

Title Page

**GOVERNMENT HEALTH CARE FINANCING AND WORKFORCE PRODUCTIVITY:
EMPIRICAL EVIDENCE FROM NIGERIA**

BY

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Declaration

I hereby declare that the work presented in this thesis titled “Government Health Care Financing and Workforce productivity: Empirical Evidence from Nigeria” was performed by me in the department of economics, under the supervision of Professor P.S. Aku and Dr. AuduIshaya. All works consulted for the purpose of this research are duly acknowledged. No part of this research has been presented for another degree or diploma at any institution. Errors committed in this research are strictly mine.

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Certification

This thesis titled “Government Health Care Financing and Workforce Productivity: Empirical Evidence from Nigeria” meets the regulations governing the award of the degree of Masters of Science Economics of the Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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Dedication

This research work is dedicated to my creator, God Almighty, the giver of knowledge and wisdom. To the loving memory of my dear, father Late Barr. Dr. D. D. Boman.

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I wish to express my deepest appreciation and allegiance to God almighty, for his grace, love, providence and faithfulness throughout the period of study.

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Abstract

The study examined empirically Government Health care financing and Workforce Productivity. The variables examined were workforce growth rate as a proxy for workforce productivity, government capital, recurrent and total expenditure, GDP and the total government expenditure as a percentage of GDP. A Vector Autoregressive (VAR) model was estimated using the Nigerian annual time series data from 1980 to 2010. Results from the VAR estimate and Granger causality revealed that; government capital expenditure on health care in Nigeria had a negative effect on workforce productivity over the period of study. Government recurrent expenditure on health care in Nigeria impacted positively on workforce productivity over the period of study although the impact was weak; government capital expenditure and government recurrent expenditure on healthcare caused workforce productivity over the period of study, meaning that changes in these form of expenditures could also account for changes in workforce productivity. The study shows that government health care financing has made a little or no positive impact on workforce productivity in Nigeria over the period of study, although a positive change in financing could lead to a positive change in workforce productivity. Therefore, government should expedite action towards providing qualitative health infrastructures; boosting recurrent expenditure to maintain them and increase spending to finance the national health insurance scheme. This will provide conducive working environment for the workers to improve in their productivity; and ensure that productive time on thinking of how to pay for out of pocket health care is channeled towards productivity. It is also recommended that better attention should be given to health personnel's remuneration in order to motivate them to give their best in production which will have a positive multiplier effect on the economy.

Table of Contents

Title Page	I
Declaration	II
Certification	III
Dedication	IV
Acknowledgement	V
Abstract	VI
Table of Contents	VII
List of Tables	X
List of Figures	XI
List of Appendices	XII
CHAPTER ONE: GENERAL INTRODUCTION	
1.1 Background of the Study	1
1.2 Statement of Research Problem	2
1.3 Statement of Research Questions	6
1.4 Objectives of the Study	7
1.4.1 General Objectives	7
1.4.2 Specific Objectives	7

1.5 Justification of the Study.....	7
1.6 Scope and sources of data.....	9
1.7 Organization of the study.....	9

CHAPTER TWO: LITERATURE REVIEW

2.1 Conceptual Literature.....	11
2.1.1 Health Care Financing.....	11
2.1.2 Government Expenditure.....	16
2.1.3 Gross Domestic Product.....	17
2.1.4 Total Health Expenditure as a Percentage of GDP.....	18
2.1.5 Productivity.....	18
2.2 Theoretical Literature.....	19
2.2.1 The Keynesian View.....	19
2.3 Government Public Health Financing in Nigeria.....	22
2.4 Productivity in Nigeria.....	33
2.5 Public Financing of Health and Productivity.....	33
2.6 Empirical Literature.....	34

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Analytical Technique.....	37
3.2 Granger’s Causality Test.....	37
3.3 Unit Root Test.....	39

3.4 Model Specification.....39

3.4.1 The VAR Model.....39

CHAPTER FOUR: EMPIRICAL RESULTS AND DISCUSSION

4.1 Unit Root Test Result.....41

4.2 Interpretation of VAR Results.....42

4.3 Interpretation of Granger Causality Test Result.....52

4.4 Discussion of Findings.....53

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION(S)

5.1 Summary.....56

5.1.1 Summary of Major Findings.....57

5.2 Conclusion.....58

5.3 Recommendation(s).....58

References.....60

Appendices.....68

List of Tables

Table 2.1 Evolution of Health Financing.....	23
Table 4.1 Summary of Unit Root Test Results.....	41
Table 4.2 Variance Decomposition of Workforce Productivity.....	49
Table 4.3 VAR Residual Serial Correlation LM Test.....	51
Table 4.4 Granger Causality Test.....	52

List of Figures

Figure 2.1 Health Care Expenditure Public (% of total health expenditure) in Nigeria 1995-2010.....	27
Figure 2.2 Health Care Expenditure Public (% of government expenditure) in Nigeria 1995-2010.....	28
Figure 2.3 Health Care Expenditure Public (% of Gross Domestic Product) in Nigeria 1995-2010.....	29
Figure 4.1 Impulse Response of Workforce Productivity to Workforce Productivity.....	42
Figure 4.2 Impulse Response of Workforce Productivity to Government Capital Expenditure on Health Care.....	44
Figure 4.3 Impulse Response of Workforce Productivity to Government Recurrent. Expenditure on Health care.....	45
Figure 4.4 Impulse Response of Workforce Productivity to Total Government Expenditure on Health Care.....	46
Figure 4.5 Impulse Response of Workforce Productivity to Gross Domestic Product.....	47
Figure 4.6 Impulse Response of Workforce Productivity to Total Expenditure as a Percentage of Gross Domestic Product.....	48
Figure 4.7 Robustness (Stability) Test of the VAR Model.....	50

List of Appendices

Appendix 1 Vector Autoregressive (VAR) Estimation.....68

Appendix 2 Granger Causality Estimation.....69

CHAPTER ONE

GENERAL INTRODUCTION

1.1 Background of the Study

A healthy workforce is an important economic asset. Health is a core contributor to an individual's productivity. Improved health supports labour productivity by augmenting life expectancy, and enhancing workers' productivity by increasing both physical and mental capacities. Sick people are unproductive and with an increased number of sick people, the number of workforce is reduced. Health financing involves the basic functions of revenue collection, pooling of resources, and purchase of interventions.

World Health Organization Commission on Macroeconomics and Health in their 2001 report made a strong economic case for investing in health, which they said, will increase workforce productivity and eventually economic growth (WHO, 2001).

It is in view of the above that financing health is significant to making health charged with the task of strengthening workforce for increased productivity. Financing Health in Nigeria is from a variety of sources that include budgetary allocations from Government at all levels (Federal, States and Local). The Federal Government's role is mostly limited to coordinating the affairs of the universityteaching hospitals, the State Government manages the various general hospitals while the Local Government focuses on health centers and dispensaries (Vogel, 1993). Loans, grants, private sector contributions, donor contributions - bilateral, multilateral, NGOs, and out of pocket expenses form the other part of health financing (Public Expenditure Review, 2009).

Financing for health care comprises of multiple sources of funding, methods of allocating funds and modes of paying providers. Different sources of funding health care affect the economy and society differently. Government spending on health from domestic sources is an important indicator of a government's commitment to the health of its people, and is essential for the sustainability of health programs (Lu *et al*, 2010).

The purpose of health financing has been seen not only as making funding available, but also as ranging from setting the right financial incentives for providers, to ensuring that all individuals have access to effective public and personal health care. To ensure that individuals have access to health care services, three interrelated functions of health system financing are crucial: revenue collection, pooling of resources, and purchasing of interventions. Categories of health care financing sources include, taxation, donor funds, social health insurance, private health insurance, other private sources like NGOs own resources and out-of-pocket (OOP) expenditures. Reliance on private OOP spending remains significant, constituting over 40% of total health expenditure in 31 countries in sub-Saharan Africa (WHO, 2006).

Investment in health indicates the expenditure on facilities and provision of drugs to cure diseases, safeguard and maintain people's mental and physical health in a given period. Extensively, investment in health care also includes the expenditure that is used in entertainment, job training etc. Therefore, investment in health care is a productive investment (Xiaoqing, 2005).

1.2 Statement of the Research Problem

Financing is an important aspect of health care and has dominated the majority issues being discussed and problems linked to Health care in developing countries especially Nigeria

where most of the financing is from the private sector with the government playing a supportive role instead of the other way round. At first glance, it may seem that a lot is being done as regards financing, with the presence of many donor agencies financing many health related projects.

The above perception fails to take into account that the government is responsible to the people, and is therefore involved in the financing of all sectors of the economy, health care being the major sector in this instance. Health affects the productivity of an individual as an individual that is healthy, all things being equal, is highly productive. Thus, when the bulk of the productive population is healthy it translates to productivity and economic growth.

Nigeria is still plagued by reduced quality of services, inadequate health facilities (including personnel, medical equipment, and drugs), poor and inadequate health infrastructure especially in the rural areas, over dependence on user fees and private sources as the major sources of health care financing. The high prevalence of poverty is a major cause of ill health and poor work force productivity in Nigeria.

By rethinking our approach to user fees and the private sector being the major financiers of health care in Nigeria, majority of the workforce, which is greatly made up of poor people, will not be able to afford health care for themselves and their families, which will greatly affect productivity negatively.

Notwithstanding the relative importance of investing in the health of a nation's work force to increase their productivity, the development of the health sector in Nigeria is still plagued by many problems that have combined to produce clearly poor health care outcomes for Nigeria's workforce. Highest on the list of these problems is insufficient financing especially by

the Government (Odusola, 1998). Therefore, any under-financing of the health care by government will invariably wreck the health system in the country, while the other part is taken care of by private spending from households, organisations and communities.

Efforts therefore, to increase performance of productivity due to more involvement of government in financing health care were noted in Finland which eventually contributed to a significantly higher rate of productivity between 1992 and 1994. This was attributed to the fact that the state subsidy reform (which was a change in the financing system of hospitals) initiated in 1993 may have greatly contributed (Miika, 1995)

The Global Business Council on HIV/AIDS (2002) reasoned that with increasing absenteeism organizations would experience loss of skills and declining morale, which is likely to lower productivity especially in hospitals. It is in view of the above that some employers (government especially since they employ a large number of the productive population) sometimes establish health schemes for their workers to address their health needs, but there have been mixed feelings about the impact of the programme on workers (Agba, 2010).

Available statistical data reveals that between 1980 and 2000, Nigeria spent an average of 0.35 percent of its gross domestic product on health. Available evidence has shown that improved health has been weighed down not only with persistent under-funding over the years but also by slow economic growth, which has led to reduced productivity (CBN, 2000). In some parts of Nigeria, public spending per capita for health is less than USD 5 and can be as low as USD 2 in other parts (World Bank, 2011). This is a far cry from the USD 34 recommended by World Health Organization for low-income countries as reported by the Macroeconomics

Commission Report (which translates to about 5.0percent of national budget expenditure) (World Bank, 2011).

The Federal Government's recurrent health budget showed an upward trend from 1996 to 1998, a decline in 1999 and a rise again in 2000. Available evidence indicates that the bulk of recurrent health expenditure goes to spending on personnel and not health care. Federal Government's recurrent health expenditure as a share of total Federal Government recurrent expenditure stood at 2.55% in 1996, 2.96% in 1997, and 2.99% in 1998, it declined to 1.95% in 1999 but then rose to 2.5% in 2000 (World Bank, 2011). Beyond budgetary allocations, which are a concern in funding health sector in Nigeria, is the gap between budgeted figures and the actual funds released from treasury for health activities (World Bank, 2011).

About three-quarters of all public expenditure on health care are for expensive medical care that benefits a small minority of the productive population living in the urban areas, and a high proportion of the budget for health. About 80 to 90 per cent in some countries is spent on hospitals and, almost all of which are located in the cities (Griffin and McKinley, 1992). The issue is that despite the above assertion, financing seems not to have had effect on productivity. Workers still go on strike, claiming poor government financing, which grossly affects their productivity in the long run.

In the 2001 Abuja Declaration on HIV/AIDS, tuberculosis, and other related infectious diseases, African leaders pledged to increase health spending to 15 percent of their government's budgets (Haines and Cassels, 2004; UNECA 2001). Low Income Countries' ability to raise enough revenue to meet needs and demands for publicly financed health is highly constrained (Gupta et al, 2004; Schieber and Maeda, 1997).

Government is not doing enough to increase productive investment in health care, or in cases where there is willingness to invest, the tendency is for policies to be fragmented, poor execution, and interventions focused on addressing short-term problems rather than long term challenges. Some governments consider the funds allocated to health to be costs rather than investments not considering the fact that in the long run will lead to increased productivity and economic growth (Atun and Fitzpatrick, 2005).

In some countries, a large share of health funding never reaches its destination. This has important implications for the analysis of the effectiveness of public health care financing and expenditures. Once fund diversions are accounted for, the relationship between public health expenditures and health outcomes can change from there being no (or even a negative) relationship, to a positive one (Gauthier and Wayne 2007). Thus if the necessary funds for health care financing are diverted, the sector will remain undeveloped thus affecting the general health status of the productive workforce, which will have negative impact on workforce and eventually productivity in general.

1.3 Statement of Research Questions

- i. How effective is government financing of health care on workforce productivity over the years?
- ii. What has been the direction of causality between workforce productivity and health care expenditure in Nigeria over the years?

1.4 Objectives of the Study

1.4.1 General Objective

The broad objective of this research work is to ascertain the impact of financing health care by the Nigerian government on workforce productivity, with the aim of using effective and efficient financing to drive workforce productivity in Nigeria.

1.4.2 Specific Objectives

- i. To examine empirically the impact of government health care financing on workforce productivity in Nigeria.
- ii. To assess the direction of causality between workforce productivity and health care expenditure in Nigeria.

1.5 Justification of the Study

Healthcare across the globe is a necessity and a basic human need. It is in recognition of this that the Alma Ata Declaration of 1979 in Kazakhstan called on all governments, health and development workers, and the world community to protect and promote the health of all vis-à-vis ensuring that basic needs are met, including health and food. However, for most developing nations, the prospects of achieving even a minimal level of adequacy in healthcare services remains a mirage (Chiejina, 2011).

A healthy workforce is a key factor and source of economic growth and productivity. In other words for growth to be sustained, government must devote a high proportion of its resources

through financing to upgrading the productive capacity of its citizens through adequate financing and investment in their health status.

While healthcare needs are increasing, government's finance for health in developing countries is declining. This has resulted in a situation whereby as populations gets older, as more people suffer chronic diseases, productivity is greatly affected and new and more expensive treatments appear, health costs seem to rise (Chiejina, 2011).

In Nigeria, the healthcare sector and government's financing of the sector does not seem to have done much based on the World Health Organization's measure of government's contribution to healthcare neither has it created any notable impact on workforce productivity in general. Contributing to this scenario is the gross ineffectiveness and inadequacy of financing, which is critical to revamping the health sector (Chiejina, 2011).

The justification for analyzing public financing of health instead of private financing is the issue of reliable estimates that will make empirical testing the impact of private financing of health on workforce productivity difficult. To further support this justification the PER (Public Expenditure Review) for Human Development added that Private spending consists of out-of-pocket payments in the form of official co-payments, fee-for-service payments and informal payments. Reliable estimates of private expenditures on health are not available for each year. One of the first assessments was made in 1998 based on a 1995 UNICEF household survey. Since then, several national household surveys have been conducted, especially in recent years. Results of these surveys vary, and it is difficult to say with certainty how much is spent out-of-pocket on health care. Different sources of data on out-of-pocket spending indicate different figures for out-of-pocket spending (Public Expenditure Review, 2009).

The American College of Occupational and Environmental Medicine (ACOEM), believes that more attention and resources should be devoted to health-related services that protect the employability of the working-age population to maximize workforce participation and productivity. Logically, improving the health status of workforce enhances their attendance to work and productivity. This has been researched and evidence generally supports this proposition (ACOEM, 2009).

1.6 Scope and Source of Data

The scope of this study covered 30 years – from 1980 to 2010. The choice of 30 years was because of the need to ensure that the real impact of government’s financing of health on workforce productivity is assessed. There have also been fluctuations in the rate at which government finances health in Nigeria. This has had varying effects on productivity in general (health workers included). Therefore, looking at a scope of 30 years assisted in drawing the right conclusions and thus making recommendations on the way forward for public financing of health in Nigeria to improve workforce productivity. Data was sourced from the Central Bank of Nigeria, National Bureau of Statistics, and publications from the internet.

1.7 Organization of the Study

The study consists of five chapters. Chapter one contains the background to the study, statement of the problem, objectives of the study, justification, scope and data sources and organization of the study. Chapter two presents a review of the conceptual, theoretical and empirical literature as well as overview of government public health financing in Nigeria, productivity in Nigeria and public financing of health and productivity. Chapter three presents the methodology and other estimation techniques while chapter four contains analysis and

interpretations of results. In chapter five, are the summary, conclusion and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 CONCEPTUAL LITERATURE

2.1.1 Health care financing

Health care financing is the process by which revenues are collected, pooled, and allocated (Murray and Frenk, 2000). The collection of revenue is from primary sources, such as households, firms, and secondary sources, like governments and donor agencies. The pooling of financial resources means a system where all that contributors share financial risk. Purchasing is the process through which revenues are disbursed to institutional or individual providers to deliver interventions. These lead to the delivery of healthcare services (Yadav *et al*, 2009). WHO views health financing as concerned with how financial resources are generated, allocated and used in health systems. Examples of health financing issues include:

- i. How and from where to raise sufficient funds for health;
- ii. How to overcome financial barriers that exclude many poor from accessing health services; or
- iii. How to provide an equitable and efficient mix of health services.

According to the World Bank report on health financing, the approaches that countries use to finance their health systems, provide the financial resources those systems need and determine some of the important institutional arrangements that create economic incentives in the operation of health systems. All health financing approaches should try to fulfill three basic principles of public finance:

- i. Raise enough revenues to provide individuals with the intended packages of health services that assure health and financial protection against catastrophic medical expenses caused by illness and injury in an equitable, efficient and financially sustainable manner;
- ii. Manage these revenues to pool health risks equitably and efficiently; and
- iii. Ensure that the payment for or purchase of health services is carried out in ways that are allocatively and technically efficient.

Health systems can be financed in four ways - out of pocket payments; taxation; social insurance; and private insurance, (Mossialos and Dixon, 2002). In the latter three ways, resources are paid for before spending occurs, resulting in a pooling of funds. Many health systems are mixed, and the mechanisms of two or more systems operate together (Yadav *et al*, 2009).

i. Out of Pocket Spending

Direct payment for services is the most common way to pay for health services worldwide (Svedoff, 2004). In 60% of countries with incomes below \$1000 (£683; €754) per capita, out of pocket spending is 40% or more of the total expenditure. In contrast, only 30% of middle and high-income countries depend to such extent on this kind of financing (World Health Organization, 2000). In this system, poor people may be unable to pay for their health care or will be impoverished because of trying to pay for their health care needs from their pockets (Yadav *et al*, 2009).

ii. Tax Based System

In this system, revenue from taxation is the predominant source of healthcare spending. One of the advantages is that it pools risks across a large population. However, the revenues collected may not be used for health alone but may be shared with other public services sectors. So complaints about under allocation of resources to health are common (Savedoff, 2004). National taxes are the main source of revenue in Greece, Poland, Portugal, Spain, and the United Kingdom (Mossialos and Dixon, 2002). Part of the tax revenue from the sale of tobacco has also been used to finance health care in Belgium and the United Kingdom (Yadav *et al*, 2009).

Funds are usually generated through taxation or other government revenues. Although the Nigerian government generates revenue through taxation, the bulk of the revenue is derived from the sale of oil and gas, which is unevenly shared amongst all sectors of the economy.

iii. Social Insurance

This forms the focus of this study, as this is the main source of funds in which government uses to finance the public sector, e.g. health. Fundraising for health is tied to the income of members, typically in the form of a percentage of members' wages, in this type of scheme. Premiums are collected separately from general state revenues. In direct payment schemes, only the user is responsible for the payment for his or her medical treatment. This differs from general taxation because in tax based systems, people contribute in an indirect way through taxes, whereas with social health insurance people directly pay for their insurance. Ghana, Nigeria, Japan, South Korea, Taiwan, Switzerland, Germany, and France have social health insurance systems (Yadav *et al*, 2009).

The Nigerian government established the National Health Insurance Scheme (NHIS) under Act 35 of 1999 with the aim of improving access to health care and reducing the financial burden of out-of-pocket payment for health care services. The NHIS became operational in 2005.

The NHIS is organized into the following social health insurance programs (SHIPs): Formal Sector; Urban Self-employed; Rural Community; Children Under-Five; Permanently Disabled Persons; Prison Inmates; Tertiary Institutions and Voluntary Participants; and Armed Forces, Police and other Uniformed Services (NHIS Program, 2011). It is only the formal sector SHIP that is currently operational in Nigeria Membership with the formal sector SHIP is mandatory for federal government employees and about 90% coverage has been achieved. The formal sector SHIP is presently extending to include all state and local government employees with Bauchi and Cross River having achieved full coverage (Kannegiesser, 2011)

iv. Private Health Insurance

Premiums are paid directly from employers, associations, individuals, and families to insurance companies, under this type of scheme. Generally, private insurance is voluntary and social insurance programs are compulsory. The problems of adverse selection and risk selection are higher with this system. Adverse selection is the tendency for insurance to attract only people at higher risk, raising the average cost of insurance beyond the reach of many people (Svedoff, 2004). Risk selection is the process by which insurers screen potential clients and try to enroll people who present health risks that are below average. The United States is a good example of a health system that relies predominantly on private health insurance. In many other countries private health insurance coexists with another type of health system (Yadav *et al*, 2009).

Presently, some organizations in the private sector especially NGOs have adopted the NHIS for their staffs.

Public health finance is also not limited to the boundaries of specific segments of public health such as prevention, protection, or promotion. The focus is on the entire public health system, with efforts crossing over programs and interventions (Honoré and Brain, 2007).

According to the WHO Fact file, 2010, there are facts about Health financing that cannot be disputed, and they all need to be acted upon to ensure that health financing is effective.

Millions of people miss out on health care because they can't afford to pay for it. In some countries for example, women in the richest 20% of the population are up to 20 times more likely to have a birth attended by a skilled health worker than a poor woman. In some countries, 5% of the population is forced into poverty every year because they have to pay for health services, and as a result, 100 million people are pushed into poverty. If 49 of the world's poorest countries allocated 15% of their government spending to health, this could almost double their government health expenditures. In total, this would represent an additional US\$ 15 billion per year for health. Tax payers money are diverted, as those that are meant to pay heavy taxes default on payments and are not prosecuted for such punishable and convictable offences. In Indonesia for example, clear and consistent regulations and a policy of zero-tolerance for corruption increased tax yield from 9.9% to 11% over four years. Health spending benefited more than other sectors.

In the Nigerian case, corruption has deprived the governed of the much promised and expected dividend of democracy. Corruption has led to the diversion of enormous amounts of funds meant for public infrastructure and development into private and personal pockets. New or

reinforced sources of revenue can boost health finances. More efficient tax collection generates more government money for health

World Health Organization recommends using prepaid mechanisms (e.g. insurance and/or taxes) to raise funds, and then pooling funds to ensure access and spread financial risks. Currently, 27 countries from the Organization for Economic Co-operation and Development (OECD) cover all their citizens with health services from pooled funds supplemented with limited direct out-of-pocket payments. Other poor and low-income earning countries could also adopt this strategy since it is evidenced based and has been proven effective.

Typically, between 20–40% of health spending is wasted, depriving many people of badly needed care. Overpaying is one form of waste, for example, in some places medicine prices are up to 67 times the international average price leading to less money for other health services. More efficient spending increases health coverage. (WHO fact file, 2010).

2.1.2. Government Expenditure

Government expenditure entails all forms of expenditure or spending incurred by the government either by national, state and or local government and some government-backed institutions to achieve its planned budget over a period of time. There are basically 2 types of expenditures that government incurs – capital and recurrent. The third kind of expenditure involves all government in an economy.

i. Capital expenditure

Includes all spending on assets in a country. In relation to government expenditure, it will include cost that are spent on the building of a new hospital, the purchase of new

computer equipment, provision of infrastructure and building new roads. Capital expenditure usually has a lasting impact on the economy and helps provide a more efficient, productive economy for example, a new hospital, will be much more efficient and allow more patients to be treated in places that once did not have for many years into the future.

ii. Recurrent expenditure

It involves recurring spending. In relation to government, it includes the cost of wages and salaries and expenditure on consumables - stationery, drugs for health service and bandages. Once this kind of cost is incurred, in most cases, it is gone and continues also has a long term effect on the economy as it ensure that expenditure on capital goods are worthwhile.

iii. Total Government Expenditure

This is the sum of general government health expenditure health expenditure in a given year, calculated in national currency units in current prices (WHO, 2006).

2.1.3. Gross Domestic Product (GDP)

This is the value of all goods and services provided in a country by residents and non-residents without regard to their allocation among domestic and foreign claims. This corresponds to the total sum of expenditure (consumption and investment) of the private and government agents(WHO, 2006). It is one of the primary indicators used to gauge the health of a country's economy. It represents the total value of all goods and services produced over a specific time period. It also measures economic activity in a country.

2.1.4. Total Health Expenditure as a percentage of GDP

This is defined as the percentage of GDP spent on the total general expenditure on health. It covers the provision of health services (preventive and curative), family planning activities, nutrition activities, and emergency aid designated for health but does not include provision of water and sanitation. As at 2010, it stood at 5.6% of Nigeria's GDP (WHO, 2010). The total expenditure on health includes the sum of public and private health expenditure.

2.1.5. Productivity

Productivity is commonly defined as a ratio between the output volume and the volume of inputs. In other words, it measures how efficiently production inputs, such as labour and capital, are being used in an economy to produce a given level of output. Productivity is considered a key source of economic growth and competitiveness and, as such, serves as a basic statistical information for many international comparisons and country performance assessments. For example, productivity data are used to investigate the impact of product and labour market regulations on economic performance. Productivity growth constitutes an important element for modeling the productive capacity of economies. It also allows analysts to determine capacity utilization, which in turn, allows one to gauge the position of economies in the business cycle and to forecast economic growth. In addition, production capacity is used to assess demand and inflationary pressures (OECD, 2008).

Workforce productivity is the amount of goods and services that a worker produces in a given amount of time. It can be measured for a firm, a process, an industry, or a country. It was originally (and often still is) called labor productivity because it was originally studied only with

respect to the work of laborers as opposed to managers or professionals. The three most commonly used measures of input are:

- i. Hours worked;
- ii. Workforce jobs; and
- iii. Number of people in employment and their growth rate (OECD, 2002).

It is one of several types of productivity that economists measure. It is defined as the ratio of a volume measure of output to a volume measure of input.

2.2 Theoretical Literature

There have been theoretical debates between the classicalist and the Keynesians on the issue of government's expenditure on public goods (of which health care is a part) and other social amenities. The classical school of thought is the advocates of laissez-fair, where market forces are allowed to control what happens in an economy. The Keynesian school of thought on the other hand, advocate for government intervention in all aspects of the economy. In between the classical and Keynesian school of thought is the neo-classicalist. This school of thought is of the view that the market forces are allowed to allocate resources and that government should only intervene when the market fails. Thus, for the purpose of this study, the focus will be on the Keynesian theory in addition to theories of increasing public expenditure.

2.2.1 The Keynesian view

This school of thought strongly advocates for government spending for the purposes of promoting growth in the economy. Government spending has a multiplier effect on the economy

(Keynes, 1936). Keynesian economics relies on government spending to jumpstart a nation (Vitez, 2009).

The theory allows for increased government spending during recessionary times, it also calls for government restraint in a rapidly growing economy. This prevents the increase in demand that spurs inflation. It also forces the government to cut deficits and save for the next down cycle in the economy. Keynes developed the precursor to the Gross National Product, in which the health of the economy can be measured by its production versus its capacity. By understanding and measuring these indicators, a government is better able to predict recessionary and inflationary cycles, and is thus better equipped to step in early to intervene in negative situations (Mohr, 2012).

Closely linked to the Keynesian view of public expenditure are; Wagner's theory of increasing government expenditure and Displacement Effect Hypothesis of Peacock and Wiseman;

i. Wagner's theory of increasing government expenditure

The earliest theory advanced is that of Adolph Wagner in 1876 which came to be known as the "Wagner's law". He propounded the "Law of increasing expansion of public and particularly state activities" which is referred to as the "law of increasing expansion of fiscal requirements". The law suggests that the share of the public sector in the economy will rise as economic growth proceeds, owing to the intensification of existing activities and extension of new activities. According to Wagner, social progress has led to increasing state activity with

resultant increase in public expenditure. He predicted an increase in the ratio of government expenditure to national income as per capita income rises. It is the result of growing administrative and protective actions of government in response to more complex legal and economic relations, increased urbanization, and rising cultural and welfare expenditures. Another reason is the decentralization of administration and the increase in the expenditure of local bodies (Gowda, 1987, Jain, 1989, and Prem, 1983).

ii. Displacement Effect Hypothesis of Peacock and Wiseman

Peacock and Wiseman based on a study entitled "The Growth of Public Expenditure in the UK, 1890 – 1955 published in 1961", provided an explanation to fluctuations in public expenditure over time. The main thesis of the authors is that public expenditure does not increase in a smooth and continuous manner, but in jerks or step like fashion. The hypothesis put forward is that public expenditure grows due to growth in revenue. During settled times, people can be expected to develop notions of acceptable rates of taxation. This can be known as the tolerable level of taxation and this level cannot be high. With real economic growth, the more or less stable level of taxation will produce increasing amounts of revenues as well as expenditure. This, however, does not explain the relative increasing growth in public expenditure.

Large scale social disturbances, like wars, influx of refugees change the tolerance limit of people to the burden of taxation, which arises because of increased spending. The result is called a "displacement effect" which shifts expenditures and revenues to new higher levels. Therefore, a displacement effect is created when the earlier lower tax and expenditure levels are displaced by new and higher budgetary levels. Even after the event is over, new levels of tax tolerance change and the society feels capable of carrying a heavier tax burden. The level of public expenditure

does not return to the low level it was before the event (Gowda, 1987, Jain, 1989, Prem C, 1983, and Bhatia, 2008).

2.3 Government in Public Health Financing in Nigeria

The case of the health sector is distinctive from other sectors. Due to market forces inability to address properly the health needs of populations, for various reasons, governments are left with special responsibilities in health development. Because of market failures, governments have an obligation to intervene in order to improve both equity and efficiency, to carry out important public health functions and to produce vital public goods, which have a lot of bearing on health development. Moreover, health is perceived not merely as a market commodity, but as a basic human need and a social right, as stated in many constitutions and signed treaties. Such commitment entails significant roles and responsibilities for governments, despite changing political and social environments (WHO, 2006).

Government's role in health can be justified on equity grounds. Since the poor cannot always afford health care, the government can play an important role in promoting equitable access to health care that would improve their productivity and well-being (Public Expenditure Review, 2009).

The WHO Constitution, adopted in its First World Health Assembly in 1948, established as its objective the "attainment by all peoples of the highest possible level of health" and stated "Governments have a responsibility for the health of their people which can be fulfilled only by the provision of adequate health and social measures". Ministries of health are responsible for leading health development through the implementation and improvement of main health system functions, including leadership and governance, health care financing, provision of health

services, and generation of inputs for health development, including human resources for health and biomedical technology. Efforts are coordinated with other related ministries and departments (WHO, 2006).

In addition to the above, Philip Musgrove is of the opinion that there are three distinct justifications for state intervention in the health care market, according to economic theory. These are to assure the optimal production of public goods; to correct or offset failings in the market for health insurance; and to subsidize consumers too poor to buy insurance or the inexpensive health care that the non-poor can finance out-of-pocket (Musgrove, 1996).

Table 2.1: Evolution of health financing

Evolution of Health Care Financing and Provision Systems				
at Various Stages of Economic Development				
GDP per capita →	Stage 1		Stage 2	Stage 3
Health Financing Method ↓	Poor (less than US\$ 1,800)	Low-Income (US\$ 1,800 - 4,800)	Mid-Income (US\$ 5,000 - 12,000)	High-Income (more than US\$ 12,000)
General Revenue:	50%-60% Public Health; Prevention;	40%-50% Public Health; Prevention;	20%-40% Public Health	National Health Service (UK); Medisave and

	Government Health Facilities (Clinics, Hospitals)	Government Health Facilities (Clinics, Hospitals)	Service	Catastrophic Insurance (Singapore)
Social Insurance:	For Civil Servants Only	10%-20%	30%-40%	National Health Insurance (Canada, Australia); Bismarckian Social Insurance (Germany, Japan)
Private Insurance:	Negligible	5%-10%	15%-20%	Managed Care and Medicare (USA)
Out-Of-Pocket:	35%-40% Private Hospitals and Clinics;	20%-40% Private Hospitals and Clinics;	15%-25%	15%-25%

	Pharmacies; Indigenous Providers	Pharmacies; Indigenous Providers		
EXAMPLE COUNTRIES:	Bangladesh India Kenya Mali Nigeria Tanzania Yemen	China Ecuador Egypt Indonesia Peru Philippines	Argentina Brazil Chile Lebanon Malaysia Mexico Thailand Turkey Venezuela	

Source: Hsiao, W.: What Should Macro Economist Know about Health Care Policy? A Premier, IMF Working Paper No. 136 Washington, D.C., 2000

The above table shows the groupings of countries in 4 (Nigeria inclusive) levels of Gross Domestic Product (GDP)per capita, and arriving at classification into three stages by William Hsiao, an economist at Harvard University. The table shows Nigeria at stage I, with between 50 to 60 % of public health and has been taken care of by the government but mainly for

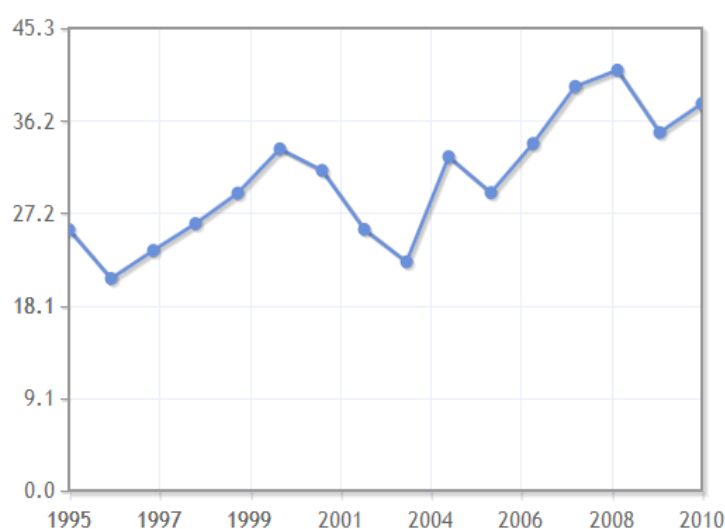
government owned facilities. In addition, the other part healthcare, handled of by out-of-pocket financing.

The structure of the Nigerian health system and mechanisms for its financing draw their origins from the colonial medical system. During colonial times, services were designed principally for public servants with preventive health care, mainly in the form of hygiene and sanitation, provided to the general population. Financing for public sector service delivery points derived largely from the government budgets. Curative care was largely undertaken and funded by the missionaries, who established Faith Based Organizations' (FBO) service delivery units, many of them outside the capital and in areas that were not readily served by public sector services. Over the years, different tiers of government were implicitly charged with the different health care delivery roles described above: the federal government for tertiary care, state governments for secondary care, and local governments for primary care services. Within this arrangement, however, funding and referral linkages have never been clearly defined (Kombe, 2009).

Health sector reform initiatives accelerated in 2001, primarily in response to the dismal ranking of the Nigerian health system in the WHO's *World Health Report 2000* (WHO, 2000). National policies were developed not only to clarify the roles and responsibilities for the delivery of health care but also to expand options for health care financing. In spite of this overall increase in resource availability in the government budget, overall allocations to the health sector decreased between 2000 and 2006. (Kombe *et al*, 2009).

Below are figures that show the value for Health expenditure, for public % of total health expenditure, % of government expenditure and % of GDP in Nigeria for a period of 15 years (1995 – 2010).

Figure 2.1: Health expenditure, public (% of total health expenditure) in Nigeria 1995 - 2010

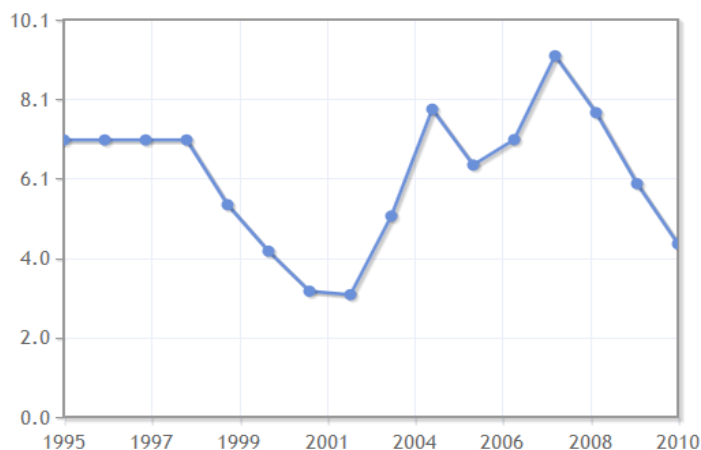


Source: World Health Organization National Health Account database 2011

Note: Over the past 15 years, this indicator reached a maximum value of 41.17% in 2008 and in 1996 a minimum value of 20.76%. It stood at 37.89% in 2010. Public health expenditure consists of recurrent and capital spending from government (central and local) budgets, external borrowings and grants (including donations from international agencies and nongovernmental organizations), and social (or compulsory) health insurance funds. Total health expenditure is the sum of public and private health expenditure. It covers the provision of health services

(preventive and curative), family planning activities, nutrition activities, and emergency aid designated for health but does not include provision of water and sanitation.

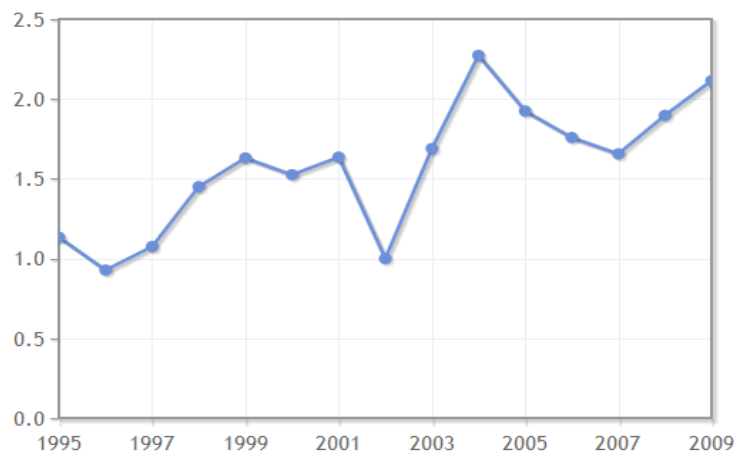
Figure 2.2: Health expenditure, public (% of government expenditure) in Nigeria 1995 - 2010



Source: World Health Organization National Health Account database 2011

Note: Its highest value over the past 15 years was 9.19% in 2007, while its lowest value was 3.11 in 2002. In 2010, it was at 4.41%.

Figure 2.3: Health expenditure, public (% of GDP) in Nigeria 1995 – 2009



Source: World Health Organization National Health Account database 2011

Note: Its highest value over the past 14 years was 2.28% in 2004, while its lowest value was 0.93% in 1996. As at 2009, it was 2.12%.

An analysis of health spending in Nigeria reveals that insufficient funds are allocated to the health sector of the economy. Hence, there is large room for improvement in terms of funding efficiency and equity. The above is an indication that the government over the years has underestimated the importance of investing in health. This among other factors is the reason for the lukewarm attitude of the service providers at both the public (especially) and private health centers. The proportion of resources devoted to health out of the available total resources continued to dwindle to as low as 1.07 per cent between 1987 and 1992. The total expenditure as a percentage of GDP for all years fell under 10 per cent as against the value recommended by UN. (Ogundipe and Lawal, 2011).

Financing health care in Nigeria is done by not just the public sector but also a non-negligible contribution made by the private sector. Part of the finance from the public sector has

been invested into the health care system of the country, which has been divided into three levels. The primary health care (PHC) with approximately 13,703 of them, are under the authority of the local government and are made up of local hospitals, health centers and clinics that treat general everyday health cases. The second level is the secondary health care (SHC) with 845 of them. They concentrate on providing general and specialist health care in addition to serious cases referred from the PHCs, the state government is responsible for the SHCs. The third tier – the tertiary health care (THC) consists of 59 teaching and specialized institutions. They train health personnel and treat complicated cases, which the other levels cannot handle. The private sector also contributes to all these tiers (Yadav *et al*, 2009, Ogundipe and Lawal, 2011).

In Nigeria, health is financed from multiple sources-tax revenue, out of pocket payments, donations, community financing, and recently health insurance, after the inception of a national health insurance scheme (Yadav *et al*, 2009).

i. Multiple sources - tax revenue

This source of health financing in Nigeria comes in different forms; the General Tax Revenue, which is made up largely of import and export duties and sale taxes. The revenue comes from a variety of taxes – income and profit taxes, value added and sales taxes, taxes on import and taxes on profits from the sales of natural resources. They may be earmarked for health services at either national or local level, for example the Petroleum (Special) Trust Fund. Other forms include the local tax revenue, which consists of the tenement rates. This accounts for almost 40% of the total internal revenue generated, local licences, fees and fines, earnings from

commercial undertakings such as transport services and markets, and rents on Local Government properties.

ii. Out of pocket payments

This forms a common and great part of health financing in Nigeria for decades. Available statistics still show that households largely bear the responsibility of financing their health needs through direct payment. Over 68% of total health expenditure comes from direct out-of-pocket payments (WHO 2006). It is the least desirable means of healthcare financing as it denies access to healthcare to those who cannot afford to pay at the time of their illness.

iii. Donations, charity and voluntary contributions

This source of health financing plays an important role. The Nigerian health sector in recent times has enjoyed a lot of financing in form of donations from both national and international organizations for example USAID, Global Fund, PEPFAR, and CDC. Religious and private organizations are also not left out of health financing.

iv. Community financing

Effective health care stresses the need for national self-reliance, community participation, and mobilization of under-utilized national and local resources, development of inter-sectoral collaboration and use of affordable and appropriate technology. However, community finance is unlikely to generate sufficient resources by itself to meet the country health need. There are some hospitals in especially hard to reach communities that are built and furnished by community self-help. Some go as far as recruiting and paying health workers to provide services for their community members. Others contribute to renovate their community health centers. Community

financing has been recognized as a community-friendly and community-driven initiative that has a wider reach and coverage of the informal sector especially if well designed. Experience with the Anambra State Community Based Health Financing scheme, and a few other similar schemes in Nigeria indicate high acceptability of the people to the scheme (Adinma and Adinma, 2010).

v. Health Insurance

Health insurance is a system whereby prospective consumers of health care make payments to their parties in the form of insurance schemes, which in the event of future illness will pay the provider of care for all or some of the expenses incurred to achieve good health. The fundamental rationale for all insurance is risk. While health care costs may be infrequent, they can come most unexpectedly and be very high. Without insurance therefore, individuals who are willing to pay for care may not be able to afford it.

In general, there are three main types of insurance. They include:

i. The Government or Social Insurance (or what can be called the National Health Insurance Scheme). Coverage is provided for those in gainful employment in the formal sector, either run by government or contracted out to private insurance companies and has great capacity to finance high-cost, hospital-based, doctor-centred curative care as well as provide support for invalidity and old age.

ii. The Private Insurance. This provides coverage for groups or individuals through institutions that operate in the private sector and differs from social insurance by not including pensions for invalidity or old age, and by basing the premium on personal or small group risks rather than on the pooled risks of a large population.

iii. Employer Based Insurance. The insurance in which the employers serve as the third party payer or collection agent in the form of;

- i. Payment for private sector health service
- ii. Direct employment of medical personnel, or
- iii. Provision of necessary facilities and equipment is often focused on accident prevention and occupational health for the workforce (Inem, 2011)

2.4 Productivity in Nigeria

In spite of the improvement in real GDP between 1993 and 1996, the political upheavals experienced during the period seriously affected overall productivity. Thus, the rate of productivity decline fluctuated between 0.24 and 2.03 during 1993-95 periods (CBN, 2005).

Evidence from Nigeria has shown that both the national and sectorial productivity (health included) measures have generally reflected a declining trend over the past decades. The long-term productivity growth rate for Nigeria (1974-1996) is disappointing. It recorded an average growth rate of -0.17% during the period (Obadan and Odusola, 1996). The average productivity rate in Nigeria as analysed by Obadan and Odusola has for over 20 years cannot be said to be growth as it has been a negative figure, which shows that productivity has been very poor.

2.5 Public Financing of Health and Productivity

In assessing the impact of public health expenditures on health status, it has been put forward that it is plausible that increase in health status associated with public health spending affect educational status and socioeconomic status by raising individuals' capacity to learn and work. The most plausible explanation is that they are related and advocate for each other. This

study concluded that public health expenditures had a potentially strong impact on health status and productivity (Division of Health Management and Policy, 1998).

The impact of health on workforce productivity cannot be over emphasized; A World Bank (1974) study on iron deficiency anemia and the product of adult males in Indonesia showed that the effect of health status on productivity is very important and so also was public spending to maintain the healthy status of workers important to their productivity.

2.6 Empirical Literature

Using non-parametric techniques and Malmquist productivity indices, Miika (1995) compared various model specifications in analyzing the development of hospital productivity in Finland during a transition period towards ‘quasi-markets’ in health care. Her study revealed that state subsidy reform initiated by the government in 1993 might have accelerated the expansion of the production possibilities frontier, judged by the significantly higher technical change of hospitals during 1992 and 1994. It also revealed significant productivity progress in the latter half of the observation period, mostly due to the exogenous rate of technical change.

The Malmquist indices used in the above research also showed that there was an average annual productivity increase of 3-4%, mostly attributable to technological change. Since productivity was already improving well before the subsidy reform of 1993, therefore the economic depression may have had a marked additional impact on hospital productivity growth (Miika, 1995). The study showed that Hospitals’ direct responses to the new financing system were not markedly associated with increased efficiency or productivity. The study was able to show that state subsidy reform affected hospital performance through other mechanisms, e.g. increased political pressure, which was not monitored in the study.

Söderlund *et al* (1997) examined the impact of National Health Service (NHS) reforms on English hospital productivity using parametric methods. According to their study hospital productivity increased, but competition between hospitals had no significant effect on productivity during the first three years of the internal market. They however show that reforms in form of increased financing can increase hospital productivity.

A study by Ichoku *et al* showed that there is a large incidence and severity of catastrophic healthcare financing in Nigeria, and that a very high percentage (77 per cent) of healthcare financing in Nigeria is through OoP (Out of Pocket) payment. This implies that individuals bear a greater percentage cost of ill health. Productive capacity is affected by ill health and the inability to pay for health care services delays recovery and increases absenteeism, which also affects productivity (Ichoku *et al*, 2009).

The productivity of agricultural workers in worm-infested regions had been observed to improve dramatically after treatment with anthelmintic drugs provided by government, and to remain higher than the productivity of their untreated peers (Hamoudi and Sachs, 1999). This shows that spending on health helps improve productivity.

Using regressive model on annual data collected from China between 1978 and 2002, Xiaoqing was able to test for the effects of investments in physical capital and health on economic growth, modeling the Cobb-Douglas production function in which physical capital and health were included. The results indicated that the investment in physical capital and investment in health contributes to GDP (Xiaoqing 2005).

Empirical evidence clearly shows that health has a major impact on the raising of labour productivity in general. Studies by Bloom, Canning and Sevilla showed that a single percentage

increase in adult survival rate as a result of increased availability of health care services increased labour productivity by as much as 2.8 percent; this also signified the importance of financing health (Bloom, Canning and Sevilla, 2002).

Davis et al used Commonwealth Fund survey data in 2005 to show that the health of workers and their families had important implications for the overall productivity of the U.S. labor force and the performance of the economy. Their survey in 2003 showed that, 12 percent of working-age adults did not work because of health reasons. Seventy-two percent either missed days of work as a result of their own illness or that of family members, or were unable to concentrate at work as a result of health concerns for which they paid for out of their pockets. Forty-one percent either were absent from work or experienced reduced productivity for more than a week. The lost economic output resulting from the combination of not working, sick days, and subpar productivity on the job came to \$260 billion in 2003— roughly 2.4 percent of the gross domestic product (Davis *et al*, 2005).

Loeppke *et al* (2009) showed from their study that a strong link existed between health and productivity, that integrating productivity data with health data can help employers develop effective workplace health human capital investment strategies (Loeppke *et al*, 2009).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Analytical Technique

The aim of this research work is to determine if there is a causal effect between public financing of health and productivity in Nigeria. That is whether using the data gathered it could be determined if government's financing of health has had any effect on the productivity of Nigeria's workforce. On the other hand, if the nation's workforce productivity had affected the way the Nigerian government had been financing health.

3.2 Granger's Causality Test

The standard Granger causality test examines whether past changes in one variable affects the other variable. It tests if a variable - X (e.g. public financing of health) helps to explain the current changes in another variable -Y (e.g. workforce productivity). If, otherwise, then one concludes that X (government financing of health) does not granger cause Y (workforce productivity). To determine whether causality runs in the other direction, from Y to X (or workforce productivity to government financing of health), one simply repeats the experiment, but with variables X and Y interchanged.

Y and X could stand for either of the variables under consideration (in this case workforce productivity, government financing of health). The test is usually run in bivariate regression forms for all possible pairs of X and Y (EViews, 2001).

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \dots + \alpha_k Y_{t-k} + \beta_1 X_{t-1} + \dots + \beta_k X_{t-k} + \varepsilon_t$$

$$X_t = \alpha_0 + \alpha_1 X_{t-1} + \dots + \alpha_k X_{t-k} + \beta_1 Y_{t-1} + \dots + \beta_k Y_{t-k} + \mu_t$$

The null hypothesis usually is that X does not granger-cause Y in the first regression equation and that Y does not granger-cause X in the second regression. If $\beta_1 = \beta_2 = \dots = \beta_k = 0$ then, X does not granger cause Y, hence, we accept the null hypothesis (Obadan and Odusola, 2005).

In economics, one may often have that all variables in the economy react to some unmodeled factor (the Gulf war) and if the response of X_t and Y_t is staggered in time one will see granger causality even though the real causality is different. There is nothing one can do (unless an experiment with the economy is done). Granger causality measures whether one thing happens before another thing and helps to predict it - and nothing else. However, of course, we all secretly hope that it partly catches some real causality in the process (Sorensen, 2005). The use of Granger causality test is an important scientific way of determining the direction of causation.

However, determining the nature of the relationship or impact is outside its scope, this, therefore informed the use of the Vector autoregressive (VAR) model to carry out the analyses of the key variables of this research work. The impulse response function of the VAR model was interpreted to examine the impact of government health care expenditure on workforce productivity in Nigeria. In addition, the variance decomposition was interpreted to determine the relative contribution of government recurrent expenditure on health care (RGEH), government capital expenditure on health care (CGEH), total government expenditure on health care (TGH),

gross domestic product (GDP), and total health expenditure as a percentage of GDP (THEGDP) on workforce productivity (WFGR).

Time series data are always non-stationary due to fluctuations, innovations or changes over time.

3.3 Unit Root Test

Unit root test was conducted to check for the stationarity and to determine the order of integration of the variables in the model. On that note, the Augmented Dickey Fuller (ADF) test was conducted to test for unit root based on equations of the following form:

$$Y_t = \alpha + \beta Y_{t-1} + \sum_{i=1}^n \beta_j \Delta Y_{t-i} + \varepsilon \quad (3.1)$$

$$Y_t = \alpha + \gamma t + \beta Y_{t-1} + \sum_{i=1}^n \beta_j \Delta Y_{t-i} + \varepsilon \quad (3.2)$$

Where, equation (3.1) signifies ADF with intercept only, while equation (3.2) signifies ADF with trend and intercept.

Thus, the null hypothesis for ADF unit root test is $\beta = 0$ (presence of unit root), and the alternative hypothesis is $\beta \neq 0$ (absence of unit root).

3.4 Model Specification

3.4.1 The VAR Model

The functional form of the VAR model that was used for this research is:

$$\text{WFP} = (\text{CGEH}, \text{RGEH}, \text{GDP}, \text{TGH}, \text{THEGDP}) \quad (3.3)$$

Where;

WFP = Workforce productivity

CGEH (x_1) = Capital Government Expenditure on Health care

RGEH (x_2) = Recurrent Government Expenditure on Health care

TGH (x_3) = Total Government Expenditure

GDP (x_4) = Gross Domestic Product

THEGDP (x_5) = Total Health Expenditure as a percentage of GDP.

The econometric form of the VAR equation is;

$$\Delta WFP_t = \beta_0 + \beta_1 WFP_{t-1} + \sum_{j=1}^L \beta_j \Delta WFP_{t-j} + \sum_{j=1}^L \beta_2 \Delta CGEH_{t-j} + \sum_{j=1}^L \beta_3 \Delta RGEH_{t-j} + \sum_{j=1}^L \beta_4 \Delta TGH_{t-j} + \sum_{j=1}^L \beta_5 \Delta GDP_{t-j} + \sum_{j=1}^L \beta_6 \Delta THEGDP_{t-j} + \mu_t \quad (3.4)$$

All variables are defined as above. The *a-priori* expectation is that all coefficients ($\beta_1, \beta_2, \dots, \beta_6$) are expected to be positively related to Work force productivity. Thus, it is expected that the ratio of health financing, which is the percentage expenditure on health care from total expenditure on health care, will increase when there is an actual increase in the total amount government expends on health care. In addition, that if there is an increase in the Government's expenditure on health, there will be an improvement in performance, which will translate to positive impact on the workforce productivity. Thus; $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6 > 0$

CHAPTER FOUR

EMPIRICAL RESULTS, INTERPRETATION AND DISCUSSION

4.1 Unit Root Test

Due to fluctuations and inconsistencies that occur in virtually all time series data, unit root test was conducted based on equations 3.1 and 3.2 to ascertain the stationarity and order of integration of the series used for the analysis. The unit root test confirmed that all the series were I (1). This meant that all the series were stationary at first difference or integrated of order one. The summary of unit root test is found in table 4.1 below;

Table 4.1: Summary of Unit Root Test Result

Variable	ADF Statistic		Critical Value	Comments
	Level	First Difference		
LCGEH	-2.6616	-4.3984**	-3.5796	I (1)
LGDP	-1.6611	-4.1464**	-3.5796	I (1)
LRGEH	-3.3137	-5.5241**	-3.5796	I (1)
LTGH	-2.6371	-4.6932**	-3.5796	I (1)
LTHEGDP	-1.9674	-4.1199**	-3.5796	I (1)
WFGR	-2.9455	-4.8500**	-3.5796	I (1)

Note: (**) represents stationary at 5% critical value

Source: Author's computation

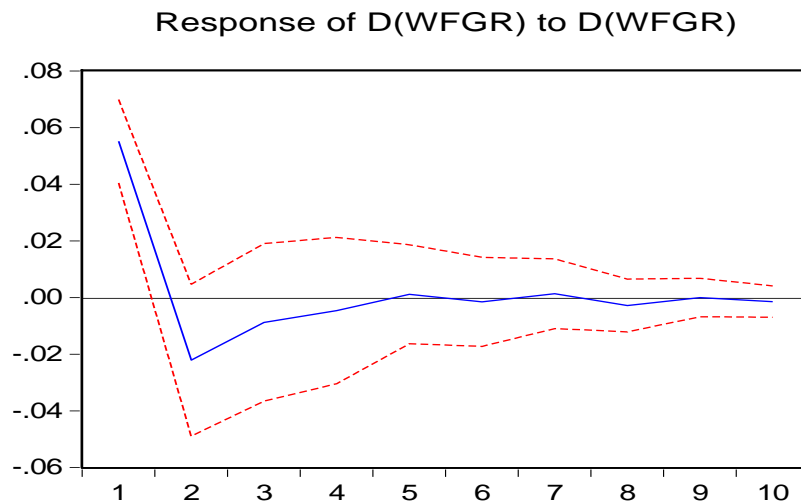
This signified that there could be a long run relationship among the variables in the model over the period of study. Co-integration test was conducted to confirm whether a long run relationship existed among the variables. The trace and maximum Eigen statistic revealed that there was no co-integration among the variables, which is a very weak evidence of long run relationship.

Due to the above weakness, a differenced VAR model was estimated instead of a VEC model.

4.2 Interpretation of the Vector autoregressive (VAR) Results

The vector autoregressive (VAR) equation 3.4 was estimated as proposed. Using the data for all the variables under study, the dynamic response of which trace out the responses of current and future values of each of the variables to a one unit increase in the current value of one of the VAR errors on workforce productivity was tested on the dependent and all the independent variables.

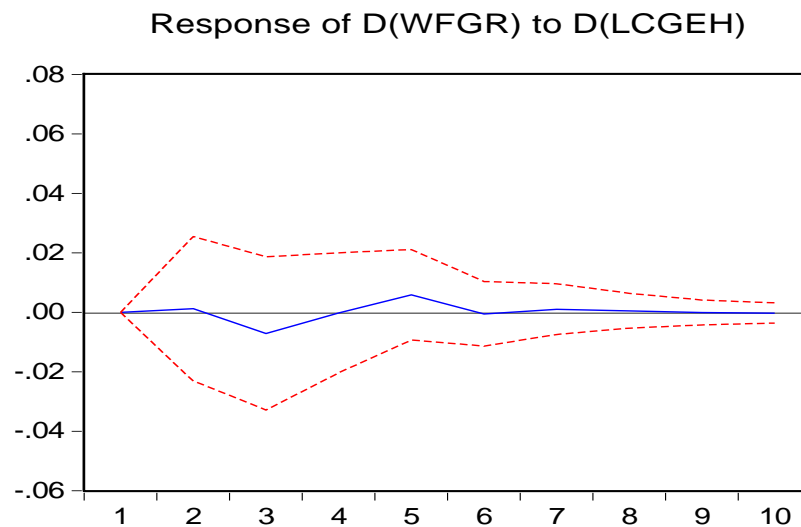
Figure 4.1: Impulse Response of Workforce Productivity to Workforce Productivity



Source: Author's computation

Figure 4.1 above represents the dynamic response of workforce productivity to a generalized one standard deviation (SD) shock of workforce productivity within a horizon of 10 periods. The response of workforce productivity to shocks from workforce productivity showed a declining trend from about 0.05 in horizon 1 to about -0.02 in horizon 2. Between horizons 2 and 5, there was an improvement from -0.02 to about 0.001. Between horizons 5 and 10, the shock died down around 0. In other words, the shock fluctuated between 0.001 to -0.001 in horizon 5 and 10 respectively. The implication of this finding is that workforce productivity affected negatively workforce productivity over the period of study, meaning that there was no positive growth in workforce productivity. This could be because of inadequate motivation to the workers in the country over the years. This supports the finding of (Ichoku *et al*, 2009).

Figure 4.2: Impulse Response of Workforce Productivity to Government Capital Expenditure on Health Care

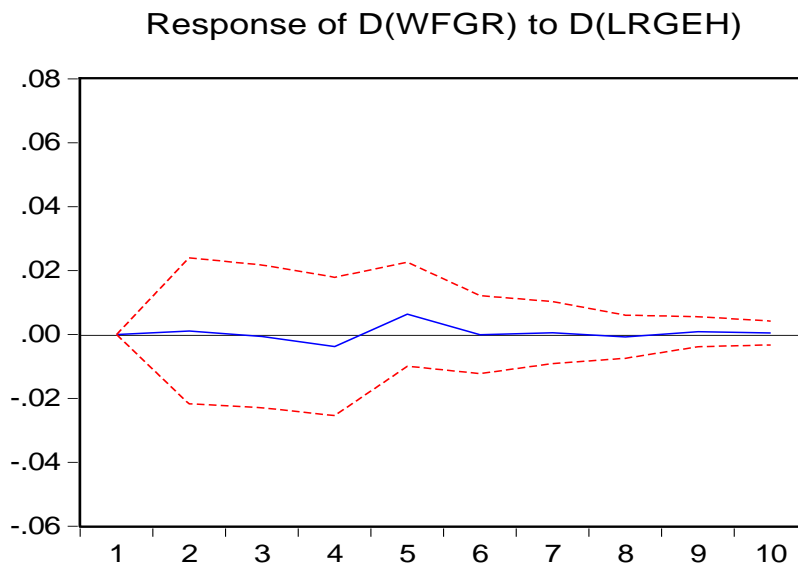


Source: Author's computation

Figure 4.2 represents the dynamic response of workforce productivity to a generalized one standard deviation (SD) shock of government capital expenditure on health care within a horizon of 10 periods. The response of workforce productivity to shocks from government capital expenditure on health care showed an increasing trend from about 0.00 in horizon 1 to about 0.001 in horizon 2. Between horizons 2 and 3, there was a decline from 0.001 to about -0.001 respectively. Between horizons 3 and 5, the shock has improved from -0.001 to about 0.001. Between horizons 5 and 10, the shock died down around 0 and moved between 0.001 and -0.001 respectively. The implication of this finding is that government capital expenditure on health care had affected workforce productivity negatively over the period of study. This could be attributable to the lopsided expenditure in favour of recurrent expenditure in the country over the

years. This supports the finding of (Ichoku *et al*, 2009). This could also be because most of capital expenditure on health is used in the purchase of expensive equipment, which has no direct impact on productivity, and that huge amount of health expenditure does not reach its destination. The assertions by (Griffin and McKinley, 1992, Gauthier and Wayne 2007) support this.

Figure 4.3: Impulse Response of Workforce Productivity to Government Recurrent Expenditure on Health Care

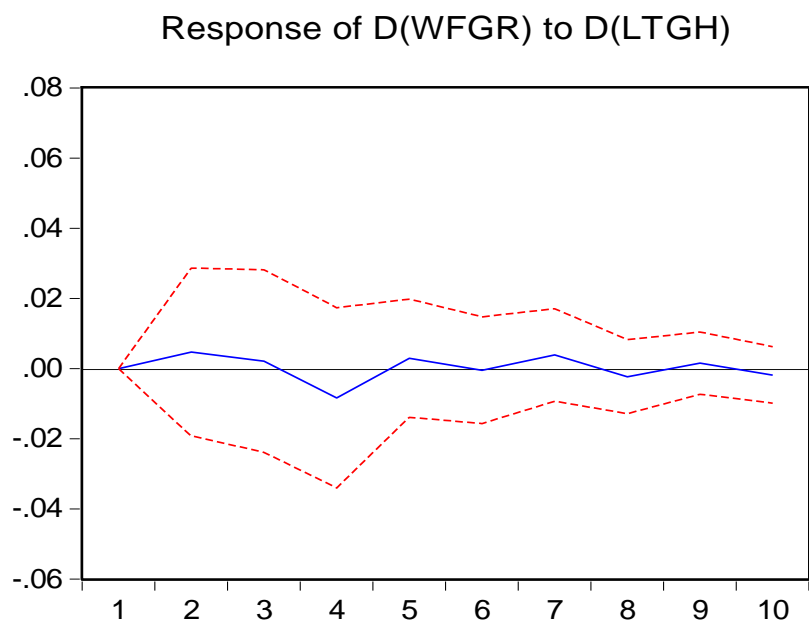


Source: Author's computation

The figure above represents the dynamic response of workforce productivity to a generalized one standard deviation (SD) shock of government recurrent expenditure on health care within a horizon of 10 periods. The response of workforce productivity to shocks from government recurrent expenditure on health care showed a declining trend from about 0.00 in

horizon 1 to about -0.001 in horizon 4. Between horizons 4 and 5, there was an increase from -0.001 to about 0.001 respectively. Between horizons 5 and 10, the shock died down around 0 and moved between 0.001 and 0.0001 respectively. The implication of this finding is that government recurrent expenditure on health care had affected workforce productivity positively over the period of study. This could be because of the priority given to recurrent expenditure in the country over the years. This supports the findings of Miika (1995), and Xiaoqing (2005).

Figure 4.4: Impulse Response of Workforce Productivity to Total Government Expenditure on Health Care

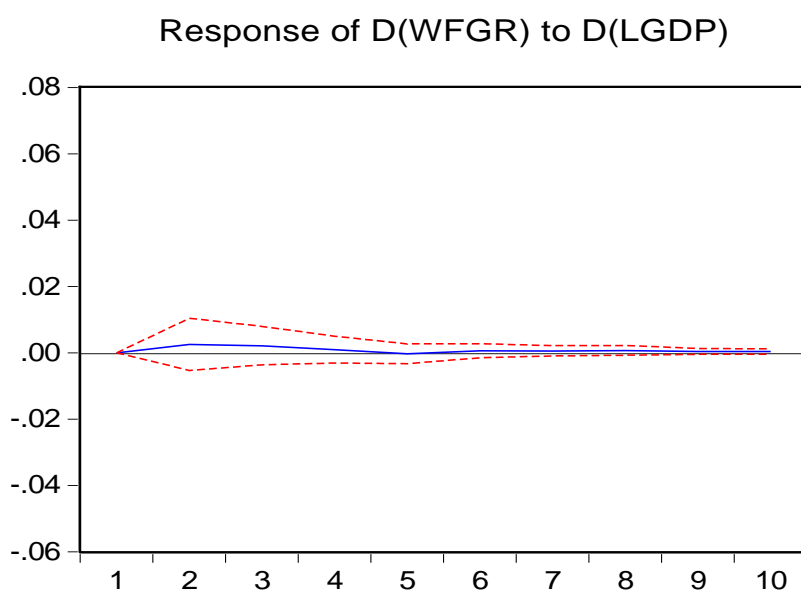


Source: Author's computation

Figure 4.4 represents the dynamic response of workforce productivity to a generalized one standard deviation (SD) shock of government total expenditure on health care within a horizon of 10 periods. The response of workforce productivity to shocks from total government

expenditure on health care showed a declining trend from about 0.001 in horizon 1 to about -0.001 in horizon 4. Between horizons 4 and 5, there was an increase from -0.001 to about 0.001 respectively. Between horizons 5 and 10, the shock died down around 0 and moved between 0.001 and -0.0001 respectively. The implication of this finding is that government total expenditure on health care affected workforce productivity negatively over the period of study. This could be attributed to poor government investment in the health sector over the years. This supports the findings of (Ichoku *et al*, 2009).

Figure 4.5: Impulse Response of Workforce Productivity to Gross Domestic Product



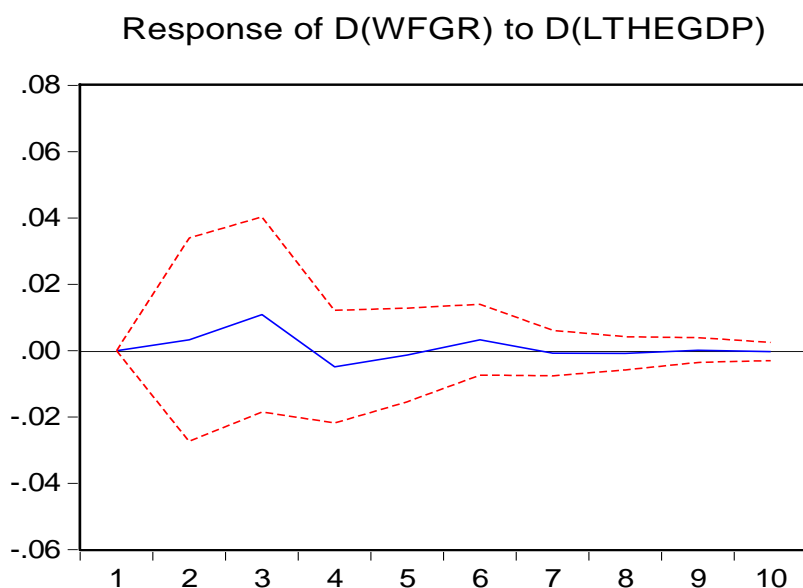
Source: Author's computation

Figure 4.5 represents the dynamic response of workforce productivity to a generalized one standard deviation (SD) shock of gross domestic product (GDP) within a horizon of 10 periods. The response of workforce productivity to shocks from gross domestic product (GDP) showed a declining trend from about 0.000 in horizon 1 to about -0.0001 in horizon 5. Between

horizons 6 and 9, there was an increase from -0.0001 to about 0.0001 respectively. Between horizons 9 and 10, the shock died down to 0 and remained constant. The implication of this finding is that gross domestic product (GDP) had affected workforce productivity positively over the period of study. This supports the findings of (Ichoku *et al*, 2009).

Figure 4.6: Impulse Response of Workforce Productivity to Total Health

Expenditure as a Percentage Gross Domestic Product



Source: Author's computation

Figure 4.6 represents the dynamic response of workforce productivity to a generalized one standard deviation (SD) shock of total health expenditure as a percentage of GDP within a horizon of 10 periods. The response of workforce productivity to shocks from total health expenditure as a percentage of GDP showed an increasing trend from about 0.000 in horizon 1 to about 0.001 in horizon 3. Between horizons 3 and 4, there was a decline from 0.001 to about -0.0001 respectively. Between horizons, 4 and 6 there was an increase from -0.0001 to 0.0001

respectively. Between horizons 6 and 10, the shock dies down to 0 and moved around 0.0001 to -0.0001. The implication of this finding is that total health expenditure as a percentage of GDP has affected workforce productivity negatively over the period of study. This supports the findings of (Ichoku *et al*, 2009).

Table 4.2: Variance Decomposition of Workforce Productivity

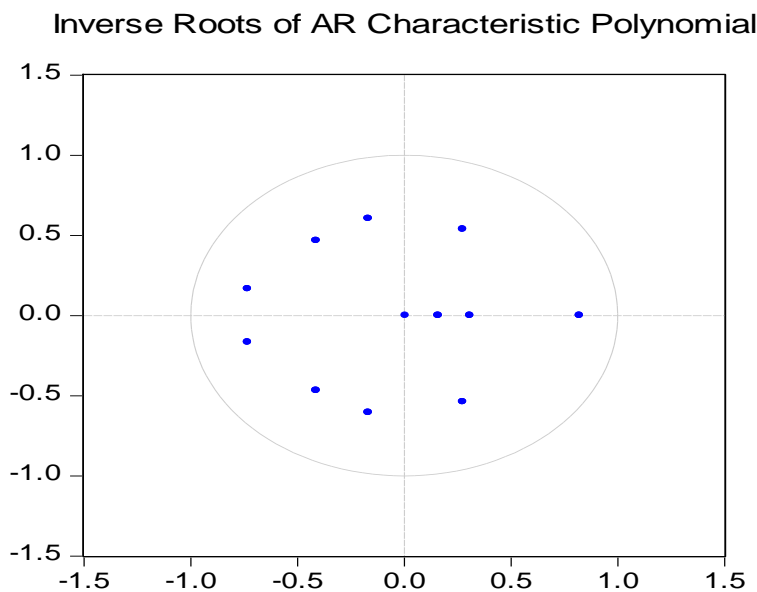
Period	S.E	WFGR	CGEH	RGEH	TGH	GDP	THEGDP
1	0.0552	100.00	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.0598	98.8418	0.0380	0.0327	0.6134	0.1767	0.2994
4	0.0629	91.6751	1.3357	0.4042	2.4403	0.2914	3.8533
6	0.0637	98.5137	2.1567	1.3741	2.5971	0.2956	4.0628
8	0.0640	89.0002	2.1684	1.3835	3.0741	0.3113	4.0625
10	0.0641	88.8515	2.1658	1.4016	3.2077	0.3169	4.0565

Source: Author's computation

Table 4.2 shows the variance decomposition or the relative contribution of all the variables in the model to the source of variation in workforce productivity forecast error. From the table, it was observed that own shocks constituted the highest source of variation in workforce productivity forecast error declining from 100% in horizon 1 to 88.85% in horizon 10 over the period of study. Total expenditure on health as a percentage of GDP (THEGDP) shocks constituted between 0.29% and 4.0% of the source of variation in workforce productivity forecast error in horizons 2 and 10 respectively,. This was followed by total government expenditure on health (TGH) which constituted between 0.61% and 3.20%, in horizons 2 and 10

respectively, followed by government capital expenditure on health (CGEH) which constituted between 0.03% and 2.16% in horizons 2 and 10 respectively. Government recurrent expenditure on health (RGEH) constituted between 0.03% and 1.40% in horizons 2 and 10 respectively, followed by GDP, which constituted between 0.17% and 0.31% in horizons 2 and 10 respectively. This implied that the contributions of the independent variables to the variations to WFGR increased over time. The THEGDP's variations increased more than any other variable.

Figure 4.7: Robustness (Stability) Test of the VAR Model



Source: Author's computation

Figure 4.7 shows the inverse root of AR polynomial of the estimated VAR model. It showed that the VAR model had satisfied the stability condition because all the Eigen values of the residuals fell within the unit circle. Hence, the VAR model is robust and suitable for policy.

Table 4.3: VAR Residual Serial Correlation LM Test

Null Hypothesis: No Serial Correlation at Lag Order H

Lags	LM-Stat	Prob
1	44.04924	0.1677
2	42.54176	0.2101
3	45.13108	0.1415
4	35.16089	0.5083
5	37.65830	0.3932
6	43.80604	0.1741
7	30.14004	0.7429
8	24.91541	0.9178
9	39.45144	0.3183
10	29.97700	0.7498
11	23.73060	0.9421
12	38.49923	0.3571

Source: Author's computation

Table 4.3 showed that there was absence of serial correlation in the VAR model within the period of study because the probability values were greater than 0.05, hence the null hypothesis of no serial correlation could not be rejected.

4.3 Interpretation of Causality

Table 4.4: Granger Causality Test

Null Hypothesis:	F-Statistic	Probability
LCGEH does not Granger Cause WFGR	4.46074	0.04408
WFGR does not Granger Cause LCGEH	0.01244	0.91201
LGDP does not Granger Cause WFGR	11.1951	0.00242
WFGR does not Granger Cause LGDP	9.08906	0.00554
LRGEH does not Granger Cause WFGR	5.86231	0.02246
WFGR does not Granger Cause LRGEH	0.00457	0.94663
LTGH does not Granger Cause WFGR	5.15023	0.03144
WFGR does not Granger Cause LTGH	0.01147	0.91552
LTHEGDP does not Granger Cause WFGR	1.44442	0.23986
WFGR does not Granger Cause LTHEGDP	0.47423	0.49692

Note: Causality exists when the probability value is ≤ 0.05

Source: Author's computation

From table 4.4, it was observed that government capital expenditure on health (LCGEH) caused workforce productivity, as the probability value of 0.04408 is lower than the 5% level of significance, meaning that the coefficients of LCGEH in the model with workforce productivity as the dependent variable are not equal to zero. The converse can be said for the coefficients of

workforce productivity when LCGEH is the dependent variable. This is because the probability value of 0.91201 is greater than the level of significance, thus the coefficients of workforce productivity are equal to zero meaning that workforce productivity did not cause LCGEH.

It was observed that Gross Domestic Product (LGDP) with a probability of 0.00242, which is lower than 5%, caused workforce productivity, the same was observed in the model with LGDP as the dependent variable as the probability was 0.00554, meaning that the causality is bi-directional over the period of study. Government recurrent expenditure on health (LRGEH) caused workforce productivity with a probability of 0.02246, on the other hand, with a probability (0.94663) higher than the 5% level of significance; workforce productivity did not cause LRGEH.

Government total expenditure on health (LTGH) caused workforce productivity with a probability of 0.03144, which is lower than 5%, on the other hand, workforce productivity did not cause LTGH again showing a uni-directional causality. The next model with workforce productivity (LTHEGDP) as the dependent variable and a probability of 0.23986 showed that total health expenditure as a percentage of GDP did not cause workforce productivity, the same was observed in the last model as the probability of 0.49692 showed that workforce productivity did not cause LTHEGDP.

LCGEH, LRGEH, LTGH and GDP granger caused WFGR, means that past changes in these variables can predict or forecast the future changes in WFGR. This implies that the more government spends on health care, the better the productivity of the workforce.

4.4 Discussion of findings

In order to test for causality between the key variables and the independent variable – workforce productivity, ten models were analysed. The first 2 models showed a unidirectional

causality between LCGEH and workforce productivity. LCGEH caused workforce productivity showing that past changes in LCGEH could predict or forecast future changes in WFGR, meaning that the hypothesis that LCGEH did not cause WFGR was not rejected, but the hypothesis that WFGR did not cause LCGEH was rejected.

In the models that focused on GDP and WFGR, the causality was bi-directional, showing that GDP caused WFGR with a probability value of 0.00242, which is less than the 5% level of significance, and WFGR caused GDP whose p value of 0.00554 is less than the 5% level of significance. The last 2 models that tested for causality between LTHEGDP and WFGR and WFGR caused LTHEGDP was rejected. There was no causality, meaning that the hypothesis that LTHEGDP caused WFGR and WFGR caused LTHEGDP was rejected.

The results of the granger's causality test conducted showed that the variables closely linked to government health care financing – LCGEH, LRGEH and LTGH caused WFGR. Meaning that they could be used to predict the past and also forecast the future in workforce productivity meaning that government financing in the past caused productivity and that for there to be workforce productivity, there had to be government financing. Thus, in the past, to increase productivity, government financing had to be increased. The one direction of the causality noted between healthcare financing in Nigeria and workforce productivity showed that for workforce productivity to increase, health care financing had to increase.

The key problem being examined in this study is the poor level of government's financing of health and its effect on workforce productivity over the years. The results were able to show that government financing played a key role in boosting workforce productivity. It is

evident that for workforce productivity to increase, government's financing of health had to increase.

The second objective of this study was to use VAR to determine if over the years there has been any kind of relationship between workforce productivity and the independent variables. The impulse response of workforce productivity to government capital expenditure on health care was negative. This showed that government capital expenditure had a negative effect on workforce productivity in Nigeria. On the other hand, government's recurrent expenditure on healthcare had a positive impact on workforce productivity; this can be attributed to the government's high recurrent expenditure on health as compared to capital expenditure. The effect of government's total expenditure on health on workforce productivity is negative. Over the years of study, the total government expenditure on health although has been increasing has not been enough to create any impact.

The impact of GDP on workforce productivity was positive. While the impact of the total government health expenditure, as a percentage of the GDP was negative. This showed that the percentage of the GDP that was spent on health was not significant enough to create any impact.

This study attempted to empirically explain the impact of government's low financing of health on workforce productivity. On the overall, the analysis of data over the years has shown that the low level of government financing influenced negatively. Moreover, government financing of health has not been able to cause any positive change in workforce productivity over the years under review.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION(S)

5.1 Summary

The study investigated government healthcare financing and workforce productivity in Nigeria over a period of 30 years (1980 – 2010). This was done to empirically ascertain the impact of government financing of healthcare on work force productivity. The types of government financing analyzed in the thesis were capital, recurrent, total government expenditure on health, gross domestic product and total health expenditure as a percentage of GDP.

In the study, workforce growth rate was used as a proxy for workforce productivity. To determine the impact of government financing of health care on workforce productivity, the relationship between the workforce productivity growth rate was compared to the capital, recurrent, total government expenditure on health, gross domestic product and total health expenditure as a percentage of GDP. Stationarity tests were conducted on all the series before the estimations to ensure the absence of stochastic processes.

The study due to the weak evidence of long run relationship among the variables, conducted a differenced VAR model to be able to determine the nature of the relationship between the variables. Variance decomposition was used to determine the relative contribution of the capital, recurrent, total government expenditure on health, gross domestic product and total health expenditure as a percentage of GDP to workforce productivity. They all exhibited different behavioral trends throughout the sample periods.

5.1.1 Summary of Major Findings

- i. The granger's causality test conducted between capital government expenditure on health (CGEH) and workforce productivity showed that CGEH was able to forecast changes in workforce productivity. On the other hand, the VAR model estimate showed that CGEH had a negative effect on work force productivity.
- ii. Recurrent government expenditure (RGEH) granger caused workforce productivity, meaning that RGEH was able to forecast future changes in workforce productivity. According to the VAR estimate of RGEH affected workforce productivity positively.
- iii. Total government expenditure on health (TGEH) was found to have affected workforce productivity negatively, although TGEH could be used to predict both past and future changes in workforce productivity.
- iv. The causality between Gross Domestic Product (GDP) and workforce productivity was found to be bi-directional meaning that both GDP and workforce productivity could predict both past and future changes in each other. The VAR estimate showed that GDP had a positive impact on workforce productivity over the period of study.
- v. There was no causality between total health expenditure as a percentage of GDP (THEGDP) and workforce productivity, showing that THEGDP was unable to predict both past and future changes in workforce productivity. In addition, THEGDP affected workforce productivity negatively, but contributed the highest increasing source of variations to WFGR
- vi. The findings in (i) to (v) above showed that the different forms of government health financing in Nigeria responded to workforce productivity differently. And that there was no strong correlation between the variables over the 30 years period that was analyzed,

although recurrent government expenditure seemed to have the strongest effect on WRGR.

5.2 Conclusion

This study attempted to determine empirically, the impact of government health financing on workforce productivity in Nigeria over the period spanning from 1980 to 2010, using different methods. The outcome of the study suggested that the with the negative impact of government capital expenditure on health over the years, the focus of capital expenditure which is to finance infrastructure although has been existing has not been enough neither has it been positively channeled towards developing health care infrastructures. Recurrent government expenditure on health over the period under study had a positive impact on workforce productivity, although the variance decomposition showed that the impact was small and weak. This could mean that it had not significantly had a positive impact on workforce productivity.

The outcome of the study suggested that government financing of health care was not enough to create a significant impact on workforce productivity over the period of study.

5.3 Recommendation(s)

Base on the findings, the following recommendation(s) were made;

- i. Government should expedite action towards providing qualitative health infrastructures and boosting recurrent expenditure to maintain them. The workers will thus be provided with favorable working environment that will boost their productivity in the long run.
- ii. Better attention should be given to health personnel's remuneration in order to motivate them to give out their best.

- iii. Government also needs to give more attention to sustaining the National health insurance schemes, this will ensure that the burden of payment for health care services is reduced on workers which will go a long way in ensuring that they can concentrate on being productive.

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APPENDICES

Appendix 1: VAR Estimation

Vector Autoregression Estimates

Date: 05/11/13 Time: 10:19

Sample(adjusted): 1983 2010

Included observations: 28 after adjusting endpoints

Standard errors in () & t-statistics in []

	D(WFGR)	D(LCGEH)	D(LRGEH)	D(LTGH)	D(LGDP)	D(LTHEGDP)
D(WFGR(-1))	-0.285393 (0.29102) [-0.98068]	4.658780 (3.14284) [1.48235]	-2.674850 (4.15925) [-0.64311]	-0.376721 (3.37837) [-0.11151]	0.232863 (0.30720) [0.75803]	-4.583124 (3.26285) [-1.40464]
D(WFGR(-2))	-0.169973 (0.26881) [-0.63232]	5.550782 (2.90302) [1.91207]	6.541351 (3.84186) [1.70265]	5.695865 (3.12057) [1.82526]	0.059208 (0.28376) [0.20866]	4.766917 (3.01387) [1.58166]
D(LCGEH(-1))	-0.019901 (0.05003) [-0.39777]	-1.158158 (0.54031) [-2.14350]	-0.625367 (0.71505) [-0.87458]	-0.580395 (0.58080) [-0.99930]	0.009771 (0.05281) [0.18502]	-0.484850 (0.56095) [-0.86434]
D(LCGEH(-2))	-0.038968 (0.04736) [-0.82274]	-0.432906 (0.51150) [-0.84635]	-0.925561 (0.67692) [-1.36732]	-0.741287 (0.54983) [-1.34822]	0.042940 (0.05000) [0.85886]	-0.692567 (0.53103) [-1.30420]
D(LRGEH(-1))	-0.035837 (0.08662) [-0.41372]	-1.406461 (0.93548) [-1.50347]	-2.774544 (1.23802) [-2.24112]	-1.921473 (1.00558) [-1.91080]	0.041276 (0.09144) [0.45140]	-1.794508 (0.97120) [-1.84772]
D(LRGEH(-2))	-0.056197 (0.09091) [-0.61815]	0.168495 (0.98180) [0.17162]	-1.901433 (1.29932) [-1.46340]	-1.206878 (1.05538) [-1.14355]	0.081325 (0.09597) [0.84743]	-1.459774 (1.01930) [-1.43214]
D(LTGH(-1))	0.050987 (0.12926) [0.39444]	2.179012 (1.39598) [1.56092]	2.987112 (1.84744) [1.61689]	2.063072 (1.50059) [1.37484]	-0.023156 (0.13645) [-0.16971]	1.476210 (1.44928) [1.01858]
D(LTGH(-2))	0.064368 (0.14206) [0.45311]	0.600488 (1.53418) [0.39141]	3.611659 (2.03034) [1.77885]	2.520746 (1.64915) [1.52851]	-0.104471 (0.14996) [-0.69667]	2.884261 (1.59276) [1.81085]
D(LGDP(-1))	0.133686 (0.19154) [0.69795]	2.489885 (2.06854) [1.20369]	2.562676 (2.73751) [0.93613]	2.772415 (2.22355) [1.24684]	0.687376 (0.20219) [3.39967]	2.027253 (2.14753) [0.94399]
D(LGDP(-2))	0.067052 (0.04992) [1.34307]	-0.181999 (0.53916) [-0.33756]	-0.782112 (0.71352) [-1.09613]	-0.524957 (0.57956) [-0.90579]	-0.038695 (0.05270) [-0.73426]	-0.503844 (0.55974) [-0.90013]
D(LTHEGDP(-1))	0.007861 (0.03683) [0.21346]	0.553893 (0.39770) [1.39274]	0.435407 (0.52632) [0.82727]	0.439003 (0.42751) [1.02689]	-0.021382 (0.03887) [-0.55005]	0.695916 (0.41289) [1.68548]

D(LTHEGDP(-2))	0.029990 (0.03393) [0.88388]	-0.072863 (0.36642) [-0.19885]	-0.575143 (0.48493) [-1.18604]	-0.402266 (0.39388) [-1.02128]	-0.003336 (0.03582) [-0.09314]	-0.312736 (0.38042) [-0.82209]
R-squared	0.270937	0.391234	0.528607	0.431313	0.224187	0.530481
Adj. R-squared	-0.230293	-0.027293	0.204524	0.040341	-0.309184	0.207686
Sum sq. resid	0.048701	5.679947	9.947849	6.563162	0.054267	6.122023
S.E. equation	0.055171	0.595816	0.788505	0.640467	0.058238	0.618568
F-statistic	0.540544	0.934788	1.631086	1.103181	0.420321	1.643401
Log likelihood	49.22946	-17.39660	-25.24240	-19.42003	47.71442	-18.44591
Akaike AIC	-2.659247	2.099757	2.660172	2.244288	-2.551030	2.174708
Schwarz SC	-2.088302	2.670702	3.231116	2.815233	-1.980085	2.745653
Mean dependent	-0.003804	0.209738	0.249106	0.224317	0.048457	0.175853
S.D. dependent	0.049740	0.587848	0.884079	0.653790	0.050899	0.694927
Determinant Residual Covariance		2.28E-10				
Log Likelihood (d.f. adjusted)		72.44473				
Akaike Information Criteria		-0.031767				
Schwarz Criteria		3.393902				

Appendix 2: Granger Causality Estimation

Pairwise Granger Causality Tests

Date: 05/11/13 Time: 10:47

Sample: 1980 2010

Lags: 1

Null Hypothesis:	Obs	F-Statistic	Probability
LCGEH does not Granger Cause WFGR	30	4.46075	0.04408
WFGR does not Granger Cause LCGEH		0.01244	0.91201
LRGEH does not Granger Cause WFGR	30	5.86230	0.02246
WFGR does not Granger Cause LRGEH		0.00457	0.94663
LTGH does not Granger Cause WFGR	30	5.15023	0.03144
WFGR does not Granger Cause LTGH		0.01147	0.91552
LGDP does not Granger Cause WFGR	30	11.1952	0.00242
WFGR does not Granger Cause LGDP		9.08916	0.00554
LTHEGDP does not Granger Cause WFGR	30	1.44442	0.23986
WFGR does not Granger Cause LTHEGDP		0.47423	0.49692
LRGEH does not Granger Cause LCGEH	30	4.17904	0.05079
LCGEH does not Granger Cause LRGEH		9.85174	0.00408
LTGH does not Granger Cause LCGEH	30	5.10852	0.03208
LCGEH does not Granger Cause LTGH		3.51491	0.07168
LGDP does not Granger Cause LCGEH	30	1.05532	0.31340
LCGEH does not Granger Cause LGDP		61.5998	1.9E-08
LTHEGDP does not Granger Cause LCGEH	30	3.84870	0.06017
LCGEH does not Granger Cause LTHEGDP		4.26846	0.04854

LTGH does not Granger Cause LRGEH	30	9.26870	0.00515
LRGEH does not Granger Cause LTGH		3.20605	0.08459
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LGDP does not Granger Cause LRGEH	30	0.52171	0.47632
LRGEH does not Granger Cause LGDP		54.1124	6.5E-08
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LTHEGDP does not Granger Cause LRGEH	30	0.20137	0.65720
LRGEH does not Granger Cause LTHEGDP		3.16772	0.08637
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LGDP does not Granger Cause LTGH	30	0.55286	0.46357
LTGH does not Granger Cause LGDP		64.3863	1.3E-08
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LTHEGDP does not Granger Cause LTGH	30	0.00054	0.98160
LTGH does not Granger Cause LTHEGDP		3.68329	0.06559
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LTHEGDP does not Granger Cause LGDP	30	24.9997	3.0E-05
LGDP does not Granger Cause LTHEGDP		10.8583	0.00275
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