 + 14.47NER + 0.06FRS – 0.81DEFEX + 0.03TPC 4.9
(0.61) (11.08) (-2.68) (6.99)

$R^2 = 0.97$, $R^{-2} = 0.96$. DW = 2.31.

OXPT = 94983.40 -53.32NER + 0.46OPQ + 3.63DEFEX + 0.04VOXPT + 0.77OXPT(-1) 4.10
(-0.40) (2.53) (2.32) (1.31) (1.70)

$R^2 = 0.63$, $R^{-2} = 0.58$. DW = 2.04.

NOXPT = 28318.64 + 21.8NER + 14.64OPS + 0.64DEFEX - 0.08BOP + 0.17NGDP 4.11
(5.17) (0.13) (3.83) (0.08) (0.17)

$R^2 = 0.97$, $R^{-2} = 0.97$. DW = 2.26.

NER = 38126.98 + 0.02KFLG – 4.08BOP - 1.11PINV + 7.52DEFEX + 8.46OXPT + 1.49NER(-1) 4.12
(0.52) (-1.91) (-1.11) (0.03) (0.42) (6.35)

$R^2 = 0.94$, $R^{-2} = 093$. DW = 2.15

Table 4.6: Summary of Significance Variables in the Export - Import block.

Equation 4.8 import of capital goods (MPK)	Significant variable at 5%	Insignificant variable
Real GDP (RGDP)	significant	
Total federal expenditure (TFE)	significant	
Defence expenditure (DEFEX)	significant	
import of capital goods previous year (MPC-1)	significant	
Manufacture capital expenditure(MCE)	significan	
Total private consumption previous year (TPC-1)	significant	
Equation 4.9 import of consumer goods (MPC)		
Exchange rates (NER)		Insignificant
Foreign reserves (FRS)	significant	
Defence expenditure (DEFEX)	significant	
Total private consumption (TPC-1)	significant	
Equation 4.10 oil export (OXPT)		
Exchange rates (NER)		Insignificant
OPEC production quarter (OPQ)	significant	
Defence expenditure (DEFEX)	significant	
Value of oil export price (VOXPT)		Insignificant
Oil export of previous year (OXPT-1)		Insignificant
Equation 4.11 non oil export (NOXPT)		
Exchange rates (NER)	significant	
Openness (OPS)		Insignificant
Defence expenditure (DEFEX)	significant	
Balance of payments (BOP)		Insignificant
Non oil GDP (NGDP)		Insignificant
Equation 4.12 Exchange rates (NER)		
Capital flight (KFLG)		Insignificant
Balance of payments (BOP)	significant	
Foreign private investment (FPINV)		Insignificant
Defence expenditure (DEFEX)		Insignificant
Oil export (OXPT)		Insignificant
Exchange rates previous year(NER-1)	significant	

Source: from equations 4.8- 4.12

4.3.5 Fiscal Block

Equations 4.13 – 4.18 represents the range of estimated equations for the fiscal block. In equation 4.13, it was assumed that OXPT, domestic oil consumption (DCON), DEFEX and

lagged value of GDPog contributes to the growth of oil revenue (ROGS) in Nigeria. The estimated result showed that the adjusted coefficient of determination R^{-2} is 0.68. This indicates that the explained variation is high. The Durbin Watson (DW) statistic test value of 1.96 indicates that there is no serious problem of serial correlation. The estimated result further revealed that all the independent variables are positively signed to ROGS. A 10 percent increase/decrease in DEFEX, OXPT, DCON and GDPog(-1) will increase/decrease ROGS by 219.5 percent, 215.0 percent, 114 percent and 9 percent respectively. The significant positive sign of DEFEX on ROGS was expected in this study. This is because DEFEX was positively signed to oil and gas output in equation 4.1. and oil export in equation 4.10. The result also showed that DEFEX, DCON and GDPog(-1) are statistically significant at 5 per cent level. The result indicates that DEFEX, OXPT DCON and GDPog(-1) contribute more to the macroeconomic aggregate of ROGS.

Equation 4.14 depicts NGDP, DEFEX, RNOGS(-1) and NOXPT as the independent variables and contributors to the growth of revenue from non oil and gas (RNOGS) sector. The goodness of fit indicates that the independent variables have a joint influence of 0.73 percent over the dependent variable (RNOGS). This means that the equation meets their statistic and economic form. The estimated result revealed that all the coefficients are positively signed. This means that the coefficients are significantly positive to RNOGS. The coefficient of DEFEX (0.68) showed that a 100 percent increase in DEFEX will result in 68 percent increase in RNOGS. This result was anticipated. This is due to the fact that the significant positive impact of DEFEX on NOXPT is expected to translate into increase revenue for the non oil sector. NGDP, NOXPT and RNOGS(-1) were positively signed had significant

positive influence on RNOGS. DEFEX and NGDP were statistically significant at 5 percent level. The magnitude of the coefficients showed that NOXPT, DEFEX, RNOGS(-1) and NGDP contribute more to the growth in RNOGS. However, NOXPT, and RNOGS(-1) are statistically insignificant at 5 percent level.

Equation 4.15 discloses that recurrent defence expenditure (REXD) as dependent variable and change in GDP (ΔGDP), military civilian regime (MCR), total federal expenditure (TFE), total federal revenue (TFR) and REXD(-1)as the independent variables. The goodness of fit indicated that the independent variable explain the dependent variable to about 98 percent. The estimated result shows that all the variables apart from MCR are positively signed and had a significant positive impact on REXD. The estimated coefficients indicated that TFR and TFE contribute positively to the growth of recurrent defence expenditure in Nigeria. The size of the coefficient reveals that TFR, ΔGDP, TFE, REXD(-1) contributes 0.02, 0.04, 0.02 and 0.75 percent respectively to the growth of REXD. The coefficient of military civilian regime (MCR) which is a dummy variable is negatively signed which indicates that civilian regime provide more defence expenditure than military regime in Nigeria within the period under review. This was anticipated in this study. The result reveals that only TFR is statistically insignificant at 5 percent level.

Equation 4.16 show capital defence expenditure as the dependent variable whereas other variables like TFR, NER, INFR, threat (TRT), TFE and lagged capital defence expenditure (CEXD(-1)) are independent variables. The group statistics indicates that the adjusted coefficient of determination (R^{-2}) is 0.89 which shows that the goodness of fit of the model is

about 89 percent of the variation in the dependent variable. The Durbin Watson statistics result (2.04) reveals there is no serious problem of serial correlation. This result suggests that the specification of the model is adequate. The signs and direction of the estimated parameters indicated that TFE, TFR, TRT, NER and CEXD (-1) are positively signed and significantly relates to CEXD while INFR is negatively signed to CEXD. The magnitude of the estimated result indicated that TFE, TFR, TRT, NER and CEXD (-1) contributes 0.04, 0.17, 12.23, 66.94 and 0.23 percent respectively to the growth of CEXD. Also, the values of NER and threat (TRT) have high positive influence on CEXD. A percentage increase in these variables will result in 66.94 and 12.23 percent increase in CEXD. The coefficient of the variable of INFR is negatively signed. This implied that an increase in INFR will impact negatively on CEXD. This was not expected in this study. This finding does not support the work of Aiyedogbon (2007), whose empirical findings showed that an increase in inflation rate will increase defence expenditure in Nigeria. The coefficient of threat (TRT) is very high which suggests that it has a high potential influence on CEXD. Threat (TRT) holds a potential influence on the level of defence expenditure, in particular, capital defence expenditure in Nigeria. The series of external aggression and internal crises have continuously accounted for the increasing growth of total defence expenditure in the purchase of military hardware and ammunition from foreign nations. The result reveals that TFR, NER and TFE are statistically significant at 5 percent level.

The equation 4.17 captures the influence of DEFEX on budget deficit finance (BDF). Over the years BDF has been very consistent in government budget policy in Nigeria. The result in equation 4.17 reveals that RNOGS, ROGS, TFE, DEFEX and BDF(-1) are assumed to

influence BDF. The goodness of fit indicated that the independent variable explain the dependent variable to about 91 percent. The coefficients of the variables in equation 4.17 indicated that DEFEX, RNOG and BDF(-1) exert positive influence on BDF. The variables of TFE and ROGS reveals negative coefficients which means that these variables have significant negative influence on BDF. The positive influence of DEFEX is expected in this study. This was due to the fact that deficit financing which result from increase government borrowing can increase DEFEX. All variables in the model are significant at 5 percent level.

Equation 4.18 shows gross domestic product (GDP) as the dependent variable whereas TFE, GFCF, PINV, GDPag, GDPss, DEFEX and total savings (TSAV) as the independent variables. The estimated result of GDP is very remarkable. The R^{-2} is 0.96 which suggests that the independent variables in the model have 96 percent explanatory power of the variation in the dependent variable. This simply suggests that the model specification was adequate and also a representation of good fit. The signs of the estimated parameters showed that TFE, GFCF, GDPag, GDPss and DEFEX positively impact on GDP. Total savings (TSAV) and FPINV negatively impact on GDP. Defence expenditure (DEFEX) in this study impacted positively on GDP. This outcome of defence expenditure growth nexus does not support the works of Olaniyi (2000), Michael (1999) Odusola and (1996) Deger (1986), but agreed with Benoit, (1973) and (1978). Ando, (2009) and Harnissa, Muzafar and Baharom (2009). However, DEFEX was statistically insignificant at 5 percent level. GFCF, GDPag and GDPss are significant at 5 percent level. Generally, the outcome of equation 4.18 basically suggests that defence expenditure contributes positively to development and sustenance of economic

growth in Nigeria. The positive impact of GFCF, GDPag, GDPss and TFE are expected in this study. But, the negative influence of FPINV on GDP was not anticipated.

ROGS = 78108.11 + 21.50OXPT + 1.14DCON + 21.95DEFEX + 0.09GDPog(-1) 4.13
(1.17) (4.07) (5.04) (2.41)
$R^2 = 0.72$, $R^{-2} = 0.68$. DW = 1.96.

RNOGS =21301.11 + 0.10NGDP + 2.97NOXPT + 0.68DEFEX + 0.49RNOGS(-1) 4.14
(3.46) (1.34) (1.97) (1.77)
$R^2 = 0.77$, $R^{-2} = 0.73$. DW = 1.83.

REXD = 540743.52 + 0.04ΔGDP – 0.43MCR + 0.02TFE + 0.75REXD(-1) + 0.02TFR 4.15
(7.27) (-7.23) (4.54) (1.95) (1.36)
$R^2 = 098$, $R^{-2} = 0.98$. DW = 2.03.

CEXD = 1786.18 + 0.17TFR + 66.94NER - 17.64INFR + 12.23TRT + 0.23CEXD(-1) + 0.04TFE 4.16
(2.47) (3.21) (-1.20) (1.39) (1.34) (4.74)
$R^2 = 0.90$, $R^{-2} = 0.89$. DW = 2.04.

BDF = 939.33 – 0.42ROGS + 1.25RNOGS – 0.07TFE + 1.58DEFEX + 0.91BDF(-1) 4.17
(-3.73) (2.31) (-2.18) (1.93) (4.78)
$R^2 = 0.92$, $R^{-2} = 0.91$. DW = 2.09.

GDP = 291900.8 + 0.34TFE + 7.59GFCF - 0.04PINV + 0.63GDPag + 42.07GDPss + 19.45DEFEX
(0.70) (2.21) (-0.54) (3.55) (1.99) (0.87)
– 2.70TSAV 4.18
(0.73)
$R^2 = 0.97$, $R^{-2} = 0.96$. DW = 1.19.

Table 4.7: Summary of Significance Variables in the Fiscal block.

Equation 4.13 Oil and gas revenue (ROGS)	Significant variable at 5%	Insignificant variable
Oil export (OXPT)		Significant
Domestic consumption oil (DCON)	significant	
Defence expenditure (DEFEX)	significant	
GDP oil and gas previous year (GDPog-1)	significant	
Equation 4.14 non oil revenue (RNOGS)		
Non oil and gas GDP (NGDP)	significant	
Non oil and gas export (NOXPT)		Insignificant
Defence expenditure (DEFEX)	significant	
Non oil revenue (RNOGS-1)		Insignificant
Equation 4.15 recurrent defence expenditure (REXD)		
Change in GDP (ΔGDP)	significant	
Military civilian regime (MCR)	significant	
Total federal expenditure (TFE)	significant	
Recurrent defence expenditure previous year (REXD-1)	significant	
Total federal revenue (TFR)		Insignificant
Equation 4.16 capital defence expenditure (CEXD)		
Total federal revenue (TFR)	significant	
Exchange rates (NER)	significant	
Inflation rates (INFR)		Insignificant
Threats (TRT)		Insignificant
capital defence expenditure previous year (CEXD)		Insignificant
Total federal expenditure (TFE)	significant	
Equation 4.17 Budget deficit finance (BDF)		
Oil and gas revenue (ROGS)	significant	
Non oil and revenue (RNOGS)		Insignificant
Total federal expenditure (TFE)	significant	
Defence expenditure (DEFEX)		Insignificant
Budget deficit finance (BDF-1)		Insignificant
Equation 4.18 gross domestic product (GDP)budget deficits financing (BDF)		
Total federal expenditure (TFE)		Insignificant
Gross fixed capital formation (GFCF)	significant	
Foreign private investment (FPINV)		Insignificant
GDP agriculture (GDPag)	significant	
GDP social service (GDPss)	significant	
Defence expenditure (DFEEX)		Insignificant
Total savings (TSAV)		Insignificant

Source: from equations 4.13- 4.18

The results indicate that the model developed for this study have very good explanatory powers and reasonable parameter when estimated with Nigerian data. This implies that the model could be used for simulation analysis. The result of this exercise is reported in the next section.

4.4 Model Appraisal and Validation.

This study provides a total of 18 dynamic stochastic model and one of the most important operations performed in this study was to solve the model. The model was solved and the policy simulation was conducted for the entire sample period of 1970 to 2008. Historical simulation or *ex post*, which is the conventional approach to evaluation of the forecasting performance of a macro model, was used to determine the forecasting performance of the estimated model. If the magnitude of the difference between the forecasted and actual value is low then the model has a good forecasting power Olofin and Afengideh (2007), Robert (2007), Adam, (2001) and Ikhide, (1988). More so, for a model to be suitable for forecasting and policy simulation, then the extent to which the model is a good predictor of the historical series also depends on the bias and variance proportions values to be low. In this case, the model for this study has shown a good result as evident in Table 4.8. The simulation evaluation result indicates that the model tracks the historical data quite closely. A close look at table 4.8 suggests that the measure of model performance (TIC and the bias proportion test) indicates that all the inefficient coefficients values are close to zero. This is a good measure for the forecast of the model. The TIC decomposed proportions - BP, VP and CP indicates systematic errors that the addition of all their values was less than one. Put in other words, the systematic error is less than one percent of the total error. This basically concludes

that the values of the error coefficients are close fit between the simulated and actual series as shown in table 4.8. Thus, the predictive power of the simulation model suggests that the actual and predicted values have high level of close match.

Table 4.8.Criteria for Goodness of Fit of Simulation model.

endogenous variables	Theil's inequality coefficient (TIC)	Theil's inequality decomposition		
		Bias proportion (BP)	Variance proportion (VP)	Covariance proportion (CP)
gdpog	0.0666	0.0009	0.0083	0.9983
gdpag	0.3705	0.5447	0.3797	0.0756
gdpma	0.4213	0.0008	0.5619	0.4381
gdpss	0.0703	0.4388	0.4173	0.1439
gfcf	0.0404	0.0507	0.0035	0.9959
tpc	0.2235	0.0010	0.1808	0.8191
dc	0.1130	0.0041	0.0200	0.9799
mpk	0.5162	0.0002	0.1963	0.8037
mpc	0.0639	0.094	0.0102	0.9889
oxpt	0.1450	0.0086	0.0421	0.9432
noxpt	0.0719	0.0016	0.0021	0.9978
ner	0.8399	0.3785	0.6109	0.0106
rogs	0.9977	0.0031	0.9958	0.0011
rnogs	0.4244	0.0064	0.2250	0.7738
rexd	0.0712	0.0027	0.0023	0.9995
cexd	0.1279	0.0007	0.0053	0.9947
bdf	0.9738	0.1634	0.7015	0.1351
gdp	0.0997	0.0002	0.0077	0.9921

Source: computed from econometric views 5. 2010.

Figure 4.1. Presentation of Graphs of the Stochastic Dynamic Baseline Simulation.

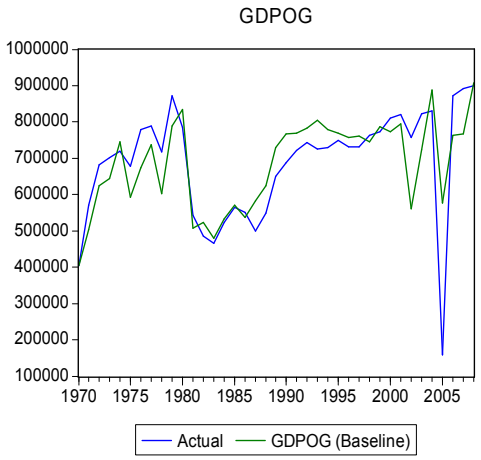


Fig 4.1 oil output

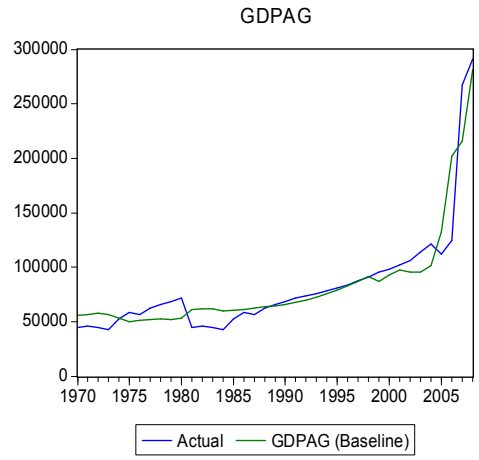


Fig 4.2 output of agriculture

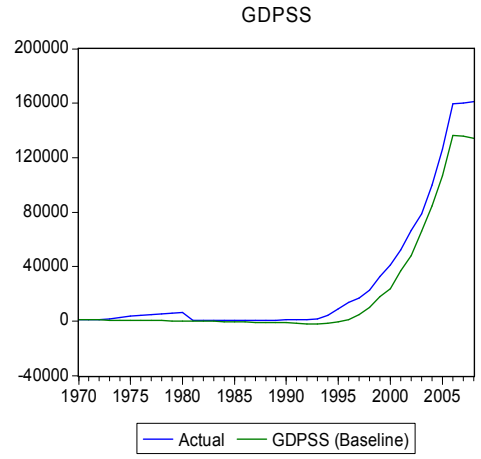


Fig. 4.3 output of social service

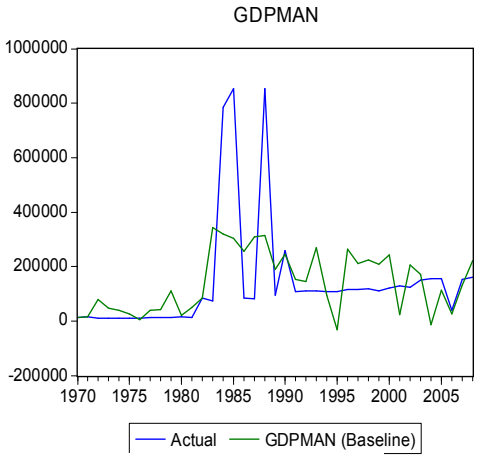


Fig. 4.4 output of manufacture

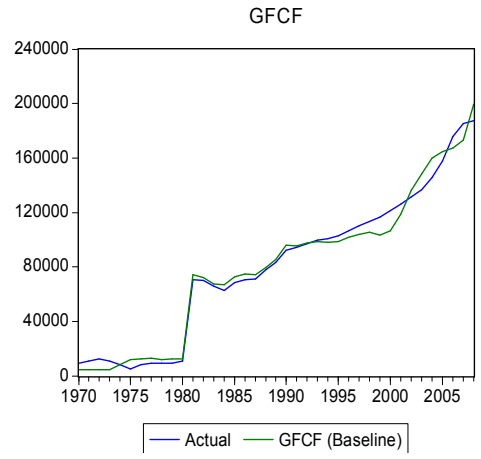


Fig. 4.5 gross fixed capital formation

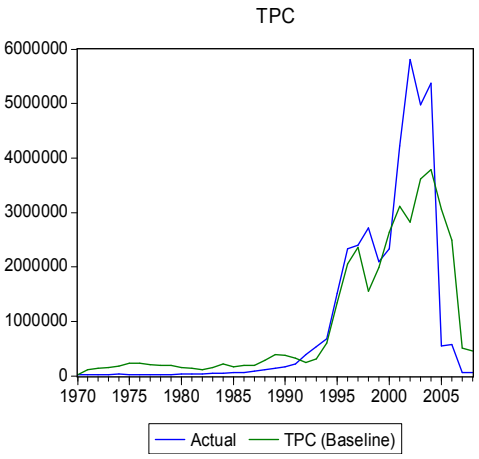


Fig. 4.5 gross fixed capital formation

Figure 4.1. Presentation of Graphs of the Stochastic Dynamic Baseline Simulation continued.

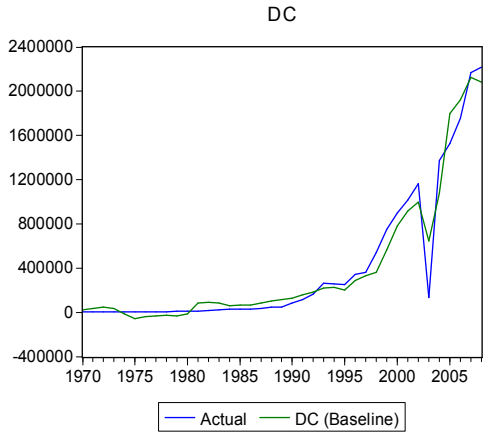


Fig. 4.7 domestic credits

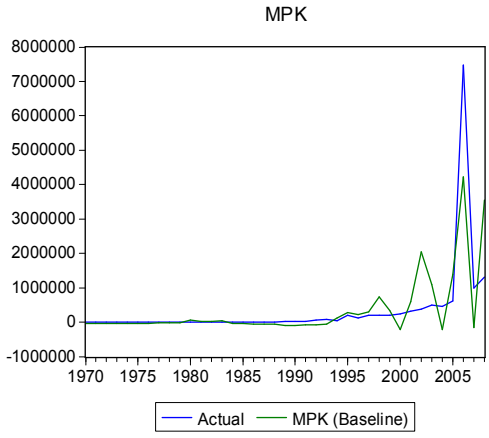


Fig. 4.8 import of capital goods

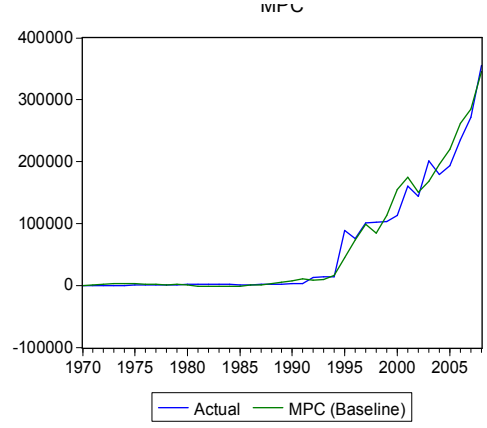


Fig. 4.9 import capital goods

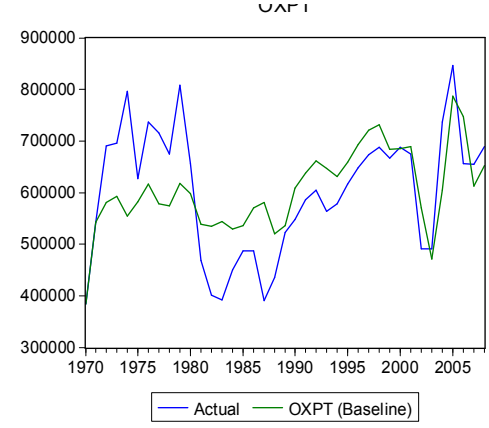


Fig. 4.10 oil export

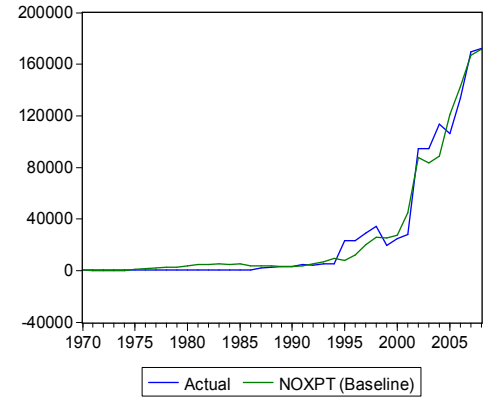


Fig. 4.11 non oil export

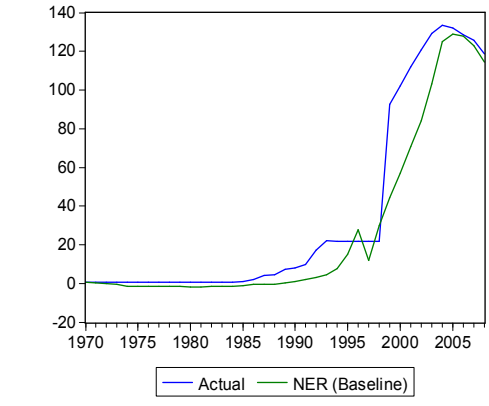


Fig. 4.12 foreign exchange

Figure 4.1. Presentation of Graphs of the Stochastic Dynamic Baseline Simulation continued.

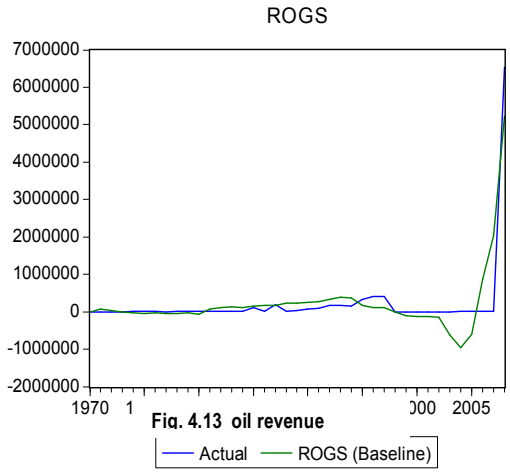


Fig. 4.13 oil revenue

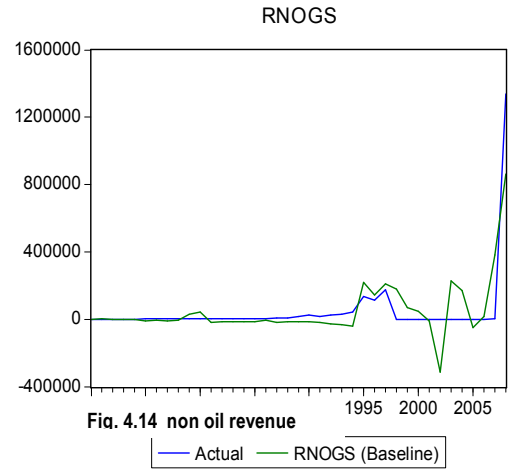


Fig. 4.14 non oil revenue

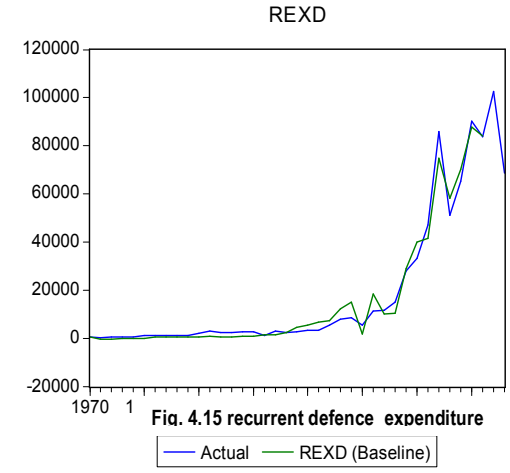


Fig. 4.15 recurrent defence expenditure

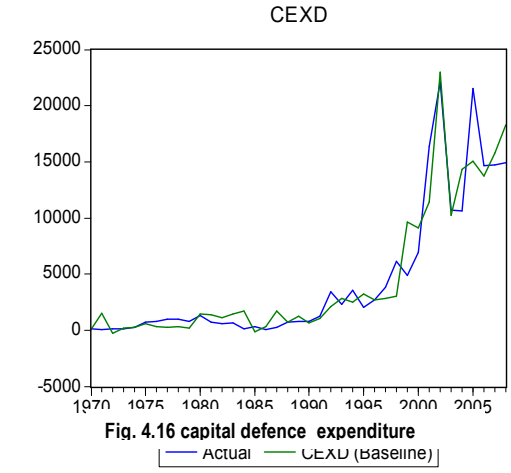


Fig. 4.16 capital defence expenditure

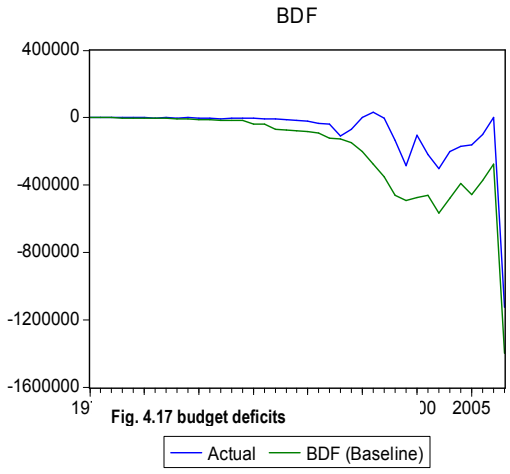


Fig. 4.17 budget deficits

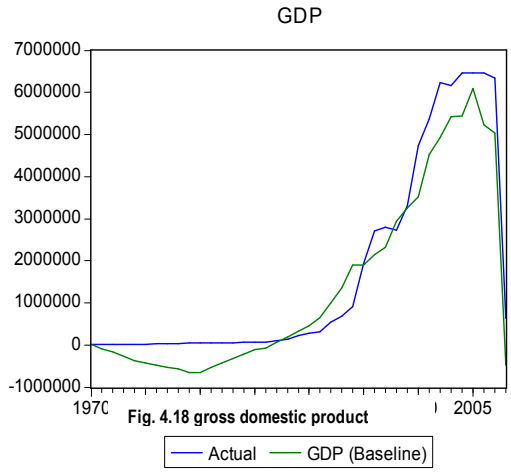


Fig. 4.18 gross domestic product

In figure 4.1 – 4.18, the horizontal axis contains the time period and the vertical axis indicates the number of deviation of that variable from baseline or its original value. The dynamic baseline simulation shows the equilibrium path of the various blocks of equations (4.1 – 4.18) to be consistent with those policies and structure of the model which shows it tracking powers. In other words, the baseline solution explains the equilibrium path of output employment, income expenditure, monetary, external and fiscal sectors to be consistent with those economic and defence policies and structure of the model. This is an indication of its tracking powers. Figure 4.1 – 4.18 represents the baseline simulated values for the endogenous variables of the models. Put differently, the graphs show the stochastic dynamic actual and baseline simulation. The series of graphs reveal that as a one-step ahead predictor, the model performed quite well.

The ability of the model to predict agricultural output (GDPag), output of oil and gas (GDPog), social service output (GDPss), and gross fixed capital formation (GFCF) in figure 4.1, 4.2, 4.4, , and 4.5 respectively tracked consistently throughout the sample period. This was clearly demonstrated by the closeness of dynamic actual to the baseline simulation. Similarly, total private consumption (TPC) in figure 4.6, non oil export (NOXPT) in figure 4.11, revenue from oil and gas (ROGS) in figure 4.13, revenue from non oil and gas (RNOGS) in figure 4.14, import of consumer goods (MPC) in 4.9 and oil export (OXPT) in figure 4.10 revealed a good tracking power. Both recurrent defence expenditure (REXD) and capital defence expenditure (CEXD) in figure 4.15 and 4.16 track their historical path well. However, the ability of output of manufacturing (GDPman) and import of capital goods (MPK) to track their historical data closely was not adequate as it diminishes and appreciates

at various points. However, this result does not reduce the good predictive power of the model and as such is particularly a very convincing forecast for the endogenous variables.

The baseline simulation for the gross domestic product in figure 4.18 demonstrated a good tracking power of the actual from the baseline simulation. The nature of the oscillation suggests a good tracking power of the model. On the whole, the graphs have shown that the models have good tracking powers, that is, the actual values are close to their baseline simulation which is an indication of the ability of the model to forecast and replicate most of the critical turning points of the historical data.

4.5 Results and Analysis of the Simulation Experiments of the Impact of 10% and 15%Increase in Defence Expenditure.

In order to examine the impact of defence expenditure on macroeconomic variables and growth of the economy, this study conducted a simulation experiment of 10%, 15%, 20% and 25% increase in defence expenditure. Put differently, the scenario experiment here is that what would have been the performance of the economy, should there be a 10%, 15%, 20% and 25% increase in the aggregate defence spending. In this regard aggregate defence spending variable is the exogenous variable that introduces shocks on the macroeconomic endogenous variables. An increase in aggregate defence spending in Nigeria can results from increase in revenue from oil and gas and from non oil and gas sector as well as foreign inflow of financial resources. The need for increased defence expenditure may result from incessant domestic crisis like religious and tribal conflicts, electoral processes, coup d'état, protection of the sovereign state from external aggression and maintenance of law and order as well as

other forms of threats. Basically, aggregate defence expenditure is on the increase and the scenario experiment in this study is for high scenarios. The scenario experiment that was conducted in this study is on *ex post* simulation of the effect of a 10%, 15%, 20% and 25% increase in defence expenditure in Nigeria.

The simulation result for the 10%, 15% increase in the exogenous aggregate defence expenditure show a remarkable influence on the endogenous macroeconomic variables. From the result in table 4.9, the respective values of the dynamic baseline simulation and scenario solution are presented. The general performance of the result shows that while some values are positive, others were negative. The scenario estimates reveals some negative and positive values for 10% and 15% scenarios. The values of oil and gas (GDPog) for 10% and 15% increase in aggregate defence show that the impact of the exogenous defence expenditure is significantly positive on GDPog. Increase in defence spending by 10% will increase the performance of output of oil and gas sector (GDPog) by 36%, while a 15% increase in defence spending will lead to an increase of 23% in the production of GDPog. Other endogenous variables that revealed significant positive signs of the 10% and 15% increased includes output of agriculture sector (GDPag), output of social service sector (GDPss) and gross fixed capital formation (GFCF). These macroeconomic endogenous variables reveal that a 10% increase in defence expenditure will lead to an increase of 1.2%, 7.9%, 1.5% and 2.9% in GDPag, DC, GDPss and GFCF respectively. Whereas a 15% increase in total defence expenditure will lead an increase of 1.9%, 1.3%, 0.91% and 0.02% in GDPag, GDPss, TPC and GFCF respectively. The result indicates that increase in aggregate defence expenditure by 10% impact positively on oil export (OXPT), non oil and gas export (NOXPT), revenue from

oil and gas sector (ROGS), revenue from non oil and gas sector (RNOGS), and gross domestic product (GDP). The result suggests that the 10% increase in total defence expenditure has a positive impact of 3.2%, 7.9%, 0.25%, 26.7%, and 11.5% on OXPT, NOXPT, ROGS, RNOGS and GDP respectively. The scenario experiment for 15% increase in defence expenditure reveals a similar position as the variables of OXPT, NOXPT, ROGS, RNOGS, BDF and GDP were significantly positive. However, 10% and 15% increase in aggregate defence expenditure had a significant negative impact on total private consumption (TPC), domestic credit (DC) import of consumer goods (MPC), foreign exchange rates and budget deficits respectively. Thus, a 10% increase in total defence expenditure will reduce GDPman, TPC, MPC and NER by -12.5%, -0.08%, -11.0% and -12.6% respectively. The 15% increase in defence spending will have a significant negative impact on the endogenous variables of DC, MPK, MPC and NOXPT -0.002 1.03%, -0.002% and -0.003 % respectively.

Table 4.2. Impact of a 10%, 15%, 20% and 25% Rise in Defence Expenditure in Nigeria.

Endogenous variables	Baseline solution	10% and 15% increase in defence expenditure		20% and 25% increase in defence expenditure	
		scenario one 10%	scenario two 15%	scenario three 20%	scenario four 25%
gdpog	0.019	0.36	0.23	1.25	0.12
gdpag	2.03	0.12	0.19	0.19	0.76
gdpman	-1.02	-1.25	-1.18	0.054	-0.11
gdpss	0.0.07	0.15	0.13	-0.03	0.19
gfcf	0.004	0.029	0.002	0.36	0.11
tpc	0.024	-0.008	0.091	1.10	1.06
dc	0.67	0.79	-0.002	0.003	0.16
mpk	-0.027	-0.006	-0.002	-0.006	-0.004
mpc	-0.002	-1.10	-1.03	-1.04	0.09
oxpt	0.06	0.032	0.014	0.032	0.13
noxpt	1.99	0.079	-0.003	0.44	0.068
ner	-1.11	-1.26	1.21	0.14	-0.01
rogs	0.066	0.025	0.018	0.025	0.021
rnogs	0.32	2.67	2.07	2.067	2.06
rexd	0.22	0.081	0.65	-0.001	0.067
cexd	-0.011	-0.022	0.09	0.022	-0.31
bdf	-0.68	0.003	0.05	-0.004	-0.002
gdp	0.089	1.15	1.02	1.09	1.03

Source : computed from econometric views 4 software package, 2011 .

4.5.1 Impact 20% and 25% Increase in Defence Expenditure.

Table 4.9 depicts the result of the simulation exercise for 20% and 25% increase in the exogenous aggregate defence spending in Nigeria. The baseline simulation was compared with the scenario simulation. The result reveals that a 20% increase in aggregate defence expenditure will positively impact on the endogenous variables of GDPog (1.25%), GDPag (0.19%), GDPman (0.054), DC (1.10%), NER (0.14) and GFCF (0.36). Other endogenous variables that showed positive impact of the 20% increase in aggregate defence expenditure include OXPT (0.032%), NOXPT (0.44%), ROGS (0.025%), RNOGS (2.067%) and GDP

(1.09%). The result of the 20% increase in defence expenditure showed some negative effect on the endogenous variables of GDPss (-0.03%)MPK (-0.006%), MPC (-1.04%) and REXD (-0.001). The 25% increase in defence expenditure reveals that GDPog, GDPag, GDPss, GFCF, DC, TPC, OXPT, NOXPT, ROGS, RNOGS REXD and GDP are significantly positive whereas, GDPman, MPK, NER, CEXD and BDF indicates significant negative effect of the 25% increase in exogenous aggregate defence expenditure This result suggests that a 20% and 25% increase in defence expenditure will have an adverse negative effect on these endogenous variables. The recurrent expenditure in this study consistently increases at the various scenarios. This result supports the Keynesian argument that in periods of less than full employment, increase in public expenditure will increase aggregate demand. The result of the various scenarios increase in the exogenous defence expenditure reveals that DEFEX crowd in public investment (GFCF) in both scenarios and consistently impact positively on the endogenous variable of GDP.

4.6. Policy Simulation.

Generally, the results of the scenarios have shown the impact of a 10%, 15%, 20% and 25% rise in the exogenous defence spending. The result of the simulation in table 4.9 showed the percentage deviation of the simulation solution from the baseline. It was observed that the 10 and 15 percent increase is significantly positive on the performance of oil and gas output by 36% and 23% respectively. This translates into positive effect of 0.32% and 1.4% increase in the oil and gas export. This has increase the oil and gas revenue by 2.5.6% and 1.8%, thereby impacting positively on the gross domestic product by 115% and 102% for 10 percent and 15 percent scenarios respectively. The 10% and 25% scenarios result also suggests that the gross

domestic products of agriculture and social services increase significantly which in turn positively affect gross fixed capital formation by 2.9% and 7.6% total private consumption by -0.8% and 1.06%. This has increased non oil export by 7.9% and 6.8% and non oil revenue increases by 2.67% and 2.06% respectively. This in turn increase gross domestic product by 115% and 103% exogenous increase in defence expenditure reveals some negative signs on some endogenous variables. This means that the import of capital goods and import of consumer goods have a negative effect on the manufacturing sector by 110% and 103% which in turn create shortage of the foreign exchange by 126% and 121% respectively.

The 20% and 25% increase the exogenous defence expenditure reveals that oil and gas output increase by 25 percent and 12 percent respectively. This in turn increases oil export by 3.2 percent and 13 percent which has increase oil and gas revenue by 6.6 percent and 2.1 percent respectively. This has in turn increased the gross domestic product by 109 percent and 103 percent respectively. The 20% and 25% increase in the exogenous defence spending increase gross domestic product of agriculture and social service. This in turn increases gross fixed capital formation by 36 percent and 61 percent, total private consumption by 110 percent and 106 percent respectively. This will in turn increase non oil and gas revenue by 203 percent and 200 percent respectively which in turn increase gross domestic product by 109 percent and 103 percent respectively. On the whole the exogenous increase in defence expenditure at all levels crowd in public investment and increase economic growth which is an indication of a positive relationship between defence expenditure and economic growth in Nigeria. This result supports Asfin and Murat, (2010), Ando, (2009), Beenstock, Gaiya (2011), (1998) and Benoit, (1973 and 1978),

CHAPTER FIVE.

SUMMARY, CONCLUSION AND RCOMMENDATIONS.

5.1 SUMMARY

The growth performance of the Nigerian economy has remained unsatisfactory for over four decades. There have been sharp fluctuations in rates of investment, employment and output. Fiscal policies have facilitated the vicious cycle of sluggish growth, declining investment and savings. The situation in Nigeria has been very disturbing given the country's abundant human and natural resources. According to Ekpo (2005), there are few countries in the world that are blessed as Nigeria. Yet Nigeria not escaped from under – development and mass poverty because of the way the economy has been manage. Nigeria has continued to experience oil booms and economic recessions and depression. The boom in the oil and financial sectors has not been used for the transformation of the economy as they have not been properly linked to the real sector. The proponents of long term fiscal adjustment have argued that the ways in which public expenditure are allocated could have significant effects on economic growth. They argued that only outlays that directly relates to growth should be protected from across - the board spending cuts as a measure for fiscal deficits reductions. The questioned to be answered is that does defence expenditure retard or enhance economic growth.

This study was an attempt to provide an empirical analysis of the impact of defence expenditure on macroeconomic variables and economic growth in Nigeria between 1970 and 2008. The study simulates the estimated model for defence expenditure, key macroeconomic variables and economic growth. The review of various literatures on studies of defence

expenditure and economic growth show the need to embark on this research. In particular, most of the studies review in the literature suggests that need to apply a macroeconomic wide model and simulation analysis to studies of defence economics especially on defence expenditure in Nigeria. Although, Gaiya (2011), Aiyedogbon (2007), Olaniyi, (2000) and Odusola, (1996) made some painstaking efforts in developing macroeconomic models, but were limited in technique of analyses and interpretation. The review of literature indicates that defence expenditure in Nigeria is an area of study that requires immediate attention in research. The study use the two stage least square system technique to estimate 18 equations, thereafter, the simulation exercise was performed. A descriptive statistics was also performed using table 4.1 and 4.2.

The research findings are as follows:

(1).The first objective of this study was to determine the pattern and structure of defence expenditure in Nigeria. The analysis shows that the structure of defence expenditure in Nigeria is largely a composition of the recurrent expenditure. The consistent increase in defence spending in Nigeria justify the Wargner's law of increase public expenditure.

(2).Other objectives of this study as shown in chapter one are captured in the macroeconometric model and the simulation exercise as well. For example, the results of the two stage least square technique showed that defence expenditure exerted significant positive influence on economic growth in Nigeria. This result does not support the empirical works of Adebiyi (2004), Olaniyi (2000) and Odusola (1996) which shows that defence expenditure was a burden on the economy but agreed with the position of Gaiya (2011) which indicated a positive impact of defence expenditure on economic growth in Nigeria. Also, the study lend

supports to Asfin and Murat, 2010, Ando, 2009, Beenstock, 1998 and Benoit, (1973 and 1978) whose results reveals positive effects of defence expenditure on economic growth in other countries. The two stage least square estimates also indicates that the impact of defence expenditure on some key sectors of the economy (such as gas, agriculture, the social service sectors) and some macroeconomic variables (oil, gross fixed capital formation, oil export, non oil export, oil and gas revenue, non oil and gas revenue, domestic credit and total private consumption) were significant and positively related to defence expenditure. But, the output of manufacture, import of capital goods, foreign exchange rates and budget deficits are significantly negative. The results were mixed.

(3).The macroeconometric model was solved and the serves as a guidepost to simulation exercise. The outcome indicates that some level of relationship with the two stage least square estimated result particularly for the baseline simulation. The positive impact of defence expenditure as witnessed in the two stage least square result was consistent for economic growth rate and some macroeconomic variables in the simulation exercise.

(4). A counterfactual policy simulation for four scenarios arising from a 10%, 15%, 20% and 25% increase in defence expenditure for the entire period of study was conducted. The impact of exogenous defence expenditure on the stochastic endogenous variables showed some positive and negative values for the scenarios simulation solutions. In essence, a 10%, 15%, 20% and 25% increase in defence expenditure produce similar impact on macroeconomic endogenous variables. From the series of simulation analysis obtain from this study, it is obvious that increase in defence expenditure is necessary and required for economic growth.

This study supports Ando (2009), but disagreed with the position of Odusola (1996) on the shift of resources away from defence sector.

5.2 CONCLUSIONS

The impacts of defence expenditure on economic growth have been long debated in the literature. One major contribution that can be drawn from this study is that defence expenditure has the potential of contributing significantly to economic growth and development. However, for defence expenditure to contribute meaningfully to growth and development it has to be managed prudently. This is because Nigeria's experience in public expenditure management has been quite unimpressive. There has been limited transparency and accountability in the case of public resources (at least to the general public). Also the share of recurrent expenditure has been consistently high in total expenditure; however, defence expenditure as a share of gross domestic product remained low. In the various empirical literature reviewed in this study, the agitation or the call for a reduction in defence expenditure was solicited by most of the authors. A distinction is made between productive and unproductive expenditures. This study found that defence expenditures are essential for economic growth. They are therefore productive. The results of the macroeconomic model and the simulation exercise in this study do not support the proposition that defence expenditure retards economic growth. As a policy conclusion, growth maximizing outcome is to avoid cut of defence expenditure. This study agreed with the Keynesian view that government spending on anything can increase aggregate demand and economic growth. However, a large number of white elephants projects and status building projects which testify to the political rather than economic gains should be reduced. Generally, the result

showed that a 10%, 15%, 20% and 25% increase in defence expenditure will have an increasing effect on oil and gas output, non oil export, non oil export, oil revenue, non oil revenue and economic growth. This outcome is a pointer to the relevance of Wagner's theory of increase public expenditure.

5.3 RECOMMENDATIONS

On the basis of the findings and the need to make government spending more functional and efficient, the following policy recommendations are made:

i). Since defence expenditure and economic growth are positively related, this study recommends adequate funding of defence sector in Nigeria.. This is to support Williams and Hemming's views that even apparently less productive expenditure like security may provide social and political stability that is necessary for growth and reducing such expenditure could be counter - productive.

ii). As a result of the positive impact of defence expenditure on economic growth, increase in defence expenditure will increase economic growth. The findings of this study suggest that in order to reach high economic growth, the need to increase research and development activities cannot be overemphasized, particularly in defence, social service, agriculture and manufacture sectors. The collaboration between defence sector and these sectors is highly recommended.

iii). This study recommends that improvement in all areas of capital or investment defence expenditure like technology, construction, computer and electronics should be given a more aggressive attention. This will spill over to the private sector and this process would have a long run positive effect on economic growth of Nigeria

d). To avoid wasteful expenditure, it is necessary to link expenditure with ends or purpose. Given the dwindling public resources, the mistakes of the past should be avoided.

iv). Since it is obvious from the result of this study that defence expenditure crowds in public investment, this study recommends greater local initiative that will reduce import of manufactured defence goods. This will reduce high import bills, balance of payments, budget deficits and creation of more jobs

v) Although, this study has found that aggregate defence spending positively relates to economic growth. There the need to decompose defence spending into recurrent and capital expenditures to examine whether the former is more growth retarding than the other.

BIBLIOGRAPHY

Abdulsalam, S. A. (2008). "An analysis of macroeconomic and policy effect of IV/AIDS in Nigeria". A Ph.D. dissertation, department of economics, Ahmadu Bello university, Zaria.

Abu -Barde. S. and Abu – Qarn. A. (2003), "Government Expenditures, Military Spending and Economic Growth: A Causality Evidence from Egypt, Israel and Syria". *MPRA Paper* http://ideas.repect.org/p/pra.mprapa/115.html

Abubakar, H. I. (2001). "The growth of federal government expenditure in Nigeria,1962 – 1995: A structural and institutional analysis". A Ph.D. dissertation, department of economics, Ahmadu Bello University Zaria.

Adam, J.A. (2001). "Debt overhang and debt relief: The case of Nigeria". *The Nigeria Journal of Economic and Social Studies. Vol. 43, No.3*.

Adam S. (1776). An Inquiry into the nature and causes of the wealth of nations. http://en.wikipedia.org/wiki/Adam_Smith#The_Wealth_of_Nations

Adebiyi M. A., and Oderinde, O. (2005). Public education expenditure and defence spending in Nigeria: An empirical investigation. http://www.saga.cornell.edu/saga/educconf/adebiyi.pdf.

Adegbite, O.E., Ayadi, S.F. and Ayadi, F. (2006). The pact of Nigeria's external debt on economic development. International Journal of Emerging Markets. http://www.emeraldinsight.com/journals.htm?articleid=1733107&show=html

Afşin Ş and Murat Ç. (2010). "New Evidence for Turkey on the Relationship between Defense Spending and Aggregate Output'. *European Journal of Social Sciences – Volume 13, Number 3 (2010)*

Aghion, P. and Howitt, P. (1992). "A model of growth through creative destruction", *Econometrica*, *60(2): 323-351. artsci.wustl.edu/~econ502/Aghion_How.*

Aiyedogbon, J. O (2007). "An Analysis of the Structure and Determinant Defence Expenditure in Nigeria 1986-2004". M.Sc Thesis, Economic department, Ahmadu Bello University, Zaria.

Aizenman, J. and Glick, R. (2003). "Military Expenditure, Threats and Growth". *NBER Working Paper* , 9618, Massachusetts.

Aizenman, J. and Glick, R. (2006). "Military Expenditure, Threats and Growth". *The Journal of International Trade & Economic Development*: An International and Comparative Review, 15 (2), 129 – 155.

Akpan N.I. (2005). "Government Expenditure and Economic Growth in Nigeria: A

Disaggregated Approach". *Central Bank of Nigeria Economic and Financial Review.* Vol.43, No.1

Alesina, A., Spolaore, E. and Wacziarg, R. (2008). "*Trade, Growth and Size of Countries*". in (ed), P. Agnion, S.N.Durlauf, Handbook of Economic Growth, North Holland, Amstrerdam (2008)

Alex M. and Randolph (2007). "Defence expenditures, economic growth, and the peace dividend: A Longitudinal analysis of 103 countries" http://jcr.sagepub.com/content/39/2/283.abstract

Alexander W.R.J. (1995), "Defence spending: Burden or growth- promoting", *Defence Economics* 6(1) 13-25.

Al-Yousif, Y.K (2002). "Defense spending and economic growth: some empirical evidence from the Arab Gulf region". *Defence and peace. Taylor and Francis Journal* Vol. 13(3): 187-197. http://ideas.reasepec.org/altaf/defpea/v/3y2002i3p187-197.html.

Ando, S. (2009). "The impact of defence expenditure on economic growth: panel data analysis based on the Feder model". *The International Journal of Economic Policy Studies.*Vol. 4. No. 8

Antonakis, N. (1996). "Military expenditure and economic growth in Less developed countries: A simulation equation approach with an application to Greece, 1958-1990". *Economia Internazationle* Vol. 49, No. 3. 329-346.

Antonakis, N (1997), "Defence spending and growth in Greece: A comment and further empirical evidence". *Applied economics letters* Vol. 4. 651-655

Apostolakis, B. E. (1992). 'Warfare-welfare expenditure substitution in Latin America. 1953-87". *Journal of Peace Research* 29(1): 85 – 98.

Arora, V.B. and T.A. Bayoumi, (1994). "Reduction in World Military Expenditure: Who

Stands to Gain"? *Finance and Development,* 31(1): March

Aruna K.D (2005). "An econometric estimation of the aggregate import demand function in India", http://papersessrn.com/so13/papers.cfm?abstract_1d=1090805

Athanassiou, E,. Kollias, C. and S. Zografiskis. (2002). "The Effects of defence spending reductions: A CGE estimation of the foregone peace dividend in the case of Greece". *Defence and Peace Ecopnomics Taylor and Francis Journal* Vol 13(2) pages109-119. http://ideas.repec.org/a/taf/defpea/v/3y2002:20109-119.html

Ayoob, M., (1997)."Defining Security: A Subaltern Realist Perspective.". In *Critical Security Studies*, edited by Keith Krause, and Michael C. William. Mineapolis: Pp. 121-46University of Minnesota Press,.

Babin, N. (1989). "Military spending, economic growth and time factor". *Armed Forces and the Society*. Vol. 15 No. 2. 249-262

Ball, N. (1992). "Adjusting to reductions in military expenditure and defence procurement". *World Bank discussion paper 185*. A symposium on research issues edited by Geoffrey Lamb and Valeriana Kallab.

Bator, F.M., (1988). In: Tyler, Cowen (Ed.). The Theory of Market Failure. George Mason University Press, Fairfax, Virginia (reprint from The Anatomy of Market Failure. Quarterly Journal of Economics 72, 351±
379 (1958)).

Barro, R.J. (1990). "Government Spending in a simple model of Endogenous Growth". *The Journal of Political Economy* 98(5), 103-124.

Barro, R.J. (1991). "Economic growth in a cross section of countries". *Quarterly Journal of Economics* 106(2): 407-443

Barro, R.J. and Xavier Sala-i-Martin, (1995). "Economic Growth", McGraw-Hill,

Boston, Mass". www.bris.ac.uk/Depts/Economics/Growth

Baumol, W. J. (1979). "Quasi Optimality: The Price We Must Pay for a Price System."

Journal of Political Economy 87(June) 578-99.

Batchelor, P., Dunne, P. and Saal, D. (2000). "Military Spending and Economic Growth in South Africa'. *Defence and Peace Economics*, 11 (6), 553–571.

Beenstock (1998). "Patterns in military spending".Economic *development and cultural change.* 41. 633 – 649. www.http:/pascal.iseg.utl.ptl~candin/portugalbrasil/files/jrsa3.pdf

Bello, D. (1995). "Public expenditure and economic growth in Nigeria (1960-1985)". A Ph.D. dissertation, department of economics, Ahmadu Bello University Zaria.

Benatar, S. (2001). South Africa‟s Transition in a Globalizing World: HIV/AIDS as a window and a Mirror. *International Affairs 77* (2) 347-375

Benoit Emile (1973). "*Defecse and Economic Growth in Developing Countries*, Lexington, MA: Lexington Books, D.C. Health and Company, 1973.

Benoit, E. (1978). Growth and defence in developing countries. *Economic development and cultural change 26(2)*:271-280.
Bhatia, H.L. (2008). *Public finance.* Vikas publishing House PVT. Ltd, New Delhi 21st Revised edition, 2008.

Bloomberg, S. B., Gregory H. D. and T, Sidharth. (2000). "Is there evidence of a poverty-conflict trap"?. *Wellesley college working paper* No. 2000-06.

Brempong, K. G. (2002). "Researching military expenditures in Africa: Findings and lessons for researchers'. Paper presented at the workshop on military budgeting process in African countries, Accra, Ghana, 2006.

Brempong, K. G (1989). "Defence spending and economic growth in Sub-Saharan Africa: An econometric investigation'. *Journal of peace research.* Vol.6. no. 1. 79-90.

Buzan, B, O W, and de Wilde, J (1998). *Security: A New Framework for Analysis*. Boulder, CO: Lynne Rienner, 1998.

Caputo, D. A. (1975). "New perspectives on the public policy implications of defence aid welfare expenditure in four modern democracies 1950 – 1970'. *Policy sciences 6(4)*: 423-446.

Carbonnier, G., (2004). "Privatisations, Sous-traitance et Partenariats Public-privé: Charirt.com ou Business.org." *International Review of the Red Cross*, Vol. 86, No. 856, pp. 725-743

Central Bank of Nigeria (2007) Statistical *Bulletin* Vol. 18

Central Bank of Nigeria (2009) Statistical *Bulletin* Vol. 20

Chan, S (1987). Military expenditure economic performance. In World military expenditure and arms transfer 1986. Washington D.C: US Arms Control Disarmament Agency (ACDA).

Chowdhury, A. R. (1991). "A causal analysis of defence spending and economic growth". *Journal of Conflict resolution*, 35 No. 1 (March): 80-97.

Chung – Ron Pi and Sandler T. (1997). "The impact of defense and non-defense public spending on growth in Asia and Latin America". *Defence and peace economics,* vol. *8, issue 2.* 205 – 224. http://www.informaworld.com/smpp/content~db=all~content=a783128482

Collier, P. and Hoeffler, A (2007). "Military spending and the risks of coups d'etat". http://users.ox.ac.uk/~econpco/research/pdfs/MilitarySpendingandRisksCoups.pdf

Collier, P. and Hoeffler, A.(2002). "On the incidence of civil war in Africa." *Journal of Conflict Resolution 46(February)* Vol. 46 (1).:13–28.

Corone G. (1996). "Modeling the U.S. import demand through cointegration and error correction model". *Journal of policy model 18*: 1-48.

Cowen, T. (1988). *The Theory of Market Failure: A Critical Examination.* Fairfax, Virginia: George Mason University Press and The Cato Institute.

Crespo, J. G. and Gerhard R. (2003), "Guns and Butter revisited: robustness and nonlinearity issues in the defence-growth nexus". Department of Economics University of Vienna *Working Paper* No: 0310.

Dabelko, D. and McCornick, J. M. (1977). "Opportunity cost of defense: Some cross national evidence". *Journal of peace research* 14(2):145-54.

Dakurah, A.H., Davies, S.P, and Sampath R.K. (2001). "Defense spending and economic growth in developing countries": A causality analysis. *Journal of Political Model, 23(6):* 651-658.

David, R. (1817), *Principle of Political Economy and Taxation*. http://enwikipedia.org/wiki/david_Ricardo

Davis D. R. and Chan, S. (1990). "The security-welfare relationship: Longitudinal evidence from Taiwan". *Journal of Peace Research* 27(1):87-100.

Davoodi, H., B., Clements, J. S. Schiffs and Debaere, P. (2001). "Military spending, the peacedividend, and fiscal adjustment," *IMF Staff Papers* 48: 290-316.

Dean B. (2007). "The economic impact of the Iraq war and higher military spending". http://www.cepr.net/documents/publications/military_spending_2007_05.pdf

Deger, S. (1992) "Military expenditure and economic development: Issues and debates.military expenditure and economic development". A symposium on Research issues Edited by Geoffrey L and Valeriana K. *World Bank discussion paper. No. 185.*

Deger, S (1988). The United Nation international conference on relationship between disarmament and development in Stockholm International Peace Research Institute Year Book (SIPRI), 1988.

Deger, S (1986). "Economic development and defence expenditure". *Economic development and cultural change.* 35(1):179-195.

Deger, S. and Sen, S. (1990). *Military Security and the Economy: Defence Expenditure in India and Pakistan*. In K. H. Sandler, The Economics of Defence Spending. London and New York: Routledge.

Deger, S., and Sen. S. (2005) **"**Chapter 11 military expenditure and developing countries". *The Pakistan Development Review* 36(411), 791-808. http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B7RKP-4FMDGC4-&_

Deger, S. (1991). "Government expenditures, defense, and economic growth in less developed countrie: A Revised perspective". *conflict management and peace science.* Vol.11 no.2. 19-35. http://cmp.sagepub.com/content/11/2/19.extract

DeGrasse, R. W. J. (1984). *Military and Semi Conductors: The Militarization of High Technology*. Cambridge MA, Ballinger.

Devaranja S., Swaroop, V and Zou, H. (1996). "The Composition of public expenditure and economic Growth". *Journal of Monetary Economics* 37(2): 313-344.

Diamond, J., (1990). "Government Expenditure and growth", *Finance and Development* 27(3), December.

Dimitrios, A. (2003). *Applied econometrics: A modern approach using E-views and Microfit.* Palgrave Macmillan, London.

Dinneen, G.P. and Frick, C. C. (1977). "Electronics and national defence: A case study". *Journal of science* Vol. 195 No. 4283 Washington, D.C.: American association for the advancement of science.

Domke, W., Richard, K., Eichenberg, C. and Melliher, C. K (1983). "The Illusion of choice: defence and welfare in advanced industrial democracies. 1948 – 1974". *American Political Science Review* 77(1): 19-35.

Douglason G Omotor. (2004), An Analysis of federal government expenditure in the education sector of Nigeria: implication for national development.http//www.krepublisher.com/02journal/jss-09-0-0002004-jss/jss-0-2-1-105-110-2004omotorD.G.pdf.

Dotan, P. (2007)."The Economic Effects of Terrorism: Counterfactual Analysis of the Case of Israel". http://www.aeaweb.org/annual_mtg_papers/2007/0106_1015_1802.pdf

Dunne, P., Smith, R. and Willenbockel, D. (2004). "Models of military expenditure and growth: A Critical Review". http://ideas.repec.org/p/uwel/wpaper/0408.html

Dunne, P., Nikolaidou, E. & Smith, R. (2005) "Is There an Arms Race Between Greece and Turkey? An Econometric Analysis". *Peace Economics, Peace Science and Public Policy*, 11(2), Article 1,http:www.bepress.com/peps/vol1/iss2/1

Dunne, P., Nikoladou, E. and Smith, R. (2002). Military spending, investment and economic growth in small industrialising economies. *South African journal of economics Vol. 70(5)* June.

Dunne, P., Smith, R. and Willenbockel, D. (2004). "Theoretically and econometric issues in analysis the military expenditure growth nexus". http://carecon.org.uk/Armsproduction/papers/Dirkpaul/Ronpap3.pdf.

Dunne, P., Nikolaidou, E. & D. Vougas (2001). "Defence Spending and Economic Growth: A Causal Analysis for Greece and Turkey, 1960-1996". *Defence and Peace Economics*, 12(1), pp.5-26

Dunne, J.P., Nikolaidou, E. and Roux, A. (2000). "Defence Spending and Economic Growth in South Africa: A Supply and Demand Model". *Defence and Peace Economics,* 11 (4), 573 — 585.

Dunne, P., Nikolaidou, E. and Vougas, D. (1998). 'Military spending and economic growth in Greece and Turkey: A causal analysis, 1960-1996', *Economics Discussion Paper*, No. 56, Middlesex University business school, march, Forthcoming in *Defence and Peace Economics.*

Dunne, P., Vougas, G. and Nikolaidou, E. (1999). "Military Spending and Economic Growth in Greece: A Demand and Supply Model". *Economics Discussion Paper Series*, Middlesex University Business School, No.64, March 1999

Durmus, Ö. and Ali, B. (2006). "The Impacts of sectoral demand for military expenditure on peace dividend: A case for Turkey and Greece". http://eco.ieu.edu.tr/wp-content/proceedings/2006/0623.pdf.

Dylan H. and Karkoszka, A. (2004). "The challenges of security sector reform". Stockholm International Peace Research Institute *(SIPRI) Yearbook 2002*. http://www.sipri.org.

Eichenberg, R. C. (1984). "The expenditures and revenue effects of defence spending in the Federal Republic of Germany". *Policy Sciences* 16 (4): 391-411.

Ekpo, A.H. (1994). *Accelerated and sustained economy for Nigeria.* In S.F. Tyoden (ed) Youth agenda for 21st Century Ibadan: Sibon Book. 147 -164.

Elisabeth, S. (2000). "Trends in military expenditure and arms transfer". http://pdf.ebooksx.com/TRENDS-IN-MILITARY-EXPENDITURE-AND-ARMS-TRANSFERS-Elisabeth-Sk-ns_75649.html

Enweze, G. (1973). "Structure of public expenditure in selected developing countries: A time series study". *The Manchester school of social studies.*

Faini, R. P. A. and Taylor, L. (1984). "Defence spending economic structure and growth. evidence among countries and over time". MA department of economics MIT. *Economic Development and Cultural Change*. Feder, G. (1983) On Export and economic *development. Journal of development economics 12*:59-73.
Feder, G. (1983). "On exports and economic growth". *Journal of Development Economics*, 12(1-2), 59{73.

Federal ministry of finance (1996). Budget of ministry of defence.

Fisher, J. R. (2001), "Cyprus: the failure of mediation and the escalation of an identity based conflict to an adversarial impasse", *Journal of Peace Research,* Vol. 38, 307–326.

Federiksen, P. C. and Looney, R. E. (1982). "Defence expenditure and economic growth in developing countries: some: Further empirical evidence". *Journal of Economic Development,* July 113-25.

Frederiksen, P. C. and Looney, R. E. (1994). "Budgetary consequences of defence expenditures in Pakistan. Short run impacts and long-run adjustments". *Journal of Research* 31(1): 11-18.

Frederiksen, P.C. and LaCivita (1987). "Defence spending and economic growth: time series evidence on causality for Philippines, 1956-82". *Journal of Philippine development*, 14(2), 354-360.

Gaiya, B. A. (2011). "An analysis of defence expenditure and economic growth in Nigeria 1970 – 2008. ". A Ph.D. dissertation, department of economics, Ahmadu Bello University, Zaria.

Galvin, H. (2003). "The impact of defence spending on the economic growth of developing countries: a cross – section study". *Defence and peace economics*, vol. 14, issue 1. http://www.informaworld.com/smpp/content~db=all~content=a713931598

Gebriella, L. (2005). "The displacement effect in the growth of governments". *Public choice* vol. 120. No. 1-2. 191 - 204 http://www.springerlink.com/content/k585500046848815/

Gerace, M.P. (2002). "US Military expenditures and economic growth: Some evidence from spectral methods", *Defense and peace economics*, Vol.13 (1), pp.1–11.

Gleditsch N. P., Cappelen, A. and Bjerkholt. O. (1994). *The wages of peace: disarmament in a small industrialized economy*. Cambridge: University Press.

Gold, D. (2005). "Does military spending stimulate or retard economic performance? revisiting an old debate". *International affairs working papers.*

Goldstien M. and Khan M. (1985). *Income and price effects in foreign trade. In handbooks of international economic theory* (Eds) R.W Jones and B.B Kenen, Armsterdam.

Goulet, D (1971). *The cruel choice: A new concept in the theory of development* cited in Thirwall A.P (198) growth and development with special Reference to developing economies 3rd ed. London Macillan.

Grier, K. B. and Tullock, G. (1989). "An Empirical Analysis of Cross-national Economic Growth, 1951–1980". *Journal of Monetary Economics*, Vol. 24, pp. 259– 276.

Grossman, G. M., and E. Helpman (1991). *Innovation and growth in the global economy*. MIT press, Cambridge, MA.

Gupta, S.P., (1967). "Public expenditure and economic growth: A time series analysis". *Public finance, No. 22.*

Gupta, S., L. de Mello, and Sharan, R. (2000). "Corruption and military spending". *IMF Working Paper No. 00/23.*

Habib, A. and Stephen, M. M. (1999). "Crowding-out and crowding-in effects of he components of government expenditure". University of Connecticut. *department of economics Working Paper Series wp1999-02.* http://www.econ.uconn.edu/.

Hamid, E.A. and James, G. (2003). "Military expenditures and inequality: Empirical evidence from global data". *UTIP Working Paper No. 24 October 10*, 2003. http//.utip.gov.utexas.ed/papers/utip_24.pdf.

Hammarskjold, D. (1975). "Towards another development dialogue". *A journal of International Development Co-operation,* No.1&2. 24-59.

Harris, G., Kelly, M and Pranowo (1998). "Tradeoffs between defence and education/health expenditures in developing countries". *Journal of Peace Research* 25(2): 165-77.

Hartley, K (2006). "Defence Research & Development: Data Issues". *Defence and Peace Economics*; 17(3), 169-175.

Hess, P. and Mullan, B. (1988). "The Military Burden and Public Education Expenditures in Contemporary Developing Nations". *The Journal of Developing Nations* 22(4):497-514.

Hilary, J. (2005) "DFID, UK and Public Services Privatisation: Time for Change." G*lobal Social Policy*, Vol. 5, No. 2, pp. 134-136.

Hirnissa, M.T., Muzafar, S. H. and Baharom, A..H. (2009). "The Relationship between defence, education and health expenditures in selected Asian Countries'. *International Journal of Economics and Finance.* Vol. 1 No. 2. 149 - 155

Hooper P. and Jamie Marquez (1993). "Exchange rates prices and external adjustment in the United staes and Japan", Board of Governors of the Federal reserve system, *International finance discussion paper* No. 456.

Ikhide, S.I. (1988). "Simulating an econometric model of Nigeria's financial sector". *The Nigeria journal of economic and social studies.* Vol. 30, No. 1.

Jeffrey, K. and Edward, K. (2006). "Bringing the Military back in: Military Expenditure and Economic Growth 1990 to 2003". *Journal of World system research*. 143 – 172.

Johansen, S., (1988). "Statistical and hypothesis testing of co-integration vectors". j*ournal of Economic Dynamics and Control*, 12 (2), 231–254.

Jonah, E.K., (2005). *Achieving efficiency and effectiveness of spending in the Nigerian Army:* The importance of contract award procedures. 118-130. eds. Gold Press Ltd, 108 Liberty Road, Ibadan.

Jones, L. and R., Manuelli. (1990). "Convex Model of Equilibrium Growth". *Working paper* No. 3241, *NBER working paper series*, January 1990.

Joshua A. and Reuven, G. (2003). "Military Expenditure, Threats and Growth". http://ideas.repec.org/a/taf/defpea/v16y2005i4p283-295.html.

Jung, W.S., and P.J. Marshall (1985), "Exports, Growth and Causality in Developing Countries," *Journal of Development Economics*, 18, 1-12.

Kaldor, M (1991). After the cold war obstacles and opportunities in cutting arms budgets. In procedings of the World Bank annual conference on development economics 1991.

Karagianni and Pempetzoglu. (2009). "Defense Spending And Economic Growth In Turkey: A Linear And Non-Linear Granger Causality Approach". *Defence and Peace Economics*, 20 (2), 139–148.

Kayode F, Oyejide A. and Soyode A (1994). Governance and polity in Nigeria. Some leading issues. Ibadon foundation for economic education.

Kegley, C. W. Jr. and Raymond. G, A. (1998). *When Trust Breaks Down: Alliance Norms and World Politics*. Colombia, S.C.: University of South Carolina Press, 1990.

Khilji N. M. and Akhtar M. (1997). "Military expenditures and economic growth in Pakistan". *The Pakistan Development Review* 36 : 4 Part II (Winter 1997) . 791—808 http://www.pide.org.pk/pdf/PDR/1997/Volume4/791-808.pdf

Kim, Y. C. (2003). " The political economy of North Korea's industrialisation". *The north Korean economy*. 47 – 79.

Klein, T (2004), "Military expenditure and economic growth: Peru 1970–1996". *Defence and Peace Economics*, Vol. 15 No.3, pp. 275–288.

Knight, M., and Loayza, N. and Villanueva, D. (1996). "The peace dividend: Military spending cuts and economic growt"h. *IMF Staff Policy Research Working Papers Series* 43 (1): 1-37.. The World Bank Revised. http://ideas.repec.org/p/wbk/wbrwps/1577.html.

Kollias C, and Makrydakis, S. (2000). "A Note on the causal relationship between defence spending and growth in Greec"e: 1955-93, *Journal of defence and peace economics*. 11(1): 173-184.

Krugman, P (1992). Towards a counter-counter revolution in development theory. In procedings of the World Bank annual conference on development economics.

Kuznets, S., (1955). "Economic growth and income inequality" http://courses.nus.edu.sg/course/ecshua/eca5374/Economics%20growth%20and%20income%20inequality_Kuznets_AER55.pdf

Landau, D. (1994). "The impact of military expenditures on economic growth in the less developed countries". *Defence and Peace Economics*, Volume 5, Issue 3 July 1994 , pages 205 – 220 http://www.informaworld.com/smpp/content~db=all~content=a783130282

Lansing, K.J. (1995). "Quantitative evaluations of efficient tax policies for Lucas supply side models". *Oxford economic papers*. Vol. 47. No. 3. 471 – 492.

Levine, R., and D. Renelt (1992). "A sensitivity analysis of cross-country growth regressions". *American Economic Review*, 84, 942-963.

Longe, J.B. (1986). "The impact of government expenditure on income distribution in Nigeria between financial years1971/72 and 2976/77. Being a thesis submitted to the department of economics, university of Lagos in partial fulfillment of the requirement for the award of the degree of Doctor of Philosophy.

Looney, R.E. (1992). "The Impact of Military Expenditures on Human Capital Development in the Arab World". http://www.emeraldinsight.com/journals.htm?articleid=848017&show=pdf

Luca Pieroni (2008). "?Miltary expenditure and economic growth". http://carecon.org.uk/DPs/0708.pdf

Lucas, R.E (1988) "On the Mechanics of economic development". *Journal of Economic Development.*22(1): 3-42.

Madden, G., & Haslehurst, P. (1995). "Causal Analysis of Australian Economic Growth and Military Expenditure : A Note". *Defence and Peace Economics,* **6**(2), 115-121.

Mathur ,S. K., and Islamia, J.M. (2001). "Casualties of militarization in the contemporary World: democracy and development". *Peace economics, peace science and public policy.* Vol.7. Issue3/ *working papers.* http://www.bepress.com/peps/vol7/iss3/3/

Mauro, P. (1995). "Corruption and growth. *Quarterly Journal of Economic s 110 (August)*: 681-712.

Meade. J. E. (1952). "External Economies and Diseconomies in a Competitive Situation." *Economic Journal* 62 (1) (1952): 54.

Michael , P. G. (1999). "A Spectral analysis of military expenditures: Implications for

data and theory" http://polmeth.wustl.edu/retrievephp?id=260

Michael, P (2005). the political economy of peace building: a critical theory perspective. International Journal of Peace Studies, Volume 10, Number 2. Autumn/Winter.

Mintz A. and Stevenson, R.T. (1989). "Defence expenditures, economic growth, and the peace dividend: A longitudinal analysis of 103 Countries. http://jcr.sagepub.com/content/39/2/283.abstract

Mjema, G.D. (1996). "The Impact of Foreign Debt and Debt Services in the Economic of Tanzania: a simultaneous approach". *African Journal of Economic Peace* (3)1. http://ideas.repec.org/p/mmf/mmfc03/41.html.

Moll, K. D. and. Luebbert, G. M. (1980) "Arms race and military expenditure model": A Review. *Journal of Conflict Resolution 20 No.1 (March)* 153-185.

Muhammed, M. U. (2008). "The impact of trade liberalization on economic growth in Nigeria, 1986-2006: A simulation analysis". An unpublished PhD dissertation, department of economics, Ahmadu Bello University, Zaria.

Mulligan C., Richard, G. and Sala-i-Martin, X.(2004). "Do Democracies Have Different Public Policies than Non-Democracies?" *Journal of Economic Perspectives*, vol. 18, no. 1, pp. 51-74.

Murdoch J. C, Chung-R. P. and Snadler, T. (1997) ."The impact of defence and non-defence public spending on growth in Asia and Latin America", *Defence and Peace Economics,* Vol.8, 205-224.

Murdoch, J. and Sandler, T. (2002). "Economic growth, civil wars, and spatial spillovers" *journal of Conflict Resolution*, 46, 91{110.

Musgrave R. A., and Musgrave P.B. (2005). *Public finance in theory and practice.* Tata McGraw-Hill companies Inc., New York. 4th reprint.

Na Huo (2009). "Arms Race, Military Expenditure and Economic Growth in India". A thesis submitted to University of Birmingham For the degree of Ph.D. Department of Economics, Business School, The University of Birmingham.

Nadir, O., and J, Yildirim, (2004). "Defence expenditures and economic growth: the case of Pakistan" Eighth annual conference on economics and security".www.usakpedia.com/content/Nadir_Ocal –

Nadir A.L. Mohammed (1993). "Defence spending and economic growth in Sub-Saharan Africa: A rejoinder". *Journal of Peace Research , Vol. 30 . No.1 February*.

Nadir, A.L. M. (1999). "Civil wars and military expenditures. A note" http://unpan1.unorg/intradox/groups/public/documents/IDEP/UNPAN002407.pdf.

Nitti, F.S. (1903). Principidi Scienza delle Finance.

Obadan, I., and F.A., Odusola (2000). "Productivity and unemployment in Nigeria", proceedings of the Ninth Annual Conference of Zonal Research unit, *Central bank of Nigeria. CBN publication.*

Odusola, F. A. (1996). Military expenditure and economic growth in Nigeria. *Nigerian Journal of Economic and Social Studies Vol. 38, No. 1, 2 & 3*

Olaniyi O. (2000) "*Peace dividend and the social welfare nexus: Nigerian experience*" being a paper presented at Middlesex University School, London, UK on 16/17 June.

Olaniyi O. (2000). "An analysis of the macro-economic impact of military spending in Nigeria: implication for economic development". A Ph.D dissertation department of economics, University of Jos, Nigeria.

Olaniyi O. O. and J.A. Adam, (2003). "Public expenditure and human Development in Nigeria". In: Human Resource Development in Africa: *Selected Papers for the Year 2002 Annual Conference, The Nigerian Economic Society (NES),* Part Three, Pp.157-197.

Oleg, B. (2002). "The changing Russian and US nuclear warhead production complexes." *SIPRI Yearbook 2002*. Armaments, Disarmament and International Security, pp. 14.

Olofin S. and U. Afengideh (2007). Financial structure and economic growth in Nigeria: A macroeconomic approach. www.africametrics.org/conference-2007.html

Paul, K. (1987). "Defence expenditures, economic growth and the peace dividends". www.jstor.org/stable/1963264

Peacock, A. T. and Wiseman, J. (1961). *The growth of public expenditure in the United Kingdom*. Princeton, N.J.: Princeton University Press.

Pesaran, M.H., Shin, Y. and Smith R.J. (2001). "Bounds testing approaches to the analysis of level relationships". *Journal of Applied Econometrics,* 16, 289-326.

Peroff, K. and Warren, M. P. (1999). "Does Spending on Defence Cut Spending on Health. A Time Series Analysis of the US Economy 1929 – 74". *British Journal of Political Science* 9(1): 21-39.

Phillips, A.O. (1971). "Nigeria's public consumption expenditure". *The Nigerian journal of economic and social studies*. Vol. 13. No.3

Quan Su. and Qiao Yu. (1999). "Determinants of China's military expenditure (1999)". *Conflict Management and Peace Science.* http://cmp.sagepub.com/content/23/3/227.full.pdf+html

Raimo, V. (2000). Stable peace through security communities? Steps towards theory-building. http//www.citeerx.ist.psuedu/viewdoc/download?doi=10.1.1.11998829.

Ram Rati (1986). " Government size and economic growth: A New framework and some evidence from cross-section and time series". *American Economic Review* 76(1): 191 - 203.

Ram Rati (1993). "Conceptual linkages between defence spending and economic growth and development: A selective review", in James E. Payne and Anandi P. Sahu eds. *Defence Spending and Economic Growth* Oxford: West View (19-39).

Ram Rati (1995). "Defence expenditure and economic growth". In Hartley and T. Sandler (eds.) Handbook of defense economics Vol. 1, *Elsevier.* http://papers.SSrn.com/Sol3/Delifverycfm/nber_w9618.pdf? Abstratid=394728 and mired = 1.

Rebelo, S., (1991). Long run policy and long run growth. *NBER working paper series*. No. 3325. 1-43. http://www.nber.org/papers/w3325.pdf.

Reitschuler, G. and Loening, J.L. (2005). "Modeling the Defense-Growth Nexus in Guatemala". *World Development*, 33 (3), 513–526.

Yildirim, J., Sezgin, S. and Ocal, N. (2005). "Military Expenditure and Economic Growth in Middle Eastern Countries: A Dynamic Panel Data Analysis". *Defence and Peace Economics*, 16 (4), 283–295.

Robert, D.K. (2007). "The effects of exchange rates on trade balance of Sierra Leone": *A simulation approach. Applied econometric and macroeconomic modeling in Nigeria.* Eds. *by Adeola Adenikinju, Dipo Busari and Sam Olofin.* Ibadan university press, university of Ibadan. Ibadan, Nigeria.

Robert, S. and Heston, A. (1995). "Standard of living: An alternative measure of nations, Current Material Well-being" CICUP 96-2. www.http:/jpr.sagepub.com/content/36/4/423/refs.

Robert, L. W. (1992). "Patterns and trends in the military expenditures of developing countries of developing countries". A symposium on research issues edited by Geoffrey Lamb with Valeriana Kallab. *World Bank Discussion Papers* 185.

Rothschild, K. (1977). "*Military expenditure, export and growth*". *Kyklos,* 26, 804-813. 87(2): www.econ.bgu.ac.il/papers/163.pdf.

Romer, P.M., (1986). "Increasing returns and long run growth'. *Journal of political economy. 94(5): 1002-1037.*
Sala - i- Martin, X. (1997). I just ran two million regression". *American economic review*
Vol. 87. 178 – 183.

Samuelson, P.A., (1954). The pure theory of public expenditure. *Review of Economics and Statistics* 36, 387±389.

Sandler, T. and Hartley, K (1995). "The economics of defence, Cambridge UK: Cambridge University Press. Gupta, S. L. de Mello and Sharan, R. (2000). "Corruption and military spending" *IMF Working Paper* No. 00123.

SIPRI Yearbook (2010). *Armament, disarmament and international security*. http://www.sipriyearbook.org/yearbook/2010.

SIPRI Yearbook (2005). *Armament, disarmament and international security*. http://www.sipriyearbook.org/yearbook/2005

SIPRI Yearbook (2002). *Armament, disarmament and international security*. http://www.sipriyearbook.org/yearbook/2002

Smith, R. P. (1977). "Military expenditure and capitalism". *Cambridge Journal of Economics* Vol. 1. 61-76: March.

Smith, R. P. (2000). "Defence expenditure and economic growth in *Making Peace Pay": A Bibliography on Disarmament and Conversion*. In: Nils Petter Gleditsch, Goran Lindgren, Naima Mouhleb, Sjoerd Smith and Indra de Soysa (eds.) *Making Peace Pay: A Bibliography on Disarmament and Conversion*. Laremont: Regina Books, 15-24.

Solow, R.M., (1956). "A Contribution to the Theory of Economic Growth", *Quarterly journal of Economics.* 70 (1), 65 ¡ 94.

Soludo, C.C. (1995). "Macroeconomic adjustment, trade and growth: Policy analysis using a macroeconomic model of Nigeria". *AERC research paper* 32, March. Niarobi.

Soumya, A., and Murty, K. N. (2006): "Macroeconomic effects of public investment in infrastructure in India". Indira Gandhi Institute of Development Research, WP-2006-003,Mumbai. (web://www.igidr.ac.in).

Spanos, A. (1990): 'The simultaneous equations model revisited: statistical adequacy and dentification', *Journal of Econometrics*, 44, pp. 87–108.

Stiglitz, J. E. (1981). "Credit Rationing in Markets with Imperfect Information." American Economic Review 77:1 (March): 228-31.

Stock, J.H. and Watson, M. (1993). "A simple estimator of cointegration vectors in higher order integrated systems". *Econometrica,* 61: 783-820.

Stroup, M.D. and Heckelman, J.C. (2001). "Size Of The Military Sector And Economic Growth: A Panel Data Analysis Of Africa And Latin America". *Journal of Applied Economics*, IV (2), 329-360.

Sungsup Ra and Bipul S. (2005). "Measuring the economic cost of conflict". *Working Paper Series* No. 2. http://www.adb.org/Documents/Papers/NRM/wp2.pdf

Swan, T.W., (1956). "Economic Growth and Capital Accumulation". *Economic Record* 32 (63), 334 ¡ 361.

Thad W. M. (1990). *Economic statistics and econometrics* 2nd edition, Maxwell macmillan editions. Macmillan publishing company, 866 third avenue, New York 10022.

Tanzi, V. and Davoodi H. (1997). "Corruption, public investment and growth". *IMF Working Paper* 97/139.

Thirwall A.P (1983). *Growth and development with special reference to development economics*. 3rd London, Macmillan.

Thomas, Hobbes, (1651). Leviathan, ed. Edwin Curley. Hackett, Indianapolis http//www.iep.utm.edu/hobmoral.

Todaro, M. P. and Stephen, C. S. (2008). *Economics of development.* 10th edition. Hardcover.

Verner J. G. (1983). "Budgetary tradeoffs between education and defense in Latin America: A Research Note". *Journal of Developing Area, October 18.* 1993. 77-92

Wargner, A (1890), *Finanzwiss enschaft*, 3rd edn. And grulegung der politishen ekonomie 3rd edn.

Weede, E. (1983). "Military participation ratios, human capital formation and economic growth: A Cross-national analysis". *Journal of Political and Military Sociology* Vol. 11, No 1. Spring.

Wilkins, N. (2004). "Defence expenditure and economic growth: evidence from a panel of 85 countries". Retrieved 14 August, 2008, from http://cama.anu.edu.au/macroworkshop/Nigel%20Wilkins.pdf

William A. H. and Hemming, R. (1987). "The Impact of Demographic Change on Social Security Financing". *Staff Papers-International Monetary Fund* Vol. 34, No. 3. pp. 471-502

Williamson, J.G. (1961). "Public Expenditure and Revenue: An International comparison". *The Manchester school*. Vol. 29. Issue 1. 43 – 56

Wolf, C. (1979). "A Theory of Nonmarket Failure: Framework for Implementation Analysis." *Journal of Law and Economics* 22 (April)107-39.

Wooldridge, M.J. (2003). *Introductory econometrics: A modern approach*. Southwestern college publishers http://www.swlearning.com/economics/wooldridge/wooldridge2e/wooldridge2e.html

Xia Jiren (2000). "Circumstances affecting China's defence budget increase" http://www.uscc.gov/researchpapers/2000_2003/pdfs/circum.pdf

Yakovlev, P. (2007). “Arms Trade, Military Spending, and Economic Growth’. *Defence and peace Economics*, 18 (4), 317–338.

Yildrim, J. and Ocal, N. (2006). “Arms race and economic growth: the case of India and Pakistan”. *Defence and Peace Economics*, 17, 37-45.

Appendix A1: Summary of Regression Result.

OUTPUT – EMPLOYMENT BLOCK

GDPog = 21064.83 + 2.50OXPT + 14.19DCON + 24.85DEFEX + 62.74GWR + 0.06GDPog(-1)
(0.88) (2.06) (1.86) (7.66) (0.11)
+ 0.031AWR 4.1
(1.89)
$R^2 = 0.98$, $R^{-2} = 0.98$. DW = 0.98

GDPag = 51591.85 + 0.07ACE + 0.59GFCF + 0.59DEFEX + 1.021AWR + 0.15RGDP - 0.05DC
(0.48) (1.90) (1.51) (0.63) (1.96) (-5.29)
+ 0.05GDPSS 4.2
(2.20)
$R^2 = 0.87$, $R^{-2} = 0.85$. DW = 1.94

GDPman = 279013.2 + 5.69GFCF(-2) + 4.61GDPss – 23.04INT(-2) + 3.05DEFEX – 16.28MCE 4.3
(1.72) (1.37) (-1.58) (0.77) (-1.00)
$R^2 = 0.34$, $R^{-2} = 0.21$. DW = 2.09.

GDPss = 1248.42 + 0.02SSCE + 0.09SSRE + 0.03GFCF + 0.04DEFEX + 1.10GDPss(-1) 4.4
(2.67) (6.44) (3.41) (0.93) (4.46)
$R^2 = 0.99$, $R^{-2} = 0.99$. DW. =2.26

INCOME – EXPENDITURE BLOCK

GFCF = 2566.48 + 0.35RGDP – 2.87GDPSS + 0.06DC + 0.04DEFEX 4.5
(2.37) (--3.02) (0.55) (0.42)
$R^2 = 0.98$, $R^{-2} = 0.97$. DW. = 1.76

TPC = 69380.62 + 0.66DIN – 3.22MPC + 24.39INFR – 24.19DEFEX – 0.46ΔMS + 0.59TPC(-1) 4.6
(2.50) (-3.41) (0.28) (1.40) (-0.41) (2.70)
$R^2 = 0.77$, $R^{-2} = 0.73$. DW = 2.00.

MONETARY BLOCK

DC = 58162.27 -0.03INT +1.71GFCF + 0.05BD + 9.79DEFEX + 1.34RGDP 4.7
(-3.48) (0.32) (1.75) (3.60) (2.68)
$R^2 = 0.93$, $R^{-2} = 0.91$. DW = 1.65.

EXPORT – IMPORT T

MPK = 28111.19 + 26.71RGDP + 1.22TFE + 35.04DEFEX + 0.69MPK(-1) + 0.98MCE 4.8
(26.11) (3.86) (4.20) (5.51) (2.69)
$R^2 = 0.75$, $R^{-2} = 0.72$. DW. =2.02.

MPC = 4187.08 + 14.47NER + 0.06FRS – 0.81DEFEX + 0.03TPC 4.9
(0.61) (11.08) (-2.68) (6.99)
$R^2 = 0.97$, $R^{-2} = 0.96$. DW = 2.31.

Appendix A1: Summary of Regression Result Continued.

OXPT = 94983.40 -53.32NER + 0.46OPQ + 3.63DEFEX + 0.04VOXPT + 0.77OXPT(-1) 4.10
(-0.40) (2.53) (2.32) (1.31) (1.70)
$R^2 = 0.63$, $R^{-2} = 0.58$. DW = 2.04.

NOXPT = 28318.64 + 21.8NER + 14.64OPS + 0.64DEFEX - 0.08BOP + 0.17NGDP 4.11
(5.17) (0.13) (3.83) (0.08) (0.17)
$R^2 = 0.97$, $R^{-2} = 0.97$. DW = 2.26.

NER = 38126.98 + 0.02KFLG – 4.08BOP - 1.11FPINV + 7.52DEFEX + 8.46OXPT + 1.49NER(-1).....4.12
(0.52) (-1.91) (-1.11) (0.03) (0.42) (6.35)
$R^2 = 0.94$, $R^{-2} = 093$. DW = 2.15

FISCAL BLOCK

ROGS = 78108.11 + 21.50OXPT + 1.14DCON + 21.95DEFEX + 0.09GDPog(-1) 4.13
(1.17) (4.07) (5.04) (2.41)
$R^2 = 0.72$, $R^{-2} = 0.68$. DW = 1.96.

RNOGS =21301.11 + 0.10NGDP + 2.97NOXPT + 0.68DEFEX + 0.49RNOGS(-1) 4.14
(3.46) (1.34) (1.97) (1.77)
$R^2 = 0.77$, $R^{-2} = 0.73$. DW = 1.83.

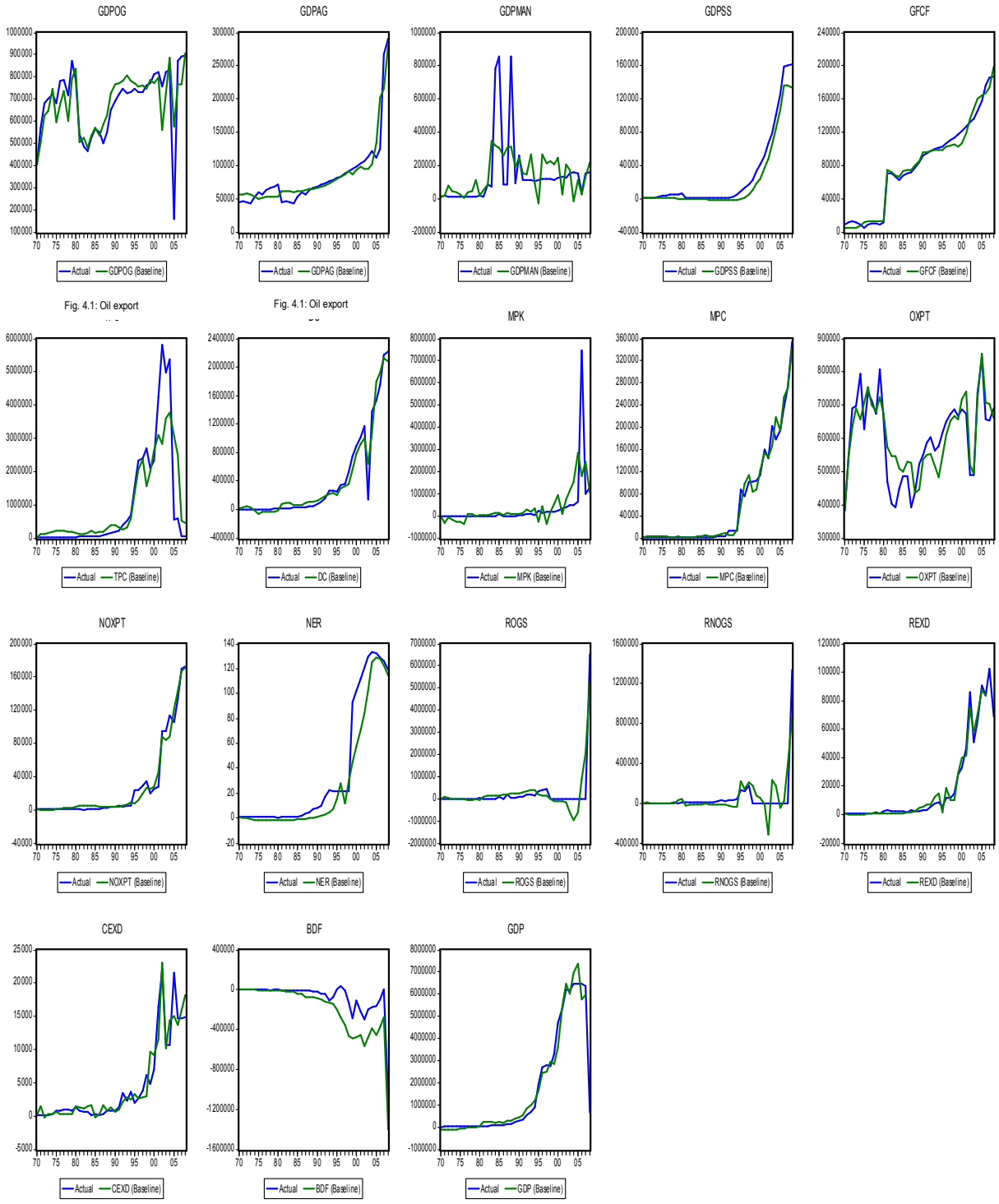
REXD = 540743.52 + 0.04ΔGDP – 0.43MCR + 0.02TFE + 0.75REXD(-1) + 0.02TFR 4.15
(7.27) (-7.23) (4.54) (1.95) (1.36)
$R^2 = 098$, $R^{-2} = 0.98$. DW = 2.03.

CEXD = 1786.18 + 0.17TFR + 66.94NER - 17.64INFR + 12.23TRT + 0.23CEXD(-1) + 0.04TFE 4.16
(2.47) (3.21) (-1.20) (1.39) (1.34) (4.74)
$R^2 = 0.90$, $R^{-2} = 0.89$. DW = 2.04.

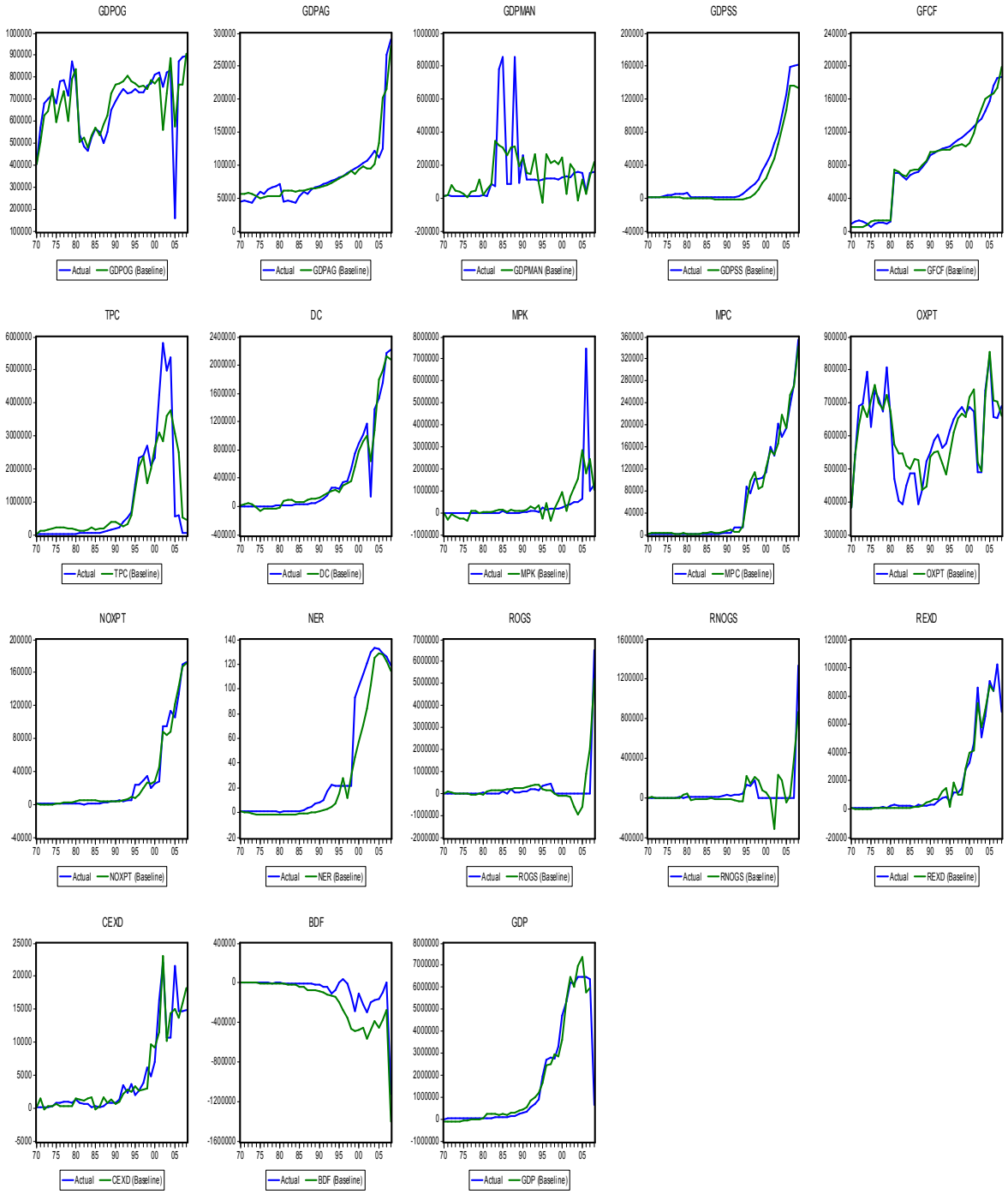
BDF = 939.33 – 0.42ROGS + 1.25RNOGS – 0.07TFE + 1.58DEFEX + 0.91BDF(-1) 4.17
(-3.73) (2.31) (-2.18) (1.93) (4.78)
$R^2 = 0.92$, $R^{-2} = 0.91$. DW = 2.09.

GDP = 291900.8 + 0.34TFE + 7.59GFCF - 0.04FPINV + 0.63GDPag + 42.07GDPss + 19.45DEFEX
(0.70) (2.21) (-0.54) (3.55) (1.99) (0.87)
– 2.70TSAV 4.18
(0.73)
$R^2 = 0.97$, $R^{-2} = 0.96$. DW = 1.19.

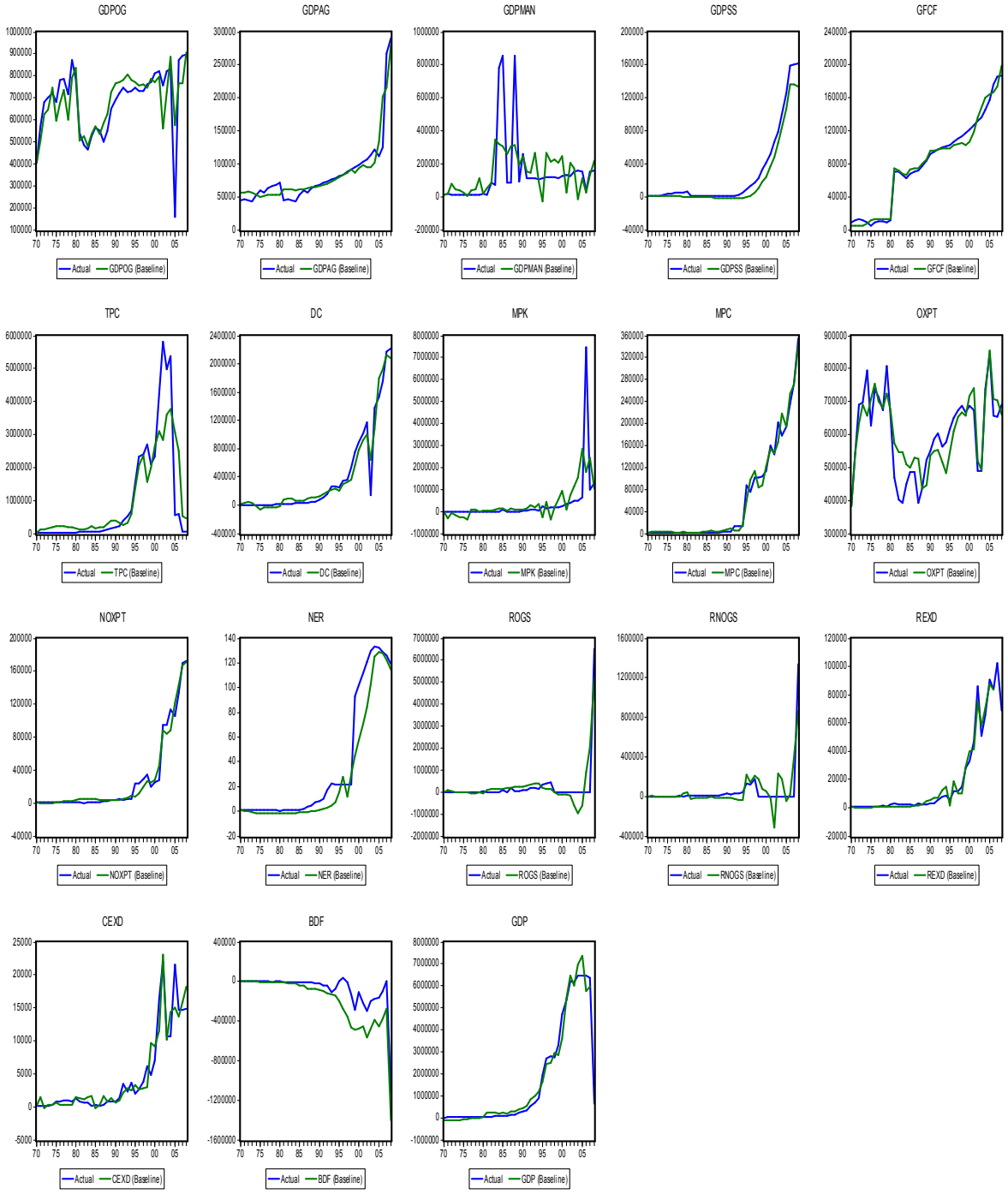
Appendix A2: Baseline Simulation: Deterministic – Dynamic : Actual and Simulated.



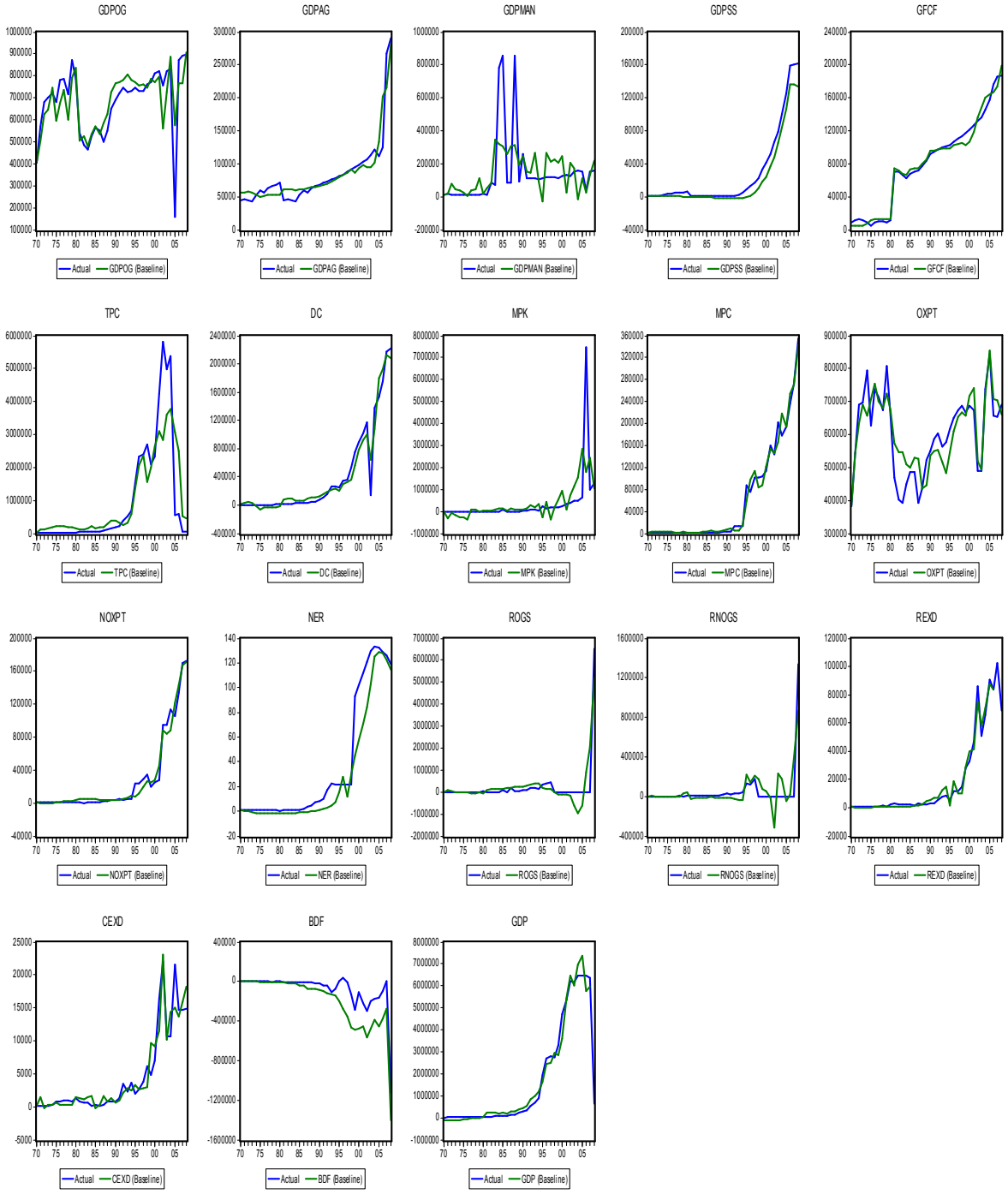
Appendix A4: Baseline Simulation: Stochastic – Dynamic: Actual and Simulated at 10 percent.



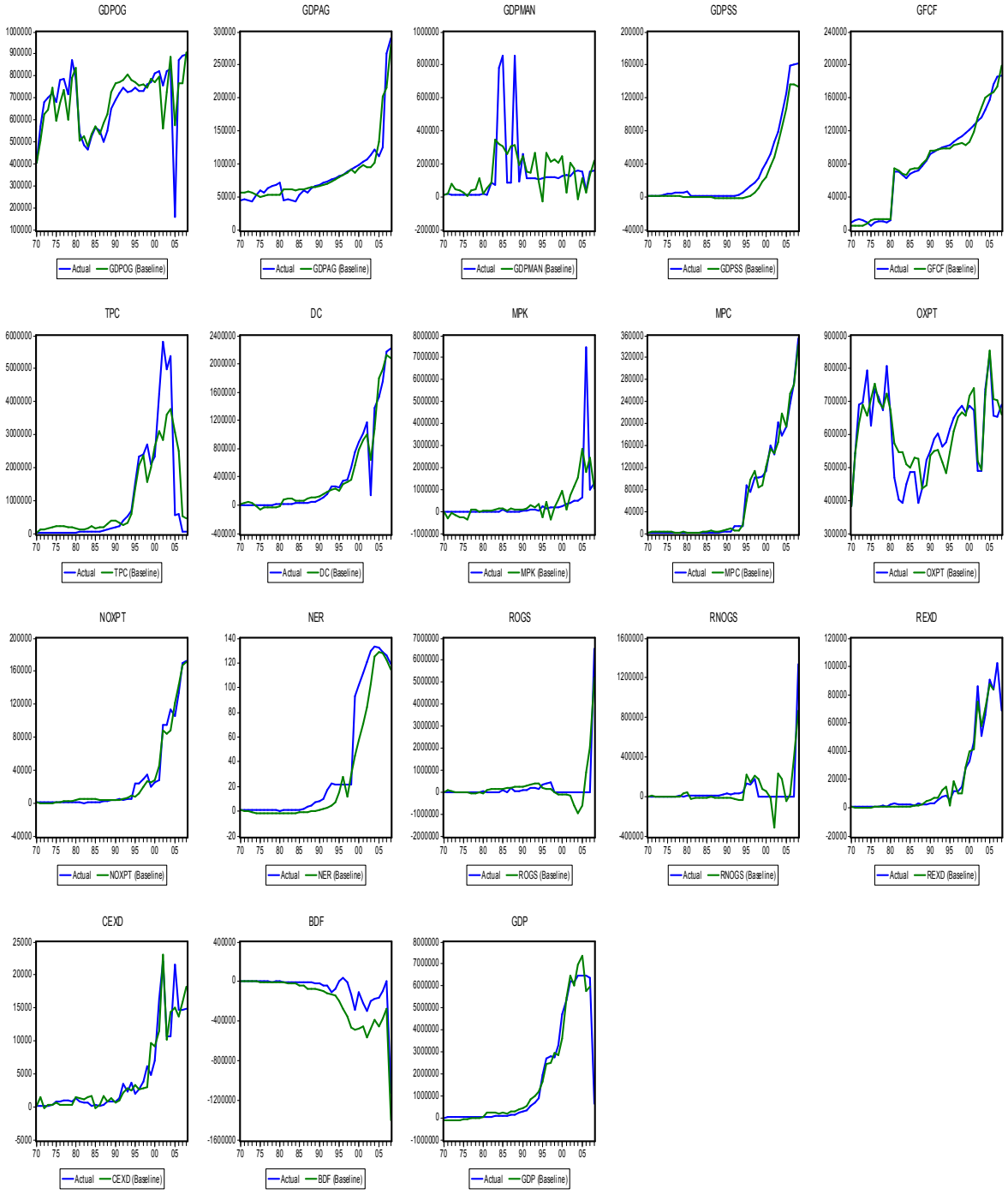
Appendix A4: Baseline Simulation: Stochastic – Dynamic: Actual and Simulated at 15 percent.



Appendix C3: Baseline Simulation: Stochastic – Dynamic: Actual and Simulated at 20 percent.



Appendix D3: Baseline Simulation: Stochastic – Dynamic: Actual and Simulated at 25 percent.



Appendix E1 : Summary of the Impact of Increased Defence Expenditure on the Endogenous Variables.

Selected endogenous variables	Baseline simulation	10 % increase Shock 1	15% increase Shock 2	20 % increase Shock 3	25 % increase Shock 4
Gdpog	+	+	+	+	+
Gdpag	+	+	+	+	+
Gdpman	-	-	-	+	-
Gdpss	+	+	+	-	+
Gfcf	+	+	+	+	+
Tpc	+	-	-	+	+
Dc	+	+	-	+	-
Mpk	-	-	-	-	-
Mpc	-	-	-	-	+
Oxpt	+	+	+	+	+
Noxpt	+	+	-	+	+
Ner	-	-	+	+	-
Rogs	+	+	+	+	+
Rnogs	+	+	+	+	+
Rexd	+	+	+	-	+
Cexd	-	-	+	+	-
Bdf	-	-	+	-	-
Gdp	+	+	+	+	+

Source: computed from econometric views four software package 2011.

Appendix E2: Data for the study.

FRS	GDP	GDPAG	GDPMAN	GDPOG	GDPOT	GDPSS	ΔGDP
104.6	5205.1	44862.3	13100.3	403718		851.9	
132.3	6570.1	45885.7	14786.8	571664		979.2	1356
191.6	7208.3	44570.5	10439	682417		1031.3	638.2
241	10990.7	42548.7	9266.6	741261		1252.2	7307.6
3112.5	18298.3	52750.9	11105.1	850490		2782.3	2997.37
3380.1	20957	58705.7	10673.1	678804		3619.8	2658.7
3057.6	26656.3	56356.9	11217.4	779334		4164.6	23997.6
2521	31520.3	62442.5	12658.8	787979		4755.6	4864
1249.1	34540.1	65564.5	12867.1	717630		5105.5	10427.4
3043.2	41947.7	68416.7	13847.5	873082		5478.3	7407.6
5445.6	49632.3	71495.5	15135.1	784668		6157.8	7684.6
2424.8	50456.1	44862.3	13100.3	542404	51989.7	368.2	4423.8
1026.5	51653.4	45885.7	83612.2	486020	53002.1	388.8	1197.3
781.7	56312.9	44570.5	72261.8	466153	51186.2	441.3	4659.5
1143.8	62474.2	42548.7	785147	523742	47917	502.2	6161.3
1641.1	70633.2	52750.9	853455	565657	49153.1	469	8159
3587.4	71859	58705.7	83085.1	551668	46432.6	514.4	1159.8
4643.3	108183	56356.9	81833.3	500354	49308.5	566.2	1778.5
3272.7	142618	62442.5	854103	549855	53194.3	607.4	19412.6
13457.1	220200	65564.6	94244.5	650961	55668.5	657.8	19681.2
34953.1	271908	68416.7	259514.2	688722	59049.9	735.9	33515.3
44249.6	316670	71495.5	108398.6	721438	59545.4	844.4	38.4
13992.5	536305.1	73640.3	109988.5	743804	62214.8	1036.2	8644.1
67245.6	688136.6	75775.9	109641.4	724844.6	64026.3	1738.4	5251.9
30455.9	904004.7	78049.2	107043.9	728983	64948.1	4304.4	2688
40333.2	1934831	80702.8	108446.5	748380	64922.6	9157.9	7417.7
174309.9	2703809	83761.5	115279.1	777160	65639.8	13574.3	14571.9
262198.5	2801973	87363.2	116867.5	796464.8	66605.3	16849.8	10612.6
226702.4	2721178	90770.4	118154.8	81204606	67666.7	22737.1	15276.4
546873.1	3313563	95526.8	110853.1	814756.4	69300.3	32804.2	5361.6
1090148	4727523	98392.6	122061.8	845417	70586.5	41341.6	28224.8
1181652	5374335	102313.5	128740	874680	74088.35	52065.2	10451.2
1013514	6232244	106374.8	123905.9	757036	81520.69	66464.9	20002.5
1065093	6161700	113821	150250.7	708439	86026.06	78546.9	43221.5
2232838	6455110	121219.4	156486.8	970348	94587.2	99648.9	32568.8
3647999	6455110	111780	155165.5	157532.6	105962.8	126112.8	8906
5425579	6455110	124512.9	39449.2	871703.7	119845.8	159545.3	184321
6055717	6341000	267051.7	151563.2	892104.6	135660.4	160121.1	185142.8
7025728	634100.5	291030.2	160123	899221.1	142163.2	161201.1	185332.6

Source: Central Bank of Nigeria Statistical Bulletin, 2008 and 2009

Appendix E2: Data for the study continued.

GFCF	GTC	INFR	INT	KFLG	MCE	MD
9094.5	3210	13.8	8	251	1267	11433.7
10841.2	4130	16	10	489.6	4532.8	10508.7
12215	4112	3.2	10	432.8	3216	11253.3
10922	4562	5.4	10	577.8	3429.8	15050.4
8135	4431	13.4	10	507.1	4629.8	12595.8
5019.8	4613	33.9	9	757.4	5124.6	25380.6
8107.3	5421	21.2	10	521.1	6006.9	27596.7
9420.6	5661	15.4	6	717.3	2300.4	53870.4
9386.3	5894	16.6	11	664.7	1331.1	13045
9094.5	5613	11.8	11	704	1865.7	12076
10841	5924	9.9	9.5	786.4	2349.3	15233.5
70365.9	6623	20.9	10	584.9	1625.7	13290.5
70243.1	6941	7.7	11.75	2193.4	1283.9	11433.7
65958	7125	23.2	11.5	1673.6	1094.4	10508.7
62474.2	7312	39.6	13	1385.3	261.9	11253.3
68286.2	7459	5.5	11.75	1423.5	240.9	15050.4
70806.4	7488	5.4	12	4024	516.1	12595.8
71194.9	7395	10.2	19.2	5110.8	575.1	25380.6
77733.2	9253.3	38.3	17.6	6236.7	703.7	27596.7
83179	10076.2	40.9	24.6	4692.7	683.8	53870.4
92238.5	11468.7	7.5	27.7	10450.2	877.4	98102.4
94235.3	12689	13	20.8	5610.2	353.4	100991.6
97019.9	20431.8	44.5	31.2	11730.7	625.3	1904532
99604.2	27583	57.2	36.09	42624.9	1436.7	192769.4
100936.7	88513.2	57	21	7825.5	1293.5	201910.8
103078.6	123152.3	72.8	20.79	55999.3	3800.3	459987.3
106600.6	143086.3	29.3	20.86	5672.9	881.7	520190
109972.5	171270.4	8.5	23.32	10004	7147.7	582811.1
113509	204339.1	10	21.34	32434.5	6227.5	463608.8
116655.5	252552.6	6.6	27.19	4035.5	3313.7	949187.9
121207.8	260335.7	6.9	21.55	16453.6	3020.9	1960160
126323.8	275461.2	18.9	21.34	4973	19241	2231533
131489.8	343582.7	12.9	30.19	8988.5	17083.2	1731838
136470	285870	14	22.88	13531.2	6639.6	2575096
145380	281340	15	20.82	20064.4	6973.8	2231533
157689	29185.21	17.9	19.49	23824.8	7102	2521452
175890.4	31245.41	8.2	18.41	25398.1	7292	2731456
185470.6	32145.22	5.4	18.36	22163.4	8954	2781421
187640.5	35412.8	11.6	16.4	32165.2	1023	2921540

Source: Central Bank of Nigeria Statistical Bulletin, 2008 and 2009

Appendix E2: Data for the study continued.

MMGS	MPC	MPK	MS	ΔMS	NED	NER	NGDP
227	57.7	285.3	978.2	317.8	175	0.7143	32154
319.3	88.3	417.8	1041.8	63.6	178.5	0.6955	165421
267.7	95.8	391.9	1214.9	173.1	265.6	0.6579	114457
323.9	126.3	491.4	1522.5	307.6	276.9	0.6579	154872
493.4	154.8	561.8	2352.3	829.8	322.4	0.6299	165543
1007.4	289.8	1561	4241.2	1888.9	349.9	0.6159	178452
1130.1	441.7	2467.2	5905.1	1663.9	374.6	0.6265	185463
1500	780.7	3311	7898.8	1993.7	365.1	0.6466	195423
1855.9	1027.6	3573.4	7985.4	86.6	1252.1	0.606	245113
1742.2	1254.3	2905.1	10224.6	2325.8	1611.5	0.5957	1245789
1981.5	1437.5	3650.4	15100	4875.4	1866.8	0.5464	2144213
2590.7	1819.6	5668.1	16161.7	31261.7	2331.2	0.61	178032.6
2287	1642.3	4569.9	18093.6	34255.3	8819.4	0.6729	181398.8
2006.1	1761.1	3213.4	20879.1	2785.5	10577.7	0.7241	170922.8
1354.2	1349.7	2568.1	23370	2490.9	14808.7	0.7649	160370.4
1611.8	1199	2414.4	26277.6	49647.6	17300.6	0.8938	180861.3
1237.1	801.9	2277.8	27389.8	1112.2	41452.4	2.0206	59588.1
4484.9	1873.6	6827.7	33667.4	6277.6	100789.1	4.0179	78500
4547.4	1891.6	8900.6	45446.9	11779.5	133956.3	4.5367	109226.1
6541.4	2108.9	12362.7	47055	1608.1	240393.7	7.3916	140267.2
10240.8	3474.5	18515.8	68662.5	21607.5	298614.4	8.0378	167326.6
51951.1	3045.7	17962.2	87499.8	156162.3	328453.8	9.9095	195614
35310.6	12840.2	62158.3	129085.4	216585.3	544246.1	17.2984	285785.9
42023.4	13952.4	74579.1	198479.2	69463.7	633144.4	22.0511	441760.1
40046	13837	46232	266944.9	68425.8	648813	21.8861	680754
175944.6	88349.9	206905	318763.5	51818.6	716865.6	21.8861	1166694
156410.2	75392	129404.1	370333.5	51570	617320	21.8861	1544808
246963.6	100728.3	202964.9	429731.3	59397.9	595931.9	21.8861	1732994
248713.4	102165.1	195956	525637.8	95906.2	633017	21.8861	1971636
253550	103489.8	204392.3	699733.7	174096.1	2577374	92.6934	2169559
289261.3	113630.5	234075.8	1036080	279789.6	309383.9	102.1052	2350958
406734.1	160209.1	327206.7	1315869	174588.5	3176291	111.9433	3016911
473478.8	144297.6	378826.5	1599495	372147	3932885	120.9702	3604183
650365.2	201648.3	498815.9	1985192	234445	4478329	129.3565	4206266
584645.4	178747.4	458917.1	2263588	717796.5	4890270	133.5004	7163351
899074.9	193259.1	613387.5	2814846	551258.2	2695072	132.147	8945998
1102133	235440	7472668	4027902	1213056	451461.7	128.6516	11581659
1437273	271679.7	990316.2	5809827	3357241	428058.7	125.8331	15747672
1954078	355287	1302719	9167068	2145781	221487.7	118.5769	15756125

Source: Central Bank of Nigeria Statistical Bulletin, 2008 and 2009

Appendix E2: Data for the study continued.

NIFD	NOXPT	OPQ	OPS	OXPT	REXD	RGDP	RNOGS
833.2	375.4	12031	0.1601	383455	402.6	4219	467.4
1243	340.4	11245	0.1892	542545	338.4	4715.4	658.7
1389	258	142135	0.1928	690640	498.2	4892.8	640.8
2319.4	384.9	102101	0.211	695627	454.3	5310	679.3
7532.1	429.1	132014	0.4116	795710	555.4	15971.7	813.4
1204	362.4	211003	0.0575	627638	1055.4	27172	1243.2
1602.6	429.5	256487	0.0601	736822	1010.2	29146.5	1400.7
537	557.9	215469	0.017	715240	1040.4	31520.3	1961.8
-2147.3	662.8	311020	0.0622	674125	1259.5	29212.3	2815.2
3364.3	670	369875	0.0802	807685	999.5	29948	2031.6
5091.1	554.4	351472	0.1026	656260	1917.4	31546.7	2880.2
1816.3	324.8	331245	0.0036	469095	2993.8	205222	4726.1
2564.1	203.2	398754	0.0496	401658	2346.1	199685.3	3618.8
1401.2	301.3	399987	0.0249	392031	2408.2	185598.1	3255.7
1909.7	247.4	412536	0.0306	450580	2677.3	183562.9	2984.1
4658.2	497.1	446873	0.0659	486580	0.2	201036.2	4126.7
2937	552.1	486580	0.0408	486584	1162.2	205971.4	4488.5
14825.64	2152	486584	0.137	390514	3073.8	204806.6	6353.6
9747.1	2757.4	390514	0.0683	435797	2218.6	219875.6	7765
27111	2954.4	522481	0.1231	522481	2552.1	236729.6	14739.9
64168.2	3259.6	548249	0.2359	548249	3171.1	267550	26215.3
32047.2	4677.3	585838	0.1012	585838	3343.7	265379.2	18325.2
6246.05	4227.8	604300	0.1165	604300	5301.9	271365.6	26375.1
53140.7	4991.3	563614	0.0772	563614	7957.4	274833.3	30667
43270.4	5349	578044	0.0479	578044	8600.9	275450.8	41718.4
228533.7	23096.1	616900	0.0845	616900	5344.4	281407.4	135439.7
746916.8	23327.5	648960	0.2763	648690	11425.7	293745.3	114814
395946.1	29163.3	673340	14.1309	673340	11607.2	302022.5	174339.9
-85562	34070.2	687390	-0.0314	687390	15130.8	310890	139.3
326454.1	19492.9	666490	0.0985	666490	28091.4	312183.5	224.8
960730.9	24822.9	688080	0.2032	688080	33119.4	329178.6	314.5
629821.7	28008.6	674930	0.1171	674930	47071.6	356994.3	524.1
425576.7	94731.8	490810	0.0683	490810	86053.8	433203.5	501
1416712	94776.4	490810	0.2299	490810	51043.6	477533	500.8
1505447	113309.4	736400	0.2332	736400	65400.2	527576	606.1
1496540	105955.8	846179.7	0.6542	846179.7	90333.8	561931.4	835.1
1556621	133594.9	656090	0.6842	656090	83674	595821.6	773.4
1635241	169709.7	587641	0.9987	654991	102597.3	604251.3	1200.8
1648978	172101.9	664510	0.8973	689451	68700	674887.9	1335960

Source: Central Bank of Nigeria Statistical Bulletin, 2008 and 2009

Appendix E2: Data for the study continued.

ROGS	SSCE	SSRE	TCE	TFR	TPC	TRE
166.6	16.9	33.8	187.8	634	16297	716.1
510.1	91.7	37.8	173.6	1168.8	19061.2	823.6
764.3	174.9	75.6	451.3	1405.1	24340.5	1012.3
1016	289.9	83.5	565.7	1695.3	25927.7	963.5
3724	824	169.3	1223.5	4537.4	31695.1	1517.1
4271.5	2242.1	419.3	3207.7	5514.7	13688.5	2734.9
5365.2	3131.1	776.4	4041.3	6765.9	16297	3815.4
1749.8	3949.5	560.2	5004.6	8042.4	19061.2	3819.2
4555.8	3883.6	631.3	5200	7371	24340.5	2800
8880.8	3425.4	624.4	4219.5	10912.4	25927.7	3187.2
12353.3	8437.8	1276.3	10163.4	15233.5	31695.1	4805.2
8564.4	4928.4	1355.4	6567	13290.5	34563.1	4846.7
7814.9	3510.8	1068.9	6417.2	11433.7	36297.3	5506
7253	3317.2	1284.4	4885.7	10508.7	41060.2	4750.8
8269.2	893.9	1094.9	4100.1	11253.3	47430.2	5827.5
102923.7	2046.7	1447.6	5464.7	15050.4	53331.1	7576.4
8107.3	1755.3	1375.7	8526.8	12595.8	55934.6	7696.9
190721	2778.8	1561.9	6372.5	25380.6	79628.3	15646.2
19831.7	3854.7	3353.4	8340.1	27596.7	113013.3	19409.4
39130.5	5774.1	5649.1	15034.1	53870.4	136569.7	25994.2
71887.1	5581.7	5009.7	24048.6	98102.4	169309.2	36219.6
82666.4	4636.7	3980.3	28340.9	100991.6	218692.8	38234.5
164102.4	4469.3	4502.7	39763.3	190453.2	396156.5	53034.1
162102.4	21920	13463.4	54501.8	192769.4	529623.6	136727.1
160192.4	32097.2	13995.4	70918.3	201910.8	686989.8	89974.9
324547.6	52364.8	19738.7	121138.3	459987.3	1517236	127629.8
408783	72237.3	23528.3	212926.3	523597	2331307	124491.3
416811.1	176515.1	29124.6	269651.7	582811.1	2401596	158563.5
324.3	224227.5	34639.7	309015.7	463608.8	2712511	178097.8
724.4	340834.3	57799.5	498027.6	949187.9	2089505	449662.4
1591.7	39473.8	88618.7	239450.9	1906160	2331878	461600
1707.6	313093.8	132645.5	438696.5	2231600	4225977	579300
1230.9	247800.7	255342.5	321378.1	1731838	5805086	696800
2074.3	153718.4	198597.7	241688.3	2575096	4979560	984300
3354.8	197754.3	193172.4	351300	3920500	5372560	1032700
4762.4	336395.9	215955.1	519500	5547500	548357.2	1223700
5287.6	340888.6	273856.3	552385.8	5965102	572197.4	1290202
4462.9	499	362.6	759323	5715600	59873.1	1589270
6530630	554	421.2	960900	7866590	65421.1	2117400

Source: Central Bank of Nigeria Statistical Bulletin, 2008 and 2009

Appendix E2: Data for the study continued.

TSAV	VOXPT
411.8	2.5
464.2	2.4
566.6	2.9
721.1	3.1
1137.1	8.1
1815.2	9.4
2255.3	13.4
2592.8	23.5
3009.7	26.1
4161.8	33.4
5769.9	38.8
6562.6	37.1
7514.4	35.6
9443.9	30
10988.1	29.2
12521.8	28.2
13934.1	14.2
18676.3	18.5
23249	15.1
23801.3	18.6
29651.2	24
37738.2	20.5
55116.8	20
85027.9	16
108460.5	16.2
108490.3	17.4
134503.2	21.6
177648.7	19.5
200065.1	12.8
277667.5	71.8
385190.9	26.1
488045.4	24.5
592094	25.4
655739.7	29.1
797517.2	38.7
1316957	57.6
2500160	66.5
2693554	74.96
4118173	89.24

Source: Central Bank of Nigeria Statistical Bulletin, 2008 and 2009