ASSESSMENT OF THE EFFECTS OF FISCAL POLICY SHOCKS ON SAVINGS DYNAMICS IN NIGERIA

(1986-2016)

By

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BEING A DISSERTATION SUBMITTED TO THE DEPARTMENT OF ECONOMICS, FACULTY OF SOCIAL SCIENCES, BAYERO UNIVERSITY, KANO IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF MASTERS OF SCIENCE (M.Sc.) DEGREE IN ECONOMICS.

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DECLARATION

I hereby declare that this work is the product of my research efforts undertaken under the supervision of (Dr Latefah Musa Pedro) and has not been presented anywhere for the award of a degree or certificate. All sources have been duly acknowledged.

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CERTIFICATION

"This is to certify that the research work for this dissertation and subsequent write-up by (Mustapha Ibrahim, SPS/14/MEC/00005) were carried out under my supervision".

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DEDICATION

I am dedicating this thesis to my Late father Alh Ibrahim Ma'aji who have meant and continue to mean so much to me. Although he is no longer of this world, his memories continue to regulate my life. May his soul continue to rest in Jannatul Firdause.

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LIST OF ABBREVIATIONS

ADF = Augmented Dickey-Fuller tests

AIH = Absolute Income Hypothesis

APC = Average Propensity to Consume

APS = Average Propensity to Save

CBN = Central Bank of Nigeria

ECM = Error Correction Model

GDP = Gross Domestic Product

GDI = Gross Domestic Investment

GDS = Gross Domestic Saving

GS = Government Spending

INF = Inflation

IRF = Impulse Response Functions

LCH = Life-Cycle Hypothesis

LDC = Less Develop Countries

MPS – Marginal Propensity to Save

OLS = Ordinary Least Square

OECD = Organization for Economic Co-operation and Development

PS = Personal Savings

RIH = Relative Income Hypothesis

SAP = Structural Adjustment Programme

S.E.M = Simultaneous Equation Model

SVAR = Structural Vector Autoregressive

TR = Tax Rate

USA = United State of America

VAR = Vector Autoregressive

ABSTRACT

This dissertationinvestigates the macroeconomic effect of fiscal policy shock and saving dynamics in Nigeria using a structural vector autoregressive (SVAR)framework on quarterly data for the period 1986:1 – 2016:4 with the used of secondary Data. From the empirical findings, the responses of saving, real output and inflation may be asymmetrical depending on the component of government spending used as a fiscal stimulus to stabilize the economy. Basically, a positive shock to government capital spending on social and community services was found to have a persistent positive and significant impact on private consumption and real output but at the cost of higher inflation in the short term. A positive shock to oil revenue yields a significant positive impact on real output through its impact on public spending, in line with theory, the response of real output to innovations in business taxes is persistently negative, though insignificant. Private investment decisions in Nigeria does not seem to depend on the taxes paid to government, but on the cost of capital (interest rate) and perhaps on other crucial variableslike market demand and profit expectations. The entire analysis clearly supports the argument that for the Nigerian experience, government is still relevant in stimulating real output through expenditure expansion on private activities. The study recommends that government's automatic build-in stabilizers must be effectively used to stabilize consumption and saving pattern in Nigeria. In addition, the study recommends that fiscal shock absorbers be strengthened in the economy.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

The relationship between fiscal policy and savings has long attracted the interest of economic scholars and policy makers in both developed and developing countries in which the Nigerian case is not an exception.The concern that Nigerian economy has been growing at lower rate than her potential has informed various policy proposals on how to facilitate long-term economic growth through enhanced saving culture. These proposals were premised on the linkages that economic theories postulate to exist between savings, resources mobilization, investment and economic growth. In view of this, it would be expected that necessary policies that will promote savings, resources mobilization and investment will be developed and efficiently implemented in order to facilitate sustainable economic growth and development; one of such necessary policy measures is fiscal policy. (Obi, 2007).Fiscal policy is concerned with rising revenue for government trough taxation and other means and decides on the level and pattern of government expenditure which is necessary to influence economic activities or attain some desirable macroeconomic goals (Iyoha, 2004); thus, fiscal policy can be used for allocation, stabilization and distribution purposes.

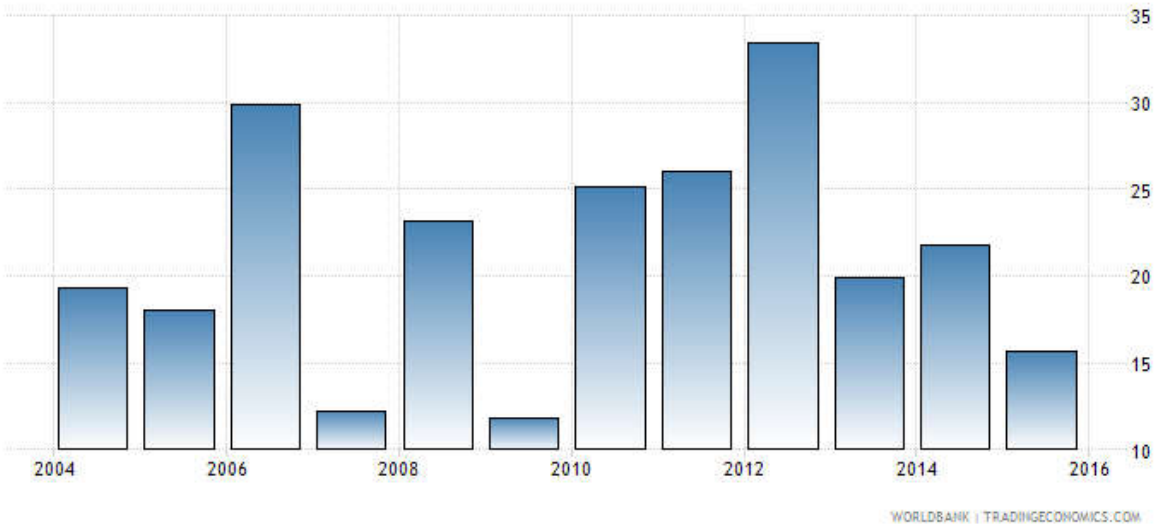
There are two main approaches to fiscal policy; counter – cyclical and compensatory approaches (Musgrave and Musgrave, 1989). Under counter cyclical approached, governments assigned the role of varying its tax and expenditure policies with the objective of moderating fluctuations in income and employment. Keynes (1936), recommended compensatory fiscal to counter recession, private consumption and investment may decline due to operation of some adverse factors. This decline in aggregate demand will reduce consumption, investments and employments etc, leading to downturn and recession in the economy. In this juncture, effort by the government trough additional

expenditure and tax cut will fill the gap in the demand, consumption and investment. The main thrust of compensatory fiscal policy is that the government should inject extra expenditure to reinstate demand.

Fiscal instruments can be broadly classified into two: automatic and discretionary fiscal stabilizers. Automatic fiscal stabilizers or passive fiscal policy instruments, are the most interesting government's anti – cyclical kit and it help the economy bounce back to an even keel without any deliberate action on the part of anyone (Shaw, 1973) automatic fiscal stabilizers include personal income tax and company income tax.

A discretionary or active fiscal policy measure, on the other hand, refers to a direct budgetary change that is initiated on an ad hoc basis in response to an immediately recognizable macroeconomic problem.

In Nigeria, the rate of response of savings to fiscal incentives, however, has been abysmally low. Despite various fiscal policies been implemented by government, to raise domestic savings, the gross domestic saving (GDS) as a ration of gross domestic product (GDP) Moved in different direction.



Source: World Bank 2007

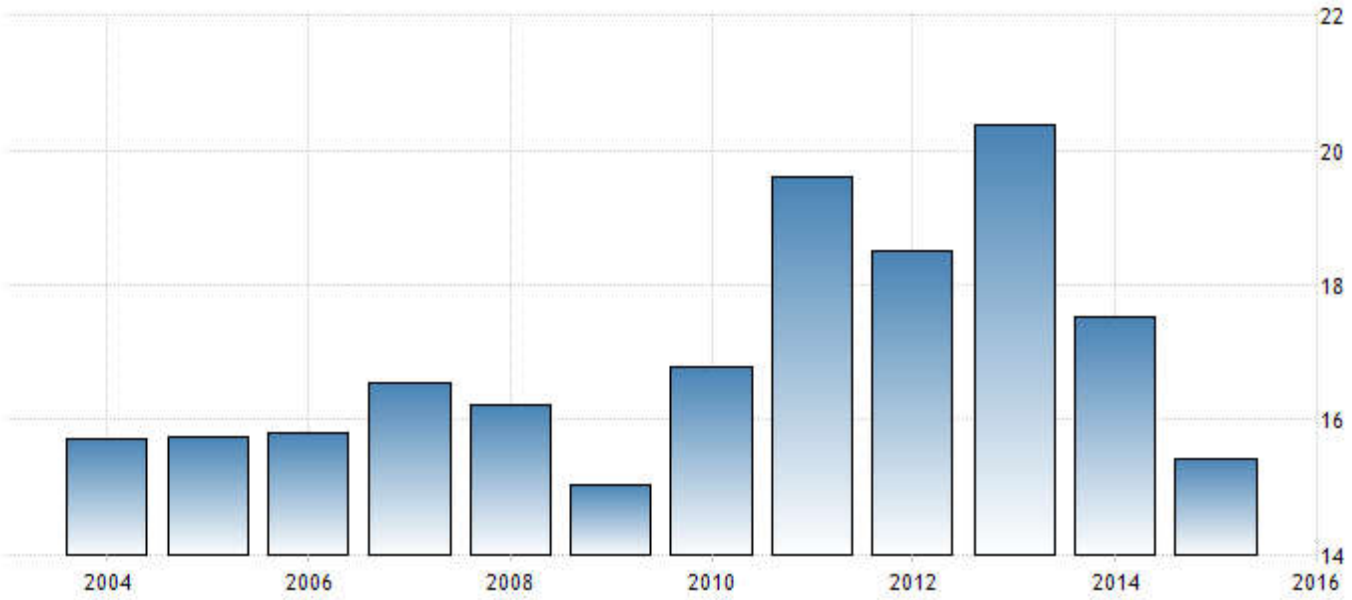
Figure 1.1. Gross Domestic Savings in Nigeria

From figure 1.1 it is evident that Savings to GDP ratio stood at 30% in 2006 and subsequently declined to 15.63 % in 2015. In 2010 the ratio stood at less than 5%. The continued decline in saving rate is something to worry about and it affects capital accumulation and consequently affects the level of investment and economic growth.

The sub-Saharan African countries (Nigeria included) have for a long time been characterised by a worrisome problem of low savings and investment. As statistics show, private savings in sub-Saharan Africa declined from 11.4% of disposable income in the 1970s to only 7.5% in the 1980s and only recovering to less than 9% in the 1990s. In addition public saving in sub-Saharan Africa has remained low at less than 3% of disposable income in the 1990s, declining from 4.3% in the 1980s. The slowdown in Gross Domestic Investment (GDI) as a fraction of GDP has been equally dramatic. It declined steadily from 21% in the 1970s to about 17% in the 1990s. Consequently, the region has heavily been dependent on foreign savings, mostly overseas development assistance to

finance the gap between savings and investment, averaging slightly less than 11% of GDP for the period 1970-1995 (Elbadawi and Mwega, 2000).

Sub-Saharan Africa has the lowest savings rate in the developing world. While figures vary from country to country, gross domestic savings in the region averaged about 18 per cent of gross domestic product (GDP) in 2012, compared with 26 per cent in South Asia and nearly 43 per cent in East Asia and Pacific countries, according to World Bank estimates



Source: World Bank 2007

Figure 1.2 Gross Domestic Savings in Sub Sahara Africa

1.2 Statement of the problem

The effects of fiscal policy on the macroeconomics are of ongoing interest to economic policy makers. For example, the German government announced a 25 billion fiscal package at the beginning of 2006, thereby intending to stimulate the economy. However, the effects of fiscal policy on the macroeconomic are still object of empirical research, and stylized facts have not been

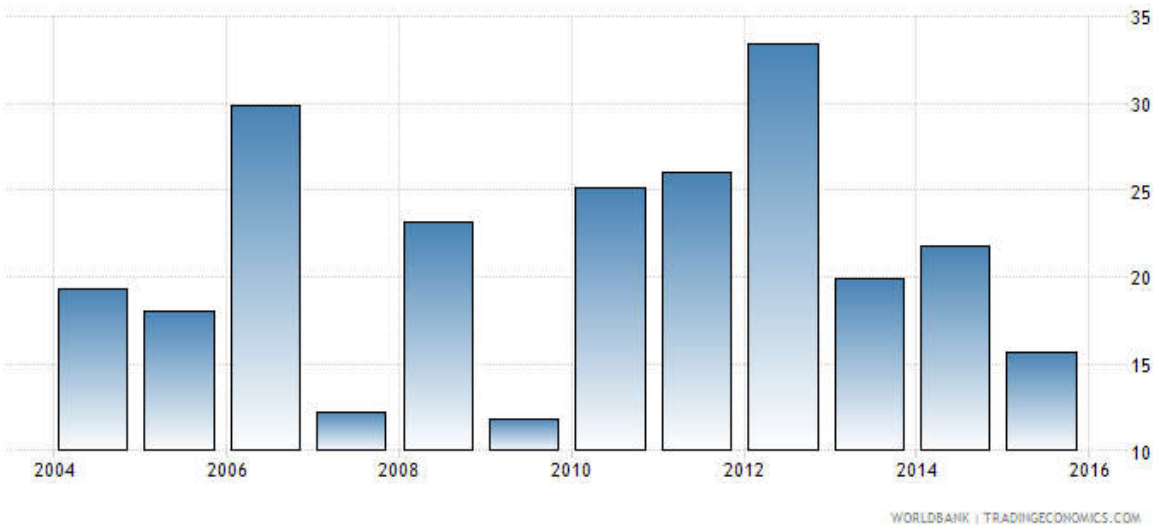
established yet, in contrast to analyses on monetary policy effects. Most studies investigate fiscal policy in the US (Blanchard and Perotti (2002), Fatas and Mihov (2001), Mountford and Uhlig (2005), Ramey and Shapiro (1997) among others). For Europe, the number of papers appears to be limited (see de Castro Fernandez and Hernandez de Cos (2006) for Spain, and Giordano, Momigliano, Neri, and Perotti (2007) for Italy). As for Germany, few studies exist (e.g., Hoppner (2003) and Perotti (2005)).

During the last three decades the relationship between fiscal policy and national saving has been at the center of many theoretical and policy debates. For instance, the 1988 crisis in Mexico, which had a global effect, was caused by huge deficits that quickly went beyond the government's capacity to repay. During the "Tequila Crisis" of 1994, low national saving contributed to huge macroeconomic problems. Although many authors, including Hernandez and Villagomez (2001) argue that the lack of national saving was not the cause of this crisis, they nonetheless agree that it helped to accelerate the process, leaving the country with huge liquidity constraints and restricted access to capital markets, thus curtailing its ability to grow. In the aftermath of these events, public policy makers and economic theorists suggested raising national saving levels by maintaining sound finances, and identified fiscal policy as the most important transmission channel.

It is known that public deficits reduce national savings and investment, and contribute to current account deficits. One common explanation for this phenomenon is that deficits tend to raise real interest rates which lead, in the short run, to a negative effect on balance sheets inducing individuals to consume less, invest less and save more, just like a negative wealth effect. However, in the long run, this effect on saving will be reverted by a fall in output. Most economists agree that public deficits reduce, in the long run, domestic capital stocks, and increase foreign debt, thus increasing the burden for future generations. Other economists believe that public deficits do not matter at all,

since they will be offset by the same amount of private saving in the long run. In any case, the impact of fiscal policy on national saving is an unsolved question in macroeconomics and justifies further empirical investigation.

In Nigeria, the rate of response of savings to fiscal incentives, however, has been abysmally low. Despite various fiscal policies been implemented by government, to raise domestic savings, the gross domestic saving (GDS) as a ration of gross domestic product (GDP) Moved in different direction.



Source: World Bank 2007

Figure 1.3 Nigerian Gross Domestic Product/ Savings

Figure 1.3 shows that the saving culture in Nigeria is very poor relative to other developing economies. For instance, during the period 2004 to 2008, domestic saving averaged 8.34 percent of GDP and decreased to average of 7.81 percent in 2010.

SVAR's have been used extensively to characterize the impact of monetary policy on the economy, e.g. Sims and Zha (1998), Bernanke and Mihov (1998) among others, but have not been applied as

often to fiscal policy. SVAR is a system of simultaneous equations and needs to be identified in order to have proper economic interpretation. One common procedure for identification is to impose a lower or upper triangular restriction on the contemporaneous coefficients matrix. This procedure, which results in a recursive system, was first proposed by Sims (1980) and is widely used in the macroeconomic literature. In this paper, we will pursue a sign restricted approach for identification. It is important to remark that this procedure implies imposing certain exogeneity restrictions on the endogenous variables, which needs theoretical or empirical justification. In terms of impulse-response analysis, identification is crucial since it makes it possible to properly simulate the effects of structural shocks on the dynamics of the system, which are different from reduced form shocks

1.3 Research questions

To serve as study guide, we provide the following questions for which this study will seeks to provide the answers:

i. What is the effect of government expenditure on household savings in Nigeria?

ii. What is the effect of tax rate on household savings in Nigeria?

iii. What is the total decomposition of aggregate shock in savings that is accounted by other macroeconomic variables?

1.4Objectives of the study

The broad aim of the research is to examine the effect of fiscal policy shocks on household savings in Nigeria. Other specific objectives the study aims to accomplish are;

(i) To examine the effect of government expenditure on personal savings in Nigeria.

(ii) To examine the effect of tax rate on personal savings in Nigeria.

(iii) To decompose aggregate shock in savings that is accounted by other macroeconomic variables.

1.5 Justification for the study

It has been generally accepted that accumulation and mobilisations of saving is crucial to the economic development. Currently, Nigerian economy is mostly based on the resource component; crude oil, natural gas and oil products. For economic diversification, the mobilisation of domestic savings into investment would prove very useful. This entails that there is desperate need for improvement in private savings (constituting corporate savings and household savings) that are more likely to be readily available for investible purposes and therefore have greater potential to contribute to growth.

Most of the literatures reviewed focus on income as the determinant savings in Nigeria. This study will make contribution by exclusively considering the impact of government expenditure and tax on household saving. Moreover previous studies under my review were based on simple regression analysis, a cross sectional data analysis, some employ multiple regressions with ordinary least square method and few employ Vector Autoregressive approach (VAR) approach. This study would employ SVAR frame work using time series data sourced from CBN statistical bulletin.

Based on the aforementioned facts, this study will significantly contribute to the existing literature by examining the impact of government expenditure and tax on household saving in Nigeria. Since research on this area is quite limited and the issue has not been adequately addressed in Nigeria.

1.6 Scope of the study

This study is limited to examine the transmission of shocks from fiscal policy to the household savings in Nigeria, within the specified period of 30 years (1986 – 2016), to achieve these household savings, government expenditure and tax rate were used as variables. The choice of time frame is to

incorporate the effect of Structural Adjustment Programme on the economy during the period under review.

1.7Organization of the study

This study will be presented in five (5) different chapters, where the first chapter is the general introduction, it comprises of background of the study, statement of the problem, research questions, objectives of the study justification of the study, scope of the study and organisation of the study. The second chapter reviews relevant related conceptual, theoretical and empirical literature on the subject matter. Chapter three presents research methodology that is adopted to achieve the research objectives and the reason for each method. This consists of explanation of types and sources of data, model specification and the choice of technique or method of data analysis. Chapter four present all the results, starting with the preliminary statistics and stationary tests, estimation, interpretation of results and the discussion of other findings will also be in this chapter. Finally, chapter five assess the findings, summarizes the study, and offer recommendation and implication for further study.

CHAPTER TWO

CONCEPTUAL, THEORETICAL AND EMPIRICAL LITERATURE REVIEW

2.0 Introduction

This chapter consists of three major interrelated parts: the first part is the conceptual part, which is concern with the conceptual definition of the variables. While the second part is the theoretical review, it reviews different theories of savings and third part is concern with empirical studies on savings.

2.1 Conceptual definitions

2.1.1 Concept of savings

According to PrinsLoo (2000) states that, ‘’ a general definition of saving in a country would be the amount of resources or income produced in the economy in a given year that is not consumed immediately but is put to use in a way that will provide returns to the economy in years to come’’ Saving is the “excess of income overconsumption expenditures”.

The national saving is the sum of saving by households, businesses, and all levels of Government. Consequently, a relatively moderate level of domestic saving could limit the country’s rate of investment. Restrain the rate of economic growth and make the country much more dependent on foreign capital.

Friedman (1975), defines personal savings in the national income accounts represents the residual obtain subtracting personal outlays from disposable person income consists of the after tax income of individual from wage and salaries (including fringe benefits or other labour income). Further defined personal saving to represent the changes in net worth of individuals place the amount saved

from currents income into tangible and financial assets and debt in the process of acquiring assets the change in net worth should equal to the amount of personal saving out of income.

2.1.2 Household savings

Saving by the household sector is defined as that part of current income, after the payment of direct taxes that is not consumed or transferred as part of household current consumption. Likewise, saving includes current consumption. Likewise, saving includes current disbursements made in the form of a reduction in household liabilities, such as repayment of capital on loans for housing and consumer durables. By contrast, any portion of the current expenditure of household not financed by current income but rather by the use of credit represents an increase in the financial liabilities of individuals and is treated as negative saving. In addition, personal saving includes regular and recurring employer and employee contributions to person and insurance funds and the interest earned on these funds. According to Prinsloo (2000) "Saving is also defined in terms of flows in the current account and excludes any capital gains and losses that might occur during the reference period."

Saving by the household sectors includes the retained income of unincorporated business enterprises and the retained income of non-profit institutions saving households.Saving by the household sector or personal saving is usually divided into two categories, namely contractual and discretionary saving. Contractual saving involves individuals committing themselves to a series of payment such as premiums on insurance policies, contributions to pension funds and the capital amount payable on household's mortgage loans. Discretionary saving, by contrast, refers to types of saving where households are not bound by any fixed commitments. All contractual saving normally stems from discretionary saving to the extent that contractual obligations are made on a voluntary basis. An exception is where the employee is bound by a contract of service to contribute to a pension fund.

2.1.3 Corporate saving

Saving in the corporate sector is the balancing item between the income and expenditure accounts, after the current receipts and payment of companies have been taken fully into consideration. It could also be described as the retained income and wealth and other net transfer payments made to the general governments, the household sector and the rest of the world. Corporate saving calculates according to these guidelines represents gross corporate saving. Net corporate saving comprises gross corporate saving after providing for the consumption of fixed capital and inventory valuation adjustment. The latter is the

Difference between the change in the book value of inventories and the physical change in inventories valued at the average prices prevailing during the period of change. This difference is a price changes (Prinsloo, 2000).

2.1.4 Saving by General Government

Saving by general government is the total of the retained profits of public enterprises and retained taxes and other current outlays by government. In contrast to households whose income consists mainly of factor income, the income of the general government consists of current transfers received from the private sector in the form of tax revenues and all current non-tax revenue. Tax revenue embraces all current taxes on income and wealth and taxes on production and imports (formally direct and indirect taxes), and non-tax revenue includes income from property, the cash operating surpluses of departmental enterprises, and some other current receipts such as times and forfeitures. On the expenditure side, current government expenditure includes all current outlays for goods and services by general government, covering the wages and salaries of government employees and outlays on other non-capital goods and services. This component also includes some defence

expenditure and an imputed expense for the capital consumption of fixed assets by general government.

The remaining part of current expenditure by general government consists of interest payments on public debt, including the discount on issues of government stock, subsidies and other transfers to the household sector and the rest of the world.

2.2 Macroeconomic important of saving

Saving is one of the most important macroeconomic variables in any economy because of its effects on the rate of capital accumulation as well as productivity and its impact on the degree of dependency of a nation on foreign capital and foreign ownership of domestic assets. Historical evidence and empirical analysis indicates that a high level of domestic saving will accelerate the rate of capital formation, enhance productivity and consequently improve the standard of living of the general populace.

In recent times, economic analysts have been using a country's absolute level of saving and its level relative to that found in other countries as a yardstick for measuring the capability of a country to achieve sustainable growth and development on the one hand, and for measuring the difference between the rate of growth in one country and the other.

The place of saving in any country could be perceived within a simple National Income Accounting framework of an open economy. According to this framework, we have the following identity:

$$\boldsymbol{Y = Cg + Cp + Ig + Ip + X - M} \ldots (2.1)$$

Where $\boldsymbol{Y}$ = Gross Domestic Product of the economy;

$\boldsymbol{Cg}$= Recurrent (Consumption) expenditure of the public sector;

Cp = Consumption expenditure of the private sector;

Ig= Capital (investment) expenditure of the public sector

Ip = Investment expenditure of the private sector

X = Total domestic exports; and

M= Total domestic imports

But we can represent ***Cg*** + ***Cp***by ***C*****;** and ***Ig*** + ***Ip***by ***I***, where ***C*** and ***I*** stand for total domestic consumption and total domestic investment, respectively. Making use of ***C*** and ***I***, equation **(2.1)** can be re-written as thus:

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

Rearranging equation (2.2) above will yield**;**

$$\boldsymbol{(Y - C) - I - (X - M) = 0} \ldots (2.3)$$

But ***(Y – C)*** is the total domestic savings in our hypothetical economy and could be Depicted by ***S***. Substituting **S** into equation (2.3) above will give the following

Expressions:

$$\boldsymbol{S - I = X - M} \ldots (2.4)$$

The left hand side of equation (2.4) is the domestic savings gap and the right hand side is called the trade gap. The expression in equation (2.4) indicates that a trade deficit reveals itself in the form of an excess of domestic investment over savings. In other words, the expression states that domestic investment is financed from domestic and foreign savings. The equation also implies that the gap

between investment and domestic savings in an economy will be reflected in the pressure on the balance of payments position of the country.

The wider the gap between domestic savings and investment, the more the dependency of the domestic economy on foreign capital and foreign ownership of domestic assets and vice-versa. In particular, if domestic savings are negative, external savings will finance total domestic investment as well as the excess of consumption over domestic production.

This is easily seen if we re-write equation (2.4) as:

$$(\boldsymbol{M} - \boldsymbol{X}) - (\boldsymbol{I} - \boldsymbol{S}) \ldots (2.5)$$

Or

$$(\boldsymbol{M} - \boldsymbol{X}) = \boldsymbol{I} - (\boldsymbol{Y} - \boldsymbol{C}) \ldots (2.6)$$

Equation (2.5) could be of particular interest if we assume that domestic savings and exports are fixed. Under this assumption, an increase in domestic investment can only come through an increase in the inflow of foreign capital which in most cases will come in the form of borrowing or foreign ownership of domestic assets or the combination of the two sources. Either of these alternatives will put debt burden on the domestic economy with its attendant adverse effects on its (the economy's) rate of growth and development (World Bank, 1989), foreign ownership of domestic assets may imply heavy repatriation of profits (which reduces the multiplier effect of such investments), from the domestic economy on the one hand, and loss of economic sovereignty by the domestic economy on the other hand. While it could be argued that the situation described here is an external one, the greater is either the burden of external debt on the domestic economy or the higher will be the degree of dependency of the domestic economy on foreign ownership of domestic assets or both.

This last phenomenon describes what happens in most developing economies with serious urge for rapid economic development in the face of relatively low MPS and severe structural rigidities. The foregoing exposition reels that for a country to attain sustainable economic growth and development there must be a combination of suitable policy and institutional framework that will stimulate savings of the economy. Based on this argument, a good number of developing countries, including Nigeria, have embarked on large scale economic reform programmes that also touch on the financial sector with a view to stimulating total savings and hence pave the path for the much desired rapid economic development. Nigeria, in particular, deregulated its financial system under the Structural Adjustment Programme (SAP) of 1986 in order to positively influence the marginal propensity to save by further promoting saving habits in the economy, among other consideration **(**Afolabi, and Halsan; 1994: 38).

2.3 The concept of Fiscal policy

Fiscal policy is concerned with deliberate actions which the government of a country take in the area spending money and or levying taxes with the objective of influencing macroeconomic variables such as the level of national income or output, the employment level, aggregate demand level, the general level of prices etc. in a desired direction. Bhatia (2015) noted that fiscal policy consists of steps and measures which the government takes both on the revenue and expenditure sides of its budget and that it is the aggregate effects of government expenditures and taxation on income, production and employment. Dwivedi (2012) stated that it is government's programme of taxation, expenditure and other financial operations to achieve certain national goals. He posited that whatever the objectives and the order of priorities, the two basic instruments of fiscal policy used to achieve social goals are taxation and government expenditure. Again, Ijeh (2008) refer to fiscal policy as government action plan concerning how to raise funds and disburse funds. He further

posited that it is the use of government revenue and expenditure programmes to affect the economy in a way to produce desirable effect such as achieving full employment, general good price level, aggregate demand and economic growth and development. He noted that the instruments of fiscal policy are taxation, government expenditure, government budget, public debts and subsidy. Government intervention in the economy through its fiscal policy is usually enunciated in its budget. Government tries to manipulate the fiscal policy instruments to stabilize the economy and achieve a desired level of economic growth. Bhatia (2015) posited that when an economy is stabilized, investment decisions are more favourably effected as consumption expenditure does not fall below certain minimum level and forms a cushion against economic contraction.

There are two types of fiscal policy that government applies to combat with the recession and inflation which are expansionary and contractionary fiscal policy.

Government used expansionary policy to overcome a recession. In the expansionary policy, government will increase their spending and decrease the tax charge on the households and firms. Over the period of recession, people will buy less on goods and services or they will just concern on buying the fundamental goods, thus it lead to a decrease in the demand of goods and services. At the equilibrium, someone spending will always become the others person income. Hence, a decrease in spending refers to a decrease in income. In order to boost the economy, government increase their spending through some activities, such as spending on building the highway, education sponsor, health care programs and so on. Furthermore, government also decreases the tax that increases the people disposable income and indirectly encourages people to spend more.

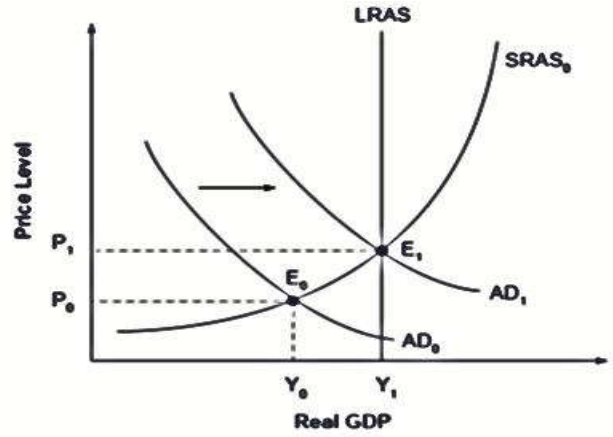


Figure 2.1 Expansionary Fiscal Policy.

The original equilibrium (E0) represents a recession, occurring at a quantity of output (Y0) below potential GDP. However, a shift of aggregate demand from AD0 to AD1, enacted through an expansionary fiscal policy, can move the economy to a new equilibrium output of E1 at the level of potential GDP. Since the economy was originally producing below potential GDP, any inflationary increase in the price level from P0 to P1 that results should be relatively small.

Contractionary fiscal policy serves by government to fight against the inflation. The high demand of goods and services will lead to inflation which called demand-pull inflation. In order to combat with this high price level, government decreases their spending and increases the tax rates. A decrease in government spending will in turn affect the aggregate demand curve decrease and shift downward. With the real GDP unchanged, the overall price levels of goods and services reduce due to the aggregate demand curve shift downward. Besides, government also decreases the demand by increase the tax rates so that people will have lesser disposable income to spend on goods and services.

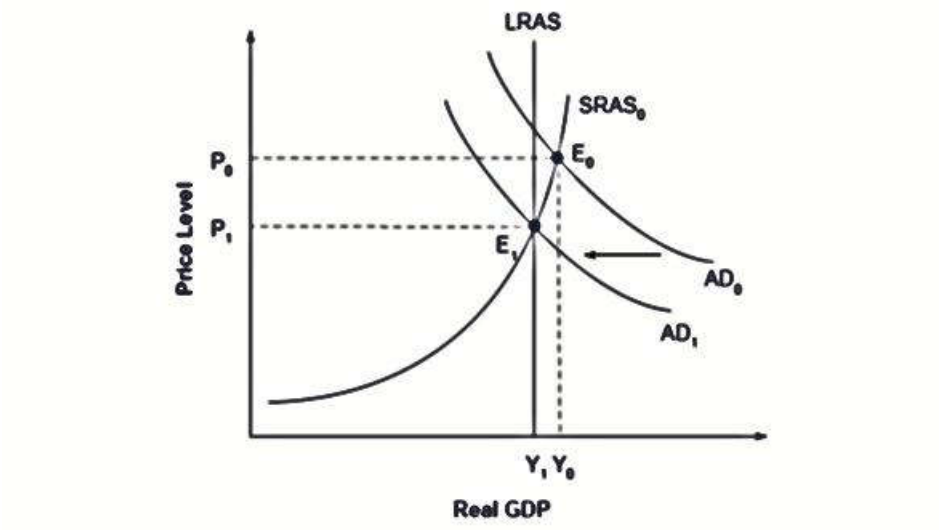


Figure 2.2. A Contractionary Fiscal Policy.

The economy starts at the equilibrium quantity of output Yr, which is above potential GDP. The extremely high level of aggregate demand will generate inflationary increases in the price level. A contractionary fiscal policy can shift aggregate demand down from $AD_0$to AD_1, leading to a new equilibrium output E_1, which occurs at potential GDP.

When government applied fiscal policy at work, there are three types of multiplier effects which included government spending multiplier, tax multiplier and balanced-budget multiplier. The government spending multiplier refers to the ratio of change in the real GDP to a change in a government spending while tax multiplier means the ratio of change in the level of output to a change in taxes. (Karl E. Case, Ray C. Fair, Sharon M. Oster, 2009) The balanced-budget multiplier shows the equal change in government spending and taxes which simultaneously changes the aggregate demand by the amount of the change in government spending (Tucker, 2010).

2.4 The concept of Shock

In economics, a shock is an unexpected or unpredictable event that affects an economy, either positively or negatively. Technically, it refers to an unpredictable change in exogenous factors — that is, factors unexplained by economics — which may influence endogenous economic variables (Wikipedia).

The response of economic variables, like output and employment, at the time of the shock and at subsequent times, is measured by an impulse response function.

If the shock is due to constrained supply, it is called a supply shock and usually results in price increases for a particular product. A technology shock is the kind resulting from a technological development that affects productivity. Supply shocks can also be produced when accidents or disasters occur. The 2008 Western Australian gas crisis resulting from a pipeline explosion at Varanus Island is one example (Wikipedia).

An inflationary shock happens when prices of commodities increase abruptly (e.g., following a decrease in government subsidies)while not all salaries are adjusted immediately throughout society (this leads to a temporary loss of purchasing power for many consumers); or that production costs fall behind corporate revenues for the same set of reasons (e.g. following energy price hikes).A demand shock is a sudden change in patterns of private expenditure, especially of consumption spending by consumers or of investment spending by businesses. A monetary policy shock occurs when a central bank departs, without advance warning, from its pattern of interest rate or money supply control. A fiscal policy shock is an unexpected change in government spending or taxation levels. In the context of microeconomics, shocks are also studied at the household level such as health, income, and consumption shocks. For example, in development microeconomics the

relationship between household income shocks and household levels of consumption is studied to understand a household's ability to insure itself(testing the full-insurance hypothesis).

2.5 THEORETICAL LITERATURE

There are a number of theories from the literature that explains saving behaviour of economic agents. These theories are Absolute Income Hypothesis (AIH) by Keynes (1936), Relative Income Hypothesis (RIH) byDuesenberry (1949), and Life-Cycle Hypothesis (LCH) by Modigliani (1963).

2.5.1The Keynesian theory

This theory focuses on current income to explain changes in savings and consumption behavior of economic agents.According to Keynes (1936), saving is a function of the absolute level of income. Other things being equal, a rise in absolute income causes an increase in fraction of that income to be saved. Keynes identified absolute income as a major determinant of savings. He defined savings as the amount left over when the cost of consumer expenditure is subtracted from disposable income that consumer earns in given period of time. Following the work of Keynes, it is widely accepted that the level of income exerts a positive influence on savings. According to Keynes, “Men and women are disposed as rule to increase their consumption as their income increase, but not as much as the increase in their income.” He thus makes a point that consumption depends on and is a positive function of the level of absolute income though consumption expenditure does not have a proportional relationship with income. As income increases, the average propensity to consume and the marginal propensity to consume tends to fall. This implies then that the proportion of income that is saved increases with increase in income.

When income increases, the increased income will be divided in some proportion between consumption and saving. This is because when the whole increased income is not spent on

consumption, the remaining is saved in this way consumption and savings moves together(jhingan,1984).

2.5.2 Permanent income hypothesis

The permanent income hypothesis was developed by an American economist Milton Friedman (1957) and says that a person spending decision are guided by what they think over their life time will be their average (known as permanent) income. It suggests that people will save an unexpected income also known as windfall gains (Economist.com, 2005). The permanent-income hypothesis observes that the expectations of income in the future do have a significant bearing upon the present consumption spending and savings out of a given income of the community.

According to Friedman, the actual or measured income (Y_m) is composed of permanent income (Y_p) and transitory income (Y_t).

Thus,

$$Y_m = Y_p + Y_t \dots (2.7)$$

Similarly, actual measured consumption (C_m) is said to be composed of permanent consumption (C_p) and transitory consumption (C_t).

Thus,

$$C_m = C_p + C_t \dots (2.8)$$

It follows thus that actual measured savings (S_m) are constituted by permanent saving (S_p) and transitory savings (S_t).

Thus:

$$S_m = S_p + S_t \ldots (2.9)$$

Obviously,

$$S_m = Y_m - C_m or S_m = (Y_p + Y_i) - (C_p + C_t) \ldots (2.10)$$

Friedman reasons out that $C_p = kY_p$ where k is the factor of proportionality and depends on interest rate (i), the ratio of non-human to total wealth (u), and other variables like age, tastes, etc. denoted by $k = f(i, w, u)$

Indeed, these factors, and so K too, are independent of the level of permanent income. Permanent consumption is the value of the services that the community planned to consume during the period in consideration. Transitory consumption (C_t) refers to unanticipated additions or subtractions in consumption. Similarly, transitory income (Y_t) refers to unanticipated additions or subtractions in income.

The idea behind the permanent-income hypothesis is that consumption depends on what people expect to earn over a considerable period of time. People base consumption on what they consider their "normal" income. In doing this, they attempt to maintain a fairly constant standard of living even though their incomes may vary considerably from month to month or from year to year. As a result, increases and decreases in income which people see as temporary have little effect on their consumption spending

Milton Freidman assumes that by making educated guesses as to their future incomes, people derive a sum they treat as their “permanent income” a much stable aggregate than their actual earnings. What is spent or saved is determined by reference to their permanent income. And any unexpected increase in income is treated as transitory and frequently saved.

The extreme version of Freidman's permanent income hypothesis hold that consumptions approaches 100% of permanent income and saving 100% of transitory income. Modified versions, however, hold only that saving out of permanent income is constant over a person's life time but can be positive. And although propensity to save out of transitory income is high not all such income may be saved.

Thus, consumption smoothening models in their forms predict that temporal fluctuation in income should go into savings. If households are not credit constrained and the temporal fluctuations do not affect the perception of permanent income, consumption would not change at all in response to temporal fluctuations and most of it would be saved. Household tend to be credit constrained, however, particularly in developing countries.

2.5.3 Life cycle hypothesis

Majority of the studies on determinants of household savings have made use Life Cycle Hypothesis propounded by Albert Ando and Franco Modigliani in 1963.the hypothesis assume that individual is a rational being who attempts to maximize utility subjects to his budget constraint. According to the hypothesis, a typical individual have a flow of relatively low income at the early stage and end of life, but high during the middle of life. The individual does maintain a slightly increasing level of consumption throughout his life, and the present value of total consumption would not exceed the present value of total income during the lifetime.

Life cycle hypothesis assumes that individuals spend their lifetime consumption evenly over their life by accumulating savings during earnings years and maintain consumption levels during retirement. Tests of the life cycle hypothesis are therefore mainly concerned with the effect of demographic variables such as age groups, birth rates, and dependency ratios on saving behaviour.

The second of variables used to describe savings during working life and saving during retirement are financial variables such as interest rate, inflation, and available financial instruments. Both theories acknowledge there is a relationship between savings and the variables such as: interest rate, income and inflation, to mention but a few.

In the life cycle hypothesis, people smooth out fluctuations in income so that they save during periods of unusually high income and dis-save during periods of unusually low income. Someone who looks ahead to a much higher future income consumes more accordingly.

The life-cycle hypothesis suggests that in the early life, a person is a net borrower; in the middle years, the person will save much more to repay the debt and to put aside part of the income for retirement; in the later years, a person will dissave and consume more than income. Thus by relating the aggregate consumption function to the present value of the expected aggregate income, the APS (also the APC) should remain unchanged as time passes, other things being equal.

In fact, if each person saves zero over his life, then the *APS=0* and *APC=1*.

The life-cycle hypothesis also introduced assets into the consumption function, and thereby gave a role to the stock market. A rise in stock prices increases wealth and thus should increase consumption while a fall should reduce consumption. Hence, financial markets also matter for consumption.

Furthermore, the life cycle and permanent income hypothesis are less likely to be binding in the less developed countries given the multidimensional and multigenerational nature of households. That is to say households first accumulate and then dis-save. Since adults expect their children to support them in their old age; they may be little need for lamp or retirement savings as a vehicle for transferring income between high and low income productivity phases of their life cycle (as the life

cycle model postulates). In such households, savings are a buffer against stochastic decrease in income.

2.6 Theoretical framework.

The theoretical framework for this study is based on Keynes (1936) absolute income theory. According to this theory, current income explains changes in savings and consumption behavior of economic agents. This theory shows how savings is linked with the fiscal variable through the accounting identity. From the accounting identity, national output is the sum of aggregate demand component which government expenditure is a part. Government expenditure is one of the fiscal tools used by the government for stabilizing the economy. Based on the traditional Keynesian theory, Mankiw (2007) showed that increases in government purchases and/or cuts in taxes reduce national saving. Also, Hayford(2005) described the relationship between fiscal policy and national saving using Keynesian framework. Unarguably, this theory fits in for this study since the major objective is to investigate the interaction of fiscal variables shocks and savings dynamic.

2.7 Review of empirical literature

There exist abundant of empirical literature that have been carried out elsewhere and in Nigeria trying to pimp point the impact of different variables of interest on savings dynamics. The studies employed different techniques of econometrics such as Ordinary Least Square (OLS) method, Error Correction Model (ECM), Vector Autoregressive Model (VAR), structural Vector Autoregressive Model (SVAR), and simultaneous equation model (S.E.M). Henceforth, these studies have come out with inconclusive and conflicting findings. Following below are some of the reviewed literature.

Hussain (1996), examine the long-run behavior of saving in Pakistan. The study employed error correction model and co-integration approach in order to test long-run relationship among variables.

The empirical results from the study reveals that financial deepening and development account for much of the rise in private saving, Population growth also found to be negatively related to savings. The major limitation of this study is that the variables used did not cover the major determinant of savings identified in the literature.

Mwega (1997), conducted a comparative analysis of average private saving rates in 15 African countries for the period 1970-1993 and found a negative and highly significant coefficient on fiscal balance. Concretely, a 1 percent increase in government budget surplus was found to reduce the private saving rate by up to 0.9, implying full Ricardian Equivalence.

Callen and Thimann (1997) studied the empirical determinants of household saving in USA using cross sectional and panel data from 21 OECD countries for 1975-95. It was found that household saving fell from 13% during 1975-81 to only 11% in 1982-89 but it has then stayed stable in general. Variables that capture the structure of the tax system and the financing and generosity of the social security and welfare system were added to the set of potential explanatory variables. The results indicated that there was a central role for public and corporate saving, growth, and demographics in controlling household saving, while some other role was also established for inflation, unemployment, the real interest rate, and financial deregulation. The results also proposed that the tax and the social security and welfare systems had an important impact on household saving.

Corbo and Schmidt-Hebbel(199 cited in Mwega1997),Mwega(1997) And Elbadawi and Mwega(1998)have used public saving as explanatory variable in their saving equation. For the sample Of LDCs they found negative and statistically significant effect of public saving on private saving. On the other hand, Government consumption is found to have a positive and significant effect in Mwega's (1997) and Elbadawi and Mwega's(1998)studies.

Given the importance of controlling for the joint endogeneity of saving and income growth, a panel instrumental-variable approach to estimate the effect of income growth on saving was carried out by Loayza, Schmidt-Hebbel, and Serven (2000). They found that a one percentage point rise in growth rate increases the private saving rate by a similar amount, although this effect may be partly transitory. In their study, they utilized the world saving database, whose broad coverage makes it the largest and most systematic collection of annual time series on country saving rates and saving-related variables, spanning 35 years (1960 – 1994) and 134 countries (112 developing and 12 industrial).

Kraay (2000), used panel data on Chinese provinces from China's household survey to analyze the determinants of the saving rates of rural and urban households during the 1978-83 and 1984-89 periods and found that, in the case of rural households, future income growth has a negative and significant impact on their saving rates, that the share of food in total consumption has a negative and significant impact on their saving rates, presumably because households closer to the subsistence level have less ability to save, and that neither the dependency ratio (proxied by the ratio of population to employment) nor future income uncertainty has a significant impact on their saving rates. In the case of urban households, virtually none of the explanatory variables has a significant impact on their saving rates.

Burnside (2000), using structural vector autoregression (SVAR) finds that positive shocks on world oil prices, on the monetary policy of the U S, and on the tax revenues of the Mexican government have a negative effect on the Mexican private saving rate, while positive shocks on government consumption-innovations and on the depreciation rate have a positive effect.

Obadan and Odusola (2001) employed both graphical analysis as well as Granger Causality tests to determine the impact of growth on saving. Their results revealed that growth of income does not

Granger-cause saving, suggesting that saving is not income-induced in Nigeria. Evidence on the reverse causation argument also shows that saving does not Granger-cause growth. The findings therefore do not show any direction.

Turning to Modigliani and Cao (2004), they conducted a regression analysis of the determinants of the household saving rate using times series data for the 1953-2000 period and found that the long-term growth rate, the reciprocal of the dependency ratio (proxies by the ratio of the employed population to the number of minors), the deviation of growth from the long-term growth rate, and inflation all have positive and significant impacts on the household saving rate.

Thus, the two studies obtain somewhat conflicting results. Kraay (2000) finds that the dependency ratio does not have a significant impact on the household saving rate, whereas Modigliani and Cao (2004) find that it does. Moreover, Kraay (2000) finds that future income growth has a negative and significant impact on the household saving rate, whereas Modigliani and Cao (2004) find that the long-term growth rate and the deviation of growth from the long-term growth rate have a positive and significant impact on the household saving rate.

Hayford (2005) uses structural vector auto regressions (SVAR) along with structural measures of fiscal policy to measure the dynamic impact of fiscal policy shocks on the output gap and national saving in the USA. Positive shocks to government purchases and negative shocks to real net taxes are found to increase the output gap. Positive shocks to the government's structural surplus increases national saving although the effects are small. Positive shocks to government purchases are found to substantially reduce national saving. Negative shocks to real net tax revenues as a share of potential GDP have a small negative impact on national saving.

Kirsten, Jörn, and Guntram (2006) investigate the short-term effects of fiscal policy shocks on the German economy following the SVAR approach by Blanchard and Perotti (2002). They find that

direct government expenditure shocks increase output and private consumption on impact with low statistical significance, while they decrease savings, though insignificantly. Allowing for anticipation effects of fiscal policy does not change the sign of the positive consumption response. Anticipated expenditure shocks have significant effect son output when the shock is realized, but not in the period of anticipation.

Similarly, Nwachuku and Egawikhide(2007), examines the determinants of private saving in Nigeria by comparing the estimation results of the Error-Correction Model with those of three conventional models: Partial-Adjustment, Growth Rate and Static Models. The conclusion is that the ECM performs much better than the other models. Its results reveal that the saving rate rises with the level of disposable income but falls with the rate of growth of disposable income. The real interest rate on bank deposits has a significant negative impact while public saving seems not to crowd out private saving. Furthermore, external terms of trade, inflation rate and external debt service ratio have a positive impact on private saving.

LumengoBonga-Bonga (2008) investigates the response of savings to fiscal shocks in South Africa. He adopted the structural vector autoregressive (SVAR) methodology and derived a structural impulse response functions (IRF). The paper concludes that the in the long term the response of national saving to fiscal policy shocks is neutral.

Rodolfo, Broth, and Alejandro (2008) used structural vector auto regression (SVAR) models to characterize the dynamic impact of fiscal policy on national saving in Mexico. From their results, they found that fiscal policy has a positive impact on national saving, has negative impact on private savings in shorter horizons but not over longer horizons, and a negative effect on the output gap.

Ang (2009), examined the determinants of household savings in India and China by modifying the lifecycle model to account for the expected benefits of pension saving. The results supported the prediction of the life cycle model that growth in income and inflation stimulates the growth in household savings, whereas age dependency has the opposite impact on savings. Furthermore, the results suggested that the expected increase in pension benefits tended to encourage the savings in India in the long run, whereas the reverse association was found for China.

In line with the notion that there is positive relationship between real income and savings,Nwachuku and Odigie(2009) conducted a study on trend in Nigerian saving behaviour, the aim of the paper was to analyse the sources and trend of saving behaviour in Nigeria. The study employed error correction modelling procedure. The results of the analysis show that saving rate rise with both the growth of disposable income and the real interest rate on bank deposits. Income level has a positive impact on saving while public saving does not tend to crowd out private savings.

Using simultaneous equation approach Brownson, Joshua and Aya (2011) analyses saving determinants among agro-based firm workers in Nigeria. The result of the analysis revealed that income, tax, job experience, education family size and membership of social group influence saving attitude of workers.

Liu & Hu's (2013) adopted the Keynesian hypothesis and Life-cycle hypothesis, variable includes per capita income and income growth, dependency ratio. They also test real interest rate, inflation rate, population average life expectancy, proportion of food consumption expenditure to total consumption expenditure. The empirical result shows that income has a positive impact on household saving rate in China. However, the result fails to pass the significant of income growth and dependency ratio.

Eze and Okpala (2014), investigated the impact of selected proximate determinants of domestic private savings in Nigeria for the sample period 1970 to 2010. Ordinary least square (OLS) technique and Johansen co integration were used in the empirical analysis. The variables namely, domestic private savings, gross domestic product, money supply, real interest rate, and inflation rate were found to be co integrated. The estimated long run regression indicated that all the variables are highly significant determinants of private domestic savings in Nigeria.

Saqib, Panezai, Hidayat, Ali, and Usman (2016), employ simple multiple regression to explore the relationship between household saving and socioeconomic determinants in rural and urban areas of Pakistan. Their results showed that income, age, and employment had a significant and positive association with household savings whereas education had a significant negative association with household savings.

In Saqibet, al, (2016), there exists a lacuna in their work because they were very silent on the concept of Life cycle hypothesis which remain the cornerstone in analyzing savings behavior. Effort should have been made by them to appreciate the good work of Ando and Modigliani which lead to the development theory of savings

One way of augmenting public saving is through taxes. It is argued that this situation brings about what is called the Ricardian Equivalence. Most empirical studies for industrial Countries reject the Ricardian equivalence. Studies for developing countries also dismiss it in its pure form and agree that public saving offsets some private saving (Haque and Monties 1989; Corbo and Schmidt-Hebble et al 1991; Easterly Rodgigues and Schmidt-Hebble et al 1994; Edwards 1995, all cited in Schmidt-Hebble et al (1996) and Masson et al (1995)). These results show that public saving is an effective tool in raising national saving (Schmidt-Hebble et al 1996, p. 99).

2.8 Research Gap

A few empirical works exist in the literature that focused on the investigation of fiscal shock effect of savings. The review of literature undertaken in this study revealed the absence of investigation in the saving response to fiscal shocks in Nigeria. This forms the existing literature gap which the study tends to address.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents and discusses the tools and methods used in the data analysis, the types of data used in the study and the description of the variables included in the models. The study try to adopt some of the recent developments in time series econometrics in examining the dynamic of the transmission of shocks from fiscal policy to household saving, with the introduction of some control variables in order to avoid the problem of misidentification and to improve the robustness of the proposed models. The data used is primarily a time series data containing a quarterly time series data of the variables spanning between 1986:1 and 2016:4 that were sourced from secondary sources. This is followed by the specification of the empirical model estimated and its specific features. The research thereafter, discusses the econometric procedure employed in the estimation of the empirical model which began with the statistical diagnostic tests, namely the unit root tests was carried out in order to determine the stationarity properties of the series and to avoid running into spurious regression problem.

3.1 Theoretical Framework

The theoretical framework for this study is based onKeynes (1936) absolute income theory.According to this theory,current income explains changes in savings and consumption behavior of economic agents. This theory shows how savings is linked with the fiscal variable through the accounting identity. From the accounting identity, national output is the sum of aggregate demand component which government expenditure is a part. Government expenditure is one of the fiscal tools used by the government for stabilizing the economy. Based on the traditional

Keynesian theory, Mankiw (2007) showed that increases in government purchases and/or cuts in taxes reduce national saving. Also, Hayford(2005) described the relationship between fiscal policy and national saving using Keynesian framework. Unarguably, this theory fits in for this study since the major objective is to investigate the interaction of fiscal variables shocks and savings dynamic.

3.2 Model specification

We specify a suitable model to investigate the dynamic relationship and to examine the transmission of shocks from some fiscal policy variables to the personal saving dynamics in Nigeria by writing our theoretical model in algebraic functional form as follows;

$$PS_t = f(GS_t, INT_t, INF_t, TAX_t) \dots (1)$$

Equation (1) shows personal savings as a function of government spending, tax rate, interest rate, andinflation rate respectively. Given the above, we can therefore specify our empirical model which is a modified version of Sakyi and Opoku (2015) and Alexander (2014) in the following form:

$$PS_t = \beta_0 + \beta_1 GS_t + \beta_2 INT_t + \beta_3 INF_t + \beta_4 TAX_t + \varepsilon_t \dots (2)$$

Where, PS is the personal saving, GS is the government spending representing cyclical variables, INT is the rate of interest, INF is the rate of inflation and TAX is the overall government tax representing fiscal policy stance, $\varepsilon_t$is the error term.

3.3 Estimation Techniques

3.3.1 Unit Root Test

Non-stationarity of time series data used by economists perhaps present the most fundamental and most common complicating issue econometricians are confronted with. Therefore, before estimation of our model, tests for stationarity i.e. unit root tests will be conducted on the variables to determine

the stationarity or otherwise of the variables by using Augmented Dickey-Fuller tests (ADF test), Phillips and Peron (PP) test and in addition, unit root tests with structural breaks are also specified. The following equation present the possible form of the ADF test:

$$\Delta y_t = \mu + \delta t + \rho y_{t-1} + \sum_{t=1}^{p-1} \pi_t + \varepsilon_t \ldots (3)$$

$$\Delta y_t = \mu + \rho y_{t-1} + \sum_{t=1}^{p-1} \pi_t + \varepsilon_t \ldots (4)$$

$$\Delta y_t = \rho y_{t-1} + \sum_{t=1}^{p-1} \pi_t + \varepsilon_t \ldots (5)$$

Equation (3) is the ADF-test with both a constant and time trend, equation (4) specifies the ADF-test with a constant only and no time trend, and equation (5) specifies the ADF-test with no constant and no time trend respectively. The unit root presence will be tested based on the null hypothesis of a unit root, i.e. whether the parameter $\rho = 0$ or otherwise in the three equations above. If ρ equals zero, the series contains a unit root and if it is not, the series is referred to as stationary.

Phillips-Perron (1988) modified the ADF test procedure to incorporate a known structural change into the tests for unit root. The test was developed in order to take care of the wrong assumption made by ADF that "the error terms are statistically independent and have a constant variance" (Asteriou and Hall, 2007). Thus, when the precise data of the structural break is unknown and if the residual process is heterogeneous, or weakly dependent, the alternative Phillips-Perron test can be used. However, the PP test also like the ADF, test the null hypothesis (H_0); there is a unit root in the series and the alternative hypothesis (H_1) is that there is no unit root in the series respectively.

3.3.2 The Structural Vector Autoregressive (SVAR) Model

In order to investigate the transmission of shocks from fiscal policy variables namely government spending and tax rate to personal savings and also how the shocks are transmitted to other macroeconomic variables. The study employed structural VAR model. The SVAR framework is generally focused on how the innovations to one endogenous variable affect other endogenous variables included in the model. Specifically, the justification for using structural vector auto regression (SVAR) is to examine the transmission of shocks from government spending and tax cut to personal savings and other macroeconomic variables. Whilst new open economy models (NOEM) were extensively utilized to analyze country level studies that predict the exchange rate and the current account, these models are normally outperformed by Structural VAR (SVAR) models (see Bergin 2006). Consequently, most empirical studies that analyze country specific current account dynamics use SVAR models and utilize Blanchard &Quah (1989)'s identification restrictions (see Hofmann 2003, Corsetti& Muller 2006, Lee & Chinn 2006, Kano 2008, Kim &Roubini 2008). The prominent use of SVAR models in analyzing macroeconomic determinants of country level current account balances, and their general outperformance of New Open Economy Models (NOEM) motivates the application of SVAR models in this study.

Thus, a structural VAR model serves as a good statistical tool for describing and analyzing the dynamic effects of innovations in the structure of a particular economy and it will be estimated in order to obtain a non-recursive orthogonalization of the error terms for the purpose of impulse response analysis. In analyzing the dynamic effects of a VAR model, identification is a necessary step in order to ensure that the impulse response functions yield proper structural interpretations.

To implement the empirical specification, we follow the model by Kim &Roubini (2008), who analyze the effect of fiscal and monetary variables on the current account, and the identification

scheme abstracts from the model by Kim (2001) who extend the closed economy identification of monetary policy to an open economy. We use VAR models to isolate the exogenous component of shocks, with the economy described by the structural equation below;

$$G(L)_{yt} = e_t \dots (9)$$

In equation (9) above, y_t is the data vector in the baseline model given by $\{INF; INT; TAX; GS; PS\}$ where all variables remain as defined before, $G(L)$ is the matrix polynomial in the lag operator, and e_t is a vector of serially uncorrelated structural disturbances. The structural model is based on the reduced form model below:

$$y_t = B(L)_{yt} + u_t \dots (10)$$

To recover structural parameters from the reduced form equation, an alternative class of structural VAR models in which structural shocks are identified by restricting the sign of the responses of selected model variables to structural shocks will be employed. This approach was pioneered by Faust (1998), Canova and De Nicolo (2002) and Uhlig (2005) in the context of VAR models of monetary policy. Uhlig, 2005 showed that sign-identified models may produce substantially different results from conventional structural VAR models. Sign-identified VAR models have become increasingly popular in other areas as well and are now part of the mainstream of empirical macroeconomics. They have been used to study fiscal shocks (e.g., Canova and Pappa 2007; Mountford and Uhlig 2009; Pappa 2009), technology shocks (e.g., Dedola and Neri 2007), and various other shocks in open economies (e.g., Canova and De Nicolo 2002; Scholl and Uhlig 2008), in oil markets (e.g., Baumeister and Peersman 2010; Kilian and Murphy 2011), and in labor markets (e.g., Fujita 2011).

Identification in sign-identified models requires that each identified shock is associated with a unique sign pattern. Sign restrictions may be static, in which case we simply restrict the sign of the coefficients in B_0^{-1} . Unlike traditional exclusion restrictions, such sign restrictions can often be motivated directly from economic theory. In addition, one may restrict the sign of responses at longer horizons, although the theoretical rationale of such restrictions is usually weaker.

For a given set of sign restrictions, we proceed as follows. Consider the reduced-form VAR model $G(L)_{yt} = e_t$, where y_t is the *K*-dimensional vector of variables, $G(L)$ is a finite-order autoregressive lag polynomial, and e_t is the vector of white noise reduced-form innovations with variance-covariance matrix Σ_ε. Let u_t denote the corresponding structural VAR model innovations.

The construction of structural impulse response functions requires an estimate of the $K \times K$ matrix B_0^{-1}in $\varepsilon_t = B_0^{-1}u_t$.

Let Pdenote the lower triangular Cholesky decomposition that satisfies $\Sigma_\varepsilon = PP'$. Then $B_0^{-1} = PD$ also satisfies $\Sigma_\varepsilon = B_0^{-1}B_0^{-1\prime}$ for any orthogonal $K \times K$matrix D. Unlike P, PD will in general be nonrecursive. One can examine a wide range of possible solutions B_0^{-1} by repeatedly drawing at random from the set D of orthogonal matrices$D$. Following Rubio-Ramirez, Waggoner and Zha (2010) we constructs the set of admissible models by drawing from the set D and discarding candidate solutions for B_0^{-1} that do not satisfy a set of a priori sign restrictions on the implied impulse responses functions. The resulting set B_0^{-1} in conjunction with the reduced-form estimates characterizes the set of admissible structural VAR models.

Therefore, equation 11 summarizes the identification scheme used following Uhlig (2005) who proposes replacing a conventional semi structural model of monetary policy by a model based only on sign restrictions:

$$\begin{bmatrix} u_1^{INF} \\ u_1^{INT} \\ u_1^{GS} \\ u_1^{TAX} \\ u_1^{PS} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ + & 1 & 0 & 0 & 0 \\ + & + & 1 & 0 & 0 \\ - & + & + & 1 & 0 \\ - & + & - & - & 1 \end{bmatrix} \begin{bmatrix} e_1^{INF} \\ e_1^{INT} \\ e_1^{GS} \\ e_1^{TAX} \\ e_1^{PS} \end{bmatrix} \quad equation \ldots\ldots (11)$$

The first line of restrictions in the equation shows the effect of exchange rate which is considered to be exogenous in our model. The exchange rate thus captures exogenous monetary policy changes and their effects on the current account. The second shows the real interest rate which is used to proxy the effects of endogenous monetary policy on the current account. Thus, we assume the real interest rate is not contemporaneously affected by other variables in the model as well in order to determine its effect on the current account. The third line controls for the effects of business cycle fluctuations on the current account based on the assumption that output is not contemporaneously affected by other variables in the system, except exchange rate and interest rate. This restriction conforms to that of Rodrik (2008). This equation is used to show the goods market in the IS-LM framework. Line 4 shows the government budget deficit, which is contemporaneously affected by exchange rate, interest rate and the current account balance. Lastly, the current account equation is represented in line 5 where all variables are assumed to have contemporaneous effects on the current account (see Kim &Roubini 2000, Kim &Roubini 2008).

From the equation 11 + and − denotes the postulated sign of the impact response and 0 denotes no restriction. The model is partially identified in that only the response to an unanticipated monetary policy shocks are identified. It is also set-identified in that sign restrictions are consistent with a range of admissible models.

It can be observed that 10 restrictions are imposed on the B matrices for the structural VAR models. This derives from the evidence in the econometric literature that the minimum number of restrictions required for identifying an SVAR model is*N(N-1)/2*. Here, *N*is the number of variables in the system, which in this study is equal to 5. Thus, there are 5(5 – 1)/2 = 10 restrictions to be imposed for identification of the shocks. Hence, our SVAR model is exactly identified with 10 restrictions.

3.4 Other forms of SVAR model identification

3.4.1 Identification by Long-Run Restrictions

One alternative idea has been to impose restrictions on the long-run response of variables to shocks. In the presence of unit roots in some variables but not in others, this may allow us to identify at least some shocks. The promise of this alternative approach to identification is that it will allow us to dispense with the controversy about what the right short-run restrictions are and to focus on long-run properties of models that most economists can more easily agree on. For example, it has-been observed that most economists agree that demand shocks such as monetary policy shocks are neutral in the long run, whereas productivity shocks are not. This idea was first introduced in the context of a bivariate model in Blanchard and Quah (1989).

3.4.2Identification by Heteroskedasticity

Rigobon (2003) develops yet another method for solving the VAR identification problem based on theheteroskedasticity of the structural shocks. Heteroskedasticity may arise, for example, as a result of financial crises. In the baseline model, Rigobon considers heteroskedasticity that can be described as a two-regime process and shows that the structural parameters of the system are just identified. He also discusses identification under more general conditions such as more than two regimes, when

common unobservable shocks exist, and situations in which the nature of the heteroskedasticity ismisspecified.

3.4.4 Sources of data

To achieve the stated objectives of the study, the work will employ the use of annual time series data of the variables. The nature of data required for the study is mainly from secondary sources, such as the Annual Reports and Statement of Account and the Statistical Bulletin of the Central Bank of Nigeria (CBN) of various years, the International Monetary Fund (IMF), and World Economic Outlook (WEO) Data for various years spanning between 1986 and 2016. The choice of the sample period and the data frequency is to ensure availability of data and to capture some of the dynamics that took place in the Nigerian economy over the period under study.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter presents estimation and analysis of the data which are divided into two broad categories; the exploratory data analysis and structural model. Structural model one, which is the restricted model, examines the relationship between Personal saving, Government spending, tax rate while considering Inflation and Interest rate as control variables. As stated in the previous chapter, the analysis is based on econometric techniques such as Unit Root Test, Co-integration Technique, Vector Error Correction Model, Granger Causality, Impulse Response Function, Forecast Error Variance Decomposition as well as Sign Restrictions for the analysis.

4.2. Pre-estimation Tests

The data collected on Personal saving, Inflation, Interest rate, Tax rate and Government spending reveals the following descriptive statistics. From the table below, the study has 36 observations; the means of all the variables are significantly different from zero. Also the Jarque-Bera statistics which is the measure of normality and derived from the skewness and kurtosis has probabilities all greater than 0.05 indicating that the data is normally distributed.

Table 4.1 Descriptive Statistics of the Variables

	PS	GS	IR	INF	TR
Mean	**1.57E+10**	**4.49E+08**	**78.23860**	**20.19389**	**1.82E+09**
Median	**1.10E+10**	**2.26E+08**	**74.30000**	**12.95000**	**1.53E+09**
Maximum	**4.45E+10**	**1.60E+09**	**192.4400**	**76.80000**	**8.80E+09**
Minimum	**7.04E+09**	**-27000000**	**0.546700**	**0.200000**	**2.52E+08**

Std. Dev.	**9.95E+09**	**5.11E+08**	**67.19704**	**18.71394**	**1.74E+09**
Skewness	**1.788590**	**1.067048**	**0.104449**	**1.576421**	**2.415090**
Kurtosis	**5.163931**	**3.847524**	**1.352466**	**4.469808**	**9.662079**
Jarque-Bera	**26.21822**	**6.866423**	**4.137010**	**18.15111**	**101.5709**
obability	**0.000002**	**0.032283**	**0.126375**	**0.000114**	**0.000000**
Sum	**5.65E+11**	**1.62E+10**	**2816.590**	**726.9800**	**6.57E+10**
Sum Sq. Dev.	**3.46E+21**	**9.15E+18**	**158040.5**	**12257.41**	**1.06E+20**
Observations	**36**	**36**	**36**	**36**	**36**

Source: researcher's computation using E-views 8

Table 4.1 shows skewness as a measure of asymmetry distribution of the series around its mean. The skewness of a normal distribution is zero. Positive skewness implies that the distribution has a long right tail and negative skewness implies that the distribution has a long left tail. From the above table we observe that PS, GS, IR, INF, and TR all have positive skewness and as such they have long right tails.

Kurtosis measures the peakedness or flatness of the distribution of the series. If the kurtosis is above three, the distribution is peaked or leptokurtic relative to the normal and if the kurtosis is less than three, the distribution is flat or platykurtic relative to normal. From table 4.1 above, PS, GS, INF and TR exceeds three, therefore they are peaked or leptokurtic.Jarque-Bera is a test statistic for testing whether the series are normally distributed. The test statistic measures the difference of the skewness and kurtosis of the series with those from the normal distribution. All data are normally distributed at either 1% or 5% level of significance. The normality assumption is further buttressed by the nearness of the mean and median values for these series. The closer the mean and median values of a

data series, the greater the probability that such series will be normally distributed. Table 4.1 above, shows that all the series display a high level of consistency as their mean and median values are perpetually within the maximum and minimum values of these series. Besides, the standard deviation revealed that actual data in the series are not really different from there mean value. The skewness and kurtosis statistics provide useful information about the symmetry of the probability distribution of various data series as well as the thickness of the tails of these variables.

4.3. Impulse Response Analysis from Sign-Identified VAR

4.3.1 Identification Scheme: Sign Restriction

Another popular application with SVAR models is the implementation of quantitative restrictions on impulse response functions. The structural VAR models with a Cholesky or triangular factorization identification scheme constitute a very simple example of such quantitative restrictions, since they permit to assume that some variables have no immediate response to certain structural shocks. While these simple settings are already quite attractive, it is possible to get more from SVAR models. The methodology developed by Arias et al. (2014) makes it possible to set not only zero restrictions, but also sign and magnitude restrictions on the impulse response functions of a SVAR model. The table below gives a representation of the restriction imposed.

Table 4.2:Sign Restriction Schemes for four- variable

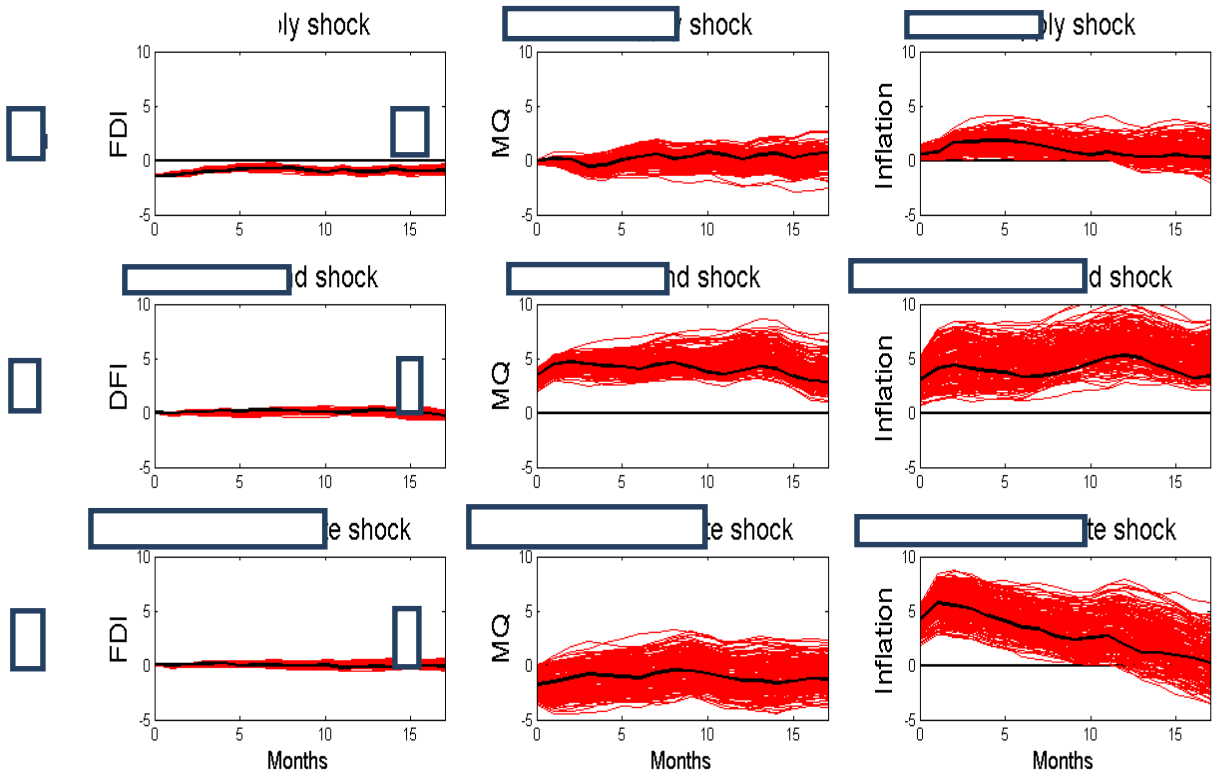
Horizon Shock	Tax Shock	Govt. Shock	Demand Shock
Personal Saving	+	+	+
Interest Rate	+	+	-
Inflation Rate	+	+	+

Source: researcher's computation using E-views 8

We identify 3 shocks: a demand shock, a tax cut shock, and government spending shock. The following is assumed for the sign of the responses to the different shocks: Following standard theory, demand shocks have a positive effect on personal saving and inflation while the response of interest rate is uncertain. Tax cut, on the other hand, has negative effect on personal saving and but positive effect on inflation while driving interest rate higher. Lastly, government spending shock is identified as positive effect on of personal saving and inflation with a negative effect on interest rate.

4.3.2 Sign Identified Structural Impulse Response Analysis

Following the table4.2, the estimates of structural impulse response function is defined in terms of the responses.



Source: researcher's computation using E-views 8

Figure 4.1: Sign identified Structural Impulse Response Analysis (SVAR)

Following Inoue and Kilian (2013) and related studies in the literature, we specify a VAR (2) model with intercept. The model is estimated on annual data for 1980-2015. Figure 1 plots the structural responses. The responses have been normalized such that each structural shock implies an increase in the demand. The response of GS is obtained by cumulating the responses of its growth rate.

All structural response function estimates are consistent with standard economic intuition. For example, a negative flow supply shock is associated with a persistent decline in of GS, a modest increase in the personal saving, and a short-lived decline in inflation. A positive flow demand shock is associated with a persistent and hump-shaped response in both personal saving and inflation and with little response of GS. Demand shocks (such as shocks to depreciation) cause a temporary increase in the personal saving, a persistent decline in inflation and little response in GS. The corresponding credible sets indicate considerable uncertainty about the price responses and to a lesser extent for the responses in personal saving, whereas the credible sets of GS responses are quite narrow. Nevertheless, several response functions are precisely enough estimated to conclude that the response differs from zero. Figure 1 also illustrates that the responses of the most likely model need not be near the center of the credible set.

4.3.3 Forecast Error Variance Decomposition (SVAR)

A second practically important question that a structural VAR model can answer is how much of the forecast error variance or prediction mean squared error (MSPE) of $y_{t+\square}$ at horizon $h = 0, 1, \ldots, H$ is accounted for by each structural shock wkt, $k = 1, \ldots, K$. In a stationary model, the limit of the forecast error variance decomposition, as $h \rightarrow \infty$, is the variance decomposition of yt because the forecast error covariance matrix converges to the unconditional covariance matrix of yt.

Table 4.3: Result of Forecast Error Variance Decomposition of (SVAR)

Horizon Shock	Tax Shock	Govt. Shock	Demand Shock	Residual
1	**0.2**	**0.2**	**1.7**	**98.0**
2	**0.6**	**0.5**	**2.1**	**97.0**
3	**0.8**	**0.5**	**2.1**	**96.6**
12	**2.8**	**6.8**	**4.5**	**85.8**
∞	**6.6**	**8.4**	**7.9**	**77.1**

Source: researcher's computation using E-views 8

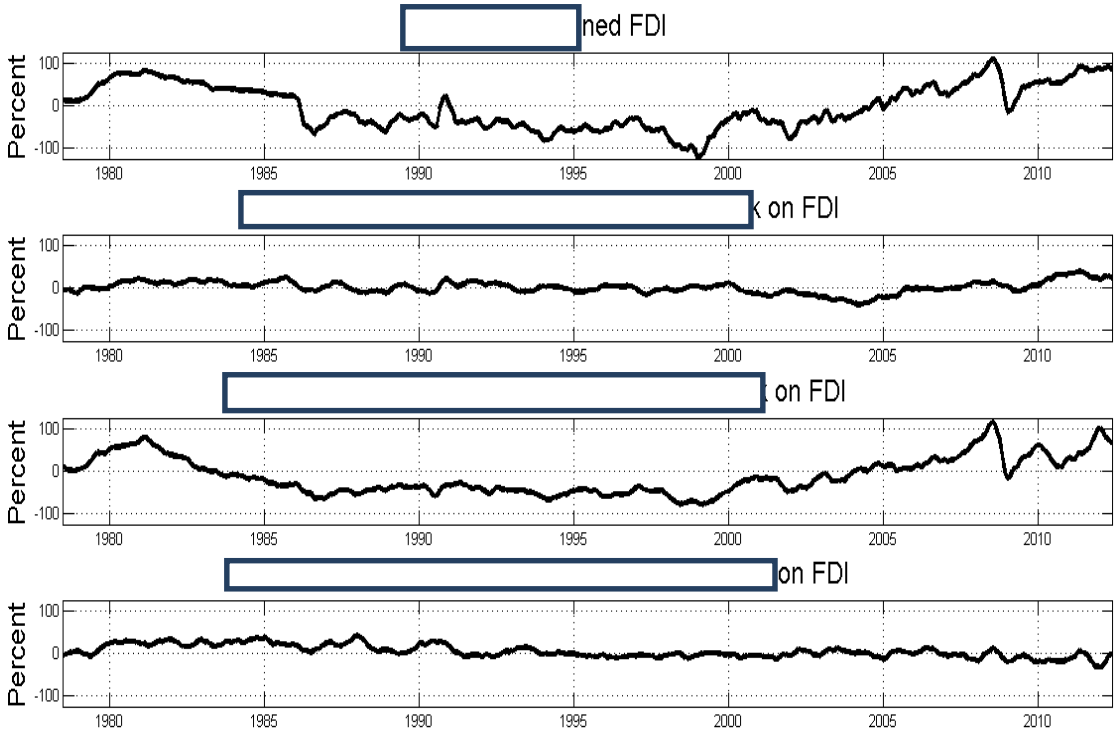
Ignoring the rounding error, the entries in each row of the table sum to 100% by construction. The entries for horizon ∞ represent the variance decomposition of GS growth in Nigeria. In practice, we can approximate ∞ by a very large number. This number is determined by showing that further increments to the horizon do not change the results up to the desired degree of accuracy.

In studying forecast error variance decompositions, one often is interested in the patterns across horizons. In this analysis, we learn that the supply shock and the two other shocks, demand shocks and government spending shock combined account for only 2% of the MSPE of GS growth at the one-month horizon, but that their explanatory power increases to 23% in the long-run. One may also be interested in the relative contribution of different shocks at a given horizon. For example, whereas at the one-month horizon oil specific demand shocks are much more important than supply shocks or aggregate demand shocks in explaining the forecast error variance of GS growth, each demand and supply shock accounts for about the same share of the unconditional variance.

4.3.4 Historical Decomposition

Structural forecast error variance decompositions and structural impulse response functions describe the average movements in the data. They represent unconditional expectations. Sometimes we are interested instead in quantifying how much a given structural shock explains of the historically observed fluctuations in the VAR variables. In other words, we would like to know the cumulative effect of a given structural shock on each variable at every given point in time. For example, we may not be interested in the average contribution of monetary policy shocks to the variability in GS growth over the last decades.

Source: researcher computation using E-views 8

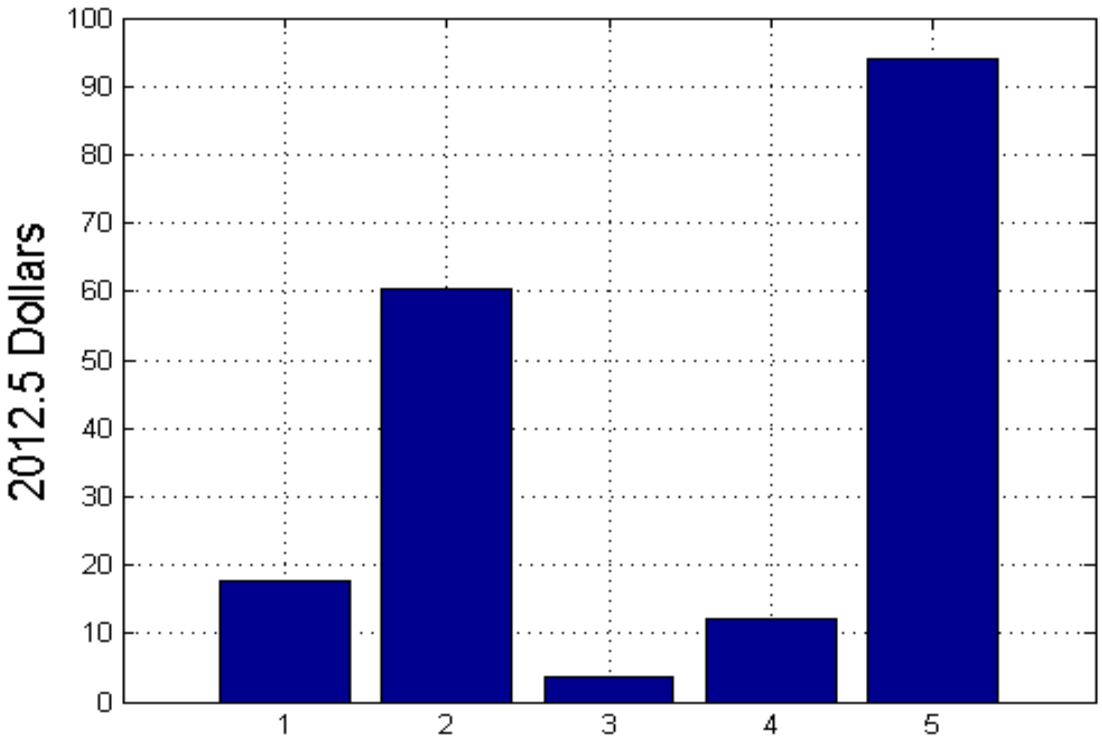


Source: researcher's computation using E-views 8

Figure 4.2: Historical Decompositions in understanding the Evolution of the GS

Figure 4.2, illustrates the use of historical decompositions in understanding the evolution of the GS from the late 1980s to early 2016. The motivation is based on a global oil market model studied in Kilian and Lee (2014). This structural model attributes variation in the GS to shocks to the flow supply, shocks to the flow demand, and demand shock, and a residual shock designed to capture various idiosyncratic shocks.

Figure 4.5, focuses on the role of the structural shocks that have an explicit economic interpretation under the maintained assumption that the log differenced of GS is an $I(0)$ time series during the estimation period. It shows that much of this surge (as well as the collapse of the GS in late 2008 and its recovery since then) must be attributed to the effects of flow demand shocks. Neither flow supply shocks nor speculative demand shocks are able to explain the surge in the real price of oil during this period. This result could not have been inferred from the structural impulse responses that trace out the average effect of a hypothetical one-time structural shock or from forecast error variance decompositions that measure the extent to which a structural shock explains the variability of a variable on average.



Source: researcher's computation using E-views 8

Figure 4.4: Summary of the Evidence for any Sub period of Interest

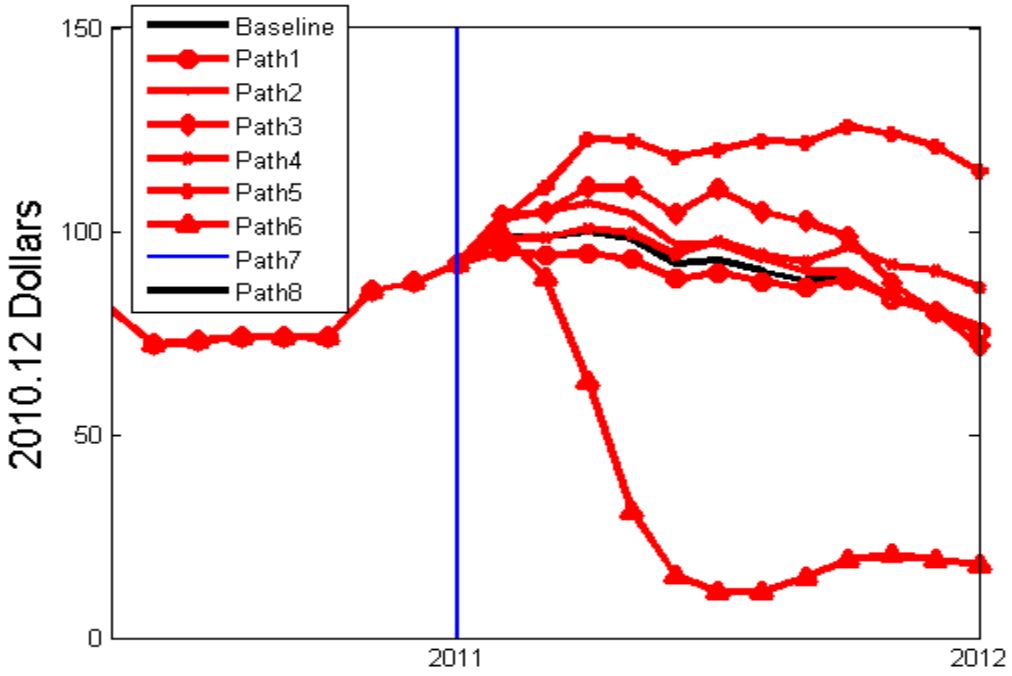
This allows us to provide a quick summary of the evidence for any sub period of interest. Kilian and Lee (2014) use this tool to summarize the determinants of the surge in the real price of oil between January 2003 and June 2008 on the one hand, and since the peak of the real price of oil on the other. Here, it is used to explain the sudden change in GS in our study.

4.3.5 Conditional Forecast

The objective of forecast scenarios is to assess the sensitivity of reduced-form VAR forecasts to hypothetical future events. Constructing such forecast scenarios requires a structural VAR model, the reduced-form representation of which generates accurate out-of-sample forecasts. It is important

to keep in mind that the objective of constructing forecast scenarios is not to improve the accuracy of the baseline reduced-form VAR forecast. Indeed, that forecast by construction already provides the best possible out-of-sample prediction from a given forecasting model.

Source: researcher computation using E-views 8



Source: researcher's computation using E-views 8

Figure 4.5: Summary of the Evidence for any Subperiod of Interest

Based on a model of the global oil market similar to that used in Kilian and Lee (2014), this empirical research also tries to investigate a wide range of real-time forecast scenarios for the Foreign Direct Investment including a return of global economic recovery to full capacity, a supply disruption in oil market, a strong recovery of the global economy, a financial meltdown similar to the collapse of Lehman Brothers, and two contagion scenarios in which expectations of rising oil

prices are triggered by political events in the Middle East. Some of these scenarios are based on historical precedent, while others are purely hypothetical. All scenarios involve sequences of structural shocks within the range of historical experience. Figure 4.5 shows how the forecast of the GS would deviate from the baseline real-time VAR forecast as of December 2010, if one were willing to condition on each one of these events occurring in isolation. Such evidence allows policymakers to gauge the potential effects of unlikely, but high-impact events on the GS.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The main objective of this research is to analyze the dynamic impact of fiscal policy shock on the performance of the Nigerian economy 1986-2016. To attain that objective, a number of econometric tools have been used in the analysis of the results. The stochastic properties of the time series data is subjected to a battery of tests by identifying the number of unit root contained in the data which is established using both formal and informal tests.

In order to investigate the transmission of shocks from fiscal policy variables namely government spending and tax rate to personal savings and also how the shocks are transmitted to other macroeconomic variables, we employ structural VAR modelwithSign Identified Restrictions. We implement the empirical specification by following the model by stated by Kim &Roubini (2008), whoanalyze the effect of fiscal and monetary variables on the current account, and we follow the identification scheme abstracts from the model by Kim (2001) who extends the closed economy identification of monetary policy to an open economy.

From the empirical section, the results of granger causality show that there exists unidirectional causality from GS to PS. It means GS has positive impact on the Nigerian personal saving. This is in conformity with the work of Ehijiele et al (2016), revealed unidirectional causality; GS has positive effect on Nigerian manufacturing sector growth. There is also a unidirectional causality running from both IR and INF to PS. It means slight change in exchange rate upward would affectpersonal saving and would lead to general increase in price of industrial goods. This indicated that the null hypothesis that GS does not granger causes PS is not rejected while the hypothesis that PS does not granger causes GS is rejected at 5% level of confidence, then the null hypothesis of the objective

number two (2) in this research work is achieved, causal relationship between PS and GS. There existsa unidirectional causality running from GS to PS in Nigeria.

The estimated SVAR response revealed that a negative flow supply shock is associated with a persistent decline in GS, a modest increase in the personal saving, and a short-lived decline in inflation. Also, we found that a positive flow demand shock is associated with a persistent and hump-shaped response in both personal saving and inflation and with little response of GS. Intuitively, we showed in the study that demand shocks (such as shocks to depreciation) cause a temporary increase in the personal saving, a persistent decline in inflation and little response in GS. In studying forecast error variance decompositions under the estimated SVAR analysis, we learn that the supply shock and the two other shocks, demand shocks and government spending shock combined account for only 2% of the MSPE of GS growth at the one-month horizon, but that their explanatory power increases to 23% in the long-run. In order to make this study finding robust, we used the historical decompositions to understand the evolution of the GS from the late 1980s to early 2016. The result shows that much of this surge (as well as the collapse of the GS in late 2008 and its recovery since then) must be attributed to the effects of flow demand shocks. Neither flow supply shocks nor speculative demand shocks are able to explain the surge in the real price of oil during this period. The forecast from the estimated model shows that GS would deviate from the baseline real-time VAR forecast as of December 2010, if one were willing to condition on each one of these events occurring in isolation.

5.2 Conclusion

This study investigates the macroeconomic effects of fiscal policy shocks in Nigeriausing a SVAR methodology. The main results from this study can be summarized as follows. The responses of real

output and inflation may be asymmetrical depending on the component of government spending used as a fiscal stimulus to stabilized the economy. Fundamentally, a positive shock to government capital spending on social and community services has a persistent positive and significant impact on private consumption and real output but at the cost of higher inflation in the short term. However, while the impact of real output is unambiguously positive, the response of inflation to total expenditure and other category of public spending remains consistently negative and most often insignificant. A positive shock to oil revenue has a significant positive impact on real output through its impact on public spending. In line with theory, the response of real output to innovations in business taxes is persistently negative, though insignificant. A private investment decision in Nigeria does not depend on the indirect taxes paid to government, but on the cost of capital (interest rate) and perhaps on other crucial variables like market demand and profit expectations.

5.3 Recommendations

At least three policy insights can be gleaned from this study.

1. First, public spending expansion, especially on productive categories like social and community services has a sizeable and robust effect on private consumption and economic growth in Nigeria. This clearly indicates that the public sector is still very relevant in stimulating economic activities in Nigeria.
2. Second, the use of taxes to finance public spending in Nigeria is highly distortionary and may lead to a fall in real economic activities this is because increases in tax erode the purchasing power. . Although Nigeria does not depend on taxes as it major source of revenue but on crude oil sales, a search for a less distortionary revenue base can be found in diversifying the nation's economic base from crude oil.

3. Lastly, stimulating private investment in Nigeria may as well require a well-coordinated monetary policy framework that moderates the rate of interest on borrowed funds.

5.4 Limitations of the study

1. Firstly, it should be considered that our estimates do not, to some extent, disentangle the movement in fiscal variables arising from discretionary fiscal policy shocks from those caused by automatic response of fiscal variables to other shocks like business cycle or monetary policy shocks. Interestingly, Mountford, and Uhlig (2005) have developed a method for dealing with such problems which can be taken up in further research.
2. More so, our model did not capture expectations to take account for anticipated fiscal policy shocks. There are good reasons to believe that the reaction of the real economy to fiscal shocks may generate different outcomes in the presence of rational expectations by economic agents. Incorporating these issues may be important and we hope to explore this further in subsequent study.
3. Lastly, the VAR approach usually requires the existence of reliable and non-interpolated quarterly data over a sufficient long period of time. To the extent that some of our data were not available on quarterly frequency and therefore were interpolated, our results should be interpreted with some level of caution.

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