



**UNIVERSITY of the
WESTERN CAPE**

**Faculty of Natural Science
Department of Statistics & Population Studies
PhD (Population Studies)**

Thesis Title:

**Public sector spending in Nigeria: implications for poverty, demographic changes
and Millennium Development Goals target**

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Due Date: March 2015

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Acknowledgements

I am indebted to a number of persons and institutions whose contributions and comments assisted in no small measure in bringing this academic quest to a completion. In writing this thesis, I have depended upon countless acts of support, generosity and guidance. But more important, in engaging with the challenges and technicalities of the subject, I have depended upon steadfast colleagues and teachers. This is an important opportunity for me to thank them for a lifetime of collegiality and support.

Firstly, I owe my profound gratitude to Prof Nancy Stiegler (Supervisor) for her scholarship and dedication throughout the period of writing this thesis. Her sustained interests, thoughtfulness and mentorship have been the guiding torchlight. Nonetheless, I am offering my utmost gratitude to Prof. R. Blignaut, Prof. S. Appuni and all my colleagues at the Department, who made comments and suggestions that enriched the research.

Special Thanks go to the Nigeria Bureau of Statistics (NBS) for granting me accessibility of secondary data on the 2010 Harmonized Nigerian Living Standard Survey (HNLSS) and 2004 Nigerian Standards Living Survey (NLSS). To my research assistants that served as field workers and painstakingly collected data from Households in the South East region of Nigeria, I would remain ever grateful. Special thanks also go to colleagues working in several research institutes both in Nigeria and beyond for constructive criticisms of the PhD proposal and earlier draft reports.

Many thanks go to anonymous reviewers that made useful comments and suggestions that sharpened our analysis. I especially thank my external examiners who read the manuscript with great care and creativity, heading off mistakes, misunderstandings, or problematic gaps. Nonetheless, I am eternally grateful to Mr. Leslie P. Selbourne (Admin Officer, Statistics & Population Studies Department, UWC) who from the start of this thesis, provided incomparable support and editorial feedback that kept us in tack and on time.

Finally, I am indebted to my wife (Chinelo) and children (Iheanyi, Obumneme and Iheatu) that kept faith with me and encouraged me all the way to the end of the *Thesis writing*. This has been a great family effort. To them, I say a Big Thank You for their understanding during the study period; I am back; and to all who continued to speak positively to me, God Bless you.

Abstract

Over the last two decades, budgetary allocations to both the Health and Education sectors have been on the increase in Nigeria, while a counter-factual feedback on its effects for various economic groups and distributional effect for different population households has not been defined and well known. The resultant effect has been gross inefficiency and sub-optimality in terms of observed outcomes of the fiscal framework. In-addition, there have been a continuous quest by the citizenry for increased allocations to these sectors because of its supposed impact on the poverty index and standard of living. Although this is a compelling reason, but what is worrisome and equally troubling, is that the increasing incidence of poverty and expanding inequality in the Nigerian society have not mitigated, despite the scaling up of funding on the social sectors. Furthermore, the current level of socioeconomic development in Nigeria is not in tandem with the distributive outcome targets set by the 2004 reforms. Thus, understanding the current structure of poverty in Nigeria as well as beneficiaries of public sector spending provides a sound basis for tackling inequality and redesigning the current pro-poor frameworks. However, our analysis is focused on the distributional spread of beneficiaries from services and the counterfactual reciprocity of expenditure benefits rather than measuring the exact value to recipients of government-sponsored services. Our research methodology used the 2004 Nigerian Living Standard Survey; 2010 Harmonized Nigerian Living Standard Survey; Recent Cross-sectional data (2014) in South East Nigeria and secondary sources. Econometric methods (Error Correction Method); Marginal Odds estimation techniques, Concentration Curves and Ordered Logistic Regression were used for our analysis. Statistical and Econometric Software's (E-Views; SPSS; DAD and STATA) were used for estimations.

Econometric results showed misalignments between population dynamics and public sector expenditure on education, health and economic services. The government consumption expenditure was not sensitive to demographic changes. The derived adjustment coefficients of -1.38, -1.51 and *0.51* respectively, for education, health and economic services indicate huge gaps in terms of what optimal spending should have been, giving the population dynamics. Our benefit incidence analysis indicates that substantive gains have been made at the primary education and health care level, at the state level for SE Nigeria but there is a gross misapplication of funds at the secondary and tertiary levels of both education and health sectors. Results show that the state governments' is subsidizing the rich at the levels of both secondary and tertiary for

education and health care. In addition, country wide results indicate that apart from public primary education and health care for urban residents, no other level of social service was absolutely progressive in general terms, by gender or by location while the tertiary level of both services were regressive as shown by the 2010 survey results, in comparison to the 2004 survey results. Using the Ordered Logistic Regression, our result inclines to the life-cycle hypothesis which maintains that poverty oscillates depending on the age. At a younger age, it tends to be on the high side and decreases during the middle ages and increases with age. Our results discards the feminization of poverty general framework that women or female headed households are more prone to poverty due principally to low education and lack of opportunity to own assets such as land amongst others. This wasn't the case for the South East Region of Nigeria. Estimates indicate that education status, health status and access to health facilities affected the category of welfare of head of households and invariable, the entire household.

In general, our analysis shows misalignment of social expenditure for various population groups, both at the federal and state levels; making doubtful the realization of basic MDGs. Nigeria has to combine growth policies and assuring that demographics count, with the poor fully participating in economic development. Also, the need for a re-focusing in resource allocation taking into cognizance gender dimensions cannot be overemphasized. A general re-allocation of spending going to females and the poorer households would lead to improvement in gender equality and health status of women and children. Expediting actions towards qualitative education will lead directly to an acceleration of many of the other MDGs, especially those focusing on the reduction of poverty and inequality. To attain MDG targets (post 2015) within a shorter period of time, there is the need to improve the quality of social infrastructure and services. Furthermore, research should be focused on improving knowledge and understanding of what policies, technologies and investments matter for sustained growth in the country. This will create the much needed multiplier effect on other aggregates. The degree to which the poor participate in the growth process and share in its proceeds matter; both in the pace and pattern of growth. It is therefore important to have categorization of the population into economic groups when formulating a developmental framework for poverty reduction programmes. The study recommends sequencing of interventions, strengthening of institutions and other several interrelated areas to attain effectiveness of public sector spending.

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Abbreviations and Acronyms

ADF	- Augmented Dickey Fuller
ACT	- Artesimin Combination Therapy
AIDS	- Acquired Immune Deficiency Syndrome
BIA	- Benefit Incidence Analysis
BOF	- Budget Office of the Federation
CBN	- Central Bank of Nigeria
CDR	- Case Detection Rate
DAD	- Distributive Analysis Design
DMO	- Debt Management Office
DW	- Durbin-Watson
EA	- Enumeration Area
E-Views	- Econometric Views
ECM	- Error Correction Model
EU	- European Union
EXEDUC	- Expenditure on Education
EXECON	- Expenditure on Economic Service
EXHE	- Expenditure on Health
FDI	- Foreign Direct Investment
FEAP	- Family Economic Advancement Programme
FGN	- Federal Government of Nigeria
FME	- Federal Ministry of Education
FMoF	- Federal Ministry of Finance
FMoH	- Federal Ministry of Health
FRA	- Federal Responsibility Act
GCE	- General Certificate of Education
GDP	- Gross Domestic Product
GMC	- General Medical Council
HERFON	- Health Reform Foundation of Nigeria
HDI	- Human Development Indicator
HNLSS	- Harmonized Nigerian Living Standard Survey
HIV	- Human Immunodeficiency Virus
HMB	- Hospital Management Board
IMNCH	- Integrated Maternal, New-Born and Child Health
IPDs	- Immunization Plus Days
KIPPRA	- Kenya Institute for Public Policy Research and Analysis
KPSS	- Kwiatkowski, Phillips, Schmidt and Shin
LDCs	- Less Developed Countries
LR	- Likelihood Ratio
LLINS	- Long Lasting Insecticide Nets
MB	- Marginal Benefit
MDGs	- Millennium Development Goals
MOH	- Ministry of Health
MOE	- Ministry of Education
NASS	- National Assembly
NBTE	- National Board for Technical Education
NBS	- Nigeria Bureau of Statistics
NCML	- National Commission for Mass Literacy
NCD	- Non-Communicable Diseases
NCCoE	- National Council for Colleges of Education
NECO	- National Examination Council

NICS	- National Immunization Coverage Survey
NTBLCP	- National Tuberculosis and Leprosy Control Programme
NUC	- National University Commission
NPC	- National Population Commission
NPHDC	- National Primary Health Care Development Agency
NLSS	- Nigeria Living Standard Survey
NMA	- Nigeria Medical Association
NGN	- Nigerian Naira
NGO	- Non Governmental Organization
NICS	- National Immunization Coverage Survey
OECD	- Organization of Economic Countries for Development
OOP	- Out of Pocket
OLM	- Ordered Logit Model
OLR	- Ordered Logistic Regression
OLS	- Ordinary Least Square Regression
PARP	- Policy and Research Project
PETS	- Public Expenditure and Tracking Survey
PPSMB	- Post-Primary School Management Board
PHDA	- Primary Health Care Development Agency
PP	- Phillips-Perron
RBM	- Roll Back Malaria
RMAFC	- Revenue Mobilization, Allocation and Fiscal Commission
SBAW	- Sargan-Bargawa Durbin-Watson Statistic
SE	- South East
SPSS	- Statistical Package for the Social Sciences
SSA	- Sub-Saharan Africa
SSCE	- Senior School Certificate Examination
SUBEB	- States Universal Basic Education Board
TA	- Transformation Agenda
TB	- Tuberculosis
UBEC	- Universal Basic Education Commission
UBE	- Universal Basic Education
UME	- University Matriculation Examination
UN	- United Nations
UNESCO	- United Nations Education and Scientific Organization
UNDP	- United Nations Development Programme
UNDESA	- United Nations Department of Economic and Social Affairs
UPE	- Universal Primary Education
USD	- United States Dollar
VAR	- Vector Autoregression
VAT	- Value Added Tax
WAEC	- West African Examination Council
WASSCE	- West African Senior School Certificate Examination
WDI	- World Development Indicator
WHO	- World Health Organization
WPV	- Wild Polio Virus

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Chapter One: Introduction

1.0 Background: Fiscal Federalism

Fiscal federalism basically means “*who gets what, when, and how*” within a federation. This is also seen as a system of intergovernmental fiscal relations, and observed mostly in contemporary federations. However, the basic elements of the concept are also found in the formation of unitary states. According to Adamolekun (1983), the concept is also applicable to non-federal states encompassing various tiers of government having decision-making authority. This indicates that fiscal federalism goes beyond decentralization in declared federations only.

The establishment of the state called Nigeria is traced back to the adoption of Richard's 1946 constitution, which granted autonomy to existing components. The plural nature of the country then was obvious in-as-much as it was seen as a federal state. The Littleton constitution of 1954 gave further credence to the Nigerian federal structure (Nwosu, 1980), but in the last three decades, fiscal federalism has remained the focus of highly contentious discussion in Nigeria. Its public expenditure implications and multifaceted structure could be adduced as the reason for this. The ethnic coloration and plural nature, have made fiscal federalism dynamic in Nigeria. However, it is normal to have constant and unending hostile struggles between federating units, where each unit seeks to maximize the welfare of its jurisdiction through public spending. This scenario exists because the consumption of public goods is localized, and not nationalized. As a result of this, the provision of a higher welfare for local jurisdictions can only be obtained if local authorities engage in the process through a central provision. According to Bird (2009), the basic foundation of the first generation theory in relation to fiscal decentralization is akin to the decentralization theorem by Oath (1999). Oates (1999: 5) posits that fiscal federalism is streamlined to provide efficiency for public goods provision for different levels of government. In addition, Olson (1996) maintains that such is akin to fiscal equivalence. As a result of the complex nature and pattern of consumption because of geography and the mix of public goods, it is difficult for a single tier of government to map

the beneficiaries of public goods in a federation. Moreover, most public goods could have spillover effects, and to mitigate this, fiscal federalism provides opportunity for the matching of grants to lower tiers of government from the central government. A public good such as road infrastructure, offers a good example of this phenomenon.

The Nigerian Federation has federating units with clear constitutional roles and public spending takes the central stage in Nigeria's fiscal framework. The federal government has the exclusive responsibility for sharing accrued revenues, both oil and non-oil, among the tiers of government. Disbursements have been a contentious issue because of political content;¹ this explains the setting up of various committees at different times in history to streamline fiscal issues and suggest a suitable formula for sharing revenues. Commissions such as those of Phillipson (1946), Hicks-Phillipson (1951), Raisman (1958), Binns (1958), Chicks (1968), Dina (1968), and Okigbo (1980) have been set up in the past to address the contentious issues in Nigeria's federalism. Furthermore, Nigeria also had the Revenue Mobilization, Allocation and Fiscal Commission (RMAFC) in 1999, apart from several military decrees in 1970, 1971, 1992 set up to still discuss the subject matter. However, the RMAFC was set up as a permanent and legal structure to deal with the subject matter on a regular basis. The commission in itself reflects the federal character of the country and, to a great extent, a response by the Federal Government toward an all-embracing and permanent revenue-sharing agency in Nigeria. A basic assumption of the formula is that the taxing powers of the federating units are equitable and can guarantee distribution of collective wealth fairly.

Howsoever, the general framework of who gets what, when, and how has been the fundamental reason for the controversy over the distribution of resources in both pre- and post- independent Nigeria—hence the in-fighting by every tier of government on the amount of allocated resources. The various military edicts and commissions of inquiry set up on the subject give credence to the importance of social welfare maximization. Still, controversy and debate still trail this revenue

allocation formula from the common pool account because of its expenditure implications across the three tiers of government.

1.1 Research Problem

In the last three decades, reduction of poverty and public expenditure allocation has taken the center stage (Aigbokhan, 2000). Major measurements of success and progress in poverty reduction have been trending in the allocation of resources. This trend propelled structural adjustment programs across many countries and, according to Geoff et al (2009), many countries recorded positive growth rates within the period. It should be noted that in the 1970s, 1980s, and 1990s the focus was on growing economies and incomes. Thus, financing of key sectors was seen as a strategy to propel growth. In addition, during the 1990s, a dominant view in development literature was that growth is the key to every poverty reduction strategy. Several studies indicated that countries with rapid or high growth made progress in poverty reduction (World Bank, 2000; Dollar and Kraay, 2000). Ravallion and Datt (1996) and Mellor (1999) modified this view and argued that it is not growth per se, but the structure of growth, driven by sectoral spendings that is fundamental to poverty reduction. Furthermore, economists over time, have come to agree that, for poverty reduction to be sustainable, social investments and income inequality matter. Addison and Cornia (2001) suggest that no meaningful progress in sustainable development can be achieved when the level of inequality is continuously rising, which contradicts earlier development theories that inequality is good for growth and poverty reduction. This dichotomy of view calls for attention to the actual role of public social sector spending, population dynamics and infrastructure in economic growth vis-à-vis poverty reduction. However, much of contemporary economics on the nexus between public expenditure and demographic dynamics has been on the "right size" for a population and its implications for standards of living. No doubt efforts by the most populous countries to provide acceptable living conditions in terms of social services are constantly frustrated with rapid population growth, without a commensurate increase in economic growth. Nonetheless, the increase in population growth has been attributed to

improvements in modern medicine and technology, and the same time, have led to a drastic decrease in death rates (Ashford, 2001 and United Nations, 2001a)

On the economic front, Nigeria has shown remarkable numbers both for economic growth and poverty levels. This has been so, especially since the oil boom of the 1970s and the productive sectors of the economy have considerably shrunk in size since the 1980s.. This paradoxical development stands out when compared with comparable countries in Africa and Asia, based on their collective histories. The current per capita income in Nigeria is still minimal in real terms and less than the 1975 estimate, despite the receipt of over two hundred and eighty-eight million dollars (USD288) in total oil revenues from 1975 to 2010. Adejuwon and Adekunle (2012)² deduce that about 70 percent of the population lives below the poverty line³. At present, Nigeria is one of the twenty poorest and most unequal societies in the world, with just half of the population controlling 5 percent of national resources (Temitope, 2008). This raises the question of what has happened to all the prior investments in the social sector. In-addition, poor capital budget implementation over the years in Nigeria has impaired key public infrastructure and critical sectors. Budgets have been condemned as mere annual rituals. Ayemokhia (2010) concludes that poor budget implementation in Nigeria constitutes a huge indictment of both the executive and legislative branches of government at the local, state, and federal levels. It is sad to note that no state or federal administration in Nigeria has been able to achieve an annual capital budget implementation level of 45% in the last twelve years⁴. Thus, the immense pressure on the government to deliver democratic dividends⁵ is unabated. A mixture of promises and disappointments has characterized the political scene for the last two decades, and the government has the enormous task of changing an economy haunted by corruption, mismanagement, and ethnic politics.

Like many developing countries, Nigeria has implemented several economic programs in the last twenty years, which have continued up to the present. As a result of this, the real growth rate turned positive in 1988. Rising from -1.8 percent in 1980/1986, the growth rate increased to 4.6 percent in 1986/1992. This

trend continued into the 1990s⁶ and culminated at about 7 percent in 2009/2011 (Asogwa, et al., 2012). However, despite this strong growth and increased budgetary allocations to sectors, the incidence of poverty has since increased from 43 percent in 1992 to about 67 percent in the 2000s. Although poverty was estimated to have declined to about 56 percent in 2004, the incidence is about 80 percent for 2010 (NGN, 2013). According to Bouchat (2003), despite huge receipts from oil exports since the 1970s; despite this, per capita income is still meager, with the economy highly under-capitalized and uncompetitive at a pre-industrial and exporting stage. With the current rate of growth at about 7 percent, Nigeria is still far behind the minimum required investment of about 32 percent of GDP that would be required to unleash sustainable poverty-reducing mechanisms.

Considering this scenario and several arguments put forth in the literature on the relationship between socioeconomic investment and poverty reduction, a number of questions on why the rate of poverty is still high in Nigeria arises:

- 1) Is this because the focus is on inputs and not on outcomes?
- 2) Is this because of emphasis on outputs, not on the impact of expenditures?
- 3) Is this the result of no definite framework for addressing benefit incidence and inequality in government policies?⁷ Or
- 4) Is this a reflection and measurement of our poverty reduction efforts?

There are no clear cut answers to the above questions. According to the 2015 MDG target, as espoused in Aigbokhan, (2008), Nigeria would need to reduce poverty incidence from 42 per- cent, reported by NBS in 1993, to 21 percent by 2015 to be on the right path. Because of the influence of, social expenditure on poverty reduction, it has become necessary to determine the nature of the relationships in the Nigerian context. This will help to redesign frameworks for sustainable growth that is pro-poor and equitable. In-addition, the period 2001 to 2010 has witnessed tremendous increases in budgetary allocations and an average real GDP growth rate (Nwachukwu, 2013). Despite huge investments, the growth rate has not yet led to a decline in unemployment or of poverty. This in itself has raised questions regarding inclusiveness in the budget process. Social expenditure,

particularly on health and education, is the most important factor in human capital development, while human capital has been identified as a key determinant of growth and poverty alleviation. The fact that poor households and females are generally disadvantaged in gaining access to important services such as health and education, significant assets in mitigating poverty, suggests that the country should seek to target the provision of these services to such groups.

Benefit incidence analysis as a quantitative technique is effective reviewing whether government expenditure policies and programmes have the desired impact on income distribution. Reforms and expenditure programmes are routinely undertaken in many countries with specific redistribution objectives, that would support the poor and vulnerable. For example, understanding the incidence of expenditures on education and health vis-a-vis the poor are important because improved health and education status have been shown to be the most effective means of escaping poverty. Therefore, public expenditures, are potentially powerful tools to combat poverty. Thus, an important question is whether government tax and expenditure policies have the intended effects or not.

The focus of this study is on well-being as measured, using Sen's notion of 'capabilities' (Sen, 1999). This notion, views the important capabilities of longevity (health) and education as critical constituent elements in wellbeing. Thus, any reduced achievements for vulnerable groups in these capabilities are intrinsically problematic. Furthermore, a prevalent feature that identifies females' poverty is the lack of access to basic health services and schooling; significant gender gaps that characterize most developing countries. Nonetheless, according to the UNESCO (2000) report, women represented two thirds of the eight hundred and seventy six millions of the world's illiterate; in the same year, about eighty-eight million children did not attend school; among them, three out of five are female. Therefore, it is worthwhile to examine whether expansion of public health and education has a gender bias in terms of benefits. This is important, especially as a large body of evidence from a range of countries demonstrates that societies

that discriminate on the basis of gender pay a significant price in terms of higher poverty and lower quality of life, slower economic growth and development, and weaker governance (UNDP, 1995). Against this background, the key policy issues or questions that require immediate attention in Nigeria are:

- a) What are the connections between public sector social expenditure, population dynamics, sustainable development, and poverty alleviation?
- b) Do these reinforce each other? And, if so,
- c) What are the critical links?

The solutions to these problems are complex, which is why effective responses have not been forthcoming. A number of reasons have been given to the complex nature of the problem. The effectiveness of intervention (inclusive budgeting) would go a long way to achieving the MDG targets by 2015. Progress reports on MDGs in Nigeria show that rural poverty, child mortality, and maternal mortality remain daunting challenges and the indicators of these social variables are currently below the average. Analyzing the effectiveness of government expenditures using welfare distribution techniques is similar to testing fiscal policy performance with respect to reduction in poverty and inequality. There is no gainsaying that not all expenditures benefit households of different income levels to the same extent, therefore establishing the benefit incidence scenario is important. Even those government expenditures intended to benefit low income households may not do so because poor targeting or present conditionalities make create a difficult access for the poor. Generally speaking, the impact of government budgets on the distribution of income is not ascertained immediately, and general impressions regarding what the impact may be can be quite mistaken. Three reasons can be cited as to why distributional outcomes from public resources are important for the government and the entire citizenry at present.

- i. Increasingly, the government is resorting to spending discretions targeted at poverty alleviation and addressing equity challenges;
- ii. Households in Nigeria differ in terms of their abilities to access social services. Often, households at upper income levels reap larger benefits of public spending programs than those at a lower income level; and
- iii. Furthermore, the poor often are not sufficiently insulated from the adverse effects of budgetary cutbacks. When reductions in total public sector budgets become obligatory due to structural adjustments or shocks⁸ to the economy, social sector programs that mostly serve the poor tend to shrink disproportionately.

Public spending on education and health is expected to improve the well-being of beneficiaries and enhance their capability to earn income in the future. Within this context, directing education expenditures for the poor holds a promise for breaking the poverty cycle. Given this perspective, the primary question that this study addresses is: To what extent has the poor benefited from government spending on education and health? The study attempts to evaluate whether these expenditures have any distributional impact. The distributional spread of government spending has become increasingly important in the current era of structural reforms as most countries, including Nigeria are under pressure because of growing deficits occasioned by increasing expenditures. According to Heltberg, Simler and Tarp (2003), reducing poverty and inequality require a mix of investments targeted towards the poor, and Okezie and Amir (2011) suggest that education and health are two areas where the multiplier effect of such investments would prove greatest. There is a budding pressure to investigate the beneficiaries of social spending (on education and health) in Nigeria, for effective policy responses.

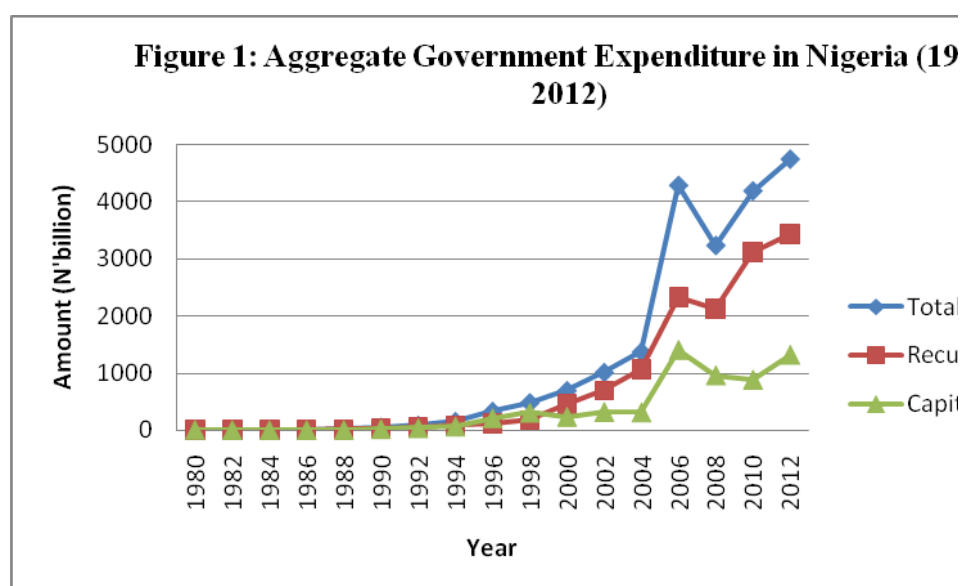
1.2 Public Expenditure in Nigeria

In most developing countries, Nigeria included, the public sector accounts for the bulk of economic activity (Agu and Aldo, 2013). One major challenge to government at all levels is the decisions they make concerned with organizing and distributing resources. The nexus between government expenditure and economic growth has been debated constantly among scholars. According to

Abdullah (2000) and Yusuf (2000), governments perform two basic functions. These offers protection and security for life and property and the provision of public and social goods such as defense, good roads, education, and health. Governments allocate resources to perform these basic functions. However, while some scholars argue that increases in government expenditure promote growth (Al-Yousif, 2000; Ranjan and Sharma, 2008; Cooray, 2009), others argue that government expenditures undermine economic growth (Laudua, 1986; Engen and Skinner, 1992; Folster and Henrekson, 2001).

Statistics from the Central Bank of Nigeria (Statistical Report of Various Years) indicate that total government expenditure and its components, as shown in Figure 1.01 (below), have constantly increased over time. Nonetheless, it fell significantly in 1984 due to the oil glut in the early 1980s. Government expenditure in Nigeria has increased consistently in the 1990s, except in 1994, when there was a major decline from the previous year. There was a significant increase in the growth of government expenditure between 1992 and 1993. This was the first time that government expenditure doubled from its level in previous years. This has been partially attributed to government spending on the general elections of 1993.

Figure 1.0.1 Aggregate Expenditure (1980- 2012)



Source: Author's Computation

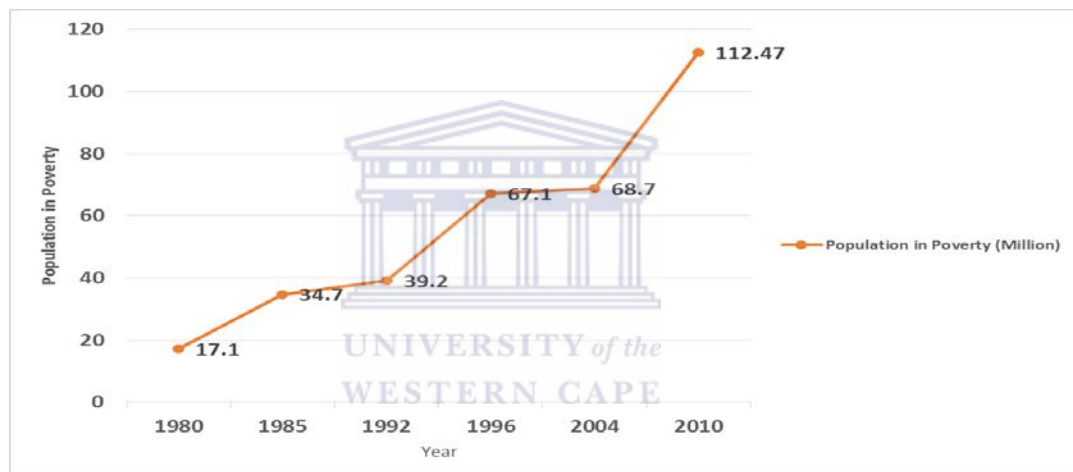
1.3 Trends in Poverty and Inequality in Nigeria

Ucha (2010) shows that Nigerians are income-poor, and there is an obviously skewed distribution of the income which has resulted in desperation and restiveness in many quarters. According to Ucha, Nigeria is also one of the most unequal societies in the world and income distribution is so skewed that growth benefits are not shared by all. Economists have since shown great interest in the nature of the relationship between inequality and growth, particularly after Simon Kuznet's paper of 1955 suggested a positive relationship after an initial negative relationship. This phenomenon is known as the inverted-u relationship. The poverty reduction effect can vary depending on the pattern of growth⁹. This means that a larger decline in poverty would be observed if accompanied by declining inequality, and vice versa. A UNDP Nigeria Report (2001) indicates that about 50 percent of total income is owned by less than 20 percent of the total population, and the highest income group that constitutes about 10 percent controls about 32 percent of total national income, while the poorest 10 percent possesses only about 1.5 percent. However, the poorest 25 percent of the population owns about 5 percent of total income. This underlines the fact that the gap between the poor and the rich is continually widening, indicating that the Gini coefficient value in Nigeria is on a positive trajectory.

Poverty and inequality are global phenomena, but the rates in Nigeria are higher than in most other countries in the world (Loveless and Whitefield, 2011). Since the 1980s, the poverty rate has decreased significantly on all continents of the world except in sub-Saharan Africa (SSA). Within that period, according to Adigun (2011), the ratio for Africa actually increased from 44.6 percent to 46.4 percent, and decreased from 27.9 percent to 21.1 percent for all less developed countries (LDCs). Poverty as a concept has been defined by so many researchers all over the world. According to (Aigbokhan 2008), this is a state of deprivation that is inadequate for living. Furthermore, Obansa and Orimisan (2013) posit that it is the inability to attain a reasonable standard of living, while inequality is the condition of being unequal.

Problems of poverty and rising inequality have constituted a challenge to the government and to policy makers in Nigeria. Earlier governments focused on rural development in order to deal with these twin problems. From the second to the fourth National Development Plans, the government devised various ways of handling these problems, but to no avail. Historical knowledge and available statistics show that various developmental programs in Nigeria focused on the provision of basic amenities, communication systems, electricity, etc. as a strategy to reduce poverty and facilitate development.

Figure 1.0.2: Nigerian Poverty Profile (1980-2010)



Source: National Bureau of Statistics. NHLSS 2010

Table 1.1: Relative Poverty Headcount from 1980-2010

Year	Poverty percent	Incidence	Estimated Population (Million)	Population in Poverty (Million)
1980	27.2		65	17.1
1985	46.3		75	34.7
1992	42.7		91.5	39.2
1996	65.6		102.3	67.1
2004	54.4		126.3	68.7
2010	69.0		163	112.47

Source: HNLSS 2010 Report; NBS

Table 1.1 (above) indicates that the percentage of the poor among Nigerians is growing yearly. Poverty in Nigeria has substantially risen between 1980 and 2010. Categorization of the population into three sectors, namely, extremely poor, moderately poor and non-poor in Table 1.2 presents the dynamic nature of poverty in Nigeria. In 1980, the non-poor group was about 73 percent, while in 1992 and

1996 it decreased to 58 percent and 35 percent, respectively. Although the rate rose to 43 percent in 2004, it further dropped to 31 percent in 2010. The proportion of the core poor group in Nigeria has continued to increase over time.

Statistical evidence suggest indicate an increase of extreme poverty in 1996 to about 29 percent from 6 percent in 1980. The poverty rate decreased in 2004 to about 22 percent, but was not sustained. The moderately poor increased to 34 percent in 1985 from a low of about 21 percent in 1980, and then decreased to 32 percent in 2004 from about 36 percent in 1996.

Table 1.2: Relative Poverty Index in Nigeria (1980 – 2010)

Year	Non-Poor (Million)	Moderately Poor (Million)	Poor	Extremely Poor (Million)
1980	72.8	21.0		6.2
1985	53.7	34.2		12.1
1992	57.3	28.9		13.9
1996	34.4	36.3		29.3
2004	43.3	32.4		22.0
2010	31.0	30.3		38.7

Source: NBS, Harmonized Nigeria Living Standard Survey 2010

Table 1.3: Zonal Incidence of Poverty by Different Poverty Measures

Zone	Food Poor	Absolute Poor	Relative Poor	Dollar Per Day
North Central	38.6	59.5	67.5	59.7
North East	51.5	69.0	76.3	69.1
North West	51.8	70.0	77.7	70.4
South East	41.0	58.7	67.0	59.2
South-South	35.5	55.9	63.8	56.1
South West	25.4	49.8	59.1	50.1

Source: NBS Nigerian Poverty Profile; 2010 Report

Table 1.4: Inequality Trend by Sector and Zones: Gini Coefficient Values

	1985	1992	1996	2004	2010	percent Change in Inequality (2004 & 2010)
National	0.43*	0.41*	0.49*	0.4296	0.447	4.1
Sector						
Urban	0.49*	0.38*	0.52*	0.4154	0.4328	2.2
Rural	0.36	0.42	0.47*	0.4239	0.4334	4.2
Geo-Political Zone						
South-South	0.48*	0.39*	0.46*	0.3849	0.4340	12.8
South East	0.44*	0.42*	0.40*	0.3760	0.4442	18.1
South West	0.37*	0.39*	0.40*	0.4088	0.4097	0.2
North Central	0.41*	0.39*	0.50*	0.4459	0.4220	-5.4
North East	0.37*	0.38*	0.40*	0.4114	0.4468	8.6
North West	0.41*	0.43*	0.44*	0.4028	0.4056	0.7

*Source: NBS Nigerian Poverty Profile; 2010 Report and Author's Calculation; * Author's Calculation*

From table 1.4 above, inequality calculated by the Gini coefficient has increased consistently since 1985 except for a slight decline in 1992. At the national level inequality declined from 0.43 in 1985 to 0.41 in 1992 and increased to 0.49 in 1996, and remained unchanged at 0.488 in 2004. However, sectoral and regional data show that despite variations around the national average, there seems to be an obvious increase in inequality between 1996 and 2010 for Nigeria.

1.3.1 Research Questions

Assessing the actual level and allocation of public expenditure is the key to understanding any government's true expenditure priorities and its coherence with the government's policy objectives. Public spending in social services like education, health care, etc. are generally considered as the main redistributive or antipoverty policy instrument in developing countries (Bourguignon and Luiz, 2003). This is because when subsidy is being provided for expenditures which households would have made, households divert their spending to another source not subsidized. Demery (2001; 1) summarizes the impact of public spending on population:

There are basically three (3) ways in which government expenditure affects people. Firstly, through economic aggregates vis-à-vis inflation and these variables affect real incomes and standard of living. Secondly, government spending creates direct income. The multiplier effect creates other incomes, possibly for poor households. Thirdly, government expenditure acts as a distribution mechanism for the public. These may be either in the form of cash or in kind. The latter incorporates health, education and other utilities and uplifts the living standards of the populace, which affects them positively in the long-run. This is usually termed the benefit incidence or the transfer effects of government spending to its citizens.

The study poses critical questions for understanding the linkages between public spending, poverty reduction and benefit incidence amongst the sample population (South-East Region), vis-à-vis demographic changes in Nigeria. The questions are as follows: (a) will changes in population dynamics affect government expenditure in terms of its per capita consumption expenditure? If so, how much do they affect aggregate per capita consumption expenditure? (b) is there any benefit to the population as a result of expenditure on Health and Education? If so, what is the spread on gender, different economic groups and location?; (c) are there progressivity of benefits on education and health expenditure at the tertiary; secondary and primary levels for the population using the 2004 and 2010 Nigerian Households Living Survey Data?; and (d) are there structural (socioeconomic) factors influencing Poverty in the South East Nigeria.

1.3.2 Study Objectives and Scope

The study is focused on the relationship between demographic changes and government expenditure at the federal level. Furthermore, Sub national governments in the South East region of Nigeria has been resorting to spending discretions to alleviate poverty, thus it has become imperative also for the governments' to understand the distributional outcomes of their expenditure. Using the South East region of Nigeria as a case study, we also analyzed the trend

of socioeconomic indicators in the geopolitical zone vis-à-vis the dynamics of poverty in the region. This is to ascertain the demographic dynamics and if public expenditure on Health and Education has impacted on the poor. Based on the above, the specific objectives are to:

1. Determine the sensitivity of Government per capita Consumption Expenditure in Nigeria (Education, Economic Services and Health) via Population Dynamics effect (household size & age composition). To determine the above, we limited ourselves to dataset of 1981 – 2010;
2. Estimate the Benefit Index of Public Expenditure (Primary/Secondary/Tertiary) on Health, and Education in South-East Nigeria (SE), using 2010 HNLSS Data based on:
 - a. Economic Groups (Quantiles Across All SE States)
 - b. Gender (Across All SE States);
 - c. Location (Across All SE States);
3. Determine the Progressivity of Benefits of Social Expenditure (Health/Education) in Nigeria. The two recent survey waves in Nigeria (2004 and 2010) were used for this objective and focused on the entire country.
4. Determine the Structural (Socioeconomic) Factors influencing Poverty in the South Eastern States. A recent cross sectional data from 2014 were used specifically to address this objective.

1.3.3 Justification of South East as a Case Study for Benefit Incidence

Analysis

The South East Region of Nigeria is known for its riches and high gender disparity. The region presents a paradox, showing the highest percentage (18.1) in Inequality, yet the percentage of food poor is higher than the North Central, South-South and South West. Also, the dollar per day poverty index (59.2) is higher in the region than the South South and South West that had a lower percentage in inequality. This figure is relatively high for a region known to have the largest number of entrepreneurs in Nigeria. Furthermore, girl education is often trivialized by the rural community in the region and boys are normally

preferred to girls. These boys are encouraged to trade rather than go to school. However, recent statistics suggest a reversal of trend. Nonetheless, the governments's of the region have allocated resources consistently for health and education sectors in the last decade. These expenditures have been classified as gender friendly by the authorities. An analysis would shed more information on the policy responses.

1.4 Significance of Study

Generally, the study is an evaluation of the public spending impact on poverty reduction. It is concerned with determining how much demographic changes, influences government per capita consumption expenditure on one hand and measuring who has benefited from government expenditure or subsidies in education and health on another and the structural dimensions of poverty. The result of the study provides information on utilization rates and distributional impacts; particularly the extent of benefit on the poorest strata can help policy makers in making public spending choices. The results would enable the framing of pro-poor evidence based policies within the context of quantitative assessment of the public spending impact across different population and age group.

Chapter Two: Literature Review

2.0 Background

Bridging the income margin between the rich and the poor as well as the efficient allocation of resources is fundamental and necessary as part of a larger strategy to design and implement a sustainable developmental framework. Ogundipe and Lawal (2013) conclude that such a design would reduce poverty to some extent, especially if resources are well targeted towards education and health. This assertion may not be totally correct for the Nigerian society. This in part may be due to the fact that households in Nigeria are divergent in their ability to access and utilize services provided by the government (Diejomaoh and Eboh 2010). A number of reasons could be responsible for this phenomenon such as urban bias in concentration of social services and the revenue sharing formula between the federal, state and local governments. Most often, it is households in the upper income echelons which may reap larger benefits from public spending programs (Suberu 2001). Available literature shows that, the poor are not properly insulated most-times from the adverse effects of public expenditure cut backs; these reductions are caused by volatility in the revenue framework, such as the current dip in the price of oil globally, implying that allocations to socioeconomic sectors could shrink (Brian, et al. 2001). As a palliative, Ravallion (2002) argues positively for safety net measures, which would reduce the negative effects on expenditure, more especially for the vulnerable. Therefore, bridging the income margin would follow a sequenced approach to mitigate obvious temporary negative scenarios.

Public expenditure can have a direct impact on human development outcomes and Shenggen et al. (1999), argues that government spending can have direct and indirect effects on people's welfare in three ways: (1) the macroeconomic effects (inflation and unemployment); (2) the primary income effect (the expenditure incidence) and (3) the transfer effect (the benefit incidence). In-addition, Cash transfers through public expenditure can also help reduce income inequality through its redistribution process. Ajawd and Wodon (2001) maintains that the poor could benefit in some cases, if public spending gets to the richer households

first and saturation is occurring at the service level for them. In this scenario, an increase in spending is desirable. Spending on social services like education and health care is generally considered as an antipoverty policy instrument in developing countries (Bourguignon and Luiz, 2003). This is so, because when subsidy is provided for a particular expenditure which households would have made; there is every tendency that the income set aside for that particular expenditure will be used for other expenditures or rather saved.

According to Demery (2000), public spending is expected to create other incomes that benefit poor households and these incomes, have multiplier effects through the income-expenditure multiplier process. Such spending generates transfers to the population either in the form of cash or monetary transfers, social assistance or social insurance payments or in kind payments if spending is progressive and otherwise if regressive. Demery (2000; 1) also argues, that there are positive effects of public expenditure on the population via the macroeconomic channels, multiplier framework and direct transfers from government to citizens. The macroeconomic channels influences the fiscal and trade balances that have the capacity to support positive living standards. These multiplier effects create income benefits that benefit the vulnerable group. In-addition, public expenditures also generate direct transfers through subsidies or cash payouts.

2.1 Conceptual Framework

2.1.1 Demographic Changes: General Framework

Demography is the scientific study of human population or the study of the size, geographic distribution, age-sex structure, and socioeconomic composition of populations and the factor that affect changes in them, such as fertility, mortality and migration.

(See <http://www.suda.su.se/docs/What%20is%20Demography.pdf>).

By the mid-19th Century, most French scholars observed a trend in the demographics of the population. Demographic revolution was evolving as a result of the voluntary limitation of fertility amongst people. Dumont (1890) had explained that the desire to be upwardly mobile was the driving factor. According

to him, large families were a pull on the social ladder. Dartanto and Otsubo (2013) points out that the number of children per family declined, obviously as a result of conscious efforts to reduce fertility within marriage. In his contribution, Notestein (1945), stressed the importance of fertility decline and its impact in the modernization process. This played a vital part in shaping the demographic transition theory. He posited that this phenomenon is bound to occur across countries once they achieve a level of development. This corroborates Dumont's position, that changes in demographic behaviour were believed to be mostly a function of progress in the society.

There are direct and indirect effects of demographic factors on poverty rates. The size and age compositions influence the relative size of the labour force including the number of dependents, thus changes in the former, affects the latter. This reconstructs the expectations from the public sector on expenditure vis-à-vis the dependency ratio of families and therefore their level of poverty. In addition, demographic changes impacts generally on savings, household production decisions, migration and labour supply. This change affects the interest rate and ultimately, the level of wages. As per the importance of these prices to family income, poverty could either increase or decrease for the household depending on the swing of the variables. Thus, Population growth is an important factor in economic development. It could facilitate or hinder the economic growth and well-being of a country. It constitutes a source of labour supply and market for a country, thereby contributing to economic growth. On the other hand, it could result in a fall in per capita income and standard of level of the citizens if population growth is not accompanied by an increase in income.

Gesano et al. (2009) while reviewing the work of D. van de Kaa (2002) and Lesthaege (1980) have contributed widely to the understanding of the underlying factors of the ensuing changes in behaviour. They noted that the long-term trends in demographic change are summarized in the theory of the first demographic transition, which describes the passage from high levels of birth and death rates to a new equilibrium of low birth and death rates. After progress in health and

nutrition lead to a decline in death rates, birth rates stayed at high levels leading to high population growth rates before a new equilibrium was reached at low levels. This was not the case for the second transition¹⁰. On the other hand, Coleman (2006) and Myers (2012) laid emphasis on the process of immigration and described current trends as a third demographic transition, where low fertility combined with high immigration lead to a rapid change in the composition of the population caused directly and indirectly through immigration. While Coleman evaluates the consequences of this transition negatively, Myers emphasizes the need for the integration of immigrants and for the expansion of educational opportunities toward them. This position supports the EC Communication on Immigration Policy [Com (2000) 757] seeing immigration as a potential for growth. Dirk (2003) and Gesano et al. (2009) were unanimous that the outcome of the first and second demographic transitions varied considerably. According to them the second transition is a consequence of fertility declining very below the levels, though plausible while the first was a consequence of mortality decline¹¹. The phenomenon of immigration hinges at the regional economic and social development, creating opportunities for immigrants. As a consequence, the diffusion process of the 2nd and 3rd demographic transition is more and more dependent on the socio-cultural and socioeconomic characteristics of the regions (Gesano et al. 2009).

Statistics on demographic changes touch most frequently on the aspects of growth or population decline and demographic changes (Gesano et al. 2009). Their study finds that at the local or regional level changes in the structure of households (diminishing average household size) and the increasing ethnic or cultural heterogeneity of the population are of great importance. Furthermore, taking the example of the labour markets, the heterogeneity of the working-age population regarding demographic and educational or skill characteristics is important. In addition, Gesano et al. (2009) finds that the working-age population is expected to increase over the next 5 to 10 years, so that the labour force will continue to increase depending on the economic activity rates. The study recommends various

public policy options for the sustainability of economic productivity and inter-generational solidarity (pension system, healthcare and long term care).

A recent report from the Berlin-Institute (2008), which may not be the case for sub-Saharan Africa classifies the European regions regarding their economic and demographic performance. The features of the demographic performance are population growth (Europe will not return to growth), fertility levels (policies to sustain accordance between work and family life), economy and labour (qualifications and skills as key variable for a fair economic growth), population ageing and social policy (solidarity between generations as best solution), migration and integration (immigration necessary for regional economic growth in an ageing society, integration through human capital formation), education (the formation of human capital as a growth potential). The report looks at metropolitan areas as the demographic and economic growth centres in Europe. Demographic policies – EU wide and national– are not interlinked with local, urban and regional policies.

Katus and Zakharov, (1997); Philipov and Kohler (2001) have argued that different environments affected behavioural choices and this in-turn explains the demographic trends found between the former socialist countries and the remaining developed world. This, according to them was same for Central and Eastern Europe. Also, Dirk (2002) conclude that couples generally may find different solutions when confronted with the same problem. This, according to him, explains the gap between advanced societies regarding the second demographic transition; and using Japan as an example of trend setting when it comes to fertility transition. However, cohabitation and extramarital births are rare in Japan. This is so as argued by Retherford, Ogawa and Matsukura (2001) and Iwasawa, (2001) that under the circumstances, marriage is not a very attractive proposition for Asian women, but Japanese in particular, while a non-cohabiting relationship offers a good alternative. It should be noted, however, that marriages were late and rare; but sexual initiation did not decline in the typical Japanese society at the time. Contemporary literature shows that in many parts of Asia, as

people get older, they have fewer resources outside of the immediate families and safety net options wane. For example, in Japan, poverty rates among the older population are on the high side relatively. Furthermore, in India, there is a negative return ¹² on old age savings because of inflation (Alam, M. 2004). According to Cobb-Clark and Cameron, (2005) support from children may not substitute for elderly parents' need to work in Indonesia. United Nations, (2007) and Jamuna, (2000) both concluded that older people are poorly educated in many parts of Asia and literacy rates tend to be lower among women than men and lower in rural areas than urban areas. Knodel et al. (2002) reported that older women are more vulnerable as they usually have less labor force experience and income, than men, and they are more likely to be widowed. However, there is an observed gender disparity in longevity for aging populations. According to United Nations, (2008) report, life expectancy in 2005 was 3.2 years longer for women in China, 3.8 years longer for women in Indonesia and 7.4 years longer for women in Japan and 2.4 years longer for women than men in India. The report indicates a widened gap in gender projections for 2050, which shows an increase to 3.9 years in China, 4 years in India, 4.4 years in Indonesia, and 7.5 years in Japan.

Demographic change deals with the transition from a high birth rate and death rates to low birth rate and death rate as a country grows from being underdeveloped to an advanced economy. Nigeria has a large population with an estimated growth rate of 3 percent and assumed to be the most populated nation in Africa and ranks number tenth in the world. According to the 1991 and 2006 census figures, Nigeria's population was 88.92 million and 140 million respectively. This statistic implies a large market and a veritable source of human resources. Nonetheless, researchers have shown that population growth impact depends not only on the total number of the population, but also on its age and sex distribution. Hence, the importance of demographic change in economic planning and management cannot be overemphasized.

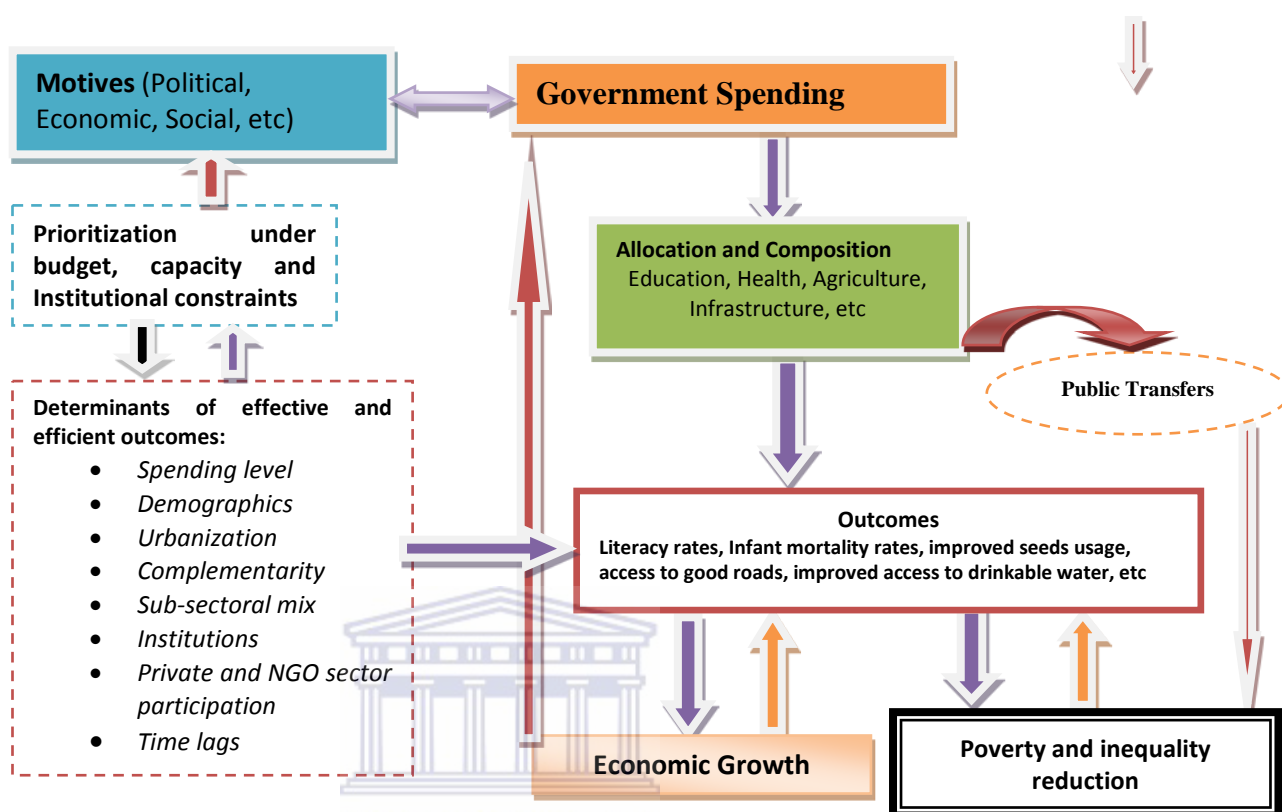
2.1.2 Relationship between Government Expenditure and Poverty Reduction

According to Wilhelm and Fiestas (2005) government spending is driven by the objective to positively affect economic growth and poverty reduction through

improved provision of social services and infrastructure. However, achieving this objective depends to a great extent on specific issues and initial conditions within a country. Available literature suggests that outstanding variables which could hamper or effect positively public spending outcome are the roles of regulatory framework and private sector interventions because of their multiplier effect on service provision to the poor.

However, there are divided opinions and findings on the relationship between public spending and economic performance, though most economists are in agreement that there are circumstances in which decreased government spending would enhance economic growth and other circumstances in which increased government spending would be sought-after. Therefore, the connection between economic growth and government spending is bi-directional, particularly with growth and sectoral outcomes, in that higher growth leads to improved sectoral outcomes (better schools, good health indicators, road access, etc.) while enhanced sectoral outcomes will correspondingly lead to superior growth (in particular, investment in education and infrastructure is associated with higher growth rates). Looking at the theoretical underpinnings of public spending effects, it becomes necessary to look at the motive and its linkages with economic growth, poverty and inequality reduction for it to have the desired effect on distributional outcome. The diagram below, shows the linkage which indicates that the motives (political, economic, social, etc.) have effects on public spending while capacity and institutional constraints do affect motives behind public spending. The diagram also indicates that effective and efficient outcomes could be determined by spending level; demographics; level of urbanization; complementarity; sub-sectoral mix; strength of institutions; the level of participation for private and NGO sector as well as time lags.

Figure 2.0.1: Public Spending Motives, Determinants and Linkage with Growth and Poverty Reduction



Source: Adapted from Wilhelm and Fiestas 2005

Furthermore, the relationship between public spending and poverty has gained sufficient attention in the literature. Economists are in agreement that expenditure on growth drivers has the capacity to reduce poverty and increase human capabilities. Asghar, et al (2012) suggests that economic growth and poverty reduction could occur with government spending on the social sector which would positively affect economic development. Using time series annual data for the period 1972 to 2008, they examined the long-run impact of public sector spending in economic services, education and health. Their results imply a positive reduction of poverty as expenditure is focused on education and the opposite when expenditure is focused on deficit financing, economic and community services in Pakistan. In conclusion, their study recommended more allocation to increase human and social capital of the economy via health and education sectors. Thus, assessing the allocation of public expenditure is therefore a prerequisite to understanding the government's coherence with its policy

objectives. However, the measurement of publicly provided goods to individuals and the society has been a problem in literature. Nonetheless, investments in health, education and generally in the social sector were the mantra in the 1990s for the Breton Woods Institutions (World Bank) in their poverty Reduction Strategies Programmes. They argued that boosting human capital formation reduces the level of poverty. Human capital, according to the World Bank enhances human capabilities and productivity level of the people, which has the capacity to reduce poverty and increase income level through improved job opportunities.

Also, according to Fan, Hazell, and Thorat (2000), expenditures on roads, research, and development have the largest impacts on poverty reduction in their study using India. In-addition, Fan, Zhang, and Zhang (2002) report that expenditure on rural education and infrastructure reduced the rural poverty rate effectively. Jung and Thorbecke (2003) study confirmed that government spending on education contributes to economic growth and supports poverty reduction. Results from Gomanee et al. (2005) show the need for new strategies in combating poverty rates, because spending on social services is not effective in poverty reduction.

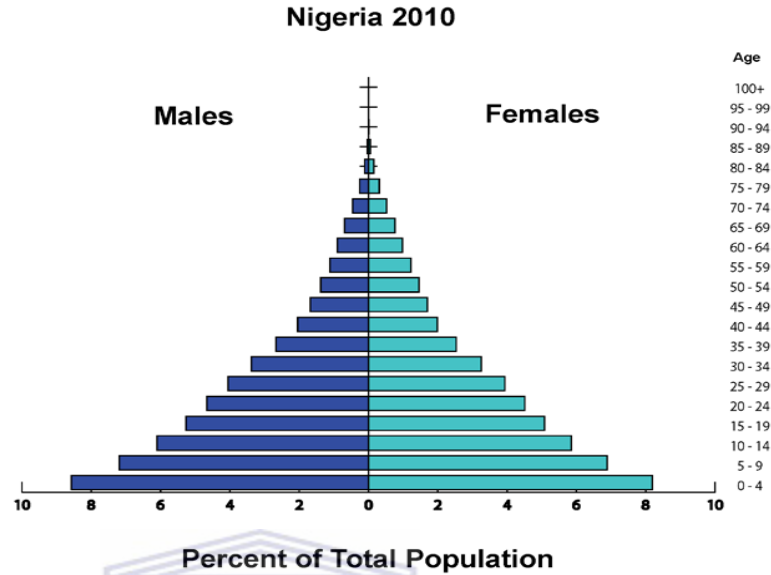
According to Lipton and Ravallion (1995), the poor that had less access to infrastructure in the past can have larger benefits from new investment. They came to this conclusion from their study on the effects of government expenditure on poverty. In another study, by Jung, et al (2009), results showed that the marginal effects of government expenditures on poverty alleviation have generally weakened over time. This was derived from their study in the Southern United States related to expenditure on parks and recreation activities. Their analysis stands out in two ways: (1) contributes to the expanding literature on the effects of government expenditure on poverty reduction by determining how the effects on poverty of four categories government expenditures have changed over time and compared these changes among categories; and (2) the study analyzed spatial variation in the effects of government expenditure on poverty across counties

using GWR and LISA clustering. Their analysis further examined marginal effects of government expenditure on poverty reduction in each of the identified poverty clusters, including the identification of poverty ‘hotspots’

2.2 Demographic Changes: Stylized Facts about Nigeria

At independence, the population of Nigeria was about forty-five (45) million, but has more than tripled (David et al. 2010). It is projected that by 2030, there will be almost 70 million more Nigerians. The facts show that the Nigeria has battled against exceptionally harsh demographic scenarios. According to UNDESA (2007 and 2008 Reports), population growth is occurring in all towns and cities of the country, thus making it an urban country. This kind of growth obviously puts a strain on available services. Nigeria witnessed a tremendous increase in fertility after the independence. This trend continued in the mid-1980s, when a woman had about seven (7) children, which led to tension and struggle at the family level because of the austerity measures. (Next Generation). A number of reasons such as high level of infant and child mortality, early and universal marriage, early childbearing, low use of contraception, and low abortion amongst others (Cliquet, 2003) have been adduced as the main factors responsible for high fertility amongst women in Nigeria.

Figure 2.0.2 Percent of Population Pyramid in Nigeria

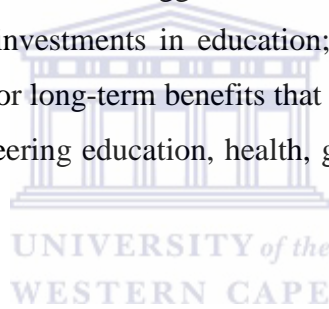


Source: Compiled by Population Action International from UNPD 2011

Bloom et al. (2010) and David et al. (2010) conclude that a prominent feature of Nigeria's economy is movement without real growth and highly obvious when it is compared with peer countries like Indonesia and Pakistan¹³. According to the duo, there is a significant difference between the GDP per capita of 1980 and that of 2006. Most analysts have argued that part of this haul is demographic in nature (Next Generation). This trend has since continued. Other factors such as rule of law, government capacity, ethics, etc. has also impaired economic growth in the country. Mason et al. (2010) in a background paper concludes that inequalities, low level of investments in education and health have dragged down the Nigerian economy a little. Alao (2010) suggest that violence poses a significant challenge to Nigeria and would inhibit it from benefiting from the demographic transition. According to Bloom et al. (2010) on the average, Nigeria's fertility rate remains higher than countries in Sub-Saharan and fertility only started declining in the 1980s but very slowly. This trend has impacted negatively to the working age to non-working age ratio. With about 3percent of the Nigerian population over 65years according to (United Nations, 2007), this suggests that there is an

increased burden for the working group. However, the demographic transition is continuing with falling death and birth rates as a result of advanced technology. Projections using the current fertility differential suggest that the share of working-age people in the population are expected to rise considerably between 2010 and 2050, while the proportion of working-age to non-working age population rising to an all time high by 2050. This could be positive and could have multiple potential for the economy in the country if the population is productively integrated into the system.

David et al. (2010) recommends that about twenty-four (24) million jobs will be created in the next ten (10) years and another fifty (50) million jobs created between 2010 to 2030 if Nigeria would realize and benefit from its demographic scenario. In-addition, David et al, suggest that the jobs would be productive and would include massive investments in education; health and institutions for the benefits to be realized. For long-term benefits that are sustainable, focus should be geared towards re-engineering education, health, gender parity and institutions in the country.



2.3 Empirical Literature (Cross Country) on Benefit Incidence Analysis

Benefit Incidence (BIA) has assumed a center stage in most economic analysis. The technique BIA is normally used in assessing the distributional impact of government expenditure in addition to determining which economic group benefits from the government (cash or in-kind). The underlying framework is that benefits derived from government expenditure should be shared disproportionately so that the lower strata benefits more than those on a higher quintile. Thus, BIA could be said to be a measure of how pro-poor government fiscal programme is. This implies that government spending, according to the Keynesian model, should correct failures in the market and promote efficiency and equitable distribution of economic welfare (Van de Walle 1995).

To use the BIA technique, a combination of costs of spending and details of the use of the service generates the benefits' spread. According to Demery et al.

(1995); Castro-Leal et al. (1996); Sahn and Younger (2000); Van de Walle (2003), the World Bank has conducted studies in low and middle income countries using the method. O'Donnell et al. (2007) in their analysis used the technique and justified it because of its application in recent years.

Also, Reinikka (2002) asserts that employing BIA is most deserving because of evidence of the limited impact of public spending on growth and human development outcomes which is the case in Nigeria. Thus, estimations of who benefits from government spending discretion is same as judging public policy efficiency in addressing issues of poverty and inequality.

Van de Walle & Nead (1995) study on thirteen African countries utilized traditional Benefit Incidence Analysis (BIA) to appraise which economic groups benefited most from the financial subsidies provided by government in education spending. They established that on the average only ten percent of the subsidies for higher education went to the poorest forty percent of the population, while forty-three percent of subsidies for all education accrued to the same income group. They concluded that the education sector expenditures differ in their occurrence according to the level of service. Primary and secondary education were more pro-poor than university/higher education. Similarly, Demery (1995) and the World Bank (1995a) used the same methodology for Ghana, Bulgaria and Vietnam and their results showed that women gained more in terms of an in-kind transfer of about 4,321 cedis per-capita as against 3,576 cedis per-capita in Ghana . Also, their results showed that the Bulgarian Turks¹⁴ were the most disadvantaged when compared to the Gypsies. On the average, the Turks and Gypsies represent Thirteen percent of the population, but they received only six percent of health subsidies. In Vietnam, the results showed that the mean subsidy for hospital inpatient and outpatient care was used for the benefit incidence estimates. In-addition, Ghana results showed that a major source of inequality in the benefit incidence of health spending in Ghana was the gender dimension. Females benefited more than males in terms of health subsidy and there was a wide disparity in racial access to health. However, targeting health services to the

poor have an ethnic undertone in Bulgaria. There was no conclusion for Vietnam in the study.

Harding (1995) employs STINMOD/94B and NATSEM's static micro simulation model¹⁵ for Australia. He concludes that the pattern of receipt shows a strong life cycle effect, with the value of non-cash benefits climaxing in the 30–40 years age group, rising again in retirement. Also, non-cash benefits were shown to have an equalizing consequence on income distribution. In sum, the major recipients of public spending on social services were families with children and the aged.

Similarly, Castro-Leal et al. (1999) examined health and education spending using comparative benefit incidence analysis. He finds that on average, the amount of overall government health spending going to the top twenty 20 percent of the population was about two and a half times the amount benefiting the bottom 20 percent. The highest 20 percent of the population received more financial gains than the lowest 20 percent in five of the seven countries; overall, the richest 20 percent gained about one and a half times from primary care expenditure as much as the poorest 20 percent. The study concluded that public spending in all the countries was found to be reverting. The work of Sahn & Younger (1999) focused on Ghana, Cote d' Ivoire, Guinea, Madagascar, South Africa, Uganda, Tanzania, and Mauritania and exploit benefit incidence using dominance tests to determine whether health and education expenditures redistribute resources to the poor. They find that primary education tended to be the most improving as well as proficient, including some broad based taxes such as the Value Added Tax (VAT) and wage taxation. Taxes on kerosene and exports showed to be the only examples of regressive taxes. The general conclusion is that social services were poorly targeted in these countries.

Ajay et al. (2000) in their study used BIA in appraising the distributional impacts of health spending in India and its principal states and uncovers that public health spending benefited the richer population than the deprived group. The financial gains from primary and outpatient service were less unequally allocated than those from hospital care. Overall, the pro-rich favoritism was larger in rural than in

urban areas and greatly in poor than in richer states. A survey conducted by Sahn and Younger (2000) discovers that primary education tends to be the more improving while university education was the least improving for eight Sub-Saharan African countries. Also, the gains connected with hospital services were less improving than other health facilities according to the findings. Generally, the survey concluded that social services were poorly targeted while concentration curves are a helpful method to sum up the details on the gains of public spending, statistical examination of disparities in curves is imperative.

Rannan-Eliya et al. (2001) in a study of Nepal, Sri Lanka and Bangladesh extended the boundaries of traditional benefit-incidence, including the private as well as public health services spending in an attempt to scrutinize the fairness of health financing all together, rather than only the proportion of financing involving the government. They detected that health financing position was reverting in Bangladesh but progressive in Sri Lanka. However, limitations of data posed a challenge for Nepal. In another study on Argentina, Jalan and Ravallion (2001) applied the propensity score matching to estimate the distribution of net income in Argentina. Their results indicate that direct gain to the participant was found to be about half the gross wages with over half of the recipients in the poorest quintile nationally and the 80 percent were in the poorest quintile. Furthermore, their results indicated that program participants were more likely to be non-participants by a selection of both objective and subjective indicators. Resources indicate the moderately low wage fee, obviously makes the programmes, unpleasant to the rich.

Ye Xiao and Canagarajah (2002) discusses the experience of Ghana and analyzed the public expenditure flows from line ministries to the basic service provision facilities, including primary and junior schools and health clinics using the general principles of Public Expenditure and Tracking Survey (PETS). The results from the PETS data indicated that only about 20 percent of non-salary public health spending and 50 percent of non-salary public education spending gets to the facilities. In the health sector, evidence implies that a huge portion of the leakage

transpired between the line ministries and the district offices where public expenditures are channeled into materials from cash flows. The study established that a reliable and transparent documentation system from the line ministries to the service provision facilities may considerably advance the competence of public resource allocation by providing simple public access to resource flow statistics. Sabir (2003) employed the benefit incidence analysis in ascertaining to what extent public spending on education in Pakistan has been efficient in reaching the poor. The analysis showed that subsidies for higher education were poorly targeted to low income households and households on a higher welfare category benefited more. By and large, subsidies benefited the rich more than the poor in the analysis.

Heltberg et al. (2001) and (2003) estimated the spread of government expenditure by socioeconomic status in Mozambique. They used the non-behavioral method and found that outcomes from the method is that post-primary education crosses the Lorenz curve at 0.1 on the horizontal axis, and lies below the Lorenz curve for the rest of the allocation. Results indicate that the poorest 50 percent of school children constitute about 50 percent of students enrolled in lower primary and 32 percent of students in upper primary. The poorest half of the sample accounted for about 19 percent and 11 percent of students in post-primary education and intermediate post-primary education respectively. Their results confirmed earlier positions that services in Mozambique¹⁶ were more equal than most African countries and a progressive distribution for services in health and public infrastructure is in place..

Yuki (2003) employed standard benefit incidence analysis to examine how government, education expenditure is distributed in Yemen. The study found that the distribution of total government education expenditure is moderately favoring the poor while expenditure on vocational training does not favor the poor. For basic education, the poor benefits while it is neutral for secondary education. The study concludes that education expenditure is equitably distributed but does not favour the poor in absolute terms. Furthermore, Liberati (2003) used extension of

consumption dominance curves to population subgroups in Belarus looking at public subsidies on rents and utilities, healthcare and public transport in six groups of the population. The outcome of the approach revealed that the highest decile consumes proportionally more of all the subsidized goods which means that an efficiency score of the corresponding subsidies was quite low with a greater degree of leakage to richer households. The most disproportionate distribution was from public transport. The study concluded that decomposition has useful informational advantages because it allows policy makers to get detailed statistics on poverty reduction strategies for population subgroups without being constrained to a specific poverty line.

However, Soares et al. (2006) developed an approach that separated out the income of different cash transfers. Evaluating the incidence of the programmes using concentration curves indexes and decomposing the Gini indexes. Soares et al. (2006) found that the old age pension and disability grant programmes were targeted properly. The Study indicates that the analysis of distributive effects of these programmes contributes to the correction of existing deficiencies; thus implying that the planning of future expansion of the programmes in eradicating poverty and inequality could be achieved within a reasonable time frame. Furthermore, Soares (2006) in his health and the evolution of welfare across Brazilian municipalities study compensates differential method in estimating the value of the observed reductions in mortality. The results suggest that benefits in life expectancy are responsible for about 28 percent of the improvement in welfare with a welfare value equivalent to 39 percent of the growth in income per capita. The study concluded that the initial income disparity across Brazilian municipalities was very high and life expectancy benefits were more or less uniform.

Amakom (2012 and 2011) in separate studies for Nigeria using the Nigerian Living Standard Survey of 2004 evaluates public spending efforts in reducing inequality and poverty at all levels of both education and health sectors using the benefit incidence analysis (BIA). Results suggest that primary education and

primary health care were more pro-poor than tertiary education and tertiary health care in absolute terms. Furthermore, secondary education and secondary healthcare showed varied results while the findings suggest state, region, location and gender partiality influence benefits from government expenditure for education and health services. In conclusion, the study posits that income redistribution may be achieved through subsidies, and not through direct consumption transfers.

2.4 Empirical Literature on Determinants of Poverty

Questions related to poverty measurement and indexes are best answered using quantitative approaches. Numerical details gotten from surveys are normally used for the analysis. Using statistical techniques according to Kanbu, (Not Dated) such data is analyzed with the interpretation of the results being guided by a discipline-specific perspective, rather than by a broad social science model. Nonetheless, there are other methods that can be used such as qualitative (non-numerical), but in the current context cannot be used for poverty analysis. However, even when such data are collected, they are converted into numerical data and usable for statistical analysis (Mwabu, 2005 in KIPPRA, 2005).

In differentiating between four types of multivariate models used for poverty analysis, Jenkins (2000) identified the longitudinal poverty patterns; transition probability models; income variance component models and the structural models. Gardiner and Hills (1999); Hill and Jenkins (1999) all concludes that longitudinal poverty pattern models have been used more for producing measures of “permanent” income or “chronic poverty” than studying poverty dynamics in terms of transitions. Secondly, Ajakaiye and Fakiyesi (2009) argue that transition probability models belong to the duration model and are most commonly used in poverty analysis. Jenkins et al. (2001) further adds that these models are a generalization of life-tables with selected personal and household characteristics. Furthermore, Dartanto and Otsubo, (2013) argue that the models vary with regard to the specification of the explanatory variables used in the analysis. The regressor in these models is the probability of entering poverty and the

regressands are time duration, observed individual and household characteristics, as well as unobserved heterogeneity. However, variances were observed regarding the mathematical expression of the explanatory variables' employed. (Dartanto and Otsubo, 2013). Thirdly, several authors like Lillard and Willis, (1978); Abowd and Card, (1989); Duncan and Rodgers, (1991); and Stevens (1999) used the models to describe the rise in earnings over time. Predictions based on these models are less efficient because they are based on different parameters from the hazard models. However, the most used models belong to the fourth category and they were introduced by Burgess and Propper (1998) and extended later by Aassve et al. (2006a; 2006b).

Howbeit, poverty has been examined according to Kenya, (1998a); Kankwanda et al. (2000); KIPPRA, (2005); Dartanto and Otsubo, (2013) from three broad definitional approaches, namely absolute, relative or subjective poverty. In addition, Andriopoulou and Tsakloglou (2011) and many other studies have ascertained that there are five key determinants of absolute poverty, namely; human capital, demographic factors, geographical location, physical assets and occupational status. Furthermore, Hassan and Babu (1991) stated that for rural Sudan, other productive assets are the determinants of food (calorie) poverty other than land, smaller-sized families. Several other studies by Rodriguez and Smith (1994; Adam and Jane (1995); Grootaert (1997); Jalan and Ravallion (1998); Herrera (1999); Haddad and Ahmed (2003); Mukherjee and Benson (2003); Mango et al. (2004); Anyanwu (2005); de Silva (2008); Alisjahbana and Yusuf (2003) and Widyanti et al. (2009) in Costa Rica, Pakistan, Cote d'Ivoire, China (rural), Egypt, Malawi, Kenya, Nigeria (rural), Sri Lanka and Indonesia respectively have clearly shown increases in human capital as shown by educational attainment decreases the probability of being poor and improves the capacity of a household to respond to temporary and transitory shocks. Also, another factor responsible for poverty reduction is changes in demographic factors. McCulloch and Baulch (1999, 2000) in Pakistan Woolrad and Klasen (2005) in South Africa Mok, Gan and Sanyal (2007) in Malaysia, Dartanto and Otsubo (2013) in Indonesia have all reached the same conclusions. More so,

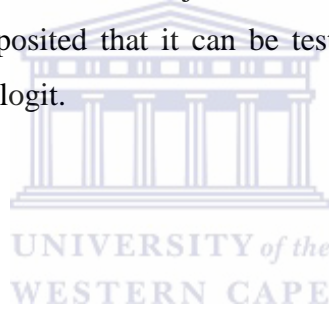
McCulloch and Calandrino (2003) in Rural Shincuan and de Silva (2008) in Sri Lanka validated that chronic poverty is usually found in rural areas, especially remote areas. Fields et al., (2003); Bigsten et al., (2003), and Kedir and McKay, (2005) have also reported that indeed, households living in urban areas have a higher chance of breaking away from. Nonetheless, Adam and Jane (1995); Grootaert (1997); Jalan and Ravallion, (1998); de Janvry and Sadoulet (2000); Mukherjee and Benson (2003); and Woolard and Klasen, (2005) showed that another important factor frequently linked with absolute poverty is lack of physical assets, which supposes that possession of physical assets in most cases signifies an average lifestyle.

Okidi and Kempaka (2002) showed that self-employed farming households are more probable to be absolutely poor in Uganda, thus conforming the position that occupation is a significant issue in poverty status of a family. Several studies such as Rodriguez and Smith (1994), Fields et al. (2003), de Silva (2008), and Kedir and McKay (2005) reported that working head of households reduces the poverty level for the household and vice-versa. Fields et al. (2003) and Dartanto and Nurkholis (2013) showed educational attainment, number of family members, physical assets, employment status, health shocks, access to electricity, changes in the household size, sectors in which they work, and the availability of microcredit programs as important issues of poverty reduction in Indonesia.

Howbeit, there have been few researches on the determinants of poverty (relative and subjective) for developing countries. In his paper, Kenworthy (1999) posits that social-welfare programs decrease both absolute and relative poverty. He examined fifteen developed countries for the period 1960-1991. Furthermore, Moller et al. (2003) showed that relative poverty is mainly a function of industrial employment, unemployment, wage coordination and welfare policies using panel data of fourteen OECD nations for the period 1970 – 1997.

Furthermore, Herrera, Razafindrakoto and Roubaud (2006) tested the determinants of subjective well-being using Peru and Madagascar as case studies;

and included several socioeconomic variables such as household demographic characteristics, socioeconomic characteristics, social and political participation, shock and vulnerability, and social comparisons on the right-hand side. They found that income inequality had a negative consequence on the individual subjective evaluation of poverty in both countries. In-addition, Luttmer (2005) affirmed that higher earnings of neighbors' were linked with lower levels of happiness reported when he used the determinants of well-being as a function of own income and employed control variables (exogenous) such as religion, age and other socioeconomic indicators in the model. Kingdon and Knight (2006) and Ladiyanto et al. (2010) had the same conclusions for South Africa and Indonesia. The former tested for the subjective well-being while the latter tested for happiness' level. Both studies used socioeconomic variables. In the same light, Frey and Stutzer (2002) noted that subjective well-being is a correct measure for human well-being, and posited that it can be tested using quantitative response models such as probit or logit.



Chapter Three: Social Sector Stylized Facts (Education, Health and Economic Services)

3.0 Preamble

For over three decades, Nigeria's public policy thrust has so far focused on economic growth management and equitable distribution of resources, but the debate on the satisfaction level that is optimistic by the stakeholders still lingers. Several governments in Nigeria have since recognized the need for massive investments in the health and education sectors of the economy, which is expected to mitigate the increasing poverty rates and decrease the inequality gap. In this regard, the target for health and education have been within the framework of basic health care services for at least 90 percent of the population, and 100 percent routine/special immunization service for the health sector and education for all for the education sector. Programmes such as the Immunization Programmes from 1970 to date, National Commission for Mass Literacy (NCML) in 1997, Universal Primary Education (UPE) in 1975 Family Economic Advancement Programme (FEAP) of 1992, National Primary Health Care Development Agency (NPHDC) in the 1990s and the Roll Back Malaria (RBM) in 2001 etc. have been launched to actualize the target.

3.1 Stylized Facts on Education

Education is central to the welfare status of households and a fundamental component of life that improves livelihood to greater heights. Unfortunately, the development of the education sector has been hindered by a number of factors in Nigeria. According to Ajayi and Ayodele (2002), increases in the allocation of resources to the sector are grossly inadequate considering the corresponding increase in student enrollment, at an increased cost fueled by inflation in the country. Also, Ajayi and Ekundayo (2006) in their seminal work posits that the governments in Nigeria have not complied with the 26 percent of the education budget allocation recommended by the United Nations Educational Scientific and

Cultural Organization (UNESCO) as a minimum for each country. In this regard, Aina (2007) concludes that priority is not given to the sector. This poor funding at all levels in the country has been agreed as a major obstacle to the full realization of the sector's potential.

Recent statistics show that the total education as expenditure shares of Household for 2009/10 decreased to 1.40 from 5.22 in 2004. In Nigeria, there is no denying the fact that education has been poorly funded, in comparison with other countries like South Africa, Kenya, Swaziland and Tunisia that spends 25 percent, 31 percent, 24.6 percent and 17 percent respectively of their total annual budget on education respectively, which has yielded positive results. This probably accounts for the reason why most University Students in Nigeria immigrate to these countries to study, and over N1.5 trillion Naira is spent annually in paying the various fees charged by those institutions (Onyechere 2013). This phenomenon which has resulted in huge economic losses to the country, and has led to the underdevelopment of the sector.

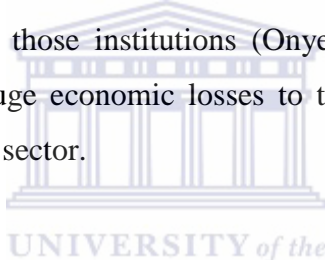


Table 3.1: Federal Government Expenditure on Education 2000-2013

Year	Totally Federal Budget in (N' Billion) & (N' Trillion)	Education Budget (N' Billion)	% of allocation
2000	677.511	56.668	8.3
2001	894.214	62.567	6.9
2002	1,064.801	73.435	6.9
2003	976.254	78.952	8.1
2004	1,302.523	93.767	7.2
2005	1,799.938	120.035	6.7
2006	1,899.987	166.621	8.8
2007	2,309.223	189.198	8.2
2008	2,748.000	220.974	8.0
2009	3,445.410	226.676	6.5
2010	4,427.184	271.196	6.4
2011	4,484.736	356.495	7.9
2012	4,877.209	409.531	8.4
2013	4,487.220	437.478	8.8

Sources: Author's Computation from various Appropriation Acts as passed by the Nigerian National Assembly

The table above shows that government budgetary allocation to the sectors has been to increase on a yearly basis as the annual budget increases. However, the percentage of the budget that is being allocated to education for these years for the

period under review still fell far below UNESCO recommendation, which says that government should spend 26% of their annual budget on education (Abayomi 2012). In Nigeria 8.8% has been the highest allocation to the education sector, which occurred in 2006 and 2013 respectively, and the lowest allocation was 6.4% and 6.5% in 2009 and 2010 respectively. This clearly shows differences when compared to other countries in Africa as mentioned earlier.

The lack of adequate funding for the education sector has been adduced as the reason for the general decline in education, utilities such as a functional library, laboratory facilities, etc. A statistical survey, estimates that in Nigeria, class sizes are small and thus leads to overcrowding and pupil-teacher ratio of 69:1. Furthermore, there are not enough facilities to aid learning by instructors. (ESA/FME, 2003). It is, very pertinent for the government to design a suitable guideline for education funding. For example, UNESCO has recommended that 26 percent of the total budget and the World Bank recommends between 8-10 percent of GDP as minimum for funding of education. Another commission in 1991 by Longe showed that the resource allocation to the education is still well below the 10 percent mark. (Odia and Omofonmwan, 2007).

Poor Physical infrastructures and working environment in the Nigerian education sector have also been identified as a source of challenge. Critical among them include inadequate instructional materials¹⁷, unavailability of facilities, building (availability of classroom), poor ICT facilities, and inadequate library (Abiola, 2011). Alifa (1994) supports the use of these materials because of its impact on overall learning especially for pupils. He argued that adequate facilities would promote learning. Udoh (1986); Adesola (1991); Fagbeja, (1993); Fakoya, (2002); Obinna, (2004); and Ifueko, (2005) all agree that school libraries in Nigeria exhibited inadequacies in personnel and funding; which could lead to adverse effects on the quality of learning in the country. As such, learning tends to be at the memory level of intelligence which is not adequate to realize the full potential. Also, libraries in Nigeria have relied mostly on foreign book donations, which in many instances are irrelevant to the needs of students and the society at large

(Omolayole, 2001; Daniel, 2002). Thus, Ayorinde (2005) further argues that to UNESCO prescription of 10,000 books and journals annually should be adopted across the country; and the facility provides a seating arrangement for at least a quarter of the population of the community in which the library is located.

Table 3.2: Education Indicators and Expenditure on Education, 2000-2011

Year	Primary School Teachers/Pupil Ratio	Secondary School Teachers/Student Ratio	Adult Literacy Enrolment	Out-turn of Bachelor's Degree by Public Tertiary Institutions	Out-turn of Doctorate Degree by Public Tertiary Institutions	Education Expenditure (N' Billion)
2000	1:43	1:31	-	-	-	67.1
2001	1:40	1:32	665,113	47,791	690	59.6
2002	1:40	1:30	842,987	58,305	721	109.2
2003	1:44	1:36	814,521	70,361	752	79.1
2004	1:36	1:41	933,868	50,419	794	93.9
2005	1:37	1:40	954,614	26,042	428	120.5
2006	1:39	1:39	983,357	44,803	583	165.7
2007	1:40	1:40	974,873	52,749	738	185.8
2008	1:41	1:22	910,148	45,534	696	164.0
2009	1:39	1:26	696,987	56,340	907	137.1
2010	1:36	1:33	848,674	67,318	435	249.1
2011	1:41	n/a	768,453	71,592	926	393.8

Sources: Central Bank of Nigeria (CBN) Statistical Bulletin 2003, 2007, 2008, 2009; Budget Office of the Federation (BoF); and PARP, 2010; National University Commission, World Bank Development Indicator, Nigeria DHS EdData, Appropriation Acts passed by NASS.

The performance of the Nigerian education sector has been characterized by several pitfalls with negative development consequences. Nevertheless, this performance will be classified under enrollment rate, outputs, completion rates, adult literacy rate and results of secondary students in key examinations in the recent past.

(i) Enrolment rate

It is evident in Table 3.3 that Pupils' enrollment in primary school increased consistently from 1999 to 2001 with an average rate of 6.5 percent and 1.2 percent in 2000 and 2001, respectively. Comparing it with the growth rate for funding education, shows an ambivalence. This increased in 2000 to 52.6 percent and declined in 2001 to -12.6 percent. It further increased from -0.2 percent in 2002 to 24.9 percent in 2003 while the funding of education declined within the same period from 45.4 percent to -38.1 percent. Subsequently, primary school enrollment declines to -19.5 percent in 2004 and continues to rise thereafter with

an annual growth rate of 3.1 in 2005, 0.5 percent in 2006, and 5.6 percent in 2007. The amount of funding in education sector also increased within the same period by 7.6 percent, 25.4 percent, 25.4 percent, 24.5 percent and 22.8 percent in 2004, 2005, 2006 and 2007 respectively.

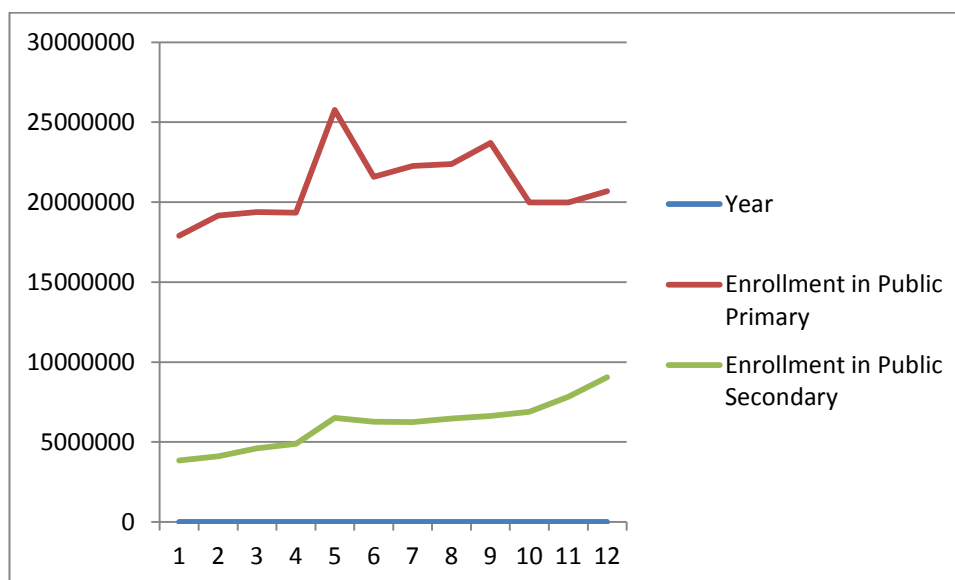
More so, the number of pupil enrollment in secondary schools increased sharply between 1999 and 2003 with an annual growth rate of 6.3 percent in 2000, 10.8 percent in 2001, 6.0 percent in 2002 and 24.8 percent in 2003. The cost of funding education increased to 52.6 percent between 1999 and 2000. It further lowered to 12.6 percent in 2001 and increased again to 45.4 percent in 2002; and another decline again in 2003 to 38.1 percent. Enrollment in secondary schools reduced to 3.7 percent in 2004 and further declined to 0.4 percent in 2005, while the cost of funding education increased within the same period by 7.6 percent in 2004 and 25.4 percent in 2005. Subsequently, between 2006 and 2007, secondary school enrollment and the cost of funding education increased respectively. For example, secondary school enrollment increased by an annual growth rate of 3.4 percent and 2.5 percent, while the cost of funding education increased by an annual growth rate of 24.4 percent in 2006 and 22.8 percent in 2007. The average growth rate of both primary and secondary school enrollment stands at 2.5 percent and 5.5 percent respectively (see Table 3.3 below). Thus, the need for further increase in public investment cannot be over emphasized.

Table 3.3: Enrolment in Public Primary and Secondary Schools (1999-2010)

Year	Enrolment in public primary school (No of pupils) Million	Growth rate of enrollment in primary schools	Enrolment in public secondary school (No of pupils) Million	Growth rate for enrollment in secondary schools
1999	17,907,010	-	3,844,586	-
2000	19,158,439	0.07	4,104,345	0.07
2001	19,385,177	-5.76	4,601,105	0.12
2002	19,342,659	0.04	4,897,048	0.11
2003	25,772,044	0.04	6,509,772	0.04
2004	21,575,178	0.04	6,279,562	0.18
2005	22,267,407	0.03	6,255,522	0.01
2006	22,386,692	0.03	6,472,453	0.00
2007	23,705,312	0.06	6,635,372	-0.51
2008	19,979,638	0.07	6,888,700	0.14
2009	19,979,638	0.00	7,827,318	0.14
2010	20,681,804	0.04	9,056,768	0.16

Sources: Federal Ministry of Education (FME); Universal Basic Education Commission (UBEC); World Bank Development Indicator, Appropriation Act as passed by NASS

Figure 3.0.1: Enrollment in Public and Secondary Schools (1999-2012)



Sources: Federal Ministry of Education (FME); Universal Basic Education Commission (UBEC); World Bank Development Indicator, Appropriation Act as passed by NASS

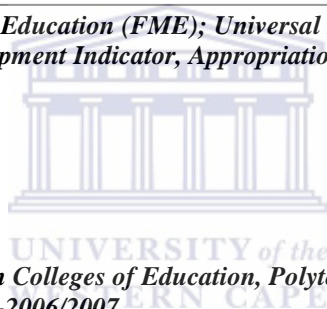


Table 3.4: Total Enrolment in Colleges of Education, Polytechnic and Tertiary Institutions in Nigeria 2000/2001-2006/2007

Year	Enrolment in colleges of education (No of students)	Growth rate of colleges of education	Enrolment of polytechnic (No of students)	Growth rate of polytechnic students	Enrolment in universities (No of students)	Growth rate of enrolment in universities	Growth rate of funding education
2000/2001	118,425	-	175,562	-	368,866	-	52.6
2001/2002	183,556	35.5	285,093	38.4	444,949	17.1	-12.6
2002/2003	197,041	6.8	228,258	-24.9	606,104	26.6	45.4
2003/2004	203,532	3.2	311,102	26.6	727,408	16.7	-38.1
2004/2005	198,249	-2.7	311,581	0.2	654,856	-11.1	7.6
2005/2006	188,372	-5.2	332,050	6.2	713,801	8.3	25.4
2006/2007	196,853	4.3	315,696	-5.1	697,587	-2.3	24.4
Average		6.0		5.9		7.9	15.0

Sources: FME and UBEC

The number of students that enrolled in colleges of education increased from 118,425 in 2000/2001 session to 203,532 in 2003/2004 session with an annual growth rate of 35.5 percent in 2001/2002, 6.8 percent in 2002/2003 and 3.2 percent in 2003/2004 respectively. It declined rapidly between 2004/2005 and 2005/2006 session. Also total students' enrollment in polytechnics increased from 175,562 in 2000/2001 to 285,093 in 2001/2002 with an annual growth rate of 38.4 percent in 2001/2002. During this period, education funding declined from 52.6 percent in 2000 to 12.6 percent in 2001. However, polytechnic enrollment annually increased to 26.6, 0.2 and 6.2 (percent) for 2003/2004; 2004/2005 and 2005/2006 respectively.

Within the period, undergraduate enrollment showed an increasing trend between 2000 and 2004 with 17.1 percent, 26.6 percent and 16.7 percent. In 2005, it declined to 11.1 percent and increased in 2006 with 8.3 percent, while in 2007 it plummeted by 2.3 percent. The average growth rate of colleges of education, polytechnics and undergraduate enrollment within the period was at 6.0 percent, 5.9 percent and 7.9 percent respectively. This decline, have been linked to persistent industrial unrest in public universities and the lower performance of secondary school leavers in regional and national exams; such as West African Examination Council (WAEC), General Certificate of Education (GCE), National Examination Council (NECO) and University Matriculation Examination (UME).

(ii) **Outputs**

There has been a consistent increase in output of Bachelor's degree holders between 2001 and 2003 with an annual average growth rate of 18.0 percent in 2002, and 17.1 percent in 2003. However, between 2004 and 2005 it declined sharply to 39.6 percent and 91.0 percent respectively. Between 2004 and 2005 when the out-put of bachelor's degree holders declined, funding of education increased to 7.6 percent and 25.4 percent respectively. The average growth rate of out-put of Bachelor's degree holders, stands at -5.6 percent within the period reviewed (see Table 3.5). A sudden fall in the number of Bachelor's Degree graduates between 2003 and 2009 was visible and this could be linked to the strike

actions which disrupted the academic calendar of most universities' examinations. This scenario has re-emerged again in the recent past.

Table 3.5: Out-turn of Bachelor's Degree holders by Nigeria Tertiary Institutions, 2001-2012

Year	No of Bachelor's degree graduate	Growth rate of bachelor's degree graduate	Growth rate of funding education
2001	47,791	-	-12.6
2002	58,305	0.22	45.4
2003	70,361	0.21	-38.1
2004	50,419	0.28	7.6
2005	26,402	0.48	25.4
2006	44,803	0.70	24.4
2007	52,749	0.18	22.8
2008	38,645	-0.27	
2009	53,923	0.40	
2010	65,192	0.21	
2011	73,189	0.12	
2012	81,709	0.12	

Source: National University Commission (NUC) various Reports

(iii) Completion Rates

Completion rates in Nigerian primary schools increases from 2,391, graduates in 1999 to 2,483,722 graduates in 2000 with an annual growth rate of 3.7 percent in 2000. It declines to 2,385,843 graduates in 2001 with a growth rate of -4.1 percent. Between 2002 and 2003 it increases by an annual growth rate of 2.8 percent and 18.9 percent respectively. In 2004, it declined to 2,609,044 graduates with a growth rate of -11.6 percent. However, it increased between 2005 and 2007 with an annual average growth rate of 6.0 percent, 1 percent and 6.7 percent respectively. The average growth rate of completion of primary schools by pupils stands at 2.6 percent within the period reviewed (see Table 3.6).

Table 3.6: Completion rates in Primary Schools 1999-2007

Year	Completion rates in primary schools (No of pupils)	Growth rate of completion rates in primary schools
1999	2,391,777	-
2000	2,483,772	.09
2001	2,385,843	-0.01
2002	2,454,763	-0.31
2003	3,026,021	0.43
2004	2,609,044	0.06
2005	2,774,292	0.04
2006	2,805,622	0.10
2007	3,006,071	-0.11

Sources: FME Reports; UBEC Reports; National Population Commission Reports and MDG 2010 Report

(iv) **Total Adult Literacy Rate**

The total adult literacy enrollment in Nigeria increased from 665,133 in 2001 to 842,987 in 2002, and declined to 814,521 with an annual percentage change of -3 percent. Between 2004 and 2006 it increases consistently to 933,868 in 2004; 954,614 in 2005; and 983,357 in 2006 respectively, while in 2007, it declined to 974,873 with -1 percent annual change (see Table 3.7).

Table 3.7: Total Adult Literacy Enrolment in Nigeria 2001-2011

Year	Enrolment	Annual percentage change
2001	665,113	---
2002	842,987	0.27
2003	814,521	0.03
2004	933,868	0.15
2005	954,614	0.02
2006	983,357	0.03
2007	974,873	-8.61
2008	910,148	0.07
2009	696,987	0.18
2010	843,674	0.23
2011	768,453	0.09

Source: National Commission for Mass Literacy

(v) **Performance in Key Examinations**

Mass failure of secondary school students in public examinations in the recent past has been a major issue of public discourse (Adepoju and Oluchukwu, 2011). Available records indicate that out of 1,351,557 students that participated in the May/June 2010 West African Senior School Certificate Examination, (WASSCE), 337,071 candidates representing 24.94 percent had credits in English Language, Mathematics and other three subjects (Adepoju and Oluchukwu, 2011).. An analysis of the results of students

who passed at least five subjects including English and Mathematics at credit level in WAEC for the past five years have been below 40% and is worrisome. Statistical records further show that in 2005, it was 27.5 percent, 15.6 percent in 2006, 25.5 percent in 2007, 13.8 percent in 2008, 26.0 percent in 2009, 24.9 percent in 2010, 37.3 percent, and 38.8 percent in 2012. The situation is the same in other examination bodies like the National Examination Council (NECO) (Leadership 12th Feb. 2010 and 11th Aug. 2011).

Table 3.8: Students Results (WAEC 2005-2010) with Credit level passes on Five Subjects including English and Mathematics

Year	2005	2006	2007	2008	2009	2010	2011	2012
Growth rate of result of students percent	27.5	15.6	25.5	13.8	26.0	24.9	37.3	38.8

Sources: Leadership Newspaper, 12 February, 2010.

Nonetheless, significant pessimism has been expressed to the effect that the quality of education in Nigeria may continue to fall, among other factors due to shortage of staff (teaching staff) (Okon, 1984 in Arong and Ogbadu, 2010), as a result of the high rate of deficits among teaching staff in Nigeria cannot be minimized (see Table 3.9). For example, primary schools record a deficit of 39 percent and 61 percent of teachers available, junior secondary shows a deficit of 1 percent and 99 percent of teachers available, adult literacy presents a deficit of 99 percent and 1 percent of teachers available, colleges of education, and polytechnics/monotechnics record a deficit of 57 percent and 43 percent of teachers available, and universities shows a deficit of 42 percent and 58 percent of teachers available. Nonetheless, poor motivation of teachers arising from poor rewards and conditions of service has also been argued as factors accountable for the poor standard of education (see Orion and Ogbadu, 2010).

Table 3.9: Availability of Teaching Staff (percent) in Nigeria

Type of education	Available	Deficit
Primary	61	39

Junior Secondary	99	1
Adult Literacy	1	99
Nomadic Education	48	52
Colleges of Education	43	57
Polytechnics and Monotechnics	43	57
Universities	58	42

Sources: Federal Ministry of Education 2007

3.2 Stylized Facts on Health

According to Obansa et al (2013) focused on Nigeria and retrieved from www.mcer.org, basic life-saving commodities are in short supply in lower income health systems. In these countries, provision of health related services depends on the availability of relevant equipment, drugs and infrastructure. In the light of this, a constant and fundamental component of health management is an effective and accountable framework for procurement. In most states of Nigeria, several health facilities are without potable drinking water, electricity, dysfunctional equipment, etc. Health system is grossly inadequate, most especially at the Primary Healthcare level (Obansa and Orimisan, 2013). According to Obansa et al (2013), poor state of infrastructure such as buildings, materials, equipment, and supplies and inequitable distribution of available facilities is the norm in many places. Furthermore, fake, substandard, adulterated, and un-affordable drugs are prevalent across the country, according to Sekhri, (2006). Moreover, the uncertainty of drug supplies, which is common across the country and lack of basic amenities, has been traced to the importation dependency of the health system in the country. In-addition, the lack of updating of the pharmaceutical regulations could also be responsible for this ambivalence which has resulted in a complete chaotic drug distribution framework in the country. A clear negative fall-out of this scenario is the observed resistance to some drugs by the disease pathogens in some patients (HERFON, 2006, FMoH, 2004, Travis et al, 2004). Nonetheless, without functional health facilities and qualified personnel, the availability of drugs alone would not improve the quality of health service. Vital to the provision of a functional health system is the former. However, it is common knowledge that in most communities in Nigeria, people travel several kilometers for basic health care services and in some case if not most, some these facilities are based on

political expediency rather than economic rationality because they lack adequate professionals.

In conformity with (Ravi Rannan-Eliya, 2008), poor services at public health institutions in Nigeria have prompted the use of unorthodox medicines by most people, and for the privileged rich, the use of private health facilities. Two recent surveys in the country have shown the low index for health. Firstly, the Nigerian Living Standard Survey (NLSS) of 2004 estimated on the average, an annual per capita for health (out of pocket expenditure) to be equivalent to twenty-two dollars (US\$ 22). A representative sample of about 19,000 households was used for the survey. The 2004 Nigeria Living Standard Survey (NLSS) (Nigerian Poverty Profile) collected data on household health expenditures from a representative sample of 19,159 households. Out-of-pocket expenditure by households in Nigeria was mostly on outpatient care, transportation to facilities and medication. According to (Yaqub et.al. 2012), this constitutes one of the largest shares of health expenditure out of total family spending in developing countries¹⁸. In this regard, private sector expenditure has exceeded public sector over the years. WHO National Health Account (2006) confirms this assertion. The statistics indicate that the private sector spending as percentage of total health spending is 74.4 percent; 72.8 percent; 69.6 percent and 67.6 percent respectively for 2002, 2003, 2004 and 2005 respectively. The trend is unabated at the moment and indicative that health services payment in Nigeria is still from out-of-pocket expenses. A key factor for this negative trend is the primary nature of health insurance in the country, with only about 0.3 percent of the population included (Ogunbekun, 1999). Secondly, the 2009/2010¹⁹ survey, which is the follow-up to the 2004 survey showed similar trends. The total health expenditure share of Household for 2009/10 decreased to 7.51 percent from 7.78 percent in 2004. Survey results suggest that fewer households visited a health provider in comparison with the 2004 survey. Also, the 2009/2010 survey results show that poverty and inequality have been on the increase since the last survey of 2004, and according to NBS (2010), this trend is still unabated.

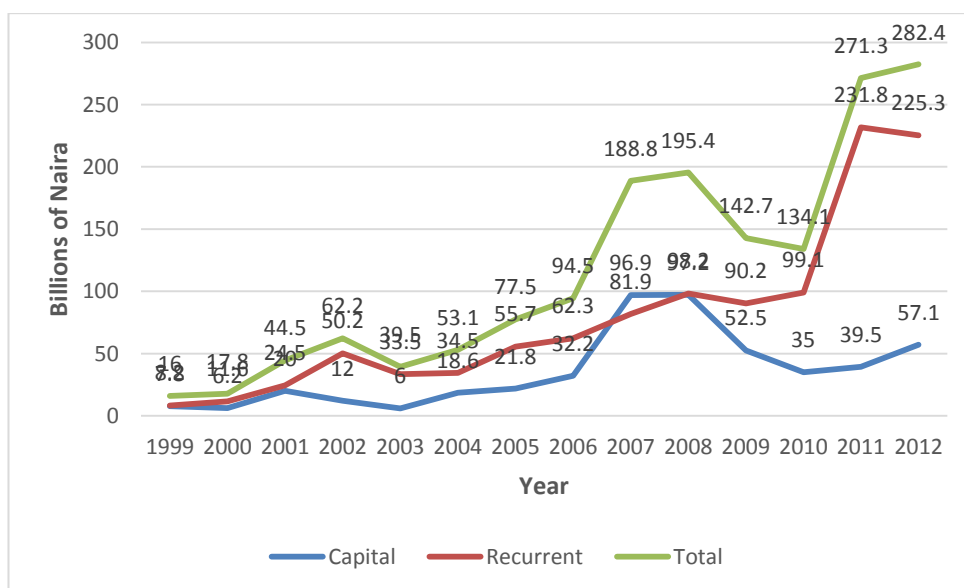
Table 3.10a: Federal Government Expenditure on Health (N' billion)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Recurrent	8.2	11.6	24.5	50.2	33.5	34.5	55.7	62.3	81.9	98.2	90.2	99.1	231.8	225.3
Capital	7.8	6.2	20.0	12.0	6.0	18.6	21.8	32.2	96.9	97.2	52.5	35.0	39.5	57.1
Total	16.0	17.8	44.5	62.2	39.5	53.1	77.5	94.5	188.8	195.4	142.7	134.1	271.3	282.4
FGN Total	947.0	701.1	1,018.0	1,018.2	1,226.0	1,384.0	1,743.2	1,842.6	2,450.9	3,240.8	3,453.0	4,194.6	4,712.1	4,987.0
Health as a % of FGN Total Exp.	1.7	2.7	4.4	6.2	3.2	4.2	4.1	5.7	5.2	3.7	3.1	3.1	5.8	5.6

Sources: NBS, CBN (Statistical Bulletin) and Federal Ministry of Finance, 2004, 2008, 2011 and 2012

The Nigerian government has been intervening in the health sector through budgetary allocations, although, public expenditure on health has not followed a definitive pattern between 1999 and 2012 (see Table 1.5). The percentage increased with 1.7 percent in 1999, 2.7 percent in 2000, 4.4 percent in 2001 and 6.2 percent in 2002. In 2003, the share reduced to 3.2 percent. Though, health expenditure was 4.2 percent in 2004 and declined slightly to 4.1 percent in 2005. In 2006, the percentage increased to 5.7 percent, but between 2008 and 2010, it declined consistently with 3.7 percent in 2008, and 3.1 percent in 2009 and 2010, respectively. The percentage rate further climbed to 5.8 percent in 2011 and decreased slightly again to 5.6 percent in 2012.

Figure 3.0.2: Graph of Federal Government Expenditure on Health (N' billion) 1999 - 2012



Sources: NBS, CBN (Statistical Bulletin) and Federal Ministry of Finance, 2004, 2008, 2011 and 2012

The pointed increase in 2011 was as a result of the need for government to improve its health sector spending. Observing selected countries in 2009, Haiti recorded 29.8 percent, Rwanda 27.3 percent, Nauru 25.0 percent, Norway 17.9 percent, Australia 17.2 percent, United Kingdom 16.5 percent, Gabon 13.9 percent, Cameroon 8.6 percent, Niger 10.6 percent and Ghana 6.8 percent (WHO, 2009). Comparing these statistics from other countries, implies that Nigeria's health spending is unfortunately weak and needs to be strengthened.

Health care indicators show that public spending on health is a source of concern in the country²⁰. However, the WHO recommended the population to doctor ratio standard at 600: 1. In Nigeria however, the ratio of population to doctor was 4,529:1 in 2000 increased to 5,075:1 in 2007. Between 2009 and 2010 it decreased to 3,967:1:3,967 and further decreased to 3,500:1 respectively. The data suggest an annual increase in the number of persons per physicians implying declined access of citizens to the services of physicians. Also, the annual increase in the population to nurse ratio is a source of concern. This indicates reduced access of the citizens to the services of nurses. For example, the ratio stood at 920:1 in 2000 and increased to 1,405:1 in 2007, which suggests a higher growth rate of

population than the number of nurses. In-addition, most citizens are not aware of the available services and their constitutional rights in relation to the health care. As Obansa et al (2013) posit, households and communities should be enlightened and their consciousness increased in understanding how best to access health care. The introduction of a bill of rights would support positive this process.

Also, Obansa et al (2013) retrieved from www.mcer.org, suggests that most laboratories in the primary and secondary health care centres in most states of Nigeria require upgrading. Their article observed a mix-up in the staffing and equipment mix between primary and secondary health centers. They posit, that even thou equipment is often minimal primary health center laboratories are better equipped than those in comprehensive health centers and some secondary level hospitals. Summarily, according to them, an ambivalence is noted in the qualifications of laboratory staff for both primary and secondary facilities.

The current skill set available in the health sector is grossly inadequate and unevenly distributed in the country, especially in the rural areas. The need for a workforce framework and appropriate professional supervision cannot be over-emphasized in rebuilding the sector in Nigeria. Furthermore, service delivery is very poor and compounded with poor incentives for workers in the industry, and this situation has resulted in a massive brain drain and the refusal by some workers for a posting to semi-urban and rural places. According to Uneke et al. (2007) lack of proper incentives has had an unfavourable effect on the morale of health professionals in Nigeria, such that over 21,000 Nigerian doctors are practicing abroad, while there is an acute shortage back home. Obansa et al. (2013) adds that Health workers in Nigeria are paid meager salaries (about 75percent lower than that of counterparts in Eastern Europe) and they work in highly insecure locations added to heavy workloads, and at the same time, lack basic resources, with no possible career development trajectory. Consequently, WHO (2003 and 2004) reports suggested an up-scaling of rewards for health professionals because of its direct effect on productivity. Also, the report recommended subsidization of health series for the poor by the use of local

government financing, and similar tools in the engagement of communities in their health care programmes.

Adepoju et al. (2011) opined that Medical Doctors in Nigeria seek better opportunities for professional advancement in other countries with better infrastructure. Also, according to Lambo (2006), Nigeria is one of the several major health-staff-exporting countries in Africa. He estimates that about, 432 nurses legally migrated to work in Britain between April 2001 and March 2002, out of a total of about 2000 legally emigrating African nurses, a trend identified by the Federal Government of Nigeria as a threat to sustainable health care delivery.

Alimi et al (2012) from another dimension concludes that corruption is a frequent occurrence and evident in Nigeria's health sector, via the supply of fake drugs, substandard equipment's, willful misdiagnosis of diseases, sharing of unallocated budget funds, inflation of contracts, diversion of drugs, favoritism in treatment and appointments based on political support.²¹ There is no gain saying that corruption impoverishes a country especially the social sectors that benefit the vulnerable and less privileged. The wealth of written materials on corruption²² in Nigeria is adequate to convince an outsider that the phenomenon is prevalent (Akinbi, 2003). Furthermore, Abiola and Adebayo (2013) noted in their study that the global coalition against corruption(i.e. Transparency International) ranked Nigeria 122th of 180 countries in 2008, 130th of 180 countries in 2009, 134th of 178 in 2010, 143th of 183 countries in 2011, and 135th of 176 countries in the corruption perception index, in 2012.

3.3 Stylized Facts on Economic Services

The recent rebasing of the Nigerian economy (GDP) from 1999 to 2010 led to an estimated increase of 89 percent for the economy. Thus the estimated nominal GDP is about USD 510 billion, whereas that of South Africa is about USD 352 billion. Despite the growth of the oil sector being disrupted in 2013 because of constant oil theft, low investments in the upstream sector, lack of funds, etc.; the

non-oil sector, especially crops production, services and trade has shown considerable improvements with real GDP growth of 5.4 percent, 8.3 percent and 7.8 percent in 2011, 2012 and 2013, respectively. However, the non-passage of the Petroleum Industry Bill also seems to be contributing to the observed weak investment in exploration and exploitation of oil and gas in the country. Nonetheless, the recorded overall GDP growth rates of 7.4 percent and 6.5 percent in 2013 and 2012 respectively, have not resulted in the reduction of poverty and inequality in the system, which confirms the paradox espoused by many analysts. Furthermore, the new statistics indicate a bit of more diversification of the economy, but the real effects are yet to be seen.

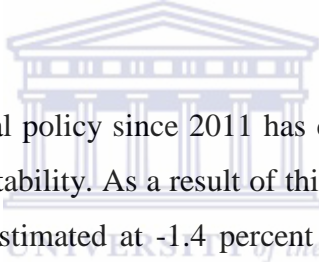
However, the recovery of the global economy, positive harvests and repositioning of the power sector would determine the prospects of continued growth. Howbeit, the rebasing of the GDP would lead to lower growth values and negative oil sector growth would reduce the overall projected GDP growth. Moreover, the rebased GDP shows the emergence of new activities that are scaling –up growth. The most prominent of these is the motion pictures, sound recordings and music waxing and production industry, otherwise known as Nollywood. The challenge of a decade of inclusive growth in Nigeria is still unabated because poverty and employment remain trigger points in the system. At the moment, the agricultural sector is largely informal and employs about 75 percent of the labour force, which belong to poor strata. Rejuvenating the sector will propel employment and integration with other sectors of the economy. This will increase revenues from export, income, boosting for the poor and reduction of poverty incidence. Thus, poverty reduction, employment creation and protection of the vulnerable group and the large informal sector group should be primarily the focus of the government.

Table 3.10b: Macroeconomic Indicators

Indicators	2012	2013(e)	2014(p)	2015(p)
Real GDP Growth	6.7	7.4	7.2	7.1
Real GDP Per Capita Growth	3.9	3.6	4.4	1.7
CPI Inflation	12.2	8.5	8.1	8.2
Budget Balance % GDP	-1.4	-1.8	-1.2	-2.0
Current Account Balance % GDP	2.8	4.4	5.8	5.1

Source: Data from domestic authorities; estimates (e) and projections (p) based on authors' calculations

In-addition, both export revenues and import expenditures declined, with export revenues declining more. This decline in export revenues has been mainly attributed to about a 10 percent decline in crude-oil and gas export earnings. Furthermore, the Foreign Capital Inflows increased by about 28 percent (USD 21 billion) in 2013 from an estimated USD 16 billion in 2012. On the FDIs declined within the period largely due to the sluggish global economic recovery and the status in the oil sector given that a large percentage of FDI inflows into the economy go to the oil sector. Furthermore, foreign reserves declined to about USD 43 billion at the end of 2013 from about USD 44 billion in 2012 due to the continued decline in oil-export revenues and its use by monetary authorities to hedge the value of the Naira (NGN) against the Dollar (USD). Howbeit, at the current level, the country's external reserves can still support about ten months of imports.



The management of fiscal policy since 2011 has centered on fiscal consolidation to gain macroeconomic stability. As a result of this scenario, the fiscal deficit as a percent GDP has been estimated at -1.4 percent and -1.8 percent for 2012 and 2013 respectively, even the values are well below the fiscal stance of a maximum of 3.0 percent deficit as espoused in the Fiscal Responsibility Act (FRA). In pursuance of its fiscal policy, the government limits its borrowing requirements in compliance with the Fiscal Responsibility Act (2007). Available figures from the Debt Management Office (DMO) as at 31 December 2013 indicate that Nigeria's public debt stock was USD 64.51 billion. Of this amount, the external debt of both the federal and state governments was only USD 8.8 billion, of which the state governments constituted about 38 percent. The balance of USD 55.7 billion (about 86.3 percent of the total) drawn by both the federal and state governments makes up the domestic debt. Following these estimates, new borrowing in 2014 is estimated to be NGN 572 billion (USD 3.62 billion), slightly down from NGN 577 billion (USD 3.65 billion) in 2013.

The 2013 budget was signed into law in February, which was two months earlier than the preceding year because the usual disagreements between the executive

and the legislature over appropriation estimates were resolved in good time. 2013 Capital Expenditure to Total Expenditure diminished to an estimated 23.9 percent from 24.3 percent in 2012. On the other hand, the share of capital expenditure on social community services (health, education and other allied services) in the total increased from 10.0 percent in 2011 to 11.1 percent in 2012 while economic services (agriculture and infrastructures) declined from 42.1 percent to 36.7 percent respectively. However, the persistent decline in oil revenues portends risk for fiscal policy management and will shape the trajectory of the medium-term fiscal outcome. Thus, if the declining oil revenues are not contained as well as the rise in non-oil revenues are not sustained, new fiscal risks may set in. This obviously would hinder the success of on-going reforms, and impact negatively on economic activities. This eventually leads to a huge downward adjustment for capital expenditure because recurrent expenditures, which are mainly salaries and overhead components. These can hardly be adjusted automatically. These downward adjustments in capital expenditure could further slow down economic and growth.

Table 3.10c: Public Finances (Percent of GDP)

Indicators	2005	2010	2011	2012	2013(e)	2014(p)	2015(p)
Tax Revenue	3.7	2.9	2.8	3.0	2.8	2.8	2.8
Oil Revenue	21.3	9.8	13.9	11.1	11.1	10.9	10.2
Total Revenue and Grants	25.3	13.3	17.4	14.8	25.7	14.3	13.7
Total Expenditure and Net Lending (a)	26.0	15.3	19.2	16.1	27.5	15.6	15.7
Current Expenditure (Total)	13.1	9.8	14.8	11.6	18.0	11.3	11.4
Current Expenditure (Excluding Interest)	11.3	8.7	13.6	10.6	17.1	10.4	10.6
Wages and Salary	2.4	2.8	2.9	2.6	2.5	2.4	2.3
Interests	1.7	1.1	1.2	1.0	0.9	0.8	0.9
Capital Expenditure	4.0	5.3	4.2	4.4	7.6	4.2	4.1
Primary Balance	1.0	-0.9	-0.6	-0.4	-2.7	-0.4	-1.2
Overall Balance	-0.7	-2.0	-1.8	-1.4	-1.8	-1.2	-2.0

Note: Only major items are reported.

Source: Data from domestic authorities; estimates (e) and projections (p) based on authors' calculations

By the end of 2012 and 2013, available credit to the private sector (percent of GDP) was 37.3 percent and 30 percent respectively as against the value of 34.6 percent by the end of 2011. Nonetheless, the formal financial market in Nigeria does not encapsulate the entire population; about 45 percent of the adult population is still outside the banking system. Several reasons such as poor

education, cultural issues, unemployment amongst others have been adduced as the cause of this scenario. Furthermore, it is estimated that Nigeria has the highest financial exclusion of about 46.3 percent in sub-Saharan Africa. As part of the Maya Declaration in 2011, the CBN launched National Financial Inclusion Strategy and the Micro, Small and Medium Enterprises Development Fund in October 2012. This has further led to the introduction of the CBN's Cashless Society Policy as well as the introduction of mobile money services in the country. In-addition, the forthcoming 2015 general elections, which are likely to induce a higher-than-normal fiscal spending has been identified as a risk to the sustainability of the current monetary policy in Nigeria. Previous experiences have shown that the CBN finds it very hard to mop up excess liquidity in the system, thus a stable inflation rate may not be guaranteed.

3.4 Review of Performance of MDG Goals for Health and Education in Nigeria

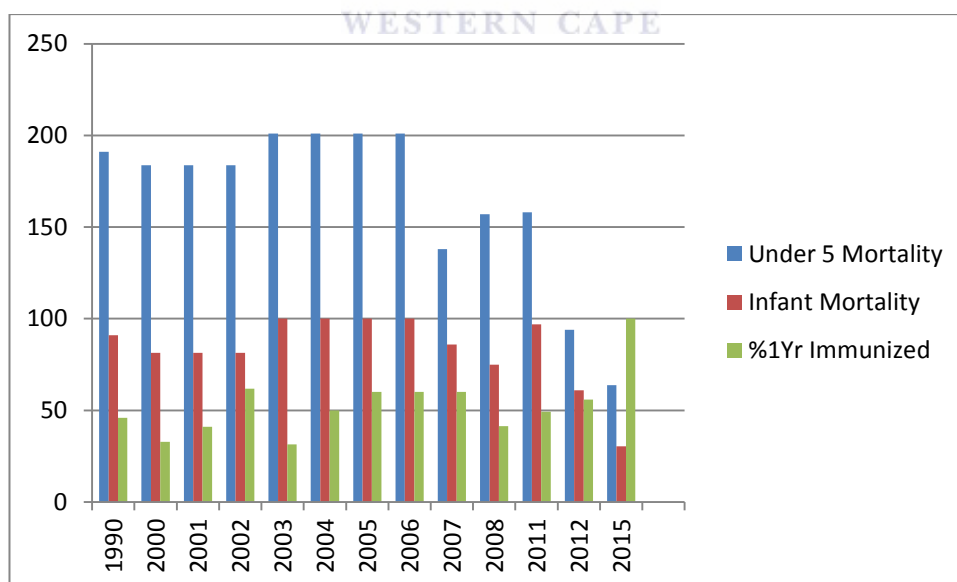
Two important variables influencing the level of poverty are health and education. There are better chances for increased earnings and higher living standards for an educated and a healthy population. Improved health status and human capital through education for the population reduces poverty level and increases productivity. Many studies indicate a positive relationship between public expenditure and health and show the capability of the sector in the reduction of poverty. Government spending on health and education has negative impact on poverty (Asghar, et al 2012), and a focus on both variables means the creation of opportunities for people to earn more for their livelihoods which eventually leads to poverty reduction. Three of the MDGs that related to health are MDG 4, 5 and 6. MDG 4, 5 and 6 addresses child mortality, maternal health and to reduce HIV/AIDS, Malaria and other infectious diseases. Furthermore, Nigeria has included Non-communicable Diseases (NCDs) as part of its MDG 6.

Table 3.11: MDG Goal 4 - Child Mortality Indicators 1990 - 2015

Indicators	1990	2000	2001	2002	2003	2004	2005	2006	2007	2008	2011	2012	2015 Target
Under 5 mortality rate (per 1,000 live births)	191	183.8	183.8	183.3	201	201	201	201	138	157	158	94	63.7
Infants mortality rate (per 1,000 live births)	91	81.3	81.3	81.3	100	100	100	100	86	75	97	61	30.3
% of one year olds fully immunized against measles	46	32.8	41.1	61.8	31.4	50	60	60	60	41.4	49.2	55.8	100

Source: 2011 MDG Report for Nigeria and <http://afrihealthoptonetassociation.blogspot.com/2013/04/press-briefing-by-prof-c-o-onyebuchi.html>

Figure 3.0.3 Graph of Goal 4 Attainment



Source: 2011 MDG Report for Nigeria and <http://afrihealthoptonetassociation.blogspot.com/2013/04/press-briefing-by-prof-c-o-onyebuchi.html>

As table 3.11 indicates, the 1990 estimate for age, less than 5 mortality was on the high side in Nigeria and the trend continued until 2011. Available statistics suggest that the index has not significantly improved. Thus, the MDG target for the goal in 2015, might not be attainable given current trends. Current statistics indicate that it has reduced to 94 as at 2012. (Chukwu, 2013) Similarly, the probability of achieving 100% target of one year olds fully immunized against measles in 2015 is far from feasible. For example, it increased from about 33 per cent in 1990 to 61.8 per cent in 2002. Its record reveals approximately 31, 50, 60, 60, 60, 60, 41, 49, and 56 per cents in 2003, 2004, 2005, 2006, 2007, 2008, 2011 and 2012, respectively.

Nonetheless, the government is making progress towards achieving MDG 4. This is in view of the integrated approach that has been adopted by the Federal Government since 2007. This approach focused specifically on women and children (Integrated Maternal, Newborn and Child Health: IMNCH). This has considerably helped to fast track the achievement of MDGs 4 in Nigeria. The IMNCH strategy provides an operational framework that ensures a continuum of care from pre-pregnancy, through pregnancy, childbirth to care of the newborn and care of under-five children. It aims to cover more than 80 percent of those who need the service in the most cost effective way, while building synergies and ensuring maximum impact. Also, the eradication of polio and limitation of the occurrence/impact of vaccine preventable diseases using education, immunization, and other proven interventions has been given top priority by the strategy. However, in keeping with the fortitude of the Federal Government to interrupt the transmission of the wild polio virus (WPV) in 2013, the National Primary Health Care Development Agency (NPHCDA) has significantly stepped up its polio eradication drive, carrying out several additional Immunization plus Days (IPDs) in 2011 and 2012. National Immunization Coverage Survey (NICS) data from 2011 shows DPT3 coverage of 67.73 percent, measles vaccine coverage of 63.55 percent and fully immunized children, 53.01 percent. The probability of achieving this goal is realistic with strong political will. Despite, all the achievements so far, Nigeria continues to face challenges of high infectious disease burden, poor birth

registration, inadequacy of skilled caregivers for neonates in the facilities and communities, and harmful traditional practices such as fontanel/cord myths among others.

Table 3.12: MDG Goal 5- Maternal Health Indicators 1990 - 2015

Indicators	1990	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2015 Target
Mortality rate (for every 100,000 live births)	1,000	704	704	704	800	800	800	800	800	545	NA	250
Proportion of births attended by skilled health personnel (%)	45	42	42	37.3	36.3	36.3	43.5	43.5	43.5	38.9	NA	100
Contraceptive Prevalence Rate (%)	NA	NA	NA	NA	8.2	8.2	12	12	12	14	6	NA
Adolescent Birth rate (%)	NA	NA	NA	NA	25	25	NA	NA	NA	NA	NA	NA
Unmet need for Family Planning (%)	NA	NA	NA	NA	17	17	NA	NA	NA	20.2	NA	NA

Source: 2011 MDG Report for Nigeria

Figure 3.0.4 Graph of Goal 5 Attainment

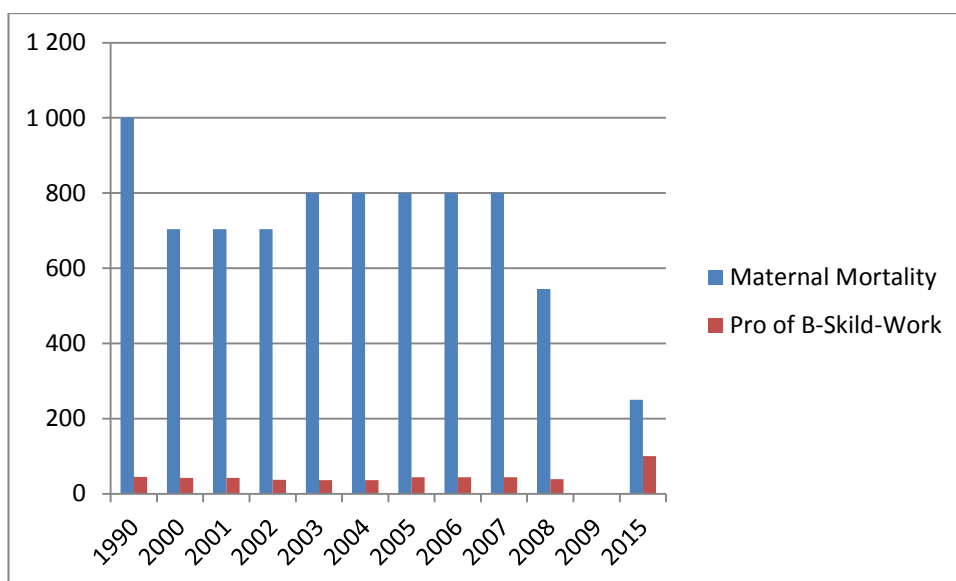


Table 3.12 above shows a weak performance for indicators of maternal health, especially for maternal mortality and the proportion of births attended by skilled personnel. A sharp decline for maternal mortality in 2008 to 548 from 800 in the preceding years if sustained, would support, the attainment of the goal.

Table 3.13: MDG Goal 6- HIV/AIDS, Malaria and other Diseases Indicators 1990 - 2015

Indicators	1990	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2015 Target
HIV prevalence among pregnant young women aged 15-24 (%)	NA	5.4	5.8	5.8	5	5	4.3	4.3	4.3	4.3	4.2		
Malaria prevalence (per 100,000)	NA	2024	1859	2203	1727	1157	1157	1157	1157	1157	NA	NA	
Tuberculosis (TB) prevalence (per 100,000)	NA	15.74	12.01	12.57	21.75	7.07	7.07	7.07	7.07	7.07	NA	NA	

Source: 2011 MDG Report for Nigeria

According to (Abdulgafar et al 2013), Nigeria has recorded a remarkable improvement in the areas of reducing the prevalence of HIV/AIDS from 5.8 percent in 2001 to 4.2 percent in 2009 (see Table 3). UNDP (2011) and Abdulgafar et al (2013) reports show that contraceptive awareness has scaled up treatment of HIV/AIDS and it doubled to 34.4 percent in 2008 from 16.7 percent in 2007. Also, Nigeria has achieved a significant record for polio eradication. Current figures indicate that the number of cases reduced significantly between 2008 and 2012 (Abdulgafar et. al. 2013). Furthermore, the statistics available indicate that malaria prevalence per 100,000 declined from 2024 in 2000 to 1157 in 2007. There has been an intensive improvement in the procurement and distribution of antimalarial drugs, namely Artesimin Combination Therapy (ACTs) and commodities such as Long Lasting Insecticide Nets (LLINs) thereby protecting over 100 million Nigerians. The health sector achieved a reduction in Malaria Prevalence from a slide Positivity Rate of about 50 percent to 33 percent in 2009. It has also achieved 46% universal coverage on Long Lasting Insecticides Nets LLINs, significantly reducing new cases of malaria. The 2009/2010 Drug Therapeutic Efficacy Test conducted across the 6 geopolitical zones indicated that ACT is safe and efficacious (99%) for the treatment of uncomplicated malaria.²³ The Ministry of Health also notes that TB prevalence per 100,000 has continued to decline from about 16 in 2000 to 7 in 2007. The various projects and policy imperatives being implemented by the government through the National Tuberculosis and Leprosy Control Programme (NTBLCP) have among other things led to an increase in access to TB specific services. For instance, the number of all forms of Tuberculosis cases reported in Nigeria increased from 90,447 in 2010 to 93,050 in 2011 representing an increase in Case Detection Rate (CDR) from 40 percent in 2010 to 43 percent in 2011. The number of new smear positive cases also increased from 45,416 in 2010 to 47,436 in 2011, but about 83.7 percent of the cases notified were successfully treated. The NTBLCP recently embarked on a countrywide prevalence survey in the 36 states and FCT.

Table 3.14: MDG Goal 2- Universal Primary Education Indicators 1990 - 2015

Indicators	1990	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2015 Target
Net enrolment in primary education (%)	68	95	95	NA	NA	81.1	84	87.9	89.6	88	NA	100
Proportion of pupil starting primary One who reach primary Five (%)	67	97	97	96	84	74	74	74	74	72.3	NA	100

Source: 2011 MDG Report for Nigeria



Chapter Four: Methodology

4.0 Data Requirements

A. Primary Data

For objective one (1), general secondary data obtained from various government agencies were used as well as projections made by the author based on the National Population Commission (NPC) baseline data. Objective two (2) and three (3) used both the 2004 NLSS Survey and the 2010 Harmonized Nigerian Living Standard Survey (see appendix). The 2004 survey covered more than nineteen thousand (19,000) households, and the questionnaire focused on urban and rural households simultaneously. Broad ranges of issues (social and economic indicators) were covered in the questionnaire and the data contained information on households' total expenditure. Data from the survey is disaggregated to state levels, region (geopolitical zones), and gender (male/female) and contains details of resources and its availability at the third tier level of governance. The second Survey wave, 2010 HNLSS was an enlarged survey and a follow-up to the 2004 survey. The latter survey included Demography, Health and Fertility behaviour, Education and Skills, Social Capital, Agriculture, Employment and Time-Use, Housing and Housing Condition, Household Income, Consumption and Expenditure. The relevant information in the 2010 survey which is relevant to the study is the information on income, expenditure, health and education across all the states of Nigeria. The two surveys were used in graphing the concentration curves discussed in objective three (3).

The designed questionnaire for the five South-East states in Nigeria was used for objective four (4). We used the Two Stage Stratified Sampling Design. The first stage deals with the delineation of clusters of housing units called Enumeration Area (EA), and the 2 second stage involved the housing units. Our size was determined from the already 120 EAs established in each of the five (5) Eastern States of Nigeria by the Nigerian Bureau of Statistics. Two housing units were randomly selected from each of the EAs, making it a total of 240 households

selected in each of the states. On the average, we selected 1,200 households, but received only 1,080 completed responses.

B. Secondary Data for the Study

Documented secondary data from federal, state, local government and donor agencies level were used to achieve objective one (1). Data sets of the following below were used:

- Population Projections by the National Population Commission
- Total expenditure for the designated sectors in the state (MoH, MoE);
- Composition of revenues of each sector expenditure by government, and unit costs;
- Composition by source of total government expenditure on the sectors; and
- Sector expenditure at the federal government level.

The above enumerated secondary data were sourced from the following:

1. National Population Commission;
2. The CBN and the Federal Ministry of Finance, for actual expenditure on education and health at the federal level;
3. The NBS, Federal Ministries as well as other state counterparts at the state levels; and
4. States were grouped and summed to realize the regional actual spending for the sectors.

Objective 1: Determine the Sensitivity of Government per capita Consumption Expenditure to Population Dynamics (household size & age composition)

4.1 Population Dynamics and Government per Capita Expenditure

The study established a link between demographic variables and various categories of government expenditures (capital and recurrent). The equations are based, on a base case expenditure scenario. The specification shown below was used to estimate equations for three expenditure categories: education expenditure (EXEDUC), economic services expenditure (EXECON) and health expenditure (EXHE). The equations served as a basis for projecting government expenditure.

The general specification of the expenditure equations is:

$$\text{Exp} = f(\text{Pop}, \text{Sa})$$

Where:

Exp = expenditure category

Pop = population variables (Pop 5+; Pop6-11; Pop12-17; Pop18-24; Pop25-34; Pop35-44; Pop45-54; Pop55-64; & Pop65-74)

SA = speed of adjustment (residual from the Cointegration Equation Model)

We estimated three (3) equations after treating for stationarity and cointegrating vectors. In our model, population dynamics were used as independent variables only to gauge the effects on the dependent variables. In estimating the equations using this general specification, lagged dependent variables were introduced on the right-hand side to test for serial dependence in public spending. This was later dropped because of its insignificance. All equations are in a log-linear form.

4.1.1 Econometric Tests:

1. Unit Root Analysis

The Augmented Dickey-Fuller (ADF) test was used for stationarity analysis. According to Dickey and Fuller (1979), the unit root is the Null Hypothesis and is based on i.i.d. error. Another test for such analysis is the Phillips-Perron test (PP) (Perron, 1988). This test is nonparametric and allows for heterogeneity and serial

correlation while the KPSS test (Kwiatkowski, Phillips, Schmidt and Shin, 1992) differ from both the ADF and PP tests. The ADF's null hypothesis takes the form of stationarity, while the alternative hypotheses is the unit root. The ADF uses a baseline for variable integration. Its results indicate if the variables are integrated of order one or a zero. Evidence of non-stationarity series required differencing of some variables to attain stationarity. This is to avoid the problem of spurious correlation, or inconsistent regression that plagues econometric estimation when some or all of the individual series are non-stationary.

2. Co integration Analysis

The existence of a linear combination between the endogenous variables would suggest a long-run relationship. The Stationarity test of the residuals from the OLS I(I) variables were used to validate this point. This can be a particularly useful approach in unrestricted (non – normalized) equations that are consistent with long – run equilibrium, but may be characterized by considerable short –run dynamics.

The process refers to a situation where each component $X_{i,t}$, $i=1,\dots,k$, of a vector time series X_t is a unit root process, but certain linear combinations of the $X_{i,t}$'s are stationary. Thus $X_t = X_{t,1} + m + V_t$,

Where V_t is a zero-mean K -variate stationary time series process and m is a K -vector of drift parameters, but there exists a $k' r$ matrix b with rank $r < k$ such that $b'X_t$ is (trend) stationary. In order to show that this is possible, let us assume that V_t can be written as an infinite order vector moving average process:

$$V_t = C(L)e_t,$$

Where e_t is i.i.d. k -variate white noise with unit variance matrix and $C(L)$ is a matrix-valued lag polynomial:

$$C(L) = C_0 + C_1L + C_2L^2 + C_3L^3 + \dots,$$

With the C_j 's $k \times k$ coefficient matrices and L the backshift lag operator (i.e., $L = \text{et-1}$). Now $C(L) = C(1) + [C(L) - C(1)] = C(1) + (1 - L)D(L)$,

Where

$$D(L) = [C(L) - C(1)]/C(1-L).$$

This is always possible because $C(L) - C(1)$ is a zero matrix for $L = 1$, hence each element of this lag polynomial matrix has root 1 and thus these elements have a common factor $1 - L$.

3. Exogeneity Tests and Diagnostic Checks

Exogeneity tests were also carried out on the variables while diagnostic checks such as autocorrelation, heteroskedasticity, Swartz-criterion, Hanna-Quinn tests, normality and re-specification tests were checked after the estimations. Furthermore, statistics such as adjusted R^2 , F-tests, and T-tests benchmarked the model and sensitivity to parameterization was also checked for model congruency.

N/b

In our analysis, we did not consider the inverse relationship between Population dynamics and government expenditure because it is out of the scope of the present study. No doubt, the inverse relationship would have some effect on the studies direct relationship. Furthermore, it should be noted that the evolution of an Age Class is not unconnected with the development of the previous Age Classes. However, we did not take into account of this dimension in our analysis, which could be studied further.

Also, we have not included Enrollment as a variable in the sensitivity analysis for government spending on Education because we are not interested in the singular effect of this, but rather how government expenditure adjusts to demographic changes in general. As a result of this, we also excluded the independent variables as dependent variables in the other equations. The issue of controlling the variables was not adjudged necessary in our estimations.

Objective 2: Estimate the Benefit Incidence of Public Expenditure (Primary/Secondary/Tertiary) on Health, and Education in the South East (SE), using 2010 NHLSS Data

4.2 Beneficiaries' and Marginal Odds of Health and Education Expenditure (South East – Nigeria)

4.2.1 BIA/MB Procedural Steps

Benefit Incidence Analysis (BIA) normally reveals who is benefiting from public services, and describes the welfare impact on different groups or individual households from government spending. Most analysis of benefit incidence is derived from the pioneered works of Meerman (1979 and Selowsky (1979) which provides estimates of the distribution of public expenditures. Almost two decades after, interest on how to incorporate a gender dimension in the estimation of the distribution of public expenditures began. However, despite the ease with which standard benefit incidence methods is being extended to include a gender character, the literature on marginal incidence is sparse.

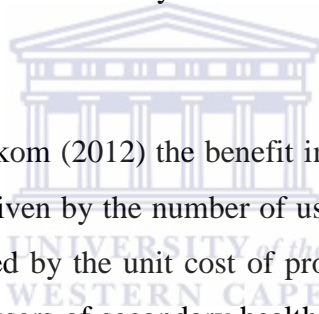
For this objective, we used both average and marginal benefit incidence methods with application to spending on education and health. BIA is achieved by combining information about unit costs of providing those services (these were obtained from ministries of education and health as well as private service-providers) with information on the use of these services [this was also obtained from the households - the 2010 Nigerian Living Standard Survey report (NLSS)].

For example, spending on (education/ health), can be formally written as:

$$X_j \equiv \sum_{i=1}^3 E_{ij} \frac{S_i}{E_i} \equiv \sum_{i=1}^3 \frac{E_{ij}}{E_i} S_i \dots\dots\dots 1$$

As cited in Amakom (2012) where X_j is the amount of the social service (education or health) subsidy that benefits group j^i (j is the economic group and

for the purpose of the study, all households have been grouped into five (5) quintiles representing their economic status from the lowest income to the highest income group). S and E refer respectively to the government social sector (education or health) subsidy and the number that is expected to benefit from (the number of public school enrollment of education and the number of people that uses the health facility for the health sector), and the subscript i denotes the level of social service (education or health). In Nigeria, education services and healthcare in both private and public are categorized into primary, secondary and tertiary hence i = 1 to 3). The benefit incidence of, for example total education imputed to group j is given by the number of primary enrollments from the group (E_{pj}) multiplied by the unit cost of a primary school added to the number of secondary enrollments multiplied by the secondary unit cost of secondary education, plus the number of tertiary enrollments multiplied by the unit cost of tertiary education.



Furthermore, using Amakom (2012) the benefit incidence of total health imputed according to group j is given by the number of users of primary health care from the group (E_{pj}) multiplied by the unit cost of providing primary health care and added to the number of users of secondary health care which is multiplied by the unit cost of providing secondary health care, plus the number of users of tertiary health care multiplied by the unit cost of providing tertiary health care.

N/b: \bar{S} \bar{E} is the mean (average) unit subsidy of an enrollment at education level i. or unit subsidy of usage of a health facility at a health level i. Thus the share of total education or health spending imputed to group (X_j) is then given by:

$$x_j \equiv \sum_{i=1}^3 \frac{E_{ij}}{E_i} \left(\frac{S_i}{S} \right) \equiv \sum_{i=1}^3 e_{ij} s_i \dots\dots\dots 2$$

Equation (2) above depends on two major determinants:

1. The e_{ij}'s which are the shares of the group in total service use (enrollments in the case of education and number that uses a health facility for health sector). These reflect household behaviour.

2. s_i which is the shares of public spending across the different types of service, reflecting government behaviour.

This study followed a procedure where behavioural information does not determine the monetary valuation of the benefits an individual receives from using public services. Rather the same monetary value of benefits are assigned to all those who used the services, which is the value of the unit cost of providing the service. Our analysis is focused on the distributional spread of beneficiaries from services and the counterfactual reciprocity of expenditure benefits rather than measuring the exact value to recipients of government-sponsored services (Heltberg, Simler and Tarp 2003). This is the marginal odds of benefits that would accrue to a group for every subsidy or expenditure by government. However, to get the gender disaggregated benefit incidence, we further measured gender disparity in education and health as:

$$r_{ij}^{g,b} = \frac{E_{ij}^{g,b}}{E_j^{g,b}} \quad (3)$$

Where

E_{ij}^g (E_{ij}^b) is the number of girls (boys) in quantile j who are enrolled in level i , and E_j^g (E_j^b) is the number of girls (boys) of the corresponding school age in quantile j .

However, there are both theoretical and practical reasons to doubt the above mentioned practice (van de Walle 1998; Sahn and Younger 1998, 2000). Given the poor quality of data on public expenditure as well as budget estimates at highly aggregated level, the binary approach proposed by Sahn and Younger (1998, 2000 and Glick and Sahn, 2004) is used for our analysis. This bypasses the need for estimating the unit subsidy (S/S_i), which then disappears in equations (1) and (2). Focus is made only on whether a service is used or not by users of public services counted and given the benefit of one, while non-users get zero. Secondly,

the above assessment of how the education and health budget is distributed across the population is based on the observed use of government funded schools and health facilities. This is called current accounting. Thus, it may not give an accurate notion of how changes in the education and health budget will be distributed across the quintiles.

Nonetheless, Ajwad and Wodon (2001) and Lanjouw and Ravallion (1999) proposed methodologies that use a single cross-section of data to identify the distribution of increases, at the margin, in access rates to public services. Both studies assumed that the distribution of new access in lagging regions will follow the pattern observed in regions where access rates are higher and used the variation in access rates across regions in a country to capture the expected evolution of access over time. But, the techniques by Ajwad and Wodon (2001) and Lanjouw and Ravallion (1999) differ in the method used for ranking individuals or municipalities because Lanjouw and Ravallion classify individuals as poor or rich according to their rank in the national distribution of income. The classification of individuals according to their rank in the local distribution of income by Ajwad and Wodon presupposes two differences between the works of Ajwad and Wodon (2000) and Lanjouw and Ravallion (1999). They are as follows:

1. The first concerns the manner in which the endogeneity bias in the estimation of the marginal benefit incidence analysis is handled. Both papers regressed access rate in a given quintile against the mean access rate. The mean access rate, however, includes information from the access rates in each quintile. To purge the mean from this endogeneity, Ajwad and Wodon use the leave-out mean as their right-hand side variable. That is, the access rate in any given quintile is regressed against the average of the access rates across all Quintiles, except for the quintile for which the regression is performed. Lanjouw and Ravallion, on the other hand, use an instrumental technique, whereby the actual mean is instrumented by the leave-out mean.
2. The second is that Ajwad and Wodon constrain the estimates of the marginal benefit incidence analysis to sum to one, and show that without such a constraint, the estimates will be biased downward, while Lanjouw and Ravallion does not.

Lanjouw and Ravallion provide the following econometric method which has been used in a few studies (Ajwad and Wodon, 2001; Kamgnia et al, 2008; Demery and Gaddis, 2009), given as:

$$\rho_{i,j,q} = \alpha_q + \beta\rho_k + \mu_q \quad (4)$$

Where i index a small geographical unit, k indexes a larger one, and q indexes the welfare quantile. The left-hand variable is the program participation rate for the region and quantile. The regressor is the program participation rate for the region in which the division is located. q , then is the marginal effect of an increase in the program participation rates of people in a given region and quantile.

According to Lanjouw and Ravallion (1999), the average participation rate is defined as the proportion of the population of a particular quintile that participates in a government sponsored program. The regressor is run separately for each quantile. In addition, because ijk is included in k , there is an upward bias in the

estimation. As mentioned earlier, Lanjouw and Ravallion resolved this problem by instrumenting k with the left-out mean. The intuition behind the regression is that by observing variations in regional participation across the country, it is possible to understand how increased coverage affects the participation of different population groups. If q is greater than one, it indicates that a general expansion in coverage is correlated with a disproportionately large increase in participation for that region and quantile.

An important assumption in the model is that across locations, the same political process determines the correlation between program size and incidence. Also, the margin that this model estimates is the incidence of an increase in program participation.

*Summary Procedural steps in computing **Benefit Incidence Analysis and Marginal Benefit Analysis:***

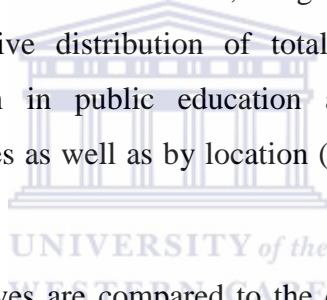
1. Ranking individuals according to welfare measures and into groups of equal sizes. This enabled the definition of the population into quintiles. Further disaggregation into states, location, and gender groupings were done along with the consumption based groupings²⁴.
2. Identifying the households that received (benefited from) public services (education/health). This was done using the 2010 Nigerian Living Standard Survey (NLSS). Also, other service data from schools for education and number of visits to hospitals were used.
3. For primary schools, the respective States Universal Basic Education Board (SUBEB) provided the data; for secondary schools, such information was provided by the Post-Primary School Management Board (PPSMB); For tertiary data, NCCoE, National Board for Technical Education (NBTE) and National Universities Commission (NUC) provided the required information.
4. Primary healthcare information was sourced from the South-East States' Primary Health Care Development Agency (PHDA); Secondary healthcare data from Hospital Management Board (HMB) of the respective states and the ministry of health for tertiary healthcare. These sets of data are collated by the NBS. Potential biases in household data that occur due to survey design, questionnaire structure and sample limit were taken cognizance of and we matched the data sets based on our knowledge of the institutions.

5. Using the 2010 NLSS household data, we ranked individuals by household consumption per capita, and we placed a premium on the benefits obtained.
6. Using Amakom (2012) methodology, we obtained firstly, the average cost of providing service by dividing government expenditure on the service by the total number of users of the service; and secondly defined the average benefit from government expenditure on a service as the average cost of providing the service.
7. A Two Stage Least Square Method was finally used to generate the Distributional spread of Benefits across the Quintiles.

Objective 3: Determine the Progressivity of Benefits from Social Expenditure in Nigeria using 2004 and 2010 survey Data

4.3 Progressivity of Benefits of Social Expenditure in Nigeria using 2004/2010 Survey Data

Using the unit cost, derived from the BIA, we graphed, (1) concentration curves that show the cumulative distribution of total consumption plotted against cumulative participation in public education and (2) health care services nationally across quintiles as well as by location (rural and urban) and by gender (male and female).



These concentration curves are compared to the cumulative distribution of total consumption (Lorenz curve) as well as the 45 degrees line (the line of equality). The Lorenz curve at p for a population subgroup k is given by:

$$L(k; p) = \frac{\sum_{i=1}^n SW_i^k y_i I(y_i \leq Q(k; p))}{\sum_{i=1}^n SW_i^k y_i}$$

where $I(y_i \leq Q(k; p)) = 1$ if $y_i \leq Q(k; p)$ and 0 otherwise and $Q(k; p)$ is the p-quantile of the subgroup k.

Also the concentration curve for the variable T ordered in terms of y at percentile p and for a population subgroup k is:

$$C_T(k; p) = \frac{\sum_{i=1}^n SW_i^k T_i I(y_i \leq Q(k; p))}{\sum_{i=1}^n SW_i^k T_i}$$

where $I(y_i \leq Q(k; p)) = 1$ if $y_i \leq Q(k; p)$ and 0 otherwise and $Q(k; p)$ is the p-quantile of y for the subgroup k.

4.3.1 Dominance Test

The dominance test was based on ranking the progressivity of benefits of categories of social spending for education and healthcare service across the primary, secondary and tertiary levels. The tests evaluated the distribution of expenditure against two benchmarks:

- i. Whether they are absolutely progressive (i.e. Inequality reducing relative to welfare benchmark which is the 45⁰ line); and
- ii. If they are per capita progressive, meaning that households at the lower (upper) end of the income distribution receive at least an equal level of benefit as upper (lower) income households.

These tests were necessary because concentration curves are estimated from the survey data and are therefore subject to sampling variability hence the need for statistical comparisons. Dominance tests in this study followed the above as applied by Sahn and Younger (1999, 2000) and O'Donnell *et al* (2007) but in addition to accounting for the possible dependence between concentration curves, we employed the covariance matrix for the ordinates estimates which was also used by Sahn and Younger (1999). This was to avoid the fact that statistical tests using only t-tests for the difference between the ordinates of two concentration curves at several abscissa (usually 0.1 to 0.9) lead to the rejection of the null hypothesis of non-dominance when one of the ordinates differs statistically in the direction of dominance as long as none of the other pairs indicates a statistically significant result in the opposite direction.

4.3.2 Testing for Differences in Concentration Curves

Apart from applying the above traditional benefit incidence analysis in determining the distribution of public spending, the study compared the distribution of benefits as used by Sahn & Younger (2000). Their analysis used a binary indicator in testing for welfare dominance. That is, by comparing concentration curves for different public services. In this study, we graphed the cumulative share of the sample, from the poorest to richest, on the horizontal axis, against the cumulative share of benefits from a given service on the vertical axis. Therefore, if any, benefits are concentrated among the vulnerable group, it will have higher or convex concentration curves, and vice versa. Sahn & Younger (2000) also compared each concentration curves with two benchmarks:

- (a) The Lorenz curve for per capita expenditures and
- (b) The degree line.

Our study followed this approach; in applying this method, we conclude that education or health spending is pro-poor, if it has to benefit households in Quintile 1 and 2 (Severly Poor and Poor) more than households in Quintile 4 and 5 (Rich and Very rich) relative to their spending per capita and regressive if it does not.

Objective 4: Determine the Structural (Socioeconomic) Factors influencing Poverty in the South Eastern States

4.4 Determinants of Poverty in (South-East Nigeria)

The Ordered Logit Model (OLM) technique was used in analyzing the varying dimensions of poverty and inequality for ease of explaining the multi-dimensional nature of poverty. This method is also known as the proportional odds model, but basically, it is an extension of the basic logistic regression that applies to dependent variables when they are dichotomous in nature. In the present case, we have five responses for the dependent variable.

In this model, the odds-ratio of the event is not independent of a category **J**, rather the covariate effects on the log-odds (hence odds-ratios) are the same irrespective of the value of J. This condition is very clear when one examines the actual mathematical (algebraic) derivation of the ordinal logistic model. The coefficient is directly linked to the comparison between Category **J** and the rest other Category/Categories, and so the odds-ratio cannot be independent of the category. Nonetheless, the model is also known as the the proportional-odds model. The ratio is constant for all categories.

The Model has the form:

$$\begin{aligned} \text{logit}(p_1) &\equiv \log \frac{p_1}{1 - p_1} = \alpha_1 + \beta'x \\ \text{logit}(p_1 + p_2) &\equiv \log \frac{p_1 + p_2}{1 - p_1 - p_2} = \alpha_2 + \beta'x \\ &\vdots \\ \text{logit}(p_1 + p_2 + \dots + p_k) &\equiv \log \frac{p_1 + p_2 + \dots + p_k}{1 - p_1 - p_2 - \dots - p_k} = \alpha_k + \beta'x \\ \text{and } p_1 + p_2 + \dots + p_{k+1} &= 1 \end{aligned}$$

The dependent variable in our analysis is the Per-Capita Consumption of households. This is derived by dividing the welfare values by the Household Size values and categorized into five (5), namely. The quintiles are:

- 1 = Severely Poor
- 2 = Poor
- 3 = Moderate
- 4 = Rich

5 = Very Rich

The, OLR model cumulative probability simultaneously estimates multiple equations. The number of equations it estimates will be the number of categories in the dependent variable minus one. So, in this case, four equations were estimated. The equations are:

Equation	Pooled Categories	Compared to	Pooled Categories
Equation 1:	1		2, 3, 4, 5
Equation 2:	1, 2		3, 4, 5
Equation 3:	1, 2, 3		4, 5
Equation 4:	1, 2, 3, 4		5

The Ordered Logistic Regression (OLR) is one of the most commonly used tools for applied statistics and discrete data analysis and there are basically three reasons for using the technique:

1. It helps in the categorization of variables and avoids inefficiency loss in the model;
2. It guards against the tendency of estimating many more parameters than is necessary; and
3. It reduces the risk of getting insignificant results because of the categorization.

Based on the above theoretical arguments, the equation estimated is:

$$\text{Welfare (Quintile)} = f(\text{AHH, SHH, HHS, HO, EduHH, HS, HFv, HosD})$$

Where:

Welfare - Quintile (Y) = Household Expenditure/Household Size

EduHH = Household Head Education

AgeHH = Household Head Age

SHH = Household Head Sex

HS = Health Status

HHS = Household Size

HO = Home Ownership

HFv = Health Facility visited when Sick by Household

HosD = Health Facility Distance

The below representations is known as the Mathematical Expression of Ordinal/Ordered Logistic Regression Model:

$$\frac{pr(y_i > j)}{pr(y_i \leq j)} = \exp[-\mu_j + \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \dots, \beta_8x_8]$$

$$\frac{pr(welfare > j)}{pr(welfare \leq j)} = \exp[-\mu_j + \beta_0 + \beta_1AHH + \beta_2SHH + \beta_3HHS + \beta_4HO + \beta_5EduHH + \beta_6HS + \beta_7HFv + \beta_8HosD]$$

Where y_i = bottom 20% =0, bottom 40%=1, top 60%=2, top 80%=3, top 100%=4; J= 5

4.4.1 Assumptions of Ordered Logistic Regression

A basic assumption of this method is relationships between each pair of outcomes are the same. This method presupposes that coefficients' describing variables are the same whether they are of lower or higher categories. This is known as the proportional odds assumption (parallel regression assumption). Thus, there is only one set of coefficients' because the relationship between all pairs of groups is the same; therefore, there is only one model for evaluation.

4.4.2 Tests of Parameters.

1. We used a likelihood ratio chi-square for this test. This value is usually derived by contrasting a model which has no independent variables with a model that does possess the characteristics. The observed probability of the results given the parameter estimates is known as the likelihood. It is normal to use -2 times the log of the likelihood. -2LL as a measure of how well the estimated model fits the likelihood. This is because the likelihood is a small number less than 1. A model is basically adjudged to be good if it results in a high likelihood of the observed estimates.
2. Diagnostics. This refers to the identification of areas or cases for which the model is not working well. We checked at several statistical techniques for looking at the results and residuals.

Chapter Five: Results and Data Analysis

5.0 Analytical Framework

Our framework enabled us to collect, sort, prioritize and interpret a variety of existing data and information about the subject and context. It allowed us a systematic evaluation of the data and thus enabled us to identify the main data needed to come to our conclusions. Quantitative and qualitative techniques were used to analyze data; firstly, deriving quantitative results, and then triangulating those results with qualitative analysis. We analyzed data both statistically and textually to understand the nexus between socioeconomic variables. Analysis of data was conducted in E-Views; SPSS; DAD and STATA software with extension to multi-level applications.

5.1 Error Correction Model

a. Unit Root Analysis

There are various statistical tests for determining integration of variables, such as the Phillips-Perron (PP) and the Sargan-Bargawa Durbin-Watson Statistic (SBAW). For our analysis, we chose the Augmented Dickey-Fuller (ADF) test. The ADF Test results, confirm if the variables are integrated of order one or order zero. Evidence of non-stationary series required differencing of some variables to attain stationarity. This is to avoid the problem of spurious correlation, or inconsistent regression that plagues econometric estimation when some or all of the individual series are non-stationary.

Summary ADF test results are shown below. (See appendices for detailed results)

Table 5.1.1: Unit Root Tests of Variables

Variables	ADF Statistic Test	1%	5%	10%	I(0)	I(1)
Education Expenditure	1.399280	- 3.670170	- 2.963972	- 2.621007	---	√
Admin Expenditure	7.831503	- 3.670170	- 2.963972	- 2.621007	√	---
Economic Services Expenditure	1.354914	- 3.670170	- 2.963972	- 2.621007	---	√
Social/Community Service Expenditure	4.294987	- 3.670170	- 2.963972	- 2.621007	√	---
Health Expenditure	0.563894	- 3.670170	- 2.963972	- 2.621007	---	√
Pop < 5	-2.720535	- 3.670170	- 2.963972	- 2.621007	---	√
Pop 6-11	-3.006983	- 3.670170	- 2.963972	- 2.621007	---	√
Pop 12-17	-2.143811	- 3.670170	- 2.963972	- 2.621007	---	√
Pop 18-24	-5.237331	- 3.670170	- 2.963972	- 2.621007	√	---
Pop 25-34	0.302025	- 3.670170	- 2.963972	- 2.621007	---	√
Pop 35-44	1.376656	- 3.670170	- 2.963972	- 2.621007	---	√
Pop 45-54	1.272002	- 3.670170	- 2.963972	- 2.621007	---	√
Pop 55-64	3.441540	- 3.670170	- 2.963972	- 2.621007	√	---
Pop 65-74	-0.893766	- 3.670170	- 2.963972	- 2.621007	---	√

ADF Statistic Test ---- Augmented Dickey-Fuller Test Statistic

I(0) ---- Variables Stationary at Level Form

I(1)---- Variables Stationary at First Difference Level

Given the above results, the choice of the selected variables for the error correction model was informed by two factors: statistical and policy reasons.

1. The variables that, were I (0) were dropped from the model because they were not consistent with the Augmented Engel Granger Cointegration Framework that requires that all variables should be I (1) to estimate an Error Correction Model.

2. Furthermore, since we are interested in public sector spending and its sensitivity to population dynamics, using the I (1) variables reflects the dynamics associated with the variables.

b. Co integration Analysis

This is the phenomenon that each component $X_{i,t}$, $i=1, \dots, k$, of a vector time series X_t is a unit root process, possibly with drift, but certain linear combinations of the $X_{i,t}$'s are stationary. The existence of a linear combination between the endogenous variables suggests a long-run relationship. This is consistent with the Granger Representation Theorem for Cointegration, which is useful for estimating an error correction model, with short and long – run equilibrium dynamics. In an Augmented Engle Granger framework, OLS was estimated first, from a set of my (I) variables shown above, and the residual obtained. The residual was then tested for stationarity using the ADF. It was found to have a cointegrating relationship since it was stationary at level form. Summary results are shown below. (See Appendices for Details)

Table 5.1.2: Cointegration Tests on the Residuals

Variables	ADF Statistic Test	Probability	1%	5%	10%	I(0)
RESEDU	-5.124437	0.0002	-3.670170	-2.963972	-2.621007	√
RESECON	-3.948105	0.0051	-3.670170	-2.963972	-2.621007	√
RESHLTH	-6.575584	0.0000	-3.670170	-2.963972	-2.621007	√

Null Hypothesis: Residuals have a unit root
 Lag Length: 0 (Automatic based on SIC, MAXLAG=0)
 Method: Least Squares
 Sample (adjusted): 1981 2010
 Included observations: 30 after endpoints
 Where:
 RESEDU – Residual of Education Spending and Population Dynamics
 RESECON - Residual of Economic Services and Population Dynamics
 RESHLTH - Residual of Health Spending and Population Dynamics
 ADF Statistic Test ---- Augmented Dickey-Fuller Test Statistic

c. Error Correction Model

To estimate the interaction between public expenditure (education, economic services and health) and population dynamics, two models were adopted: Augmented Engle Granger (AEG) and Error Correction Model. The residual obtained in the cointegration model was included in the ECM, where all non-stationary variables were transformed to I (1) by differencing. The result shows the short run relationship between population dynamics and public spending, the speed of adjustment and the long run cointegrating relationship.

This section examines the interaction between public sector spending on education, economic services and health on population dynamics. As an instrument of the government long term plan, annual budgets are expected to have significant impact on the changing structure of the national population. The interaction, however, would be premised on the sensitivity of government spending to population dynamics. To achieve parsimony and robustness, diagnostic checks such as autocorrelation, heteroskedasticity, Swartz-criterion, Hanna-Quinn tests, normality and re-specification tests were checked after the estimations. Adjusted R^2 , F-tests, and T-tests statistics served as evaluation benchmark. Sensitivity to parameterization was also checked for model congruency.

5.1.1 Sensitivity of Education Expenditure to Population Dynamics

Qualitative and basic education are a basic human right that must be provided by any authority. This is the basis of any education agenda. This concept promotes possibilities and improves knowledge and basic skill set that increases opportunities. In-addtion, fast-tracking MDG education goal targets will lead directly to the achievement of many of the other MDGs.

Table 5.1.3: Error Correction Model – Education Sector Spending and Population Dynamics

Dependent Variable: D(EDUC)

Method: Least Squares

Date: 01/23/14 Time: 12:48

Sample(adjusted): 1981 2010

Included observations: 30 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10236.15	4251.962	2.407395	0.0253
D(POP5)	0.015730	0.054580	0.288208	0.7760
D(POP6T11)	-0.103602	0.038135	-2.716676	0.0129
D(POP12T17)	-0.009981	0.012062	-0.827520	0.4172
D(POP25T34)	0.077668	0.198119	0.392026	0.6990
D(POP35T44)	0.370579	0.132179	2.803607	0.0106
D(POP45T54)	-0.325947	0.449299	-0.725455	0.4762
D(POP65T74)	-0.880141	0.246164	-3.575430	0.0018
RESEDU(-1)	-1.388002	0.237918	-5.833943	0.0000
R-squared	0.748610	Mean dependent var	8507.103	
Adjusted R-squared	0.652843	S.D. dependent var	23269.72	
S.E. of regression	13710.53	Akaike info criterion	22.13304	
Sum squared resid	3.95E+09	Schwarz criterion	22.55340	
Log likelihood	-322.9956	F-statistic	7.816961	
Durbin-Watson stat	1.886761	Prob(F-statistic)	0.000075	

The above model results showed robustness and indicated a good fit. Durbin-Watson value of 1.886 showed evidence of no *First Autocorrelation* amongst the variables. The F statistic and probability indicated a good fit at the 1 % significance level. Also, the adjusted R squared value of 0.652 further indicates the predictability of the dependent variable by the independent variables.

The changing age structure of the country's population in the short run vis-à-vis public spending would yield, significant long term benefits as the long run error correction component is a priori significant. The speed of adjustment coefficient of -1.38 also show that the annual rate of adjustment required in education spending to bring about equilibrium in education spending in response to population dynamics. It implies that education spending should be increased by 1.38 units annually for every 1 unit of change in population. This would boost the equilibrium in the relationship between public spending on education and population dynamics. At the moment, this is not the case for Nigeria because resource allocations are not determined by changes in demographic characteristics.

Results indicate that as the Pop 5 and below increases, expenditure in this category increases but not significantly. This is an indication of the government's poor commitment to crèche and nursery education. This category of expenditure have been monopolized by the private sector. Increasing commitment through budgetary allocation to the ministry of education and creating an enabling environment for the private sector to engage in educational investment for populations less than 5 years of age, would support the governments compulsory universal basic education programme. The high significant negative relationship between age group (6-11; 12-17) and government education consumption expenditure is very worrisome and portends danger for primary and secondary education in Nigeria. Results show that changes in these age groups are not taking into consideration when resources are allocated to the sector. This is, a further misalignment of expenditure that would ultimately, lead to negative out-turns.

Results also show that as the population (Pop 65-74) increases, their share of education spending decreases. Since people between these ages are dependents or retirees, not investing in them will increase the country's illiteracy rate, which would constitute a major problem for human capital development and reduce the country's HDI rating. This trend portends danger for MDG target for universal primary education.

Population group 25-34 (Youth Age) showed a positive relationship with expenditure, but the improbability is very high. This again, suggests that understanding the structural dynamics of the sector would be the first step before allocation of resources. The implication of the above is the increasing unemployment in the country by this category as a result of lack of capacity development. This has exacerbated the social tension in the polity. Nonetheless, while expenditure on education for those within that age range is expected to increase with the changing structure of the population dynamics, the increase has not been significant. This would decrease the country's HDI rating and more importantly, create a bulging youth population problem in the country that can exacerbate poverty levels.

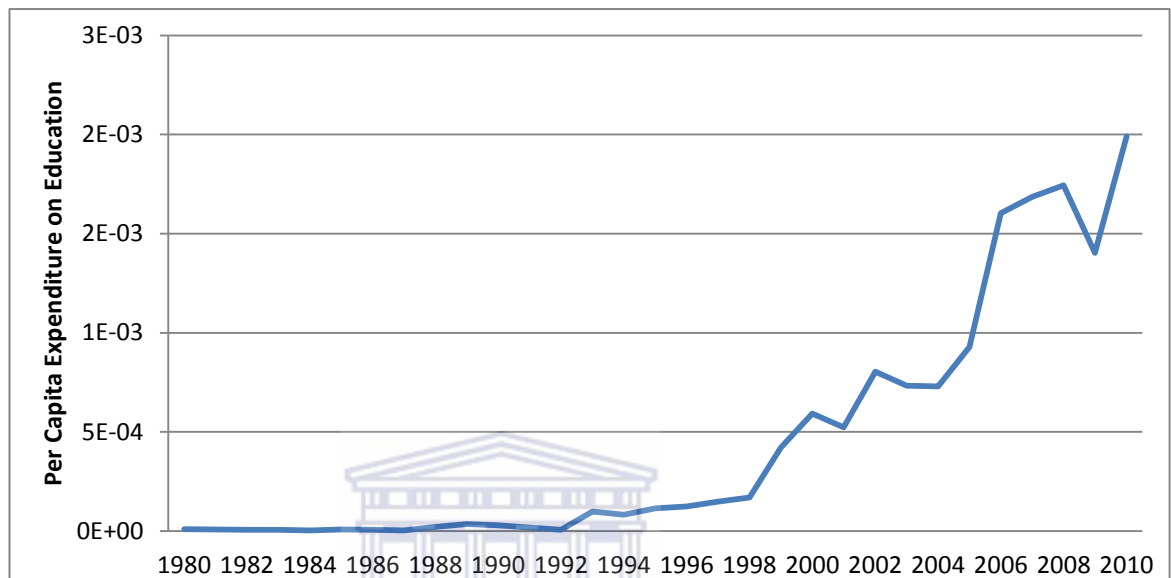
The Population between 35 – 44 years, however, showed a positive significant relationship with public spending on education. Thus, as their population increases, spending on their capacity development increased as well. This situation shows a misallocation of funds to the wrong age group, which indicates a wrong benefit incidence amongst the population. In addition, those within this age group are actively employed and usually within the postgraduate age in Nigeria. Therefore, spending on this category is not in alignment with MDG targets of universal primary education.

Target 3 (MDG Goal 2: Achieving Universal Primary Education) and Target 4 (MDG Goal 3: Gender Equality and Empowerment of Women) seeks to ensure that children everywhere complete a full course of primary schooling and also, to eliminate or reduce the gender disparity at the primary and secondary education level. This same result is expected to be achieved at all levels of education in 2015. However, this has become very doubtful given the negative relationship between primary school age population and expenditure on education. The non-significant value of expenditure for population 5 and below is a pointer that an overhauling of priorities in education spending is imminent for Nigeria.

Target 16 (MDG Goal 8: A Global Partnership for Development) that seeks to productive and decent work for the increasing youth population is also in doubt also because of the observed insignificant relationship between population 25-34 with expenditure on education. The government of Nigeria requires a quantum investment in this regard to stem the budding negative consequences. Also, to support Target 11 (MDG Goal 7: Environmental Sustainability) that seeks to make significant improvements in the lives of not less than a 100 million slum dwellers by the year 2020, expenditure pattern of the adult population of 65-74 have to be reversed. Increasing expenditure for this group would strengthen their ability to attract more income and further strengthen Target 1 and 2 (MDG Goal 1: Eradication of Extreme Poverty and Hunger), which is focused on reducing the number of poor people.

Figure 5.0.1 below shows the per capita public spending on education within the study period (1980 – 2010). To derive this, total public spending on education was divided by the total population within the period.

Figure 5.0.1: Per Capita Spending on Education



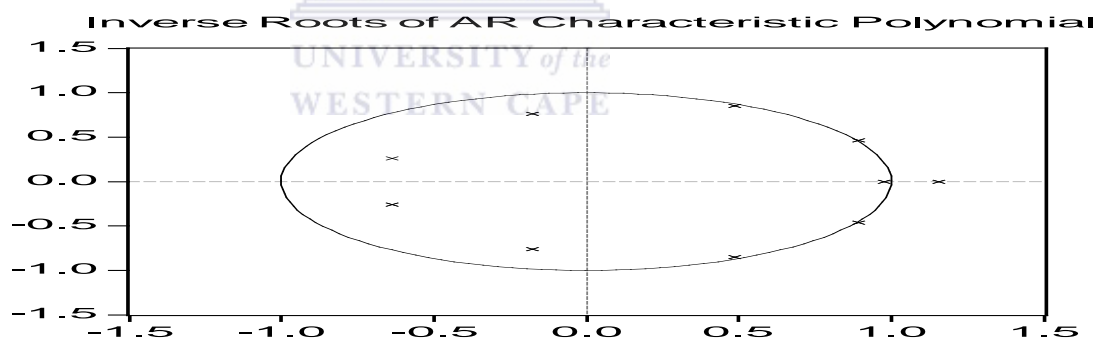
Source: BOF and MoE Reports of various Years

Generally, attention has not been given to demographic changes and its effects on public sector spending on education in Nigeria. Education expenditure became sensitive to population dynamics as strikes in the country’s educational system began to gain prominence. From 1993 to 1997 marked a different period on the trend of per capita educational expenditure as the government’s spending on education increased slightly with respect to population changes. With the preparation to hand over to the civilian administration in 1999, per capita spending on education increased between 1997 and 2006 period. Nonetheless, the financial meltdown globally between 2007 and 2008 period, in addition to the flood impacts, desertification and security crisis in the rural areas, per capita public spending on education declined in 2009 but quickly picked again in 2010. The trend of per capita spending is likely to continue if urgent strategies are not in place. To achieve the MDG 2015 target, quality of education needs urgent attention.

Educational spending in Nigeria is slow to adapt cyclical fluctuations in age dynamics as has been observed. Our findings are consistent with international evidence that shows, educational spending exhibiting an inelastic response to population dynamics (see Ueli G and Stefan W; 2005). The findings show on the average, a mixed response as school-age is on the increase and the highly negative relationship of the elderly population with education spending. However, the observed inelasticity in our results suggests, a possibility of re-channeling the resources freed up by a particular age group for consumption by another.

The VAR model derived from the ECM on the other hand, is estimated to provide the interaction of public expenditure and population dynamics. The Model provided the inverse Roots stability test which shows the impact of population dynamics on the public spending. The disequilibrium in the relationship is shown by the Inverse Roots VAR tests for instability below.

Figure 5.0.2: Vector Autoregressive Model – Education Sector and Population Dynamics



Source: Derived from the Estimated VAR Model

The above diagram shows a plot lying outside the inverse root plot, while most plots are within the circle. This implies that the relationship between public spending on education and population dynamics for the period studied is not a completely fitted model, but passed the minimum requirement. Nonetheless, this requires fiscal actions to bring about equilibrium in the system. The VAR model yielding the Inverse Root result had an adjusted R-square of 76.39 percent and recorded the smallest Akaike Info Criteria and Schwarz selection criteria.

5.1.2 Sensitivity of Economic Services Expenditure to Population Dynamics

With an increasing population trend in the country, creating an enabling macroeconomic environment is important for job creation and infrastructural development. Public spending, however, is expected to spur economic activities by addressing infrastructural gaps across various sectors of the economy. We examined the sensitivity of economic services spending to demographic changes in Nigeria. The estimated ECM result is presented below.

Table 5.1.4: Error Correction Model – Economic Services and Population Dynamics

Dependent Variable: D(EXECON)

Method: Least Squares

Date: 01/23/14 Time: 12:54

Sample(adjusted): 1981 2010

Included observations: 30 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-26145.77	26245.06	-0.996217	0.3305
D(POP5)	0.346210	0.252398	1.371683	0.1846
D(POP6T11)	-0.172755	0.203550	-0.848710	0.4056
D(POP12T17)	-0.080165	0.061203	-1.309810	0.2044
D(POP25T34)	-0.917144	0.951189	-0.964208	0.3459
D(POP35T44)	0.264149	0.693832	0.380710	0.7072
D(POP45T54)	1.595785	2.169844	0.735438	0.4702
D(POP65T74)	-0.107615	1.321568	-0.081430	0.9359
RESECON(-1)	-0.514267	0.264400	-1.945035	0.0653
R-squared	0.645492	Mean dependent var		33779.35
Adjusted R-squared	0.510441	S.D. dependent var		105733.7
S.E. of regression	73980.31	Akaike info criterion		25.50431
Sum squared resid	1.15E+11	Schwarz criterion		25.92467
Log likelihood	-373.5647	F-statistic		4.779619
Durbin-Watson stat	2.132337	Prob(F-statistic)		0.001878

Table 5.14 above shows a positive relationship between population less than 5 years of age (coefficient – 0.346) and public spending on economic services. This result was however not statistically significant, but the findings (statistical insignificance) was rather consistent for the population within the age of 35 – 44 and 45 – 54 years of age.

The population below the age of 5 requires sustained increase in public spending on economic services that would galvanize their inert potentials and benefit the society in the long-run. While this has the a-priori expected sign, it is not statistically significant. Economic services that can benefit the population within

this age should aim at achieving lower prices for food and nutrition, reduced cost of health care services and improved government funding for day care services. Designing policy frameworks to stimulate a healthy relationship between public spending on economic services and Age Group less than 5 years of age would support positive, Target 2 (MDG 1: Eradicating Extreme Poverty and Hunger) and Target 5 (MDG 4: Reduction of Child Mortality).

Furthermore, econometric results of the sensitivity of population within the ages of 35 – 54 to expenditure, also suggest that demographic changes in the population within this age group, leads to an increase in public spending on economic services but not significantly. It should be noted that this population are typically married and with children, but largely unemployed in present day Nigeria or when employed, usually over burdened with dependency. Thus increasing public spending targeted to this age group will have a positive spillover effect on extended family welfare. Public spending on this age group could also take the form of unemployment benefit, would help keep the crime rate lower and increase economic participation. This course of action would support Target 1 and 2 (MDG 1: Eradicating Extreme Poverty and Hunger). However, this seems doubtful because, the relationship in the model is not significant, indicating that the improbability of the variation in the dependent variable (Economic Services) is high.

The population groups with a negative relationship with public spending on economic services are: 6 - 11, 12 – 17, 25 – 34 and 65 – 74. The same results observed for health expenditure is also observed in the working class, age bracket (35-44) for economic services. The probability of any impact not occurring is very high. This supports the evidence that there are huge unemployable persons in the country. Results indicate that resource allocations for this category would not address the problem; rather the remote causes of unemployment must be tackled first. The statistical evidence above suggests that as the population within these age group increases, public spending on economic services decreases. This evidence lends credence to the behavioural pattern in both the southern and northern parts of Nigeria. In the northern part of Nigeria, those within age 6 – 17

are caught up in the Amajiri's²⁵ while their counterpart in the south is usually caught up as road hawkers of consumables or are already signed up to learn a trade to receive their freedom in five (5) to ten (10) years' time. This is usually due to the need to make children within this age to contribute to the well-being of the family due to harsh economic conditions. The negative relationship between the variables in question further indicates the impossibility of meeting Target 1 and 2 (MDG 1); Target 3 (MDG 2: Achieving Universal Primary Education) and Target 6 (MDG 5: Improvement in Maternal Health).

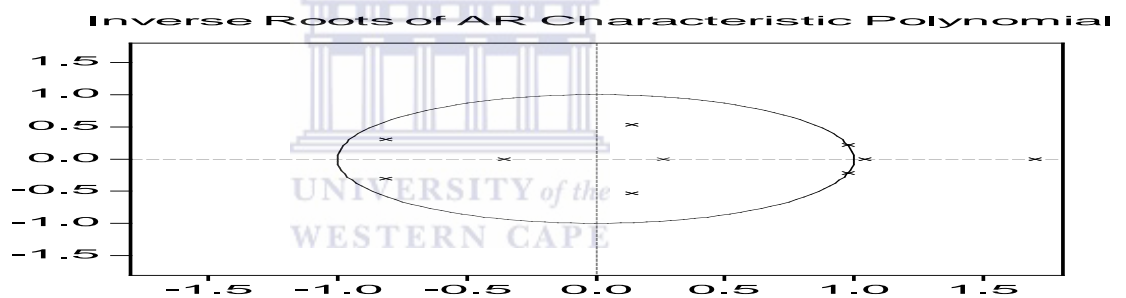
Also, changes in the population within age 25 – 34 shows a negative relationship with public spending on economic services. This implies that rising population of this group has been met with decreasing public spending. The inability of this group to find sustainable economic opportunities in the system is a derivative of the above facts. This scenario serves as a source of social tension, as unemployment could lead to aggravated crime rate. In a recognition of this fact, the government had in the past and in recent times introduced policies to deliberately create employment opportunities for the teeming youths through NAPEP²⁶ programme and YouWIN²⁷ programme, while the problem is not abating. Consequently, the possibility of Target 6 (MDG 5: Improvement in Maternal Health) is slim because the age group in question is within the child bearing stage. Howbeit, the estimated model indicates a not too significant relationship between the independent and dependent variables.

The long run relationship between population dynamics and public spending shows a statistically significant relationship. This implies that there is a long run relationship between population dynamics and public spending on economic services. Estimated speed of adjustment was, however, lower compared to that estimated for public spending on education. This shows that while public spending on economic services is important to support the rising youth population trend, direct government spending on economic services should be complemented by sustainable policies that seek to achieve macroeconomic stability. The overall estimates of the model are robust. The adjusted R-square is higher than 50

percent, implying that population dynamics explains over 51 percent variation in public spending in economic services. Nonetheless, the estimated model indicates that population dynamics do not have a significant impact on economic services expenditure, rather other factors other than population dynamics influence the former. Durbin Watson statistic is robust as it shows no evidence of first order autocorrelation. F-statistic, which is significant at 1 percent, also shows the robustness of the model.

Inverse Roots (Autoregressive Model) stability test below shows that the model is not unstable as more points lie within the circle (Figure 5.0.3 below). Also, the plots outside implies that public spending on economic services has not been consistent with population dynamics over the study period.

Figure 5.0.3 Vector Autoregressive Model – Economic Services and Population Dynamics



Source: Derived from the Estimated VAR Model

Notwithstanding the above results, the indirect impact of economic services on poverty alleviation, through sustained growth and productivity, has long been recognized. Therefore, deploying economical services to facilitate government administration and service delivery has the potential for improving efficiency and service delivery towards MDG targets in Nigeria, which would lead to enhancing and improving government responsiveness to citizens. This scenario is achievable through the reduction of operating inefficiencies and redundant spending, which will further support the transformation of the Nigerian government into a citizen-centered government and improve productivity for the government and its institutions. In general terms, the cumulative effects of all these on the different age groups on developmental process would be very significant.

5.1.3 Sensitivity of Health Expenditure to Population Dynamics

For a stable society, health education must become a major component of the educational curriculum. In order to achieve MDG health targets, the need for an improved balance between primary, secondary and tertiary health care expenditure cannot be overemphasized, as poor people derive more benefits from primary healthcare supply them from extended care services for hospitals. Also, understanding the sensitivity of age dynamics in this regard would be beneficial to the system. To further bridge the observed inequities, female education needs to be on the front burner of policy implementation to support better health outcomes for households.

Table 5.1.5: Error Correction Model – Health and Population Dynamics

Dependent Variable: D(HEALTH)

Method: Least Squares

Date: 01/23/14 Time: 12:58

Sample(adjusted): 1981 2010

Included observations: 30 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5141.510	3240.944	1.586424	0.1276
D(POP5)	0.130388	0.039670	3.286837	0.0035
D(POP6T11)	-0.021580	0.028845	-0.748125	0.4627
D(POP12T17)	-0.024472	0.008869	-2.759166	0.0118
D(POP25T34)	-0.512859	0.149074	-3.440299	0.0025
D(POP35T44)	-0.239544	0.101659	-2.356354	0.0282
D(POP45T54)	1.192868	0.338085	3.528307	0.0020
D(POP65T74)	0.105624	0.188681	0.559805	0.5815
RESHLTH(-1)	-1.511103	0.193848	-7.795312	0.0000
R-squared	0.773501	Mean dependent var	5614.298	
Adjusted R-squared	0.687215	S.D. dependent var	18889.37	
S.E. of regression	10564.29	Akaike info criterion	21.61167	
Sum squared resid	2.34E+09	Schwarz criterion	22.03203	
Log likelihood	-315.1751	F-statistic	8.964446	
Durbin-Watson stat	1.956674	Prob(F-statistic)	0.000027	

The model above showed robustness and indicated a good fit. Durbin-Watson value of 1.956 showed evidence of no First Autocorrelation amongst the variables. Also, the F statistic and probability indicated a good fit at the 1 percent significance level. Furthermore, the adjusted R squared value of 0.773501 indicates a good fit between the behavioral information and independent variables.

Public spending in the health sector, which takes into cognizance the changing age structure of the country's population in the short run would, however, yield significant long term benefits. The speed of adjustment coefficient of -1.511 shows the annual rate of adjustment required in health spending to bring about equilibrium in health spending and population dynamics. The above results implies that health spending should be increased by 1.511 units annually for every 1 unit of change in population to support the dynamics of demographic changes.

Population between the age below 5, 12 – 17 years, 25 – 34 years and 45-54 years had coefficients 0.130, -0.024, -0.512 and 1.192 respectively. These values showed a significant relationship with spending on the health sector. Results indicate that as the Pop 5 and below increases, expenditure in this category increases but not too significantly. This scenario suggests an indication of some sort of commitment to child health care programmes²⁸. This would support positive, non-governmental sector to engage with the sector for populations less than 5 years of age, would support the governments compulsory primary health programme.

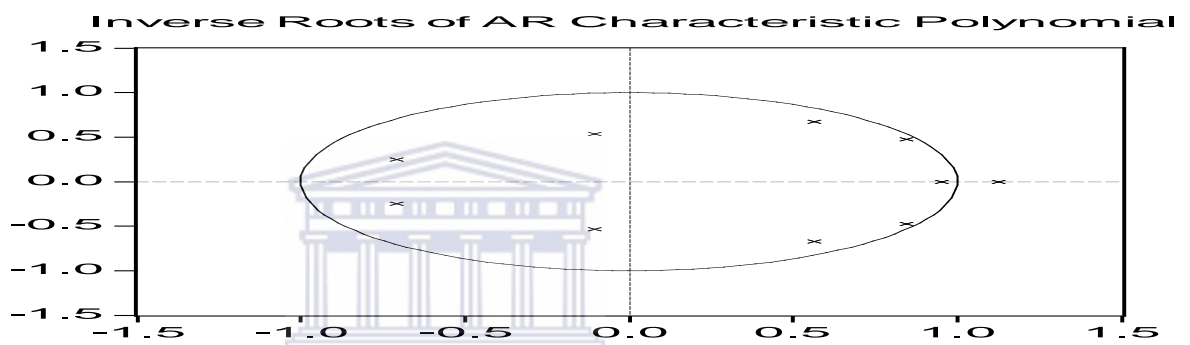
The following population groups show a negative relationship with public spending on health services: 6 - 11, 12 – 17, 25 – 34 and 35 – 44. The statistical results suggest that as the population within these age group increases, public spending on health services decreases. This negative relationship between the variables, further indicates the impossibility of meeting MDG Goals 4, 5 and 6 focused on Child Mortality, Maternal health and Combating Diseases respectively.

In-addition, the population within age 45–64 and 65-74 shows a positive relationship with public spending on health spending. This implies that rising population within this group has been met with increasing public spending. However, the model showed a high probability that there would not be, any impact of expenditure on those in the age bracket (65-74). This would obviously put enormous pressure to the working class, thereby worsening welfare conditions

generally. The elderly and aged should normally get support from the government on health and economic related issues for a sustainable development path.

Results show a structural defect in the system that needs to be addressed for MDG targets to be achievable and sustainable. The child age bearing group (12-117/25-34) and active working age group (35-44) has a negative relationship with health sector spending. This pattern negates the principle of Maternal Mortality Ratio Target of MDG Goal Five (5).

Figure 5.0.4 Vector Autoregressive Model – Health Sector and Population Dynamics



Source: Derived from the Estimated VAR Model

Inverse Roots (Autoregressive Model) stability test shows that the model passed the minimum requirement because most of the plots lie within the circle.

Health spending in Nigeria as a proportion of total federal government spending has been fluctuating from 2.7 percent to 6.2 percent between 1999 and 2012, which is lower than 2012 allocations in Ghana (57.1 percent), Gabon (51.2 percent), Cameroon (33.5 percent) and Niger (39.7 percent) respectively (WHO National Health Account Database). These countries are smaller than Nigeria in terms of population and they spend higher relatively on total public spending on health than Nigeria (Abiola, 2011). Our analysis are in tandem with FMOH (2005) position that annual budgetary allocations to the health sector are misaligned because of poor framework, bureaucracies and other institutional factors, which frequently results to a haphazard implementation. The insignificant health spending could also explain why Nigeria ranks 187 among the 191 signatory member states by the World Health Organization (WHO) in 2000

(National Health Policy, 2004) and 142 out of 169 countries with 48.4 years in life expectancy at birth in 2009 (HDI UNDP Report, 2010). The infant mortality rate (91 per 1000 live births) is among the highest in the world (Obansa and Orimisan, 2013). These scenarios raise concern on the attainment of MDG targets' by 2015.

Generally, well being (health) involves many dimensions both for the individual and society in general. For health benefits to reach all, expenditure on the sector should be targeted and specific to the social and cultural dynamics of each age cohort. The health system needs to be integrated into the overall development strategy of the government and would further address existing inequities in the system. Thus, health care service could be readily available with benefits accruing to those who need it.. Emphasis should be placed on improving social conditions of women and children and in addition developing social safety nets. In-addition, restructuring the vertical and horizontal imbalance in the distribution of resources would support attainment of MGD goals on Health. Furthermore, measuring MDG health goals and understanding health problems would benefit the poor and disadvantaged.

5.2 Benefit Incidence

The calculated marginal odds have not been valued benefits in either in implicit or explicit monetary terms, but rather our approach identifies the distribution of beneficiaries across the per capita expenditure distribution. The tables below show the estimated marginal odds of participating in health and education programmes.

5.2.1 Beneficiaries' of Health Expenditure for Quintiles (SE States)

Table: 5.2.11 Primary Health Care (Benefit Spread using 2010 HNLSS)

States	Abia	Anambra	Ebonyi	Enugu	Imo
Quintile 1	0.964	1.385	1.113	1.453	0.988
T - Stat	2.515	2.335	2.449	2.262	1.558
Quintile 2	0.997	1.520	1.063	1.480	1.088
T - Stat	1.644	2.521	2.277	1.734	1.785
Quintile 3	1.112	1.393	1.067	1.327	1.063
T - Stat	2.559	3.060	2.446	1.555	2.466
Quintile 4	1.014	0.514	0.957	0.449	1.039
Std error	0.564	0.289	0.564	0.206	0.564
T - Stat	1.875	1.768	1.788	2.150	1.908
Quintile 5	0.923	0.200	0.822	0.300	0.837
T - Stat	6.619	1.997	5.992	3.908	8.282
Total	5.010	5.012	5.021	5.008	5.015

Source: Author's Computations

N/b:

1. Tables 5.2.11 – 5.2.13 gives the instrumental variables estimate of the regression coefficient of the quintile specific service rates on the average rate for the South-East Region, based on the 2010 HNLSS.
2. The leave-out mean region service rate is the instrument for the actual mean.
3. The numbers in parentheses are the standard errors and t-ratios.

Table 5.2.11 above gives the estimated benefits and marginal odds of using public primary health services obtained by regressing participation rates of each quintile across average participation rate. The estimated numbers in the table can be interpreted as the gain in subsidy incidence per capita for each quintile from a one Naira increase in aggregate spending on primary health care.

A cursory look at the above table indicates a pro-poor target for only three states (Anambra, Ebonyi and Enugu) out of five SE States regarding primary health care. Quintiles (1, 2 and 3) for the states showed that more benefits from the allocations were received by the vulnerable group. They received a benefit of more than N1 expenditure from government. This is in-tune with MDG Goal 4: Reducing Child Mortality and MDG Goal 5: Improving Maternal Health. However, this supposed improvement would not show an improved average because the other states are still far off from the expected mark. The other three states to a great extent subsidized the rich in the society, which obviously would lead to further poverty and weakness in the overall health structure. In- as much as Ebonyi State showed some targeting, resources devoted to the rich was on the high side. These resources could have been re-channeled towards the weak and vulnerable in the society. Out of a 100 percent scale, Anambra and Enugu states

subsidized Quintile 5 with 3.9 percent and 5.9 percent respectively, while Ebonyi, Imo and Abia states gave 16.4 percent, 16.7 percent and 18.4 percent respectively to the same group. The scenario suggests that the scourge of poverty at the minimum would still be felt by the people who do not have access to primary health care. Also, health data from developing countries invariably indicate higher-than-average instances of disease, premature mortality, maternal mortality, or HIV/AIDS infection rates. A preliminary conclusion would be that poverty is increasing the vulnerability of the poor to health-related problems in these countries, as well as exacerbate ill-health and whether poverty in itself is proving an impediment to the capacity of the poor to seek adequate health care when sick. A comparative study of Demographic and Health Surveys in over 25 countries suggests that the health status of children is closely linked to poverty, thus suggesting the need for a proper targeting of resources to the most vulnerable to abate this scenario.

On the other hand, a closer look at primary health care services data in Nigeria shows that those living in poverty do not enjoy the same levels of care and treatment as other people. Some may not be able to access any health care at all. Furthermore, poor people are less able to enjoy protection against ill-health that is easily accessible for others elsewhere and most children in poor households may not be immunized against preventable diseases.

From the foregoing, a maximum impact in targeting poverty in Nigeria would be achieved if all the states focus resources exclusively on the households within Quintiles 1 and 2 across the country. This would support poverty reduction via productivity increase of able-bodied men and women.

Table 5.2.12: Secondary Health Care (Benefit Spread using 2010 HNLSS)

States	Abia	Anambra	Ebonyi	Enugu	Imo
Quintile 1	1.015	1.068	0.964	1.074	0.995
T - Stat	3.747	3.156	2.246	3.622	3.889
Quintile 2	0.927	1.117	1.016	1.076	1.015
T - Stat	6.721	2.458	7.400	2.142	3.556
Quintile 3	1.115	0.979	1.015	1.065	1.023
T - Stat	4.832	2.152	2.720	2.663	5.956
Quintile 4	0.879	0.973	0.891	0.993	1.057
T - Stat	1.445	1.591	1.958	1.163	1.727
Quintile 5	1.066	0.863	1.117	0.793	0.913
T - Stat	3.887	3.519	2.847	2.649	3.483
Total	5.002	5.000	5.003	5.001	5.002

Source: Author's Computations

Table 5.2.12 above gives the estimated benefits and marginal odds of using public secondary health services obtained by regressing participation rates of each quintile across average participation rate. The estimated numbers in the table can be interpreted as the gain in subsidy incidence per capita for each quintile from a one Naira increase in aggregate spending on secondary health care.

Table 5.2.13: Tertiary Health Care (Benefit Spread using 2010 HNLSS)

States	Abia	Anambra	Ebonyi	Enugu	Imo
Quintile 1	0.633	0.700	0.670	0.760	0.803
T - Stat	2.246	2.934	1.705	2.450	3.177
Quintile 2	0.814	0.850	0.788	0.882	0.699
T - Stat	3.208	1.776	2.012	1.499	2.803
Quintile 3	1.082	0.974	1.019	1.070	0.975
T - Stat	4.525	2.167	2.456	2.886	3.850
Quintile 4	1.207	1.132	1.113	1.067	1.186
T - Stat	4.648	2.360	2.829	1.996	4.485
Quintile 5	1.264	1.344	1.411	1.223	1.338
T - Stat	4.613	3.926	3.258	4.165	3.615
Total	5.001	5.001	5.002	5.001	5.001

Source: Author's Computations

Table 5.2.13 above gives the estimated benefits and marginal odds of using public tertiary health services obtained by regressing participation rates of each quintile across average participation rate. The estimated numbers in the table can be interpreted as the gain in subsidy incidence per capita for each quintile from a one Naira increase in aggregate spending on tertiary health care.

5.2.2 Beneficiaries' of Education Expenditure for Quintiles (SE States)

Table 5.2.14: Primary Education (Benefit Spread using 2010 HNLSS)

States	Abia	Anambra	Ebonyi	Enugu	Imo
Quintile 1	1.094	1.554	1.200	1.463	1.234
T - Stat	2.349	3.140	3.045	5.694	2.085
Quintile 2	1.232	1.194	1.113	1.165	1.100
T - Stat	5.004	2.303	2.831	1.944	4.321
Quintile 3	1.116	0.877	1.194	0.979	1.082
T - Stat	4.577	0.823	2.194	2.510	7.804
Quintile 4	0.873	0.711	0.991	0.818	0.837
T - Stat	3.279	8.338	2.281	2.649	3.293
Quintile 5	0.691	0.668	0.507	0.580	0.750
T - Stat	3.108	0.846	1.029	1.487	4.321
Total	5.005	5.004	5.004	5.006	5.003

Source: Author's Computations

N/b:

1. Tables 5.2.14 – 5.2.16 gives the instrumental variables estimate of the regression coefficient of the quintile on the average rate for the South-East Region, based on the 2010 HNLSS.
2. The leave-out mean region enrolment rate is the instrument for the actual mean.
3. The numbers in parentheses are the standard errors and t-ratios.

Table 5.2.14 gives the estimated benefits and marginal odds of being enrolled in public primary schools, obtained by regressing participation rates of each quintile across average participation rate. The estimates in the table can be interpreted as the gain in subsidy incidence per capita for each quintile from a one Naira increase in aggregate spending on primary education.

Results in Table 5.2.14 show some sort of pro-poor targeting in Abia State as regards primary education. For every N1 spent by the government, the *very poor*; *poor* and *moderate* receives a more than N1 benefit, with the highest beneficiaries being Quintile 2. However, Quintiles 3 and 4 receives N0.8 and N0.69 which is less than a N1 benefit. Using 100 percent scaling, Quintiles, 1; 2; 3; 4; and 5 would receive 21.9 percent, 24.6 percent, 22.3 percent respectively from any expenditure subsidy from the government. The scenario in Abia presupposes that any further increase in expenditure for primary education would benefit the Poor more than the *very poor*. Results do not show how a re-alignment can be done to favour the Very Poor more. This would require a further analysis. For Anambra State, the results were progressive and seem to have a better targeting of resources to the primary education than all other states in the South East Region. Quintiles 1 and 2 receives a coefficient of 1.5 and 1.19 respectively which is more than a N1

benefit from a N1 expenditure, while Quintiles 3 (Moderate); 4 (Rich) and 5 (Very Rich) receives benefits of N0.87, N0.77 and N0.66 respectively from every expenditure of N1 to the sector. The Very Poor (Quintile 1) and Poor (Quintile 2) receives a 31 and 23.9 percents from any given subsidy to the sector from the government. This kind of targeting supports poverty and inequality reduction.

Ebonyi State followed similar trend with other states. For example, an extra N1 per capita spent on primary education will increase the public expenditure per capita going to the poorest quintile by N1.2. The marginal odds of participation estimates suggest that an expansion of primary schooling would be decidedly pro-poor and the moderate at the margin. The coefficients of benefits for Quintiles 1, 2, 3, 4 and 5 are 1.2; 1.113; 1.194; 0.991 and 0.507 respectively. However, results indicate that Quintile 3 receives more than Quintile 2 but not very significantly. This suggests that using primary education as a tool of poverty reduction would be effective in the state. Nonetheless, this would be more effective if the subsidy going to Quintiles 4 and 5 are reduced and more channelled to Quintiles 1 and 2. Enugu and Imo States showed similar trends for expenditure on primary education by the government. Quintile 1 and 2 benefited more according to Table 5.1.14. In Enugu and Imo, for every N1 expenditure, the very poor in Quintile 1 benefits N1.463 and N1.234 respectively. Although the coefficient for Quintile 1 is higher in Enugu state, both states showed a progressive pattern of targeting. Enugu (0.580) and Ebonyi (0.507) states had the lowest benefit shares for Quintile 5 categories suggesting that their policies excluded those in that group, which is evidently pro-poor targeting.

The marginal odds from our analysis suggest that increased subsidies to primary are captured by Quintiles 1 and 2. This result negates findings from Kamgnia et al., (2008) that only middle income groups benefit from public expenditure on the sector. On the other hand, our results are in agreement with Lanjouw and Ravallion (1999) findings that primary education expansion mostly benefits the poor. Thus, this is a good framework at fighting poverty and expanding inequality in Nigeria.

It is obvious that the poor benefit relatively more from public spending on primary education. Nonetheless, findings as shown in Table 5.14 could be influenced by the fact that total enrollment in public institutions is much higher for the poor in primary education because it is free, while it is higher for the non-poor in secondary and tertiary education. As a result of this, the number of children from poor households (Quintiles 1 and 2) in public primary schools is significantly higher than the number of children from better-off households (Quintiles 3, 4 and 5).

Table: 5.2.15 Secondary Education (Benefit Spread using 2010 HNLSS)

States	Abia	Anambra	Ebonyi	Enugu	Imo
Quintile 1	0.965	1.062	1.016	1.072	0.995
T - Stat	3.574	3.095	2.347	3.487	3.929
Quintile 2	0.971	1.027	1.027	1.080	1.052
T - Stat	4.038	2.610	1.887	2.839	2.199
Quintile 3	1.095	1.023	1.033	1.078	1.027
T - Stat	4.253	1.969	2.617	2.014	4.048
Quintile 4	1.054	1.030	1.102	1.056	1.021
T - Stat	2.262	2.080	2.805	4.252	1.728
Quintile 5	0.922	0.864	0.825	0.726	0.911
T - Stat	2.622	1.965	1.668	1.734	5.145
Total	5.007	5.006	5.002	5.009	5.006

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Table 5.2.15 gives the estimated benefits and marginal odds of being enrolled in public secondary schools, obtained by regressing participation rates of each quintile across average participation rate. The estimated numbers in the table can be interpreted as the gain in subsidy incidence per capita for each quintile from a one Naira increase in aggregate spending on secondary education.

There is not much observed difference between the benefits that accrue to Quintile 5 and Quintile 3, 2 and 1 for all the South-East States in Nigeria. Households in Quintile 3 (moderate) benefited about 1/5th of all subsidies across the five states. The middle group had a benefit of more than a N1 from every expended N1, unlike the case with primary education.

Our results are in conformity with Sakellariou and Patrinos, (2004) which posits that most studies find that public expenditures in education seem to favour the

poor when they are focused on primary education, middle income group when invested in secondary education and strongly pro-rich when directed towards tertiary education respectively. There is no gainsaying that basic education (primary and secondary) helps to reduce poverty by reducing fertility and improving health outcomes, increasing the productivity of the poor, and equipping poor households with the skill set to participate fully within the society. Several reforms at the secondary education level in Nigeria increased enrollments, but a number of problems, including lack of qualified teachers and teaching facilities compared to the number of students enrolled seem to reduce the effects of the reforms. The sector requires more funding and quality improvement. Nonetheless, econometric studies have further shown that the greatest social returns are at primary education level, but a number of other quantitative studies suggest that for some potential benefits of education to be realized, including reduced fertility and improved livelihoods, the effects of the primary education level are limited and it is only at the secondary education levels that the benefits are fully realized (Wedgewood, 2005). MDG 1; 4 and 5 could be achieved with focus on secondary education.

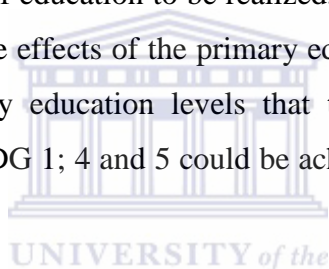


Table: 5.2.16a Tertiary Education (Benefit Spread using 2010 HNLSS)

States	Abia	Anambra	Ebonyi	Enugu	Imo
Quintile 1	0.776	0.827	0.678	0.672	0.725
T - Stat	3.071	2.238	1.760	1.939	2.730
Quintile 2	0.847	0.931	0.876	0.976	0.928
T - Stat	3.168	3.829	2.224	3.292	3.605
Quintile 3	0.909	0.952	1.016	0.962	0.887
T - Stat	4.033	1.206	2.760	2.462	5.107
Quintile 4	1.167	1.127	1.091	1.075	1.183
T - Stat	2.506	2.276	2.755	4.196	2.011
Quintile 5	1.299	1.167	1.339	1.316	1.277
T - Stat	5.209	2.967	2.457	3.430	2.667
Total	5.000	5.004	5.000	5.000	5.000

Table 5.2.16a gives the estimated benefits and marginal odds of being enrolled in public tertiary schools, obtained by regressing participation rates of each quintile across average participation rate. The estimated numbers in the table can be interpreted as the gain in subsidy incidence per capita for each quintile from a one Naira increase in aggregate spending on primary education.

Pro-poor growth requires the sectoral pattern of growth to be biased in favour of the poor, but estimates across the South East States show that four (4) out of the five (5) states, households in Quintile 5 (very rich) had the highest benefits from the 2010 survey. These states recorded an average of 1/4th of the subsidies going to the group with the highest welfare index. Interestingly, Enugu State showed a better progression and targeting of resources towards the very poor for this sector. However, the rich still had about 1/5th of resources. Estimates from Abia, Anambra, Ebonyi and Imo states showed that for every N1 expended, the very poor (Quintile1) had less than a N1 benefit. Despite the huge resources and subsidies directed towards this sector by the various governments of the South-East, the very poor and poor have not benefited, and as such this cannot be a good programme for poverty and inequality reduction. The status-quo rather fuels the widening inequality in the country.

Government expenditure and subsidies directed towards tertiary education are poorly targeted and the poorest income groups (Quintiles 1 and 2) receive less than the richest income groups (Quintiles 3; 4 and 5). This framework obviously favours households who are already better off. These results are in agreement with similar studies by Kamgnia, (2003); Kamgnia et al, (2008) and Tabi et al. (2009; 2011) in Cameroon.

From the foregoing, the poor received smaller subsidies than average per capita transfers from tertiary education spending in our analysis, thus suggesting that spending on tertiary education benefits the rich more than the poor in South-East Nigeria. The two lowest quintiles received lower per capita transfers than other quintiles. As could be expected, this does not hold for spending on primary education, from which the poor benefit more than the non-poor.

Tertiary education is an effective instrument of socioeconomic mobility of the poor segments in the society. This kind of education supports self-reliance in manpower needs of the economy on one hand and drives growth on the other. It is believed by many that this sector of education makes the basic difference between

the developed and the developing countries. The current scenario negates MDG1B: Achieving Full and Productive Employment. To have a productive employment, the poor needs advanced education to build their skill set in-order to participate fully in the economy. This would not be plausible because the available resources are being utilized by the few rich within the SE states and Nigeria as a whole. Thus, a re-alignment of spending towards tertiary education would lead to an improvement in the share of the total budget going to poorer groups in the society. However, such decisions should be a mix of household behaviour and benefit incidence analysis. This would support understanding of affects expenditure reallocations and other socioeconomic factors that act as obstacles. Nonetheless, in interpreting our results, we would also state that Benefit Incidence does not necessarily result to increased outcomes for the sector. This is supported by Demery et al. (1996) study, which employed traditional BIA in assessing who benefited from educational expenditures in Cote d' Ivoire. Their results suggest a noticeable development regarding education expenditure for Cote d' Ivoire from 1986 - 1995, even with a decrease in overall education expenditure. They concluded that transformation in benefit incidence were not necessarily an outcome of transformation in public expenditure.

5.2.3 Social Sector Spending/Poverty/Inequality Nexus in the SE States

Effective inclusion of the poor and less privileged in sustaining societal growth and economic progress may be a potent strategy for curtailing poverty and inequality. Education and health care services are prominent social facilities that are very much needed by the citizenry; hence efforts at providing these services should be a national priority. Excitingly, they were listed among the Millennium Development Goals (MDGs).

Table 5.2.16b: (Poor versus Rich) - *Summary of Education Benefits in the SE States (Quintile 2, 4 and 5)*

Abia State			
	<i>Primary Education</i>	<i>Secondary Education</i>	<i>Tertiary Education</i>
Poor	24.5	19.4	16.9
Rich	31.2	39.4	49.3
Benefit/Loss	-6.7	-20	-32.4
Anambra State			
	<i>Primary Education</i>	<i>Secondary Education</i>	<i>Tertiary Education</i>
Poor	23.9	20.5	18.6
Rich	27.6	37.9	45.9
Benefit/Loss	-3.7	-17.4	-27.3
Ebonyi State			
	<i>Primary Education</i>	<i>Secondary Education</i>	<i>Tertiary Education</i>
Poor	22.3	20.5	17.5
Rich	29.9	38.5	48.6
Benefit/Loss	-7.6	-18	-31.1
Enugu State			
	<i>Primary Education</i>	<i>Secondary Education</i>	<i>Tertiary Education</i>
Poor	23.3	21.6	21.6
Rich	27.9	35.5	35.5
Benefit/Loss	-4.6	-13.9	-13.9
Imo State			
	<i>Primary Education</i>	<i>Secondary Education</i>	<i>Tertiary Education</i>
Poor	21.9	21	18.6
Rich	31.7	38.6	49.2
Benefit/Loss	-9.8	-17.6	-30.6

Notes:

1. *Figures Derived from the Benefits Spread/Marginal Odds Tables above*
2. *Benefits refers to Coefficient/Total x 100; Rich – Quintile 4+5; Poor – Quintile 2*

According to Vogl (2012) childhood health enhances schooling outcomes, and enduring incentives to human capital investment and education improves adult health. But in our context, the results raises alarm and questions the possibility of achieving this in Nigeria. Despite that education is available to all classes of citizens (from the core poor to the affluent) in Abia State. However, the benefits disproportionately favour the rich. The access to education between the rich and very poor was examined and statistics indicate that benefits from primary, secondary and tertiary education were much consumed by the rich by 9.3 percent,

20.1 percent and 32.4 percent over the access given to the core poor. The rich in this context refers to Quintile 4 and 5. The economic implication of this inequality is in terms of societal growth and productive employment. The increasing tendency for educational benefits to accrue only to the rich would likely result to massive lack of education for the core poor in the state. This outcome weakens the labour markets, and essentially results in reducing employment opportunities or having unproductive employment because the available labour forces are substandard. To account for increased societal growth, the government has to expend additional cost of producing policies to recognize and improve conditions in the informal sector of the economy. Following above scenario, the rising spate of uneducated persons, mostly the core poor of the society, due to lack of opportunities and educational benefits, may be culled and used like instruments by conflict-ridden member and powerful persons in the society for personal gains, as resource endowments between the wealthy and the labour classes' continues to widen. As more children are being born into poverty, it portends danger to Nigeria that makes the country more vulnerable to crisis. The need for social protection to reduce poverty and make growth more pro-poor will earn additional cost. Therefore, for Abia state to stay more focused and deliver pro-poor growth, the need to evenly distribute, and if not favour, the poor and the very poor becomes paramount. This scenario negates Millennium Development Goals of achieving universal primary education and eradicating extreme poverty and hunger. Statistics here, confirm that much of access to primary education was given to the wealthy group, likewise, secondary and tertiary education. The finding show that lack of education breeds poverty and then affects health of the core poor.

In the same vein, Education and other forms of training which increases knowledge has been found to galvanize industrial growth, thereby spurring economic take-off in an economy (OECD Report, 2006). Statistics reported, has both economic and social implications. The observed outcome is that rich individuals have more education benefits than the core poor. For sustained growth, quality education and access to it should be broad-based across all levels in the state. On the back of the low vital statistics of the poor in the state, it can be

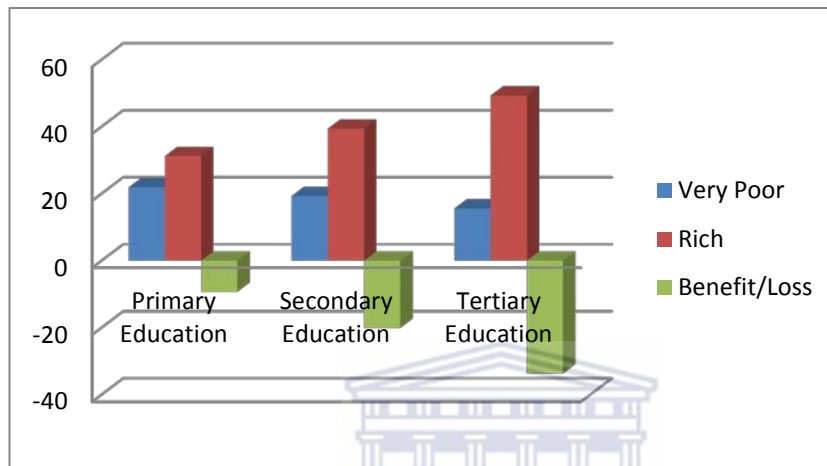
inferred that future workforce may not be sufficient to stimulate economic growth in the system. The above scenario has implications for poverty reduction strategy. Poverty tends to rise when the poor and very poor categories are not given the appropriate educational benefits, which is in support of the findings of the OECD Report (2006), that concluded that the pattern of growth are essential for long term sustainable poverty reduction. Thus, widens pro-poor pattern of growth would be more effective in reducing poverty. The powerlessness of the poor due to lack of desirable benefits to education may have implication for future work force. Thus, ensuing inequality in opportunities by the poor and very poor may also hinder them from participating and contributing to societal growth and stability. Therefore, making the idea of inequality more relevant²⁹ and pronounced across the region. Inadequate access to good education flattens the confidence of the poor and very poor people, and thus, hinders creativity.

In Enugu and Anambra States, the very poor were given more benefits to primary education than the other three (3) states in South East Nigeria. However, a society that wants to enhance efficiency through inclusive growth should also monitor the proportion of the benefit that accrues to both the rich and poor. The pro-poor growth campaign could be compromised from the beginning if the persons from the rich cadre implement such programmes. The socioeconomic implication is that it will increase the vulnerability of the poor and very poor to economic hardship (OECD, 2006), which will require substantial government interventions/expenditure to ameliorate. The poor and very poor often avoid getting educated because of its challenges, therefore, making excuses on the limited access to educational benefits, but the government needs to encourage them by giving them some level of comfort and accessibility through reduced fees and other related benefits. In addition, it should be clear, that the journey out of poverty that characterized our immediate society is not one way and therefore, should be inclusive. The very poor and the poor classes were marginalized in terms of overall educational benefits in SE states. It can be observed that due to limited benefits of education, the number of unskilled labour will rise astronomically and could clog efficiency and higher productivity. The

attractiveness of the State to foreign investors may be hindered due to absence of skilled workforce.

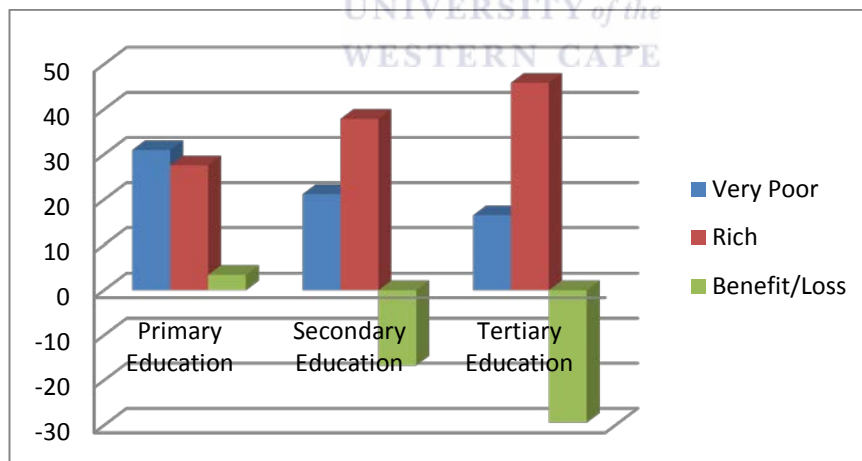
The figures below, shows the education benefits spread in the SE states. The Rich (Q4 + Q5) is compared to Q1 and the benefit /loss is derived by (Q4+Q5-Q1).

Figure: 0. 5.4.1: Education Benefit Spread in Abia State of Nigeria



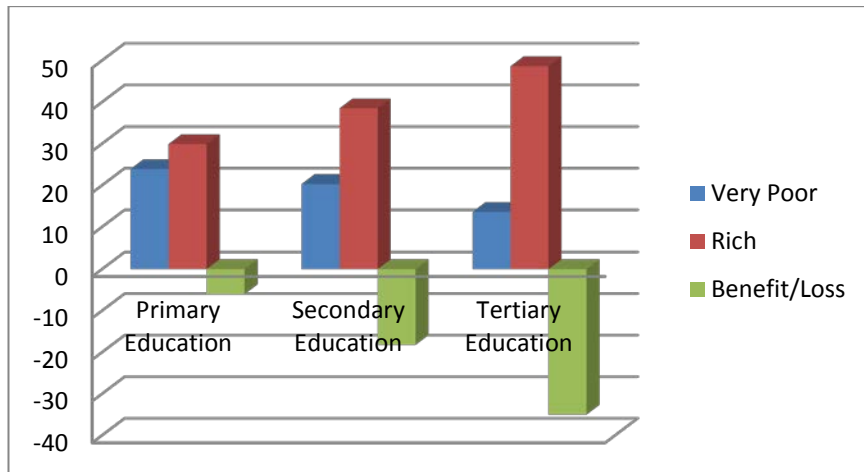
Source: Figures derived from the Table 5.2.16a

Figure 0.6 Education Benefit Spread in Anambra State of Nigeria



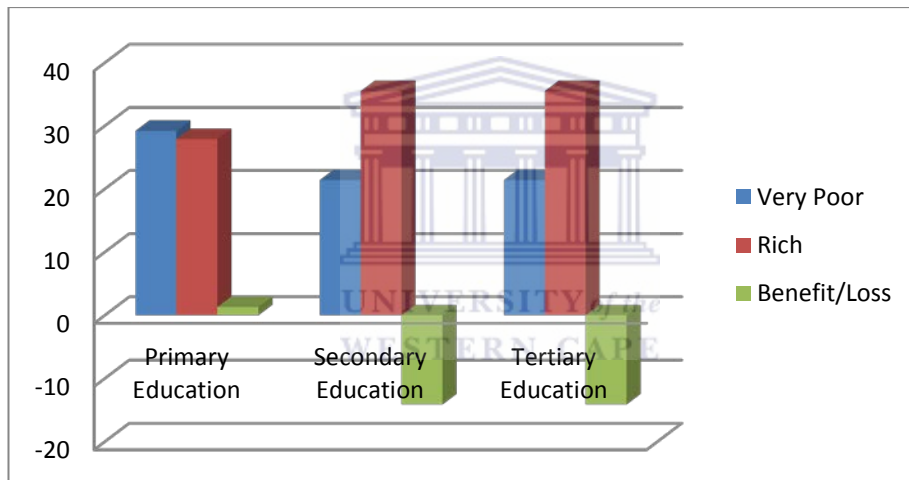
Source: Figures derived from the Table 5.2.16a

Figure 0.6 Education Benefit Spread in Ebonyi State of Nigeria



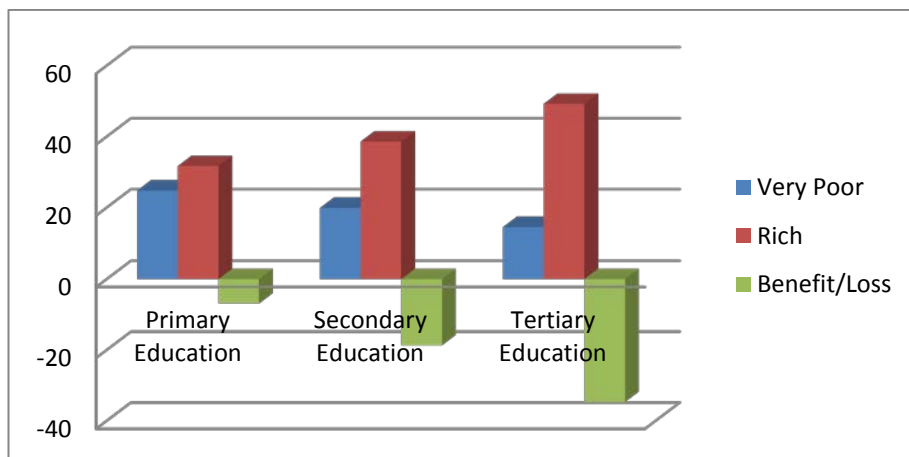
Source: Figures derived from the Table 5.2.16a

Figure 0.7 Education Benefit Spread in Enugu State of Nigeria



Source: Figures derived from the Table 5.2.16a

Figure 0.8 Education Benefit Spread in Imo State of Nigeria



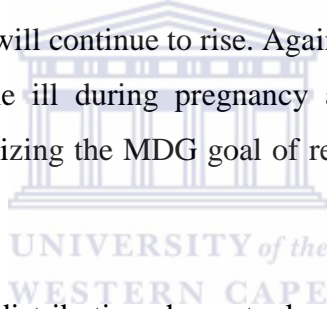
Source: Figures derived from the Table 5.2.16a

5.2.4 Distribution of Beneficiaries' between Males and Females (SE States)

Public expenditure reviews supports government in promoting pro-poor growth and assisting poor and vulnerable groups. However, this strategy would be most effective when it is informed by gender-disaggregated data analysis.

Gender issues are discerned to be prominent when determining health care policies; especially, when there are differences in health accessibility and outcomes between male and female sexes. Our analysis provides insight to the distribution of health care benefits between men and women. In the primary health care division, there are no significant differences between the primary health care benefits given to women and men in Abia state. Except for quintiles 1 and 2 that have negligible differences in percentile, quintiles 3, 4 and 5 depicted par percentiles for both women and men. This suggests that much of the primary health care benefits available in the state are proportionally shared by both genders. The same situation was observed in Ebonyi and Imo states while Anambra and Enugu states recorded significant differences in the distribution of primary health care benefits between male and female residents of the states. In Anambra state, the male sex is significantly favoured in distribution shares (see quintiles 2 and 3 on table 5.2.17). However, for quintiles 1, 4 and 5 the female sex is given more concentration in terms of access to primary health care benefits. Likewise, Enugu state also has mixed outcomes. The male sex has a higher preference in Quintiles 2 and 3 while the female counterpart is given more privilege in quintiles 1, 4 and 5. The distribution shares in these states imply that, primary health care benefits were evenly distributed in the South Eastern states. Another obvious implication is that, since female sex social and economic role in the society have a negative impact on their health position couple and the fact that the fourth World conference on women in Beijing (1995) identified strategic objectives for women's health, one of them is to increase women's access throughout the life cycle to appropriate, afford and enjoy quality health care. In the context of these distributions, the reality of this objective will be a serious challenge for many of these South Eastern states.

Amidst the mixed outcomes noticed for primary health care category in the South Eastern states of Nigeria, the Secondary health care class was fairly distributed between the two genders. Imo state had mixed results in some of the quintiles. Quintiles 2, 3 and 5 were slightly in favour of the male, but quintiles 1 and 4 proportionately favoured the women. In Abia and Anambra states, there are no major differences in the allocation of benefits between the male and female. Meanwhile, in Ebonyi State, quintile 2 recorded 1.003 and 1.029 percentiles; quintile 5 percentiles were 1.121 and 1.113 percentiles for male and female (see table 5.2.18). This authenticates the negligible differences in the distribution of benefits between both genders in the South Eastern states. These analyses show that, with the limited percentile ascribed to female, the male counterparts will have improved health and there is a possibility of them living longer than the female. In other words, the amount of women that will suffer from reproductive and sexual health issues will continue to rise. Again, there are tendencies for many more females to become ill during pregnancy and remain with post-delivery consequences. Thus, realizing the MDG goal of reducing maternal mortality may be a great challenge.



The tertiary health care distribution shares took a different perspective. Some of the states have mixed outcomes while some of them tend to proportionately accrued more of the benefit to male sex. States like Abia, Anambra and Enugu have mixed results. In some instances they give more of the benefit to the female sex. Quintiles 3 and 4 gave more access to female sex in Abia. Anambra favours female with more tertiary health care benefits in quintiles 3, 4 and 5 while Enugu ensued more benefits to the female in quintiles 1, 3 and 5. States that significantly favour the male sex in all quintiles are Ebonyi and Imo states. In Imo state, quintile 1 percentile shows that more of the benefits are proportionately in favour of the male sex, in other words, 0.827 shares was ascribed to the male and 0.778 percentile to the female. Percentiles in other quintiles reported similar trends. Enugu state has much of its percentiles in favour of the female; indeed, quintile 4 reported almost the same percentile for both sexes. This implies that the outlook

supports fairer distribution of the benefits of tertiary health care in this part of the country.

Males across all quintiles had more primary health benefits except for Quintile 5. No significant difference across gender for all states. Results show that there are no categorization and focus regarding gender in health expenditure by the government. Furthermore, males and females at a higher Quintile level had more benefits than those at the lower Quintiles.

Table: 5.2.17 Primary Health Care (Gender Benefit Spread using 2010 HNLSS)

States/Gender	Abia		Anambra		Ebonyi		Enugu		Imo	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Quintile 1	1.003	0.924	1.303	1.467	1.103	1.122	1.283	1.622	1.029	0.947
T – Stat	2.701	2.329	2.425	2.245	2.971	2.027	1.503	3.022	1.098	2.019
Quintile 2	1.012	0.981	1.607	1.433	1.112	1.013	1.667	1.293	1.072	1.104
T – Stat	1.909	1.378	3.031	2.012	2.098	2.457	1.954	1.514	2.021	1.550
Quintile 3	1.120	1.104	1.753	1.034	1.101	1.034	1.723	0.931	1.022	1.103
T – Stat	2.113	3.005	3.306	2.815	2.077	2.815	2.020	1.090	1.928	3.004
Quintile 4	1.012	1.017	0.221	0.807	0.900	1.013	0.211	0.687	1.072	1.007
T – Stat	1.491	2.259	1.744	1.792	1.326	2.250	2.086	2.214	1.580	2.236
Quintile 5	0.864	0.983	0.136	0.264	0.814	0.830	0.126	0.474	0.828	0.847
T – Stat	8.276	4.961	1.307	2.688	7.797	4.187	3.126	4.691	7.929	8.635
Total	5.011	5.009	5.020	5.004	5.030	5.012	5.010	5.006	5.022	5.008

Source: Author's Computations

N/b:

1. Tables 5.2.17 – 5.2.23 gives the instrumental variables estimate of the regression coefficient of the quintile on the average rate for the South-East Region, based on the 2010 HNLSS.
2. The leave-out mean region, enrollment rate is the instrument for the actual mean.
3. The numbers in parentheses are the standard errors and t-ratios.

Table: 5.2.18 Secondary Health Care (Gender Benefit Spread using 2010 HNLSS)

States/Gender	Abia		Anambra		Ebonyi		Enugu		Imo	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Quintile 1	1.013	1.017	1.121	1.015	1.014	0.914	1.015	1.133	0.977	1.013
T – Stat	2.705	4.788	3.804	2.508	2.707	1.784	2.179	5.066	4.803	2.974
Quintile 2	0.901	0.953	1.122	1.113	1.003	1.029	1.139	1.013	1.102	0.929
T – Stat	8.634	4.809	2.733	2.182	9.607	5.192	2.261	2.023	2.685	4.426
Quintile 3	1.101	1.129	1.025	0.934	1.113	0.916	0.967	1.162	1.101	0.944
T – Stat	2.077	7.587	2.148	2.156	2.401	3.039	2.821	2.506	7.401	4.511
Quintile 4	0.876	0.881	0.931	1.015	0.750	1.031	1.107	0.878	1.011	1.102
T – Stat	1.652	1.238	1.757	1.425	1.414	2.502	1.298	1.029	1.908	1.547
Quintile 5	1.112	1.020	0.802	0.924	1.121	1.113	0.773	0.814	0.809	1.016
T – Stat	2.970	4.804	4.062	2.975	2.993	2.700	1.660	3.638	3.981	2.984
Total	5.004	5.000	5.001	5.000	5.001	5.004	5.002	5.000	5.001	5.003

Table: 5.2.19 Tertiary Health Care (Gender Benefit Spread using 2010 HNLSS)

States/Gender	Abia		Anambra		Ebonyi		Enugu		Imo	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Quintile 1	0.723	0.544	0.737	0.663	0.665	0.674	0.815	0.705	0.827	0.778
T – Stat	1.931	2.560	3.733	2.134	1.776	1.635	1.749	3.151	4.069	2.285
Quintile 2	0.824	0.805	0.912	0.788	0.811	0.765	0.832	0.932	0.757	0.641
T – Stat	4.052	2.364	4.052	1.595	2.383	1.642	1.114	1.884	3.724	1.881
Quintile 3	1.028	1.137	1.028	1.031	1.013	1.026	1.121	1.018	1.031	0.918
T – Stat	3.311	5.738	3.311	2.516	2.468	2.444	3.740	2.032	3.323	4.378
Quintile 4	1.114	1.300	1.114	1.143	1.113	1.114	1.113	1.021	1.010	1.362
T – Stat	5.477	3.818	5.477	2.311	3.267	2.391	1.927	2.066	4.969	4.001
Quintile 5	1.312	1.215	1.312	1.375	1.401	1.421	1.120	1.325	1.375	1.301
T – Stat	3.504	5.722	3.504	3.396	3.741	2.774	2.406	5.924	3.408	3.822
Total	5.001	5.001	5.001	5.000	5.003	5.000	5.001	5.001	5.001	5.001

The above gender disaggregated benefit incidence of health has created an information and benchmarks. It is recommended that ministries of health in Nigeria develop realistic gender disaggregated targets for reaching beneficiaries and set up systems for reporting success in reaching those targets. This would be an important step for optimizing the poverty reduction impact of public spending in the country. The implications of these results are in two folds. Firstly, the need to actualize the MDG goal of reducing maternal mortality is pertinent, and in realizing this goal, there is need to give more access to women at all stages of the health care delivery system, nonetheless, continuing with these directions will require the region not meeting this MDG goal. Secondly, women tend to battle with the issue of reproduction, which require that more access to sound health care have to be given to women compare to the men, but with these analyses we could have increasingly, devastating reproductive health outcomes in these states.

Gender based analysis is not limited to the health sector alone. Gender analysis on education is an important development strategy for developing countries. This framework is broadly agreed to by all stakeholders' across governments. Primary, secondary and tertiary school enrollment for girls has been maintained or increased in most countries since 1970. Nonetheless, women's literacy increased from 54 percent of the male rate in 1970 to about 80 percent in the last decade. However the females' educational opportunity remains significantly lower than males and the gap is particularly marked in the poorest countries. Although the World Bank and others have accepted the argument that investment in female education pays off through higher social benefits, this calculation has been contested. Berhman (1997) posits that the externalities to female education are not as great as is often claimed and are actually realised as private benefits. Furthermore, he argues that child health and welfare and fertility reduction might be gained in a more cost-effective way by spending directly on child health and family planning rather than on female education (Baden and Green 1994).

In our analysis, Males and females at Quintile1, Quintile2 and Quintile3 had more benefits on the average than those at Quintile4 and Quintile5. For primary

education, there was no targeting for the female gender across the five states. At the secondary level, females had a little advantage over the males for the lower Quintiles but less benefits at a higher Quintile. This is expected because of the cultural ideology of sending more of males in higher education than females. Females on the average normally get supported through the primary education level and afterwards encouraged to get married, while their male counterparts continue through secondary and tertiary education. Results also indicate that both females and males at Quintile 4 and Quintile 5 benefited more than those at the lower Quintiles at the tertiary level.. Also, there was no significant difference in terms of who benefited more than the other.

Table: 5.2.2 Primary Education (Gender Benefit Spread using 2010 HNLSS)

States/Gender	Abia		Anambra		Ebonyi		Enugu		Imo	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Quintile 1	1.079	1.109	1.546	1.563	1.189	1.210	1.410	1.516	1.226	1.242
T – Stat	2.316	2.381	3.332	2.947	3.493	2.598	6.935	4.453	2.243	1.928
Quintile 2	1.400	1.063	1.169	1.220	1.117	1.109	1.210	1.121	1.099	1.102
T – Stat	6.886	3.122	2.139	2.467	3.281	2.381	1.621	2.267	5.405	3.236
Quintile 3	1.077	1.154	0.748	1.006	1.199	1.188	0.897	1.062	1.079	1.085
T – Stat	2.102	7.051	0.677	0.970	2.350	2.037	2.782	2.237	13.135	2.473
Quintile 4	0.814	0.931	0.809	0.613	0.967	1.015	0.867	0.769	0.843	0.831
T – Stat	2.174	4.383	10.835	5.841	2.580	1.981	1.861	3.438	4.147	2.439
Quintile 5	0.636	0.747	0.734	0.602	0.534	0.481	0.620	0.541	0.757	0.744
T – Stat	1.199	5.017	0.955	0.738	1.151	0.907	1.809	1.165	5.084	3.558
Total	5.006	5.004	5.005	5.003	5.006	5.003	5.004	5.008	5.003	5.003

Table: 5.2.21 Secondary Education (Gender Benefit Spread using 2010 HNLSS)

States/Gender	Abia		Anambra		Ebonyi		Enugu		Imo	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Quintile 1	0.953	0.978	1.021	1.103	1.013	1.019	1.124	1.020	1.017	1.242
T – Stat	2.543	4.606	3.466	2.723	2.704	1.989	2.414	4.559	5.001	1.928
Quintile 2	0.911	1.031	1.024	1.030	1.032	1.022	1.133	1.026	1.102	1.102
T – Stat	1.777	6.298	2.864	2.356	2.023	1.752	3.515	2.162	2.114	3.236
Quintile 3	1.047	1.143	1.032	1.013	1.011	1.055	1.140	1.016	1.042	1.085
T – Stat	5.150	3.357	1.889	2.049	2.970	2.264	1.974	2.055	5.124	2.473
Quintile 4	1.081	1.026	1.014	1.046	1.112	1.092	1.170	0.936	1.029	0.831
T – Stat	2.322	2.203	2.187	1.973	3.266	2.344	5.756	2.748	1.882	2.439
Quintile 5	1.016	0.828	0.913	0.815	0.835	0.814	0.441	1.011	0.813	0.744
T – Stat	1.917	3.327	1.914	2.017	1.800	1.536	1.287	2.181	5.460	4.830
Total	5.008	5.006	5.004	5.008	5.003	5.002	5.009	5.009	5.002	5.101

Table: 5.2.22 Tertiary Education (Gender Benefit Spread using 2010 HNLSS)

States/Gender	Abia		Anambra		Ebonyi		Enugu		Imo	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Quintile 1	0.801	0.750	0.805	0.849	0.774	0.581	0.689	0.656	0.605	0.846
T – Stat	3.939	2.204	2.322	2.153	2.273	1.247	1.193	2.685	2.974	2.486
Quintile 2	0.814	0.884	0.902	0.959	0.813	0.939	0.921	1.030	0.887	0.970
T – Stat	2.174	4.162	4.570	3.088	2.172	2.277	1.977	4.606	4.362	2.848
Quintile 3	0.860	0.959	1.012	0.893	1.053	0.979	1.021	0.902	0.895	0.879
T – Stat	1.622	6.443	1.317	1.095	2.271	3.248	2.979	1.945	6.013	4.201
Quintile 4	1.213	1.121	1.113	1.141	1.046	1.136	1.049	1.102	1.261	1.104
T – Stat	2.605	2.407	2.400	2.153	3.071	2.440	5.157	3.235	2.308	1.714
Quintile 5	1.312	1.286	1.171	1.162	1.314	1.364	1.321	1.311	1.353	1.201
T – Stat	2.560	7.858	3.277	2.656	2.575	2.340	4.097	2.762	2.595	2.739
Total	5.000	5.001	5.004	5.004	5.000	5.000	5.001	5.000	5.000	5.000

Based on the foregoing, a variant set of policies can be recommended to improve gender mainstreaming. Firstly, public expenditure on education should be targeted towards the rural areas where poor households reside and poverty is usually higher. Secondly, region specific policy could be helpful for more female benefits. Public spending in rural areas for female education will be more significant than the expenditure in urban areas. Generally, a reallocation of spending going to females and the poorer households would lead to improvement in gender equality and health status of women and children. Nonetheless, the decision on who gets what and how should not be based on benefit incidence estimates alone, but on a sound understanding of how household behaviour would be affected by expenditure re-allocations and other socioeconomic factors that act as obstacles to female enrollment.

Furthermore, there is also a broad range of possibilities for girl child education outside of the schooling system with a focus on poverty reduction. One of such initiatives is the adult literacy programme. This is a valuable tool in reaching women who were not schooled as girls. This kind of education can be integrated with other programmes such as micro credit, etc. The primary focus should be learning for empowerment. Involving women socially, economically and politically would be a potent force in attaining the MDGs.

Nonetheless, further analysis is required to explain the observed persistent gender gaps and to formulate solutions for more equitable distribution of education benefits. Macro-level analysis of the effects of investment in education on poverty, and of the social returns to female education, needs to be accompanied by an analysis (at micro- and meso-levels) of how household poverty and other institutional biases lead to gender inequity in educational outcomes.

5.2.5 Distribution of Beneficiaries' by Location (SE States)

Table: 5.2.23 Primary Education (Location Benefit Spread using 2010 HNLSS)

States	Abia		Anambra		Ebonyi		Enugu		Imo	
Location	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Quintile 1	1.027	1.198	1.563	1.546	1.242	1.226	1.516	1.410	1.210	1.189
T – Stat	2.387	2.423	2.947	3.332	1.928	2.243	4.453	6.935	2.598	3.493
Quintile 2	1.126	1.000	1.220	1.169	1.102	1.099	1.121	1.210	1.109	1.117
T – Stat	5.540	2.147	2.467	2.139	3.236	5.405	2.267	1.621	2.381	3.281
Quintile 3	1.120	1.188	1.006	0.748	1.085	1.079	1.062	0.897	1.188	1.199
T – Stat	2.970	5.163	0.970	0.677	2.473	13.135	2.237	2.782	2.037	2.350
Quintile 4	1.024	1.075	0.613	0.809	0.831	0.843	0.769	0.867	1.015	0.967
T – Stat	4.578	1.977	5.841	10.835	2.439	4.147	3.438	1.861	1.981	2.580
Quintile 5	0.703	0.544	0.602	0.734	0.744	0.757	0.541	0.620	0.481	0.534
T – Stat	2.051	2.602	1.907	2.651	3.558	5.084	3.300	1.809	2.089	1.151
Total	5.001	5.005	5.003	5.005	5.003	5.003	5.008	5.004	5.003	5.006

Education is the process of becoming critically aware of one's reality in a manner that leads to effective action upon it. An educated male/female understands his/her world well enough to deal with the outcomes and realities surrounding him/her effectively. Therefore, it is not surprising that achieving universal primary education and promoting gender equality and women empowerment were listed among the millennium development goals in 2000.

In the primary category, the distributive shares of benefits were evenly arranged between the male and female genders. In exception of some Quintiles that have a remarkable difference in their distribution. For example, in Abia state, quintile 2 has its distribution disproportionately favours the men with a difference of about 0.3 percentile while quintile 3 favours the female sex. Quintiles 4 and 5 favour the male in Anambra state while quintile 3 gave more credence to the female. The distribution of benefits was fairly made in Ebonyi, Enugu and Imo states in all quintiles, whereby, both genders were given approximately the same outcomes in percentiles. In Ebonyi state, 1.189 and 1.21 percentiles are the distribution shares in quintile 1. Quintiles 2 and 3 have 1.117 and 1.109 for male and female; and

1.199 and 1.188 for both sexes. Likewise, in Enugu and Imo states the accessibility in terms of gender is almost identically distributed between men and women. Therefore it could be said, that at present the situation is unhealthy bearing in mind that home ideally is the first and last school of the child and the foundation of learning starts from the mother, albeit, women serves as the first teacher to every generation and therefore, needed more access than what was recorded in these states. Consequent to this, the low access to primary education will not only increase illiteracy level, especially in these states, but also allow them to be ignorant of opportunities extended to them, for instance, simple issues concerning them such as writing, reading and socialization.

In the secondary arena, the bane of the distribution of education benefits in all the south east states is that, the distribution is made in equal proportion between male and female. For instance, the distribution shares for male and female in quintile 1 for Abia state were 0.953 and 0.978 percentiles which were significantly not different from each other. The distribution shares for Anambra state stood at 1.021 and 1.103 for men and women; 1.013 and 1.019 for Ebonyi State. Enugu state has 1.124 and 1.020 percentiles while Imo state filed 1.017 and 1.242 percentile for male and female, respectively. These statistics buttressed the fact stated in the first statement, that the differences in access to secondary education between the male and female were inconsequential. Quintiles 2, 3, 4 and 5 also have comparable trends. It is crucial to know that in a country where women constitute about half of the total population and are known to be the most vulnerable to diseases and economic frustration (FGN/UNICEF, 2001), they should be given more access to education so as to reduce the alarming spread of diseases and to lessen their involvement in low paying ventures (Oladunni, 1999). Going by these distributive shares among Quintiles, most women will have no choice than to have ventured themselves into less paid jobs in this region, a situation tantamount to increasing the poverty level.

The male/female disparity in access to education in the southeast states is not restricted to the primary and secondary cadres of education; rather it is almost the

same for the tertiary class. By examining the states end-to-end, Abia state has much of her control in favor of the men, in other words, the male sex was given more access to education. With exception of Quintiles 2 and 4 that women got trivial scores over the male percentiles (See Table 5.2.23). A different scenario was observed in Anambra state where the distribution share was highly in favour of the female. Three out of five quintiles examined, totally gave credence to the female. There was no significant difference in distributive shares for both sexes in Quintile 5 (1.171 percentile for men and 1.162 percentile for women) while shares in quintile 3 disproportionately favours the male. Ebonyi, Enugu and Imo states have similar distribution shares. The distribution shares were evenly distributed between male and female.

The depth of physical deterioration in education standard and health care status in Nigeria has called for the need to appraise social expenditure shares by location (rural and urban). In particular, not only was the deterioration in standard far more than expected, but the possibility of achieving the Millennium Development Goals (MDGs) in 2015 and sustaining the level are major concerns. The figures in table 5.2.24 show that there is no clear cut strategy by all the states in SE Nigeria for the vulnerable. Allocations to urban and rural areas seem to be the same and have no significant variations. This is not pro-poor given that the majority of poor people resides in the rural areas. More funds should be focused towards the vulnerable in the villages than those in the urban places. Furthermore, the rich (Quintile 4) were heavily subsidized both in the rural and urban places. A need for a total over-haul of the policy framework adopted by states in Nigeria becomes imperative. Statistics for Imo and Abia states show that for every N1 spent on primary education, Quintile 4 (Rich households) had a benefit of more than a N1 for those in the rural places. On the other hand, Anambra and Enugu states showed a benefit of less than N1 to Quintile 4 households in the urban places. This strategy would be more sustainable and encourage the actualization of MDG targets.

Statistics for both rural and urban cities are compared in SE States of Nigeria. In Abia state, 20.6 percent benefits were attributed to the very poor that live in rural settlement; while 34.5 percent benefits went to the Rich (Quintile 4+5) for primary education. This implies that, the benefits of primary education in rural cities favor the rich. Quintile 1 and Quintile 2 in the urban areas had 23.9 percent and 19.9 percent social benefits respectively from primary education, while the combination of Quintile 4 and Quintile 5 accounted for 32.4 percent. In Anambra state, the urban dwellers on the average earned less educational benefits for primary education when compared to rural dwellers. The rich in the rural areas have 24.4 percent benefits while the urban obtained a 30.9 percent benefit which is about 6.5 percent over the rich domiciling in the rural area. Furthermore, the very poor in the rural settings have 0.3 percent excess benefit over those residing the urban cities while the poor and the moderate populace in urban areas enjoys slower benefits compare to the rural dwellers. Enugu and Imo states presented mixed outcomes for primary education benefits; with the benefits disproportionately favouring the very poor in case of Enugu and the Rich in Imo state. In Ebonyi state, the benefits were evenly distributed between the rural and urban cities. However, the access to primary education was more in favour of the rich.

Summarily, social expenditure shares given to primary education favoured the urban dwellers in Abia state with the rich getting increased shares. Anambra state gave more focus to the rural areas while very rich in both rural and urban settlements were given highest priority in Enugu state. The distribution in Imo state favour the rich in both locations while Ebonyi state expended more on the rich than the core poor in the state. Available statistics confirm that much of access to primary education was given to the wealthy populace in both rural and urban cities Therefore, to achieve evenly distribution of primary education and eradicate extreme poverty and hunger as documented in the Millennium Development Goals (MDGs) excerpt, these states have to focus immensely on empowering the core poor through increased expenditure share for rural dwellers.

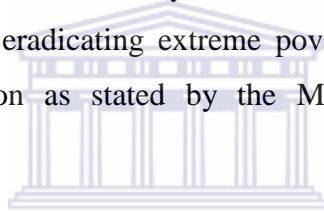
Table: 5.2.24 Secondary Education (Location Benefit Spread using 2010 HNLSS)

States/Gender	Abia		Anambra		Ebonyi		Enugu		Imo	
Location	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Quintile 1	0.985	0.971	1.103	1.021	0.973	0.017	1.020	1.124	1.019	1.013
T – Stat	4.404	1.785	2.723	3.466	2.856	5.001	4.559	2.414	1.989	2.704
Quintile 2	0.970	1.025	1.030	1.024	1.002	1.102	1.026	1.133	1.022	1.032
T – Stat	2.572	4.457	2.356	2.864	2.284	2.114	2.162	3.515	1.752	2.023
Quintile 3	1.011	1.057	1.013	1.032	1.012	1.042	1.016	1.140	1.055	1.011
T – Stat	4.973	2.269	2.049	1.889	2.971	5.124	2.055	1.974	2.264	2.970
Quintile 4	1.021	1.025	1.046	1.014	1.014	1.029	0.936	1.170	1.092	1.112
T – Stat	3.367	2.073	1.973	2.187	1.573	1.882	2.748	5.756	2.344	3.266
Quintile 5	1.013	0.441	0.815	0.913	1.010	0.813	1.011	0.441	0.814	0.835
T – Stat	2.954	2.110	2.017	1.914	4.830	5.460	2.181	1.287	1.536	1.800
Total	5.000	4.519	5.008	5.004	5.010	5.002	5.009	5.009	5.002	5.003

Furthermore, benefits of secondary education spending in Nigeria are still low compared to other developing countries and the quality of education is also doubtful. In-addition, teachers assigned to work not only in rural but also urban secondary schools do not correspond to the student population in Nigeria. This has implications for achieving poverty reduction through education. Poor environment and accommodation facilities for teachers make it very difficult for the teachers to be retained in the rural areas.

Statistics indicate a large proportion of education benefits to a secondary category in Anambra state were found to have gone to the richest in rural and urban cities. The very poor living in the rural settings, the poor and the moderate classes in the state had 22 percent, 20.6 percent and 20.2 percent, benefits respectively. The rich populace had the highest benefits of 37.2 percent. This implies that secondary education is more available to the rich people in rural areas of the state. The urban centers, like the rural area follow the same trend as educational benefits are often engrossed by the Quintile 4 and Quintile 5. Hence, the rich populace on the average had 38.5 percent of educational benefits at the secondary stage. In Abia state, the core poor (Quintile 1 and Quintile 2) received minimal benefits. The Rich received 40.7 percent benefits of secondary education expenditure in rural areas, whereas, the very poor and poor categories had 19.7 percent and 19.4 percent benefits of the expenditure distribution respectively. Ebony and Enugu states are not left out in the uneven distribution of secondary education

expenditure benefits in both rural and urban areas. Although, Enugu state has high potential to meet the Millennium Development Goal (MDG) of achieving universal basic education by 40.9 percent and 42.3 percent expenditure benefits going to the core poor in rural and urban dwellings. The case of Imo state was quite similar to the other states in the region. Quintile 4 and Quintile 5 households in urban and rural settings, cities received a 38.9 percent and 38.1 percent benefit from secondary education spending respectively. Meanwhile, the core poor (Quintile 1 and Quintile 2) received 20.4 percent and 20.3 percent benefits in the rural and urban areas, respectively. The further implication of these results suggests that the human capital structure in the region may be unbalanced and weak to drive growth, which may jeopardize the effort to eradicate extreme poverty and hunger. Statistics show that the states sampled have increased interest for the rich in the pursuit of secondary education. These findings contradict goal one (1) and two (2) of eradicating extreme poverty and hunger and achieving universal basic education as stated by the Millennium Development Goals (MDGs).



Secondary education and other forms of middle level training that enhances knowledge forms the bedrock for tertiary education, and thereby enhancing quality labour stock in an economy. The even distribution of shares of expenditure on this class of education to citizens could nurture its positive effect on the workforce and thereby, spurring economic output of a country.

Table: 5.2.25 Tertiary Education (Location Benefit Spread using 2010 HNLSS)

States/Gender	Abia		Anambra		Ebonyi		Enugu		Imo	
Location	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Quintile 1	0.750	0.801	0.846	0.805	0.846	0.605	0.686	0.689	0.581	0.774
T – Stat	3.691	1.719	2.153	2.322	2.486	2.974	2.685	1.193	1.247	2.273
Quintile 2	0.937	0.915	0.959	0.902	0.970	0.887	1.030	0.921	0.939	0.813
T – Stat	4.189	1.682	3.088	4.570	2.848	4.362	4.606	1.977	2.277	2.172
Quintile 3	0.938	0.828	0.893	1.012	0.879	0.895	0.902	1.021	0.979	1.052
T – Stat	2.736	3.959	1.095	1.317	4.201	6.013	1.945	2.979	3.248	2.271
Quintile 4	1.152	1.174	1.141	1.113	1.104	1.261	1.102	1.049	1.136	1.046
T – Stat	3.797	2.374	2.153	2.400	1.714	2.308	3.235	5.157	2.440	3.071
Quintile 5	1.224	1.283	1.162	1.171	1.201	0.353	1.311	1.321	1.364	1.314
T – Stat	3.245	5.577	2.656	3.277	2.739	2.595	2.762	4.097	2.340	2.575
Total	5.001	5000	5.004	5.004	5.000	5.000	5.000	5.001	5.000	5.000

Our analysis indicates that the wealthy class (Quintile 4 and Quintile 5) appropriates tertiary education benefit of up to 49.2 percent and 47.5 percent in urban and rural areas of Abia state; whereas, the core poor (Quintile 1 and Quintile 2) in rural and urban dwellings take a meager percentile of 14.9 percent and 16 percent expenditure benefits. The differences in the statistics indicate unequal distributions in favour of the Rich. Furthermore, Enugu state has the least shares of tertiary education expenditure benefits to the core poor in the rural area among the sampled states with 13.1 percent, meanwhile, Anambra and Ebonyi states have the largest expenditure benefits shares allocated to core poor. Nonetheless, Abia and Anambra states give higher tertiary education benefits to the core poor with 16.0 percent and 16.1 percent. Lower percentiles accrue to the core poor that reside in urban areas of Ebonyi and Enugu states, while Imo state offers moderate value to citizens. The moderate group (Quintile 3) received about 19 percent of tertiary education benefits, except for states like Anambra and Enugu that exceptionally increased the expenditure benefits for those that reside in the urban settlements. Quintile 4 and Quintile 5 households residing in urban areas in Ebonyi state received as high as 52.2 percent expenditure benefits from tertiary education. Likewise, these groups in the rural areas in Imo state received about 50 percent.

The above situation decries efforts to achieving the Millennium Development Goals through pro-poor initiatives and broad based growth. It should be acknowledged that, a society that desires to enhance efficiency through inclusive

growth should monitor the proportion of advanced educational spending benefits, especially to the core poor, irrespective of the location they reside. The implication of apportioning par percentile to both genders in these states is that, the quantity and quality of education available to women will invariably determine the level of development to be experienced in these states, so given them an equivalence access compare to men sounds to be an uninteresting omen. Another implication of this distribution is the denial of women holding public offices and indeed, their influence on public policies and programmes, unlike their male counterparts in these states may be shambled. It thus implies that women are currently marginalized, and that their ability to positively affect children's educational development and make a meaningful contribution to their environment, especially, in these states remains a major concern.

Table: 5.2.26 Primary Health (Location Benefit Spread using 2010 HNLSS)

States/Gender	Abia		Anambra		Ebonyi		Enugu		Imo	
Location	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Quintile 1	0.814	0.927	1.467	1.303	0.947	1.029	1.622	1.283	0.924	1.003
T – Stat	1.968	2.498	2.245	2.425	2.019	1.098	3.022	1.503	2.329	2.701
Quintile 2	0.941	1.017	1.433	1.607	1.104	1.072	1.293	1.667	0.981	1.012
T – Stat	3.015	1.918	2.012	3.031	1.550	2.021	1.514	1.954	1.378	1.909
Quintile 3	1.237	1.210	1.034	1.753	1.103	1.022	0.931	1.723	1.104	1.120
T – Stat	3.369	2.282	2.815	3.306	3.004	1.928	1.090	2.020	3.005	2.113
Quintile 4	1.017	1.012	0.807	0.221	1.007	1.072	0.687	0.211	1.017	1.012
T – Stat	2.259	1.491	1.792	1.744	2.236	1.580	2.214	2.086	2.259	1.491
Quintile 5	1.007	0.864	0.264	0.136	0.847	0.828	0.474	0.126	0.983	0.864
T – Stat	5.084	8.276	2.688	1.307	8.635	7.929	4.691	3.126	4.961	8.276
Total	5.017	5.030	5.004	5.020	5.008	5.022	5.006	5.010	5.009	5.011

Improve health care service delivery has been a key determinant of sustained growth (OECD, 2006) and had been made crucial to achieving some stated development goals. However, the beneficial distribution of primary health care services remains a contending issue among states in Nigeria. Using the SE states as case studies provided interesting results. For instance, in Abia state, primary health care spending gives a benefit of about 40.3 percent to the Rich (Quintile 4 and Quintile 5) on the average for households staying in rural areas; while the poor got minimal benefits. This indicates that, the benefits still favour the rich. Compared to health care services in the urban cities, people in the urban areas have more benefits than those residing in the rural locations. This statement

supports the findings of Adeyemo (2005) which attributes the causes of reduced benefits of primary health care service delivery to core poor and rural dwellers as a shortage of qualified personnel and finance, inadequate logistics and lack of maintenance culture. The benefits to quality health care service delivery generates mixed results for Anambra and Enugu states. In Anambra state, spending benefits were higher in the core poor (Quintile 1 and Quintile 2) in rural and urban centers with 57.9 percent and 57.9 percent of the benefits respectively. However, results show that the case was not the same in Imo state, as the expenditure benefits were tilted towards the Rich in both locations. Again, the objective of achieving reduction in child mortality, improving maternal health for rural dwellers poses a challenge. This could result in not meeting the health targets for Millennium Development Goals.

Table: 5.2.27 Secondary Health (Location Benefit Spread using 2010 HNLSS)

States	Abia		Anambra		Ebonyi		Enugu		Imo	
Location	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Quintile 1	0.802	0.891	1.015	1.120	1.012	0.976	1.133	1.015	0.016	1.013
T – Stat	3.585	1.638	2.507	3.803	2.974	4.802	5.066	2.178	4.788	2.704
Quintile 2	0.892	0.759	1.112	1.121	0.928	1.102	1.013	1.139	0.952	0.901
T – Stat	4.505	7.273	2.182	2.733	4.426	2.685	2.022	2.260	4.809	8.633
Quintile 3	1.102	1.118	0.933	1.024	0.943	1.101	1.162	0.967	1.129	1.101
T – Stat	3.215	5.347	2.156	2.148	4.511	7.401	2.505	2.820	0.587	2.077
Quintile 4	1.102	1.121	1.015	0.931	1.102	1.011	0.878	1.107	0.881	0.876
T – Stat	3.529	2.115	1.425	1.756	1.547	1.908	1.029	1.298	1.237	1.652
Quintile 5	1.103	1.112	0.924	0.802	1.016	0.809	0.814	0.773	1.020	1.112
T – Stat	4.931	2.046	2.975	4.062	2.984	3.981	3.638	1.660	4.804	2.970
Total	5.002	5.002	5.001	5.008	5.003	5.001	5.000	5.002	5.001	5.004

Table: 5.2.28 Tertiary Health (Location Benefit Spread using 2010 HNLSS)

States/Gender	Abia		Anambra		Ebonyi		Enugu		Imo	
Location	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Quintile 1	0.393	0.447	0.662	0.737	0.778	0.827	0.704	0.814	0.544	0.723
T – Stat	1.755	0.822	2.134	3.733	2.285	4.068	3.151	1.748	2.560	1.930
Quintile 2	0.786	0.781	0.788	0.911	0.640	0.757	0.931	0.831	0.804	0.823
T – Stat	3.865	1.676	1.594	1.957	1.881	3.724	1.884	1.114	2.363	4.051
Quintile 3	1.149	0.934	1.031	0.917	0.918	1.031	1.017	1.121	1.136	1.027
T – Stat	2.738	3.009	2.516	1.818	4.377	3.322	2.032	3.739	5.738	3.310
Quintile 4	1.018	1.113	1.1427	1.1217	1.362	1.0102	1.021	1.112	1.300	1.113
T – Stat	5.011	2.389	2.311	2.4082	4.0009	4.968	2.065	1.9269	3.818	5.477
Quintile 5	1.654	1.726	1.375	1.312	1.301	1.374	1.324	1.120	1.215	1.312
T – Stat	7.394	3.174	3.395	4.455	3.822	3.408	5.923	2.405	5.721	3.503
Total	5.001	5.008	5.004	5.0005	5.009	5.007	5.006	5.008	5.000	5.000

The benefits from government spending at the secondary and tertiary tier of healthcare service delivery favour the wealthy people in all the sampled states, regardless of their location. The implication is that, outcome of core poor with poor health status may increase by the day. This could lead to an increase in poverty incidence, amidst, low income and weak workforce which may drag growth and increase social vices. In the light of these findings, outcomes across states indicate that social expenditure on education and health care services are distributed unduly to favour the rich people of the society. States in the SE Nigeria may be faced with rising spate of poor, uneducated people and increased medical needs; for the poor, which may turn out to increase government spending in the long-run.

5.3 Determine the Progressivity of Benefits of Categories of Social Expenditure

We used survey information from both the 2004 and 2010 waves and disaggregated them by gender; education and healthcare. These key social indicators have a close correlation with the welfare status of households. Furthermore, disaggregation of data for (rural and urban) residencies was done. Brief descriptive statistics of key variables for the two survey waves are presented in table 5.3.1 below.

Table 5.3.1: Summary Descriptive Statistics of 2004 and 2009 Survey Data

Variable Categories	Observations	Mean	Standard Deviation
2003/2004			
Household size	19,158	4.83	2.908539
Per capita expenditure	19,158	31,894.75	40538.26
Urban	4,646		
Rural	14,512		
2009/2010			
Household size	73,329	6.02	1.061198
Per capita expenditure	73,329	53,533.12	22460.69
Urban	20,035		
Rural	53,294		

Source: Author's Combination

Preliminary analysis showed that there were basic inconsistencies in the data set. Hence we assumed that service access rates for each household group in a specific zone overlaps with corresponding rural and urban patterns to overcome this problem. This problem would have compromised our policy recommendations. Apart from the survey data, secondary sources such as the total actual revenue and expenditures on education and health across the three tiers of government, sourced from the Federal Ministry of Finance, the Central Bank of Nigeria (CBN) and the National Bureau of Statistics were also used.

Our third objective was analyzed along the following lines:

- a. Above 45 degrees line (Absolutely progressive - the poor receiving more benefits than the rich) pro-poor distribution;

- b. Above the Lorenz curve (Progressive and above the Lorenz curve - the poor benefiting more in relative terms); and
- c. Below the 45 degree line and the Lorenz curve (Regressive - the rich benefiting more than the poor).

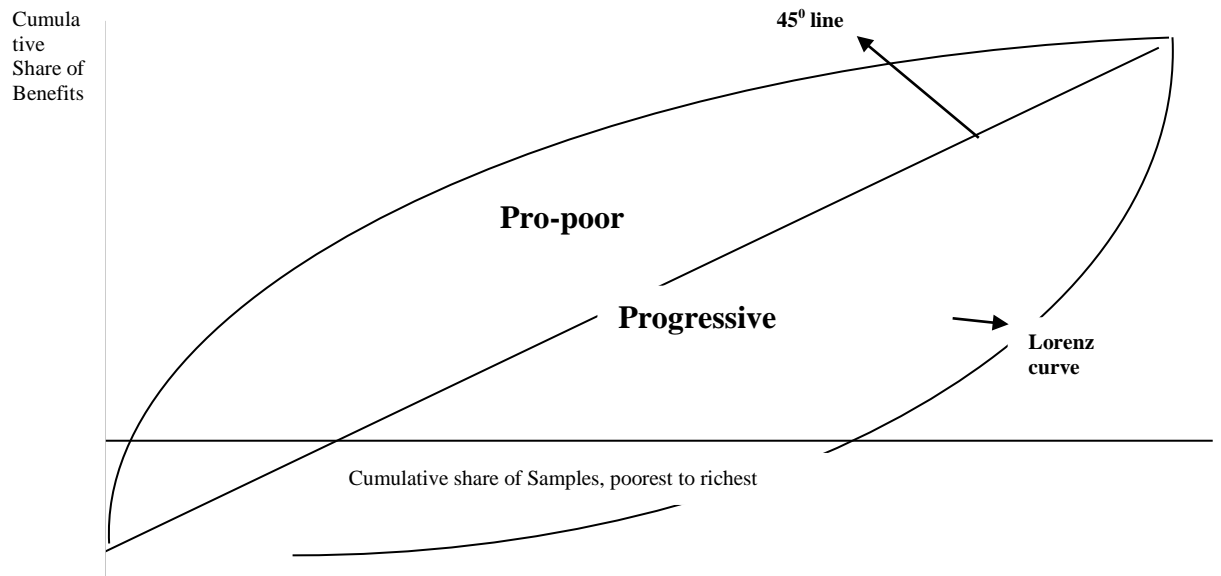
Furthermore, our dominance test results using the two household data sets (2003/2004 and 2009/2010) showed the spread of social services (education and healthcare) in Nigeria at different levels (primary, secondary and tertiary) by gender and location.

5.3.1 Dominance Test Results/Concentration Curve

The combination of cumulative plots on the y-axis and x-axis for net fiscal incidence and per capita consumption-based population quintiles respectively gives rise to a concentration curve. Thus, the progressivity or regressivity of public expenditure could be analyzed by comparing different benefit concentration curves. The concentration curves can indicate: (1) absolutely progressive when it is above the 45⁰ line, which is inequality reducing; (2) per capita progressive indicating that households at the lower (upper) end of the income distribution receive at least an equal level of benefit as upper (lower) income households; and (3) regressive showing that benefits are distributed more unequally because the concentration curve lies below the Lorenz curve.

Neutrality in benefit incidence is shown by the diagonal 45⁰line. This shows perfect equality in the distribution of expenditure benefits. On the other hand, when curves cross the diagonal line, there can be no determination of progressivity or regressivity using the Lorenz criterion.³⁰ See 5.0.10 below for details.

Figure 5.0.9 Concentration Curves and Public Spending Benefit Incidence



Source: Author's



5.3.2 Concentration Curves

Figure 5.0.10 2004 Concentration Curves for Primary Education and Healthcare in Nigeria

Figure 5.0.11: 2010 Concentration Curves for Primary Education and Healthcare in Nigeria

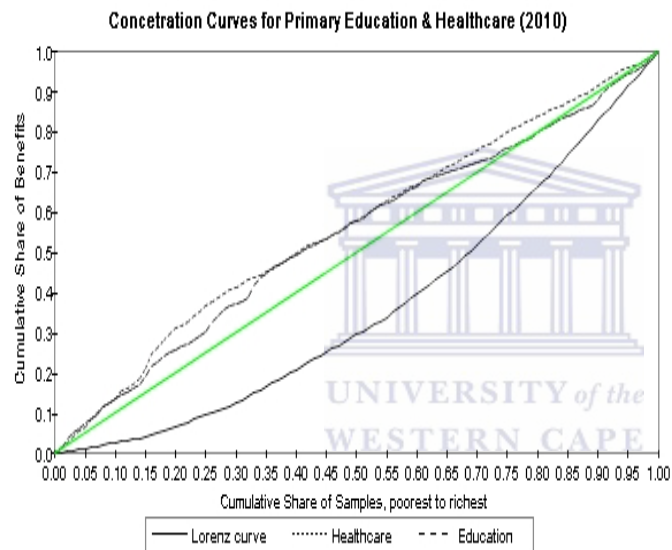
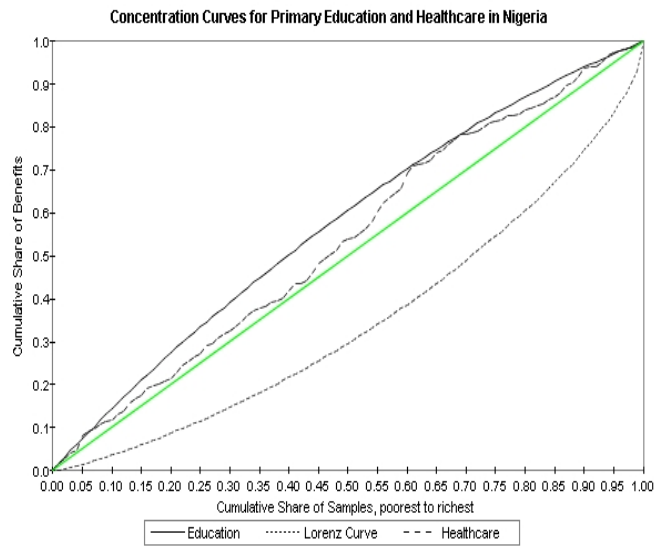


Figure 5.0.12 2004 Concentration Curves for Secondary Education and Healthcare in Nigeria

Figure 5.0.13 2010 Concentration Curves for Secondary Education and Healthcare in Nigeria

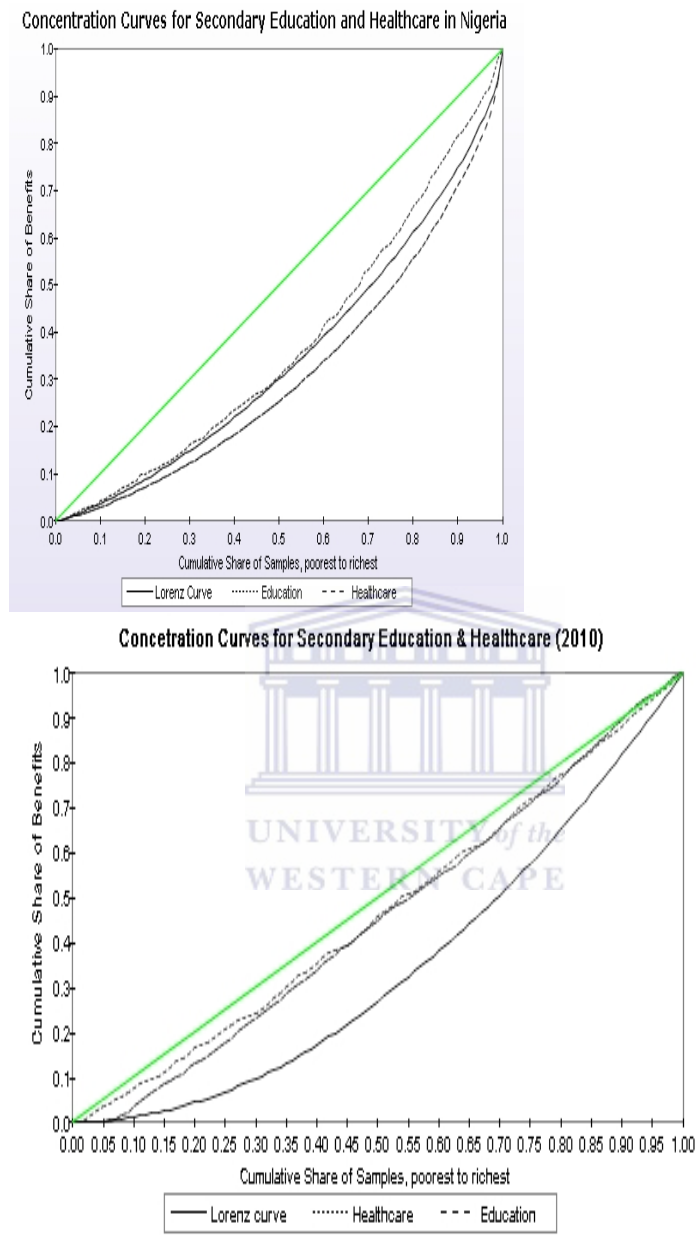


Figure 6.0.14 2010 Concentration Curves for Tertiary Education and Healthcare in Nigeria

Figure 6.0.15 2004 Concentration Curves for Education by Gender in Nigeria

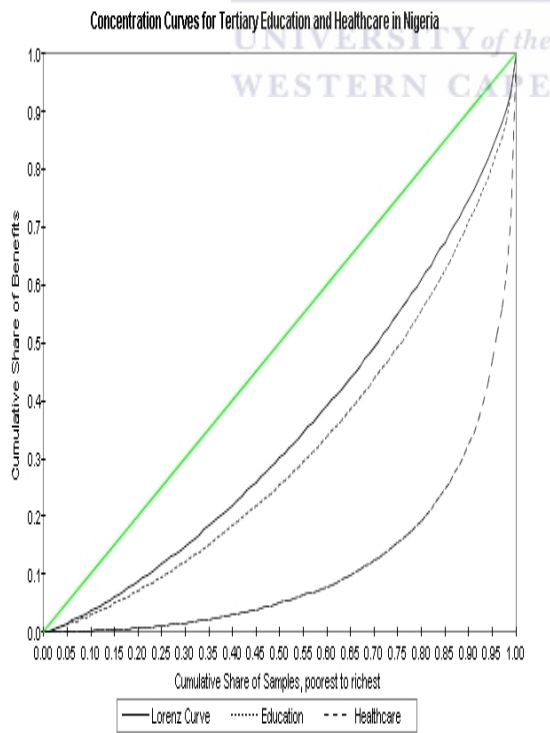
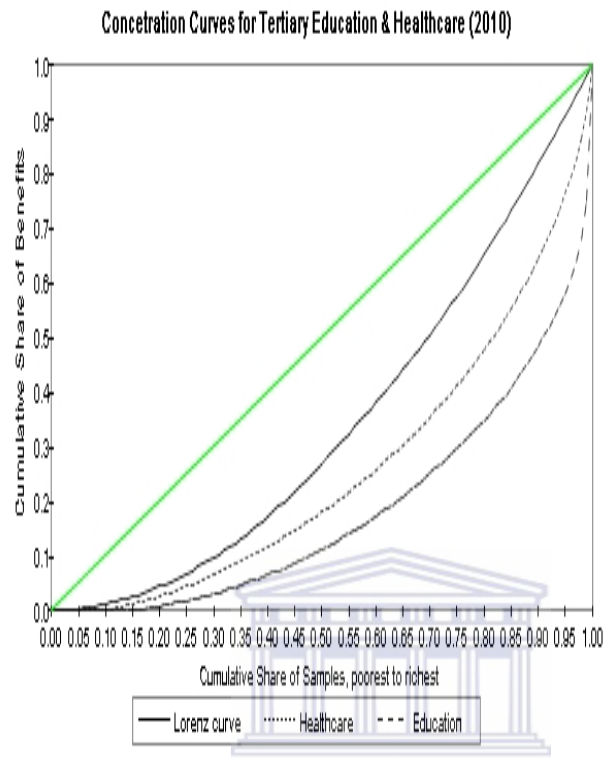


Figure 6.0.16 2010 Concentration Curves for Education by Gender in Nigeria

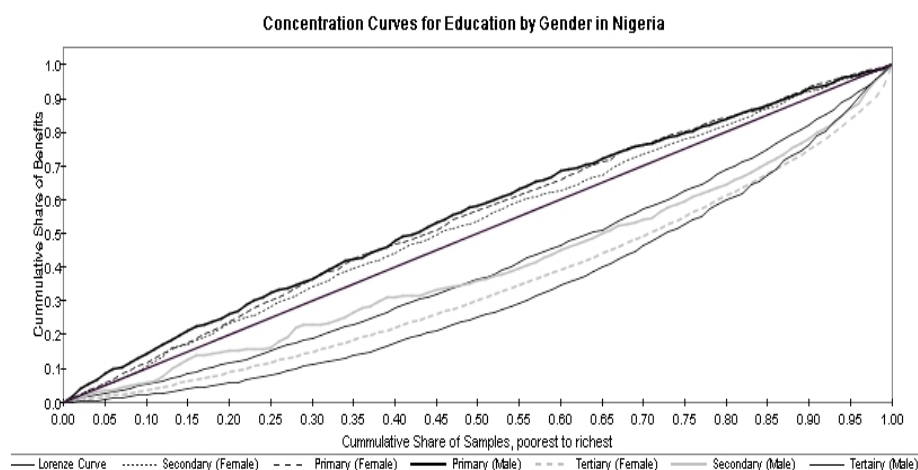


Table: 5.3.2 Dominance Tests Results Relative to the Lorenz Curve and the 45-degrees line in Nigeria (2003/2004 and 2009/2010 Household data sets)

	Primary Education		Primary Healthcare		Secondary Education		Secondary Healthcare		Tertiary Education		Tertiary Healthcare	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
2003/2004												
National	+	+	+	x	x	--	x	--	--	--	--	--
Male	+	+	+	x	x	--	x	--	--	--	--	--
Female	+	+	+	x	+	+		--	--	--	--	--
2009/2010												
National	+	x	+	--	+	--	+	--	--	--	--	--
Male	+	--	+	x	+	--	+	--	NA		NA	
Female	+	x	+	--	+	--	+	x	NA		NA	
Rural	+	x	+	x	+	--	+	--	NA		NA	
Urban	+	+	+	+	+	--	+	x	NA		NA	

Source: Author's Computation

Notes:

If the curves are statistically insignificant from one another, the corresponding cell is blank

(1) » compares the column's concentration curve with the Lorenz curve for per capita household expenditure

(2) » compares the column's concentration curve with the 45-degree line

+ » indicates that the benefits from the column's service are more concentrated among the

poor than per capita expenditure (Lorenz curve) (*for (1)*) or an equal per capita distribution (*for (2)*)

-- » indicates that the service is less concentrated among the poor

x » indicates that the concentration curves cross

NA » indicates Not Available

5.3.3 Primary Education and Healthcare Distribution Benefits across Gender and Location

There were about 2.02 million children in pre-primary schools in Nigeria and about 54,434 public primary schools with 24,422,918 pupils in all the primary schools (54.5 percent males and 45.5 percent females) in 2010. In-addition, there are about 16,723 public primary health care and 9,000 private primary healthcare centres across the country. Table 5.3.2 and the curves above indicate that Primary Education and Health were just progressive and not pro-poor using the 2010 survey for the entire country. The curves and supported by the table was just above the Lorenz curve and below the 45⁰ degree line. This scenario showed the same tendency for both rural and urban dwellers. This suggests that households at the lower or upper end of the income spread received an equal level of benefit with those, at the upper or lower end of the spread. This scenario is counterproductive and would not narrow the current inequality gap or reduce poverty level. However, analysis indicates a concentration of service among the poor that dwell in urban places for primary education while there is, less concentration for the poor in rural places. This is also counter intuitive when available statistics show that the majority of the poor live in the rural places. The 2010 survey also suggests that there is less concentration of benefits for poor females and the poor nationally regarding primary health. This is worrisome given the dynamics of reproductive health in the country.

The 2004 survey in comparison with the 2010 survey regarding primary education and health doesn't show much difference in terms of the beneficial spread. Using the former survey, education and health were pro-poor while health benefit spread was not constant and oscillated around the 45 degree line. Health benefits at the primary level were much lower than that of education. On the other hand, 2010 survey indicates a further diminishing of benefits for primary education below the 45 degree line at the end, showing a poor targeting of the poor despite the huge resources spent on the Universal basic Education Programme. Explaining this situation could be debated, however, there was an appreciable drop in net primary enrollment from 65.6 percent 2003 to 57.55 percent in 2010³¹ and drop in primary completion rates from 77.23 percent to 74.36 percent. Most of them who

are out of school (about 5,487,901 females and 5,045,204 males 10,542,105 in totals) are from the poorest households that live in rural communities across Nigeria. Primary health was more pro-poor, according to survey results and stayed above the 45 degree line. This shows a marked improvement nationally for the poor regarding primary health. This result is expected given the huge intervention in the sector by both the government and the donor community in Nigeria. Furthermore, strategic reforms have been carried out in the sector since the 2004 survey.

Furthermore, the progressivity of urban primary education and healthcare in the 2010 survey as shown by Table 5.3.2 does not explain quality or standard of services provided by the government at public schools and health facilities. However, a common trend observed in Nigeria is that the rich do not patronize government facilities because of sub-standard services. Therefore, it is highly plausible that the richer urban households' may not have benefited much from public primary education and health care services.

5.3.4 Secondary Education and Healthcare Distribution Benefits across Gender and Location

In Nigeria, subnational governments are in-charge of secondary education and health care except for unity schools where they receive about 1 percent intervention funds. Nonetheless, this is not the case for secondary health care. Secondary schools in Nigeria are divided into the junior secondary and the senior secondary schools. In 2010, there were about 7,129 public junior secondary schools with a total of 3,266,780 students (55 percent males and 45 percent females). In-addition, about 18,238 public secondary schools are in operation as well as 1,245 public secondary health care facilities and 5,000 private secondary health care centres across the country. Table 5.3.2 indicates a less concentration of benefits among the poor for both education and health at the secondary level. This is same for the national average; males and females; rural and urban dwellers. This shows a similar trend to that of primary education and health. The scenario is simply per capita progressive ,meaning that households at the lower (upper) end of the income distribution receive at least an equal level of benefit as upper

(lower) income households and not inequality reducing. For a country such as Nigeria, public resources should be channeled in such a way that it achieves both poverty and inequality reduction.

The curves as shown in Fig 5.0.13 and Fig 5.0.14 show that secondary health benefits were regressive using the 2004 survey results and simply progressive and not pro-poor with the 2010 survey. For education, the curves were below the 45 degree line for both surveys. This result was same for all locations (rural and urban) as well as gender (male and female) with the exception of male for secondary education which is statistically insignificant. The 2010 survey results showing progressive benefits for secondary education and healthcare can be attributed to the efforts by different levels of government. Several reports between 2004 and 2008 showed the weak links in both education health sectors. This improvement can be attributed to the strengthening of the junior secondary component of the UBE programme. The free three years have encouraged most poor parents to support their wards through the senior secondary level. Also, it has been observed that some of the state governments in Nigeria have extended the tuition free to the senior level, including a payment free Senior School Certificate Examination (SSCE). Most of the states in the north have done that to encourage high enrollment and improvement in female literacy rates.

2010 survey Results indicates just simple progressivity for secondary education and health care, but the improvement is a good step in the right direction when compared against the 2004 survey results. Comparing the outcome with WDI (2013) data shows that secondary students-teacher ratio improved in 2010 and net secondary enrollment rates increased from 31.86 percent in 2003 to 44.05 percent in 2010 with the enrollment rate for the female folk increasing from 28.02 percent in 2003 to 41.20 percent in 2010. However, male enrollment rates decreased from in 2010 corroborating the findings that only male secondary education was not as progressive as others. Similarly, several WDI basic health care indicators improved within the period. It is equally noteworthy to highlight the fact that since 2004, major donors' intervention has been centered on immunization and

most of them done in the rural places. This may also be one of the reasons; the direction of benefits in the secondary healthcare has improved.

5.3.5 Tertiary Education and Healthcare Distribution Benefits across Gender and Location

Tertiary education in Nigeria spans across Universities; Monotechnics; Polytechnics; Colleges of Technology and Colleges of Education while health, tertiary institutions include Federal Medical Centers; Specialist Hospitals and University Teaching Hospitals. In-addition, some states build and operate tertiary facilities or specialist hospitals. While the Federal Government is responsible for the management of teaching hospitals and medical schools for the training of doctors, the states are responsible for training nurses, midwives and Community Health Extension Workers.

Nigerian tertiary education and health care system have since shown a negative out-turn since the 1990s. Both 2004 and 2010 survey results show a regressive direction of benefits. Fig 6.0.15 and Fig 6.0.16 show education and health curves for both surveys below both the 45 degree line and the Lorenz curves. This is quite worrisome given the importance of tertiary education and health care towards the development of any country. Available statistics suggest that expenditure at this level is not pro-poor. This could suggest that the index of capture has further declined at this level prompting that the country may not reach the desired level of MDG target for 2015. The obvious question is what happens to the huge allocations to these sectors yearly, despite the increase in resources made available in the last two (2) decades.

The above findings corroborates findings of other studies from developing countries such as Ajay, Singh and Afridi (2000); Castro-Leal (1999); Sahn & Younger (2000); Rannan-Eliya et al (2001) for India, seven Sub-Saharan African countries, eight Sub-Saharan African countries and Bangladesh respectively. The Nigerian scenario could be responsible for the huge capital flight from the country for the search of better tertiary education. The Academic Staff Union of the Universities (ASUU) in Nigeria estimates that over US\$1 billion is spent privately from Nigerian parents to send their wards to tertiary educational institutions in

Ghana alone annually (The Nation Newspapers, April 10, 2014). The capital flight - without comparable human knowledge transfer to Nigeria - is even worse for statistics regarding Nigerian students in schools in Europe and the United States. In the United Kingdom alone, a Nigerian News Paper (*Daily Vanguard*) reported that in 2010, Nigerians fuelled the UK education sector to the tune of N246 billion or approximately one billion British Pounds Sterling.

Evidence in Nigeria from different studies (Ichoku 2008) indicates that in the health sector, the nature of the tertiary health care which includes tertiary facilities like teaching hospitals, medical colleges and specialist hospitals are in shambles and hence has been a boost for health tourism in favour of other countries with better health facilities. In the health sector, for example, most households across some states are already incurring catastrophic expenditure as they spend 40% or more of their discretionary (non-food) on health care. Also, Amakom and Ezenekwe (2012) analyzed whether there is a positive association between a household's poverty shortfall and its health out-of-pocket budget share from two standpoints. Their study found that high out of pocket (OOP) in healthcare has succeeded in changing the poverty situation (pushing households below poverty line) even households who were originally on or above the poverty line including some of the households that were originally in the 4th and 5th quintiles.

Statistical data from WDI seem to concur with the above findings, as it suggests that out-of-pocket health expenditure (percent of private expenditure on health) was 95.34 percent in 2010 while the Nigerian Medical Association (NMA) in 2012 opined that over 5,000 Nigerians travel to India and other countries monthly for medical treatment implying that the country spends between \$1bn and \$2bn in medical tourism annually. In 2011, the United Kingdom General Medical Council (GMC) blacklisted medical graduates from nine (9) Nigerian universities because they no longer meet the required standards for practice in the UK. That's a harbinger for a broken (failed) health care system.

5.4 Ordered Logistic Regression

The OLR model is applied to data sets with underlying proportional odds assumption. In this case, the proportions of household members of the population who would answer "severely poor", "poor", "moderate", "rich", and "very rich" are respectively p_1 , p_2 , p_3 , p_4 , p_5 . Then the logarithms of the odds (not the logarithms of the probabilities) of answering in certain ways are:

$$\begin{aligned} \text{Severely Poor, } & \log \frac{p_1}{p_2 + p_3 + p_4 + p_5}, 1 \\ \text{Severely Poor or Poor, } & \log \frac{p_1}{p_3 + p_4 + p_5}, 2 \\ \text{Severely Poor, Poor or Moderate, } & \log \frac{p_1}{p_4 + p_5}, 3 \\ \text{Severely Poor, Poor, Moderate or Rich } & \log \frac{p_1}{p_5}, 4 \end{aligned}$$

Positive coefficients indicate an increased chance of a subject with a higher score on the independent variable to be observed in a higher category. On the other hand, negative coefficients indicate that subjects with a higher score on the independent variable may be observed in a lower category. STATA does not report the Odds ratio like SAS; but the ratios can be derived from the coefficients by taking the exponent of the coefficient. These coefficients in the linear combination cannot be consistently estimated using ordinary least squares. These estimates were derived using the maximum likelihood technique. The iteratively re-weighted least squares is used in calculating the maximum-likelihood estimates.

5.4.1 Interpretation of Results

Total household expenditure per capita was used as an index of wellbeing and classified it into quintiles. We regressed on a set of predictors, namely, age of household head, gender of household head, household size, and House ownership. Other factors that were included in the model are, education of household head, health status, type of health facility visited and distance travelled to the facility.

Number of observations = 1,021
 LR chi2(8) = 273.47
 Prob > chi2 = 0.0000

Log likelihood = -1506.1438 Pseudo R2 = 0.0832

Table 5.4.1: Ordered Logit Regression

Quintile	Coefficient	Std. Err	Z	P> z	95% Conf. Interval	
AHH	.008721	.0052817	1.65	0.099	-.0016309	.0190729
SHH	-.388972	.1435838	-2.71	0.007	-.0016309	.0190729
HHS	-.243525	.0226805	-10.74	0.000	-.2879781	-.199072
HO	.0671506	.0495002	1.36	0.175	-.029868	.1641692
EduHH	.4240912	.0604547	7.02	0.000	.3056021	.5425802
HS	-.2278804	.0718137	-3.17	0.002	-.3686326	-.0871283
HFv	-.1851168	.0322818	-5.73	0.000	-.248388	-.1218457
HosD	-.043915	.0084714	-5.18	0.000	-.0605186	-.0273115
_cut1	-3.598971	.5145723	(Ancillary parameters)			
_cut2	-2.425274	.5097179				
_cut3	-1.409424	.5056871				
_cut4	-.2436745	.5027605				

Approximate likelihood-ratio test of proportionality of odds across response categories:
 chi2(24) = 58.33
 Prob > chi2 = 0.0001

omodel logit estimates from Table 5.4.1

Iteration 0: log likelihood = -1642.8771
 Iteration 1: log likelihood = -1508.2417
 Iteration 2: log likelihood = -1506.1494
 Iteration 3: log likelihood = -1506.1438

5.4.2 Model Summary

a. Iteration – This shows a listing of the log likelihoods for each iteration. Just as the binary and multinomial regressions, the ordered logistic regression uses maximum likelihood estimation, which is an iterative procedure. First iteration is the log likelihood of the null model, which represents a model with no predictors. At the next iteration, the predictor(s) are included in the model. As the iteration increases, the log likelihood increases. When the difference between successive iterations is very small, the model is said to have "converged", the iterating stops, and the results are displayed.

b. Log Likelihood - This is normally used as tests in nested models or in the Likelihood Ratio Chi-Square test of predictors' regression coefficients in the model being simultaneously zero.

c. Number of Observations - This refers to the number of observations used in the regression model. Normally, this value may be less than the number of cases in the dataset if there are missing values in the equation.

d. LR chi2(8) - This is the Likelihood Ratio (LR) Chi-Square test that at least one of the predictors' regression coefficient is not equal to zero in the model. The number in the parenthesis indicates the degrees of freedom of the Chi-Square distribution defines the number of predictors in the model and used for testing LR Chi-Square.

e. Prob > chi2 - This is the probability of getting a LR test statistic as extreme as, or more so, than the observed under the null hypothesis; the null hypothesis is that all of the regression coefficients in the model are equal to zero. In other words, this is the probability of obtaining this chi-square statistic (273.47) if there is in fact no effect of the predictor variables. This p-value is compared to a specified alpha level, our willingness to accept a type I error, which is typically set at 0.05 or 0.01. The small p-value from the LR test, <0.00001, would lead us to conclude that at least one of the regression coefficients in the model is not equal to zero, which is the case in our model. The parameter of the Chi-Square distribution used to test the null hypothesis is defined by the degrees of freedom in the prior line, chi2(8).

f. Pseudo R2 - This is McFadden's pseudo R-squared. Logistic regression does not have an equivalent to the R-squared that is found in OLS regression; however, many people have tried to come up with one. There are a wide variety of pseudo R-squared statistics which can give contradictory conclusions.

4.4.2.2 Parameter Estimates

g. Quantile - This is the response variable in the ordered logistic regression. Underneath it are the predictors in the models and the cut points for the adjacent levels of the response variable.

h. Coefficient. - These are the ordered log-odds (logit) regression coefficients. Standard interpretation of the ordered logit coefficient is that for a one unit

increase in the predictor, the response variable level is expected to change by its respective regression coefficient in the ordered log-odds scale while the other variables in the model are held constant. Interpretation of the ordered logit estimates is not dependent on the ancillary parameters; the ancillary parameters are used to differentiate the adjacent levels of the response variable.

AHH - This is the ordered log-odds estimate for a one unit increase in age indicator on the expected Quintile level given the other variables are held constant in the model. If a household head were to increase his age score by one point, his ordered log-odds of being in a higher welfare quintile category would increase by .008721 while the other variables in the model are held constant. The coefficient is not significant at the 0.05 test but lies within the 95% confidence interval.

SHH - This is the ordered log-odds estimate for either being a male or female head of household. The ordered logit for households headed by males being in a higher category of welfare quintile is -.388972 less than females while the other variables in the model are held constant.

HHS - This is the ordered log-odds estimate for a one unit increase in household size indicator on the expected Quintile level given the other variables are held constant in the model. If a household head were to increase in size score by a point, their ordered log-odds of being in a lower welfare quintile category would increase by -.243525 while the other variables in the model are held constant. This result is highly significant and lies within the 95% confidence level.

HO – This represents the ordered log-odds estimate for a one unit increase in the response for home ownership on the expected welfare quintile level given the other variables are held constant in the model. A higher welfare quintile category would increase by .0671506 all things being equal for a unit change in response.

EduHH - This is the ordered log-odds estimate for a one unit increase in the education of the head of the household on the expected quintile level given the other variables are held constant in the model. If a household head were to

increase his education score by a point, his ordered log-odds of being in a higher welfare quintile category would increase by .4240912 while the other variables in the model are held constant. The coefficient is highly significant at the 0.05 test but does not lie within the 95% confidence interval.

HS - This is the ordered log-odds estimate responses in Health Status of household members on the expected welfare quintile level given the other variables are held constant in the model. This value is negative (-.2278804) and indicates the possibility of being in a lower welfare quintile category as the health status deteriorates. The coefficient is also highly significant but lies outside the 95% confidence interval.

HFv - This is the ordered log-odds estimate for a one unit increase in Health Facility indicator visited by households on the expected quintile level given the other variables are held constant in the model. If a household head were to visit more of unorthodox health places, their ordered log-odds of being in a lower welfare quintile category would increase by -.1851168 while the other variables in the model are held constant. This result is highly significant but does not lie within the 95% confidence level.

HosD - This is the ordered log-odds estimate for a one unit further travel to a health facility on the expected Quintile level given the other variables are held constant in the model. If household members were to travel a further kilometre in distance score by a point, their ordered log-odds of being in a lower welfare quintile category would increase while the other variables in the model are held constant. The value is negative (-.043915)

Ancillary parameters - These refer to the cutpoints (a.k.a. thresholds) used to differentiate the adjacent levels of the response variable. A threshold can then be defined to be points on the latent variable, a continuous unobservable mechanism/phenomena, that result in the different observed values on the proxy variable (the levels of our dependent variable used to measure the latent variable).

_cut1 - This is the estimated cutpoint on the latent variable used to differentiate low very poor (**quintile**) from poor, moderate, rich and very rich quintile when values of the predictor variables are evaluated at zero. Subjects that had a value of -3.598971 or less on the underlying latent variable that gave rise to our **quintile** variable would be classified as very poor.

_cut2 - Subjects that had a value of -2.425274 or more for the underlying variable which is latent is the quintile classified as the poor.

_cut3 - Subjects that had a value of -1.409424 or more or more for the underlying variable which is latent is the quintile classified as the poor.

_cut4 - Subjects that had a value of -.2436745 or more or more for the underlying variable which is latent is the quintile classified as the rich.

i. **Std. Err.** - These are the standard errors of the individual regression coefficients. They are used in both the calculation of the **z** test statistic, superscript **j**, and the confidence interval of the regression coefficient, superscript **k**.

j. **z** and **P>|z|** - These are the test statistics and p-value, respectively, for the null hypothesis that an individual predictor's regression coefficient is zero given that the rest of the predictors are in the model. The test statistic **z** is the ratio of the Coefficient to the Std. Error of the respective predictor. The **z** value follows a standard normal distribution which is used to test against a two-sided alternative hypothesis that the Coefficient is not equal to zero. The probability that a particular **z** test statistic is as extreme as, or more so, than what has been observed under the null hypothesis is defined by **P>|z|**. The **z** test statistic for all the predictors have been found to be statistically different from zero in estimating welfare Quintile except AHH and HO because of our alpha level to 0.05. However, if we set alpha level to 0.10, both variables become significant.

k. [95% Conf. Interval] - This is the Confidence Interval (CI) for an individual regression coefficient given the other predictors are in the model. For a given predictor with a level of 95% confidence, we'd say that we are 95% confident that

the "true" population regression coefficient lies in between the lower and upper limit of the interval. : The CI is the same as the **z** test statistic and very illustrative. It also identifies a range where a true parameter may lie. If the CI includes zero, we accept the null hypothesis that a particular coefficient is zero given the other predictors are in the model.

5.4.3 Testing Model Assumptions: Tests of Parallel Regression Assumption

The Omodel and Brant Tests are used in this regard. The `omodel` and `brant` command performs both tests respectively. An insignificant test statistic provides evidence that the Parallel Regression Assumption have not been violated.

First Test: (`omodel` logit estimations)

Approximate likelihood-ratio test of proportionality of odds across response categories:

chi2(24) = 58.33

Prob > chi2 = 0.0001



The null hypothesis is that there is no difference in the coefficients between models. As the note at the bottom of the output above indicates, these tests are significant.

Second Test: (Brant Test of Parallel Regression Assumption):

Table 5.4.2: Brant Test of Parallel Regression Assumption

	chi2	p>chi2	df
All	63.08	0.000	24
AHH	4.70	0.195	3
SHH	3.07	0.381	3
HHS	1.26	0.740	3
HO	9.90	0.019	3
EduHH	1.95	0.582	3
HS	20.31	0.000	3
HFv	5.83	0.120	
HosD	9.34	0.025	

A significant test statistic provides evidence that the parallel regression assumption has been violated.

The likelihood ratio chi-square value derived from the `ologit` command is not significantly different from the value obtained from the `brant` command. It is not

at all unusual to have a violation of this assumption. This is always the case with large sample estimations using ordered logit regression technique (Scott Menard 1997; Kant Borooah 2001 and Lawrence Hamilton 2013).

Nonetheless, a further look at the coefficients from the binary logits shown below, confirms that the variations of the coefficients in the four equations are not significant, thus our acceptance of the model. We have used the **detail** option here, which shows that the estimated coefficients for the four equations are not too divergent. (We have four equations because we have five categories in our response variable.)

Table 5.4.3: Estimated Coefficients from Binary Logits (Brant Test)

Variable	y_gt_1	y_gt_2	y_gt_3	y_gt_4
AHH	0.014 1.80	0.016 2.45	0.006 0.88	-0.003 -0.30
SHH	-0.519 -2.48	-0.243 -1.41	-0.327 -1.81	-0.195 -0.88
HHS	-0.232 -7.61	-0.218 -8.11	-0.243 -8.14	-0.227 -6.21
HO	0.222 2.98	0.122 2.03	-0.019 -0.31	-0.046 -0.56
EduHH	0.490 5.25	0.405 5.40	0.461 6.05	0.410 4.61
HS	0.082 0.81	-0.295 -3.44	-0.340 -3.79	-0.277 -2.56
HFv	-0.144 -3.04	-0.160 -4.12	-0.188 -4.58	-0.291 -5.26
HosD	-0.047 -4.73	-0.039 -4.26	-0.033 -3.33	-0.015 -1.38
_cons	1.916 2.63	1.677 2.78	1.811 2.93	0.936 1.28

Our continued use of this model (ordered logistic regression) is because the practical implications of violating this assumption are minimal. Nonetheless, the use of a multinomial logit model instead, would free us of the proportionality assumption, but it is less parsimonious and often dubious on substantive grounds. Furthermore, dichotomizing the outcome and using a binary logistic regression would lead to further loss of information and it would alter substantive conclusions.

5.4.3.1 Coefficient Interpretations

An increase in the household head age influenced the welfare position in the current context. Welfare status increases as age increases, supposing a corresponding increase in human capital (education and/or working experience)³². This is mainly why a negative relationship is hypothesized between the age in quadratic form and level of income. Furthermore, we statistically tested the non-linearity hypothesis in this study, by introducing into the OLR model, the non-linear terms of the covariate AGE (e.g. age-squared, age-cubed, etc.). The test for non-linearity indicated that the current effect-coefficients is valid. 'AGE' in particular is known for its statistical notoriety on most human problems whose dynamics at individual level change with Age over time. As a result of this problem, we fitted one other model in which an extra non-linear term for Age is included. There was no statistically significant improvement in the fit of the model compared to the current linear model that was fitted.

Our result rather inclines to life-cycle hypothesis which maintains that poverty oscillates depending on the age. At a younger age, it tends to be on the high side and decreases during the middle ages and increases with age (Datt and Jolliffe, 1999; Rodriguez, 2002; Gang, Sen and Yun, 2004). This age framework negates some cultural practices in Northern Nigeria, where there are predominantly younger heads of households and incidentally higher incidence of poverty. A plausible reason for this could be lack of adequate skill sets at a much younger age. Therefore, the government could enlighten the public on the need to acquire relevant skills to enable them have stress free livelihoods.

Also, statistical estimates indicate that the ordered logit for households headed by males being in a higher category of welfare is $-.388972$ less than female headed households when other variables remain constant. Thus, there are chances that female headed households will be observed in a higher category of welfare and vice-versa in the sample. Our results discarded the feminization of poverty general framework that women or female headed households are more prone to poverty

due principally to low education and lack of opportunity to own assets such as land amongst others. In the SE Nigeria, there is no discrimination against women in the labor market, and women tend to have higher education than men. Feminized poverty may be existent in the Northern part of Nigeria, where discrimination obtains mainly against the women folk. This practice has to be discouraged because of its negative ramifications. However, analysis using the SE region shows that poverty is not a gender neutral condition as women and men experience poverty in distinctive ways. Our subsequent extrapolating to other parts of Nigeria, especially the Northern part of Nigeria is done very cautiously, with a clear acknowledgement of variations in local conditions from one region to another in the country. Furthermore, the results suggest that public spending on education, health and other human capacity, when targeted at women, increases the chances for women to access formal jobs and thus break free from the poverty trap. Thus, the government should focus on increasing educational levels to ensure that productive jobs are created for the newly educated and women in particular³³.

Furthermore, estimates indicate that households with the more number of members will also be observed in a lower category of welfare. This is consistent with conventional knowledge that size influences household welfare. The larger the size the larger the resources required to meet basic needs of food and other necessities. In Nigeria and most part of Africa, children are considered as a part of the household's work force to generate household income. This high number of children obviously impedes basic investment in human capital, thus maintaining the low-income status of the household, and thereby supporting a poverty-fertility trap. Available literatures also indicate that large households are associated with poverty (Lanjouw and Ravallion, 1994; Szekely, 1998; Anyanwu, 1997, 1998a, 2005, 2010, 2012; and Gang, Sen and Yun, 2004). This is in tandem with our results. However, the absence of a social security system in tends to increase fertility rates among the poor. The general argument is that for the parents to have some economic support from children when parents reach old age there is need for more children. Furthermore, Schultz (1981) indicates, high infant mortality rates among the poor tends to provoke excess replacement births or births to insure

against high infant and child mortality, which will increase household size. It is, therefore, often hypothesized that the larger the household size the higher the likelihood of falling below the poverty line.

Home ownership variable showed an interesting result indicating the possibility of home owners belonging to a lower category than those renting, having an inheritance or residing in a family (communal) property. The argument posits that more savings would have been made by households sampled if they lived in an inheritance or communal owned houses. It should be noted that this might not always be the case. However, the provision of affordable housing becomes imperative for reduction of poverty.

Education, being a measure of human capital, is hypothesized to be positively correlated with income, and therefore welfare. It follows that the more educated the household head, the less the probability that the household will belong to a lower category of the quintile. Generally, education increases the stock of human capital, which in turn increases productivity. Since labor is the most important asset of the poor, increasing the education of the poor will tend to reduce poverty and a higher level of welfare. However, the poor most times are unable to afford good education, even if it is provided publicly, because of the high opportunity cost that they face. Plamer-Jones and Sen (2003) and Anyanwu (2005, 2010, 2011) have found, rural households in India whose main earning member does not have formal education or has attended only up to primary school are more likely to be poor than households whose earning members have attended secondary school and beyond. Thus government policies need to become more targeted to avoid this scenario.

The type of accommodation had indirect effects on healthcare and school enrolment. Furthermore, the demand for essential services increased the growth of unsanitary urban slums. Thus, provision of accommodation by the government in a subsidized pattern could reduce the level of poverty. Spending less by households on houses raises the probability of climbing into a higher level of welfare quintile.

Health status of the household is also considered to influence the level of poverty for the family. Households that indicated lower status for health would possibly belong to a lower category of welfare than households with a better health condition. This analysis is also true for households that used conventional health facilities than unorthodox means. The use of hospitals and clinics had a positive relationship with the level of welfare. Distance travelled for medical attention did influence the level of welfare for households in the model. Further travel to health centres impacted negatively to the level of welfare. The health status of a person or group of people is a clear indication of their welfare position. Lack of health is many times, a result of poverty. In response to the unavoidable intersection between poverty and lack of health, most of the MDG targets are partially related to health and three goals (4, 5 and 6) in particular were created to expressly address the main elements. MDG 4 aims to reduce infant mortality by two-thirds by 2015. MDG 5 calls for increased efforts to improve maternal health, especially to reduce by three-quarters the maternal mortality ratio and achieve universal access to reproductive health. MDG 6 aims to combat HIV/AIDS, tuberculosis, malaria and other diseases. A focus on these issues through targeted expenditure and increasing of access would support positive, MDG goals.

Howbeit, the effect of poverty goes beyond the measurement of a household's welfare. Poverty concept has many dimensions and may include inadequate access to government utilities and services, environmental issues, limited infrastructures, ignorance, poor healthcare, insecurity, socioeconomic exclusion. NBS (2010) report summarizes that the burden of demand of social services effected enrollment in schools, primary health care access and rise in unsanitary urban slums. For MDG attainment and poverty reduction to occur, there is the need to enhance and improve access to social services, especially health and education. This would create a multiplier effect on other aggregates.

Chapter Six: Conclusion and Recommendation

6.1 Summary and Conclusion

Our inferences in chapter five are supported by, Foster et al. (2002) in their case studies of selected African countries. They summarized, that the relationships between poverty reduction approach and public spending management in Ghana, Malawi, Mozambique, Tanzania and Uganda indicated that the efficiency and effectiveness of public spending were very low and benefited largely the wealthy. However, the nexus between the growth rate of population and socioeconomic development is also complex in that high fertility, productivity, poverty and migration interact in ways that make it very difficult to separate the causes from the effects. For instance, one of the most important characteristics of population dynamics in Africa is that its fertility rate is the highest in the world. This is attributed partly to the need of vulnerable households to meet labour demand in a predominantly labour-intensive agricultural production system. These households also desire to have a large number of children to mitigate against poverty in times of old age. Generally, the quantitative evidence of these relationships is most-times very ambiguous.

Government spending is justified on the basis of equity and efficiency. That is, government spending should promote efficiency (i.e., to correct market failures and/or generate positive externalities) and equity (i.e., to improve the access of the poor to important services or distribution of economic welfare). In this context, the government's role in health and education expenditure is supported on the following grounds. Firstly, basic education and health in particular are perceived to yield social returns in excess of private returns as it tends to be associated with positive externalities. The benefits from these sectors are seen in the higher productive capacity of an individual and are, thus, internalized by him. Furthermore, basic literacy affords the society at large important additional benefits by facilitating social cohesion and nation-building. Also, women's education is linked to fertility reduction as well as child health and nutrition. At the same time, primary education is also associated with improved technological adoption among farmers. Given these reasons, complete reliance on private

provision would result in under investment in the these sectors. In-addition, because not all of the returns to education and health are captured by the relevant statistical authorities. This to a large extent is attributed to the poor state of most families. Some of them, especially the poor ones, may decide not to send their children to school or afford local health facilities. This may help explain why some children drop out of school and rather asked to help with household chores or work on farms, etc. to support the education and health needs of others. No doubt that good education and stable health are major determinants of an individual's or the households future earnings stream, and a key ingredient in breaking the cycle of poverty. However, the cost of education, especially higher education and tertiary health, are generally beyond the reach of poor families in many developing countries and Nigeria in particular. At the same time, capital market underdevelopment and imperfections in Nigeria have severely limited the ability of poor families to borrow to finance the costs of education or health.

In this regard, government cannot but play a major role in education and health spending if existing inequalities in socioeconomic opportunities are to be minimized. Therefore, to record success in reduction of poverty, there must be a higher public investment in basic social services. Development experts are in agreement that rapid and sustained growth is effective in reduction of poverty and inequality. Also, available literature and statistics indicate that economic growth accounts for more than 80 percent of poverty reduction and has lifted about 600 million above the poverty line since 1980. Better growth trajectory for poor countries is fundamental to achieving the MDGs; while ensuring that more countries achieve and sustain high per capita growth rates to sustain the momentum. During the 1990s and for the first time, growth rates in the developing world surpassed those of developed countries. This, however, started to decline sharply in the 2000s. MDG lessons in a global context aside, there are a number of difficult issues that developing countries are grappling with towards the run up to 2015. These include the post- economic crisis context and fiscal squeeze; climate change; demography and urbanization amongst others. These evolving issues will obviously change the dynamics for 2015 MDG attainment to

be different from that in the run up to 2000. Furthermore, there is already emerging evidence that the recent global crisis, it is leading to significant changes in the context for development more broadly.

The report of the Harmonized Nigeria Living Standard Survey (HNLSS, 2010) shows that 69% of Nigerians (112 million persons) in the estimated population of 163 million Nigerians are living in poverty represents a sharp increase from the Nigeria Living Standard Survey report of 2004 showing that 54.4% representing (68 million persons) in the estimated population of 123million Nigerians were living in poverty. Statistical records suggest that poverty incidence worsened in the country between 2004 and 2010. On the average, the number of Nigerians living below the poverty line scaled up (64% rise in poverty incidence) during the period while the population increased over the same period. Following the current trajectory, it becomes very doubtful if the MDG 2015 Goal of halving extreme poverty is at attainable in Nigeria. This challenges the current MDGs poverty and governance framework in the country. Both from poverty and gender perspectives, institutional features of the current budget process make it difficult for the government to achieve its objectives through public expenditure policy. Therefore, an exploration of an alternative framework for the eradication of extreme poverty in Nigeria has to be developed. Furthermore, in order to attain MDG targets, setting of clear policy objectives based on equity, poverty reduction framework that is gender sensitive must be done.

Poor education and lack of health care leads to poverty and makes the poor further vulnerable. Nonetheless, health care and education services not only imparts specific knowledge and develops general reasoning skills, but leads to changes in beliefs and values, as well as attitudes toward work and society. The lack of education and health access contribute to the marginalization of the poor. Focusing on raising health and education standards by the authorities in Nigeria could enhance empowerment, which represents the expansion of assets and capabilities. This will support households in Quintiles 1 and 2 to participate fully; negotiate and hold accountable institutions that affect their lives. For the

Government of Nigeria to meet the challenge of initiating an inclusive rapid growth and social transformation. Expenditure frameworks must be derived from an evidence based analysis and evaluation of “who gets what, when and how”. Therefore, poverty and inequality reduction strategies in Nigeria, must incorporate distributive features and high level of inclusiveness. This could be achieved by promoting qualitative rapid human capital development. Public policy should go beyond building people’s capacities but rather matching capacities with opportunities in order to significantly link the demand and supply of human capital. Furthermore, government should invest more on social services and enhance access as well as benefits to education and health care with a focus on outcomes and not on outputs. A revision of the existing government policy framework, the provision of vocational training centers to equip the youth population, in particular for self-employment would support positively, poverty reduction in the system and narrowing of inequalities. Quality social infrastructure in the country would facilitate business and provide the enabling environment, and attract domestic and foreign investments, amongst others.

The expansion of basic education and health care in Nigeria would lead to the scaling up on the other MDG targets across the general populace, especially for the socially and economically marginalized groups (those in the lower quintile). Both sectors are powerful drivers for poverty reduction and sustainable economic development. This will empower the populace with the skill set necessary to increase production and income. This scenario will further create opportunities for employment. The expansion of quality learning and health care depends on social change and long-term prospects for growth. Emphasizing the effects of stronger linkages between education and healthcare in the current Transformation Agenda (TA) would revitalize the profile of education on health care and political agendas, and the other MDGs. The proposed two distinct frameworks necessary for facilitating movement towards the other MDGs in Nigeria, through further development of the education and health system are:

1. Improving access and benefits to quality education and healthcare services. This requires increased and better utilization of domestic and external expenditure (education/health); accountability and transparency in the delivery of education and health services, programme based budgeting, inclusive institution building and greater political will. This will translate into increased attention given to both sectors at the highest decision-making levels.
2. Activating sector-wide initiatives that support vulnerable groups. This has the tendency to influence positively, the impacts of education and health on other MDGs.

6.2 Policy Recommendations (Poverty Reduction and MDG Attainment)

Most aspects of population policies are related to those for pro-poor health and education. For instance, policies involving education for girls as well as programs to reduce maternal and infant mortality are likely to reduce fertility. As with health and education, high fertility is also both a cause and a consequence of poverty. High fertility compromises household consumption per family member, increases the vulnerability of maternal mortality for older mothers with higher birth-order of children and reduces the opportunity for escaping from poverty for poor households. These families, may not have the capacity to invest in their children's education and health. Poverty, in turn, is a likely cause of high fertility because poorer families are more likely to respond to higher infant and child mortality by having more children. The challenge for policy framework in Nigeria is twofold, namely; (a) that population dynamics count and matter; (b) the existence of an all-inclusive growth, that would encapsulate the poor.

Thus, the research challenge of improving knowledge and technological investments for the above frameworks remains a daunting task for the authorities. Thus, to reduce inequality and poverty incidence, a sustained categorization of the population into quintiles and inclusion of the poor in the growth proceeds and its sharing would be fundamental. Actualizing the inclusion of the poor in the fiscal process requires targeted improvements in their social, physical and human

capital. The government would have to re-strategize its primary health care programs and focus explicitly on the vulnerable population. On the other hand, a revamping of the education curriculum with emphasis on technical and vocational skills would benefit the poor most. Furthermore, targeted subsidy and expanding non formal education programmes would also assist the poor in gaining literacy; acquire skills and making a positive transition. Summarily, the trajectory and speed of these initiatives would matter for poverty reduction.

Authorities in Nigeria, needs to contain budgetary deficit and to reduce it to the barest minimum. The target should be at the lowest possible rate when compared to the GDP. In doing this, monetary and fiscal authorities must avoid deficit monetization often used to support the macroeconomic environment. In-like manner, the functional budgetary allocations should be rearranged to would improve the shares of spending going to social services (education and health care in particular) and physical infrastructures. Further decentralization of fiscal powers to state and local governments would support efficiency and enable the economy to capitalize on local entities' informational edge. In-addition, public spending on utilities in disadvantaged zones will support positively the poverty reduction drive initiatives and attainment of MDGs in Nigeria.

In terms of the post-2015 framework, the key question for Nigeria is to decide the rules of engagement and what should constitute the process for discussions? If there is to be a framework for post-2015 to address gaps in poverty reduction measures and MDGs, its development needs to start soon for Nigeria. Two broad strategies are recommended that could fast-track the new process:

1. New Paradigm Shift

A. Setting of New Targets and Agreeing on Coordinated Action Plan

- i) Profiling the population and categorization into socioeconomic groups;
and
- ii) Using the strengths and weaknesses of the different quintiles in resource allocations.

B. Combining Policies and Programmes for Social Sectors in Nigeria

- i) Investments focussed on the vulnerable and poor Quintiles such as safety nets, cash transfer etc.;
- ii) Using education and health as a long-term development strategy of creating productive jobs for the poor group. This will further increase the value of their current assets;
- iii) A mix of balance between economic and productive efficiency in the social sector of the economy. This could be achieved through policy consistencies and coherence; and
- iv) Scaling down of inequalities in both income and access to assets. This will strengthen, the positive effects of economic growth on poverty reduction.

2. Focused Policies and Investments in Rural Areas

- i) The fight to meet MDGs in Nigeria should be concentrated in the rural areas, where about 65 percent of the vulnerable group resides in these places. These groups derive their livelihoods from agriculture and related activities. Education focused initiatives in enhancing food security in the rural areas would improve the productivity of smallholder agriculture for the people. The derived multiplier effects will contribute to improved standards of nutrition, and open up opportunities for broadened participation in market-led growth;
- ii) Public programs that create employment for the able-bodied poor;
- iii) Scaling-up of rural infrastructure facilities will support research and communications; functioning of markets; and enhancing rural based institutions. The multiplier effects of these activities will also activate the general pursuit of MDG goals; and
- iv) Developing rural strategies within the context of poverty reduction framework will target poverty where it is concentrated.
- v) Focused measures, which promote access to reproductive health services and rights, social, economic and political empowerment.

6.3 Scientific Contribution of the Study

Our analysis have a number of policy specific uses. An understanding of the demographic dynamics that accompany social sector spending suggests complementary investments, for example, investments in family planning, can greatly improve other health related issues which translate into improvements in the standard of living. Specifically:

1. The results contribute to a more nuanced understanding of the mechanisms and nexus that underlie the relationship between public sector spending and socioeconomic growth; as well as information on the distributional impacts of government expenditure;
2. Analysis highlights the sensitivity of government expenditure to demographic dynamics (age structure changes);
3. The Study highlighted potential policy shocks on select categories of expenditure via population dynamics, thus shedding more light on population-expenditure nexus; and
4. The analysis will support policy makers in their adjustment of fiscal policy, to increase inclusive participation, productivity, bridge income inequalities and reduce poverty.

6.3.1 Limitation of Study

Chapter 5 and 6 discussed the overall implications of the findings of the current study. Limitations in the research design, methods of data analysis and adequacy of sample/data collection are also discussed, particularly within a Nigerian context in the relevant sections.

The Error Correction Model (ECM) we used, measured the speed at which deviations from the long-run equilibrium are corrected. One of the major drawbacks of this estimation technique in panel data application, is that differences in adjustment speeds and dynamics across different individuals are not taken into account. It assumes that model parameters and statistics are homogenous and dependent on one another. As a result of this drawback, we tested for robustness and validity of the model at the least, to authenticate our

results and findings. Also, the Benefit Impact Analysis technique does not provide the mechanism to rank the significance of one benefit factor versus the other. That is, it does not prioritize issues. This is a weakness of the technique, but however, our results are quite informative to necessitate policy actions from the government. Furthermore, our BIA approach does not address the policies that might bring about program expansion for both health and education. Rather, it makes a more general appeal to the political economy behind the policies to argue that, whatever policies are used, the outcome must respect the political constraints implied by each group's cost, benefits, and political power.

Another limitation of our analysis is the use of the OLR method. One major demerit of the OLR method is the assumption that the relationship between the mean of the dependent variable and a set of independent variables follows a logistic distribution and that errors are binomially distributed. In reality, this may be untrue, due to over-dispersion in the dependent variables. In addition, some data points which are termed influential values may have undue influence on the overall fit of the model, either on the set of parameter estimates or on a single parameter estimate. Nonetheless, this weakness does not nullify the robust model we built.

It should be noted that the techniques we adopted in the use of the various techniques to avoid the weaknesses are mentioned throughout this thesis, as and when various topics are discussed. Further research on the subject could be done with refinements to the observed challenges.

6.4 Reflection and Implications of Study Findings for Current Theory

One of the most important goals of public policy is to address inefficiencies and inequalities in the distribution of income on one hand and to try to improve the welfare of the vulnerable and poor on the other. A part of the theory of public finance is dedicated to conceptualizing and measuring how the revenue and expenditure sides of government budgets affect the distribution of income. This is concept is known as expenditure

incidence. This body of research enables us to understand how policies change the distribution of income, how equitable these changes may be, and, how government policies actually help the poor.

The concept Benefit Incidence Analysis contains a blend of both positive and normative issues. Asking the question of who is benefiting from and who is paying for government service is a positive question, while judging, the adequacy, desirability of the outcomes is a normative question. Normative values are likely to differ, sometimes quite significantly across individuals, so, there would not be an agreement about the degree of redistribution. Nevertheless, it would be an error of judgement to shy away from distributional and equity issues because they cannot be scientific. Understanding the distributional impact of government policy is at the core of fiscal framework. From a proactive perspective, a major goal of Benefit Incidence Analysis is to contribute to the design of good government policy. The right policy choices require information on which groups are likely to pay for particular changes and which groups are more likely to benefit from such expenditure programs. Nonetheless, economists have many questions about how to lighten the burden of taxation for lower income groups and about how to increase the effectiveness of public expenditures. Is it possible to broaden the bases of a value added tax or flatten the rate structure of income taxes without decreasing the overall progressivity of the tax system? Also, what is the best way to target public spending, which would improve the condition of the poor?

6.5 Reflection on Methodological Issues

In the present context, we needed to estimate both the short and long run effects of our time series data. The ECM Model is theoretically-driven and helped in our estimations. This approach meshed well with the study's logical framework (political and social processes) and coped well with both the study questions and objectives. Our model directly estimated the speed at which a dependent variable

Y returns to equilibrium after a change in an independent variable X . Furthermore, odds ratios and logistic regression are powerful tools for researchers and the acceptance of these tools results from their versatility and relative ease of interpretation. There is abundant literature on the mathematical basis of logistic regression, as well as its application and interpretation. The interpretations presented in Chapter 5 of this Thesis herein highlight some of the characteristics of logistic regression. The technique coped with the study questions and objectives that it was used for. However, there are basic shortcomings such as already mentioned in the interpretation and *section 6.3.1*, but did not diminish the estimated results.

In the literature, most of Benefit Incidence Analyses (BIA) divide the population into subgroups (e.g. Quintiles or Deciles) based on household per capita income. Because expenditures on health and education are expected to have a redistributive impact, BIA is centered on assessing whether public spending is progressive, that is, whether it improves the distribution of welfare, proxied by household income or expenditure. Likewise, BIA shows how the initial “pre-intervention” position of individuals is altered by public spending or how well public spending serves to redistribute resources to the Put differently, it estimates how much the income of a household would have to be raised if the household were to pay in full the subsidized public services. Furthermore, Younger (2002), considered a variety of options for analyzing the marginal benefit incidence of the policy change and argued, that despite the reality that each approach measures, they neither in reality measure the same thing nor propose to do. Empirically, the accuracy of the approaches varies considerably with those relying on the dissimilarity data or aggregations of household into groups yielding normal errors that are fairly large relative to the expected shares. Nonetheless, in our context, fair treatment was given to the various components of our estimations. This removed the bias considerably from our results.



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Endnotes

¹ Politics of revenue allocation in Nigeria has remained a continuous exercise since Nigerian post-Independence.

² Poverty is also becoming *dynastic* in Nigeria—with the threat that the children of the poor are also likely to end up poor (Ehigiene 2007).

³ Poverty is deep, severe and pervasive in the country.

⁴ Administrators are always quick to blame abysmal budget performance on dwindling revenues.

⁵ Verdicts on the government's economic performance seem to oscillate around the extremes. For some critics, the economy has done very badly relative to its potentials

⁶ Real growth rate was 6.6percent in 2002/2004 and 6.24 percent in 2004/2006 periods.

⁷ Statistics show a rising trend in income and expenditure of households since 1991

⁸ A notable shock in Nigeria comes from her overdependence in oil revenue

⁹ That is if it is inequality-neutral or accompanied by rising inequality.

¹⁰ During the second demographic transition a combination of factors lead to radical changes in the living arrangements and patterns of family formation and in most cases to low fertility and a shrinking population.

¹¹ It is probable that the 3rd demographic transition is even less uniform.

¹² U.S Department of Health and Human Services and U.S. Department of State (2007) *Why Population Aging Matters: A Global Perspective*. Publication no. 07-6134. Bethesda, MD: national institutes of health.

¹³ Indonesia and Pakistan are comparable to Nigeria because they started out with a similar GDP/capita in 1980; all three have large populations which are heavily Muslim (though Nigeria is less), have a history of inter-group conflict, hot climate, ample coastline. Indonesia and Nigeria are also major oil producers. Pakistan and Nigeria have a history of British rule, and Indonesia a history of Dutch rule. All three have also history of authoritarian and/or military rule.

¹⁴ The Turks and Gypsy are the two minority groups in Bulgaria comprising 13% of the total population, 25% of the poorest quintile and very few are found among the better off (only about 3% in the richest quintile).

¹⁵ STINMOD is a publicly available computer model of major federal government revenue and expenditure programmes.

¹⁶ Except for Upper Secondary and University Education

¹⁷ Instructional materials are materials that support and facilitate teaching and learning process.

¹⁸ Allocations to the health sector in Nigeria remains extremely low in comparison to the monumental issues at stake.

¹⁹ The 2009/2010 Survey is an enlarged survey compared to that of 2004. The questionnaire included Demographics; Health; and Fertility behaviour, Education and Skills/Training; Employment and Time-use; Housing and Housing Condition; Social Capital, Agriculture; Social Capital, Agriculture; Household Income, consumption and Expenditure.

²⁰ For instance, Population to doctor ratio indicates level of access to doctors. When the ratio of people to a physician is relatively high, for example 15,000:1, it indicates that there are too few doctors available suggesting poor public access to doctors and medical care. When the ratio is low e.g. 2,748:1 as in California, it means good or adequate health service delivery due to better access to doctors and medical care (PARP, 2010).

²¹ For example, a consignment of vitamin A supplement by the Canadian government through its bilateral assistance to Nigeria was diverted in 2008 and it was found in most itinerant chemist shops across the country (UNICEF, 2007).

²² A classic example is the sacking of a Federal Minister in 2008 for complicity in the sharing of Health Ministry funds meant for retirement into National Treasury.

²³ see <http://afrihealthptonetassociation.blogspot.com/2013/04/press-briefing-by-prof-c-o-onyebuchi.html>

²⁴ This kind of analysis is relevant in assessing poverty. It should also be noted that that lack of proper targeting of vulnerable groups is more at the state and local levels because of a generic assumption in expenditure.

²⁵ Predominantly seen in Northern Nigeria and categorized as non-beneficiaries of basic services from Government.

²⁶ The National Poverty Eradication Programme (NAPEP) was introduced in 2001 and supervised by the National Poverty Eradication Council (NAPEC) charged with the responsibility of coordinating all poverty eradicating programmes of all government agencies and parastatals and the ministries with the aim of ensuring the central planning and coordination of all poverty reduction programmes in the country.

²⁷ This is a new initiative from the Nigerian Government that provides opportunity for 1,200 Nigerian youths below 40yrs with bankable business ideas to receive grant of between N1m to N10m to start up and enhance their businesses.

²⁸ Increasing commitment through budgetary allocation to maternal and child care programmes.

²⁹ See the OECD report on '*Promoting Pro -Poor Growth, Key policy messages*', 2006.

³⁰ In such situations, one could resort to other criteria such as the Gini coefficient, Atkinson index, or generalized entropy measures for a complete ordering.

³¹ Data for net primary enrolment, children out of school as well as primary completion rates are from World Development Indicators (WDI) assessed on February 14, 2013.

³² Income, however, tends to fall after retirement and when in old age.

³³ (See Anyanwu, 2012)



Appendices

1. **Appendix I: Stationarity Results**
2. **Appendix II: Cointegration Results**
3. **Appendix III: VAR Results**
4. **Appendix IV: Ordered Logit Regression Results**
5. **Appendix IV: Household Socio-Economic Characteristics Questionnaire**
6. **Appendix VI: Harmonized Nigeria Living Standards Survey (HNLSS) Questionnaire**





**UNIVERSITY of the
WESTERN CAPE**

**Faculty of Natural Science
Department of Statistics & Population Studies
PhD (Population Studies)**

**Public sector spending in Nigeria: implications for poverty, demographic changes and
Millennium Development Goals target**



Thesis Appendices:
UNIVERSITY of the
WESTERN CAPE

**Student: Ogujiuba Kanayo (3278896)
Supervisor: Professor Nancy Stiegler
Due Date: March 2015**

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Appendix I: Stationarity Results

1. EDUC – I(0) Tests

Null Hypothesis: EDUC has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	1.399280	0.9985
Test critical values:		
1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EDUC)

Method: Least Squares

Date: 12/18/13 Time: 16:23

Sample (adjusted): 1981 2010

Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EDUC(-1)	0.087279	0.062375	1.399280	0.1727
C	4391.930	5110.888	0.859328	0.3975
R-squared	0.065358	Mean dependent var		8507.103
Adjusted R-squared	0.031978	S.D. dependent var		23269.72
S.E. of regression	22894.64	Akaike info criterion		22.97953
Sum squared resid	1.47E+10	Schwarz criterion		23.07295
Log likelihood	-342.6930	Hannan-Quinn criter.		23.00942
F-statistic	1.957984	Durbin-Watson stat		2.186428
Prob(F-statistic)	0.172710			

2. EDUC – I(1) Tests

Null Hypothesis: D(EDUC) has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.030157	0.0003
Test critical values:		
1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.
 Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(EDUC,2)
 Method: Least Squares
 Date: 12/18/13 Time: 16:26
 Sample (adjusted): 1982 2010
 Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EDUC(-1))	-1.164431	0.231490	-5.030157	0.0000
C	9804.499	4644.950	2.110787	0.0442
R-squared	0.483772	Mean dependent var		2718.105
Adjusted R-squared	0.464653	S.D. dependent var		32576.78
S.E. of regression	23835.60	Akaike info criterion		23.06222
Sum squared resid	1.53E+10	Schwarz criterion		23.15652
Log likelihood	-332.4022	Hannan-Quinn criter.		23.09175
F-statistic	25.30248	Durbin-Watson stat		1.742181
Prob(F-statistic)	0.000028			

3. EXADM – I(0) Tests .

Null Hypothesis: EXADM has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=0)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	7.831503	1.0000
Test critical values: 1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.
 Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(EXADM)
 Method: Least Squares
 Date: 12/18/13 Time: 16:38
 Sample (adjusted): 1981 2010
 Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXADM(-1)	0.220335	0.028134	7.831503	0.0000
C	2541.404	10951.69	0.232056	0.8182
R-squared	0.686564	Mean dependent var		50851.13

Adjusted R-squared	0.675370	S.D. dependent var	86991.10
S.E. of regression	49564.33	Akaike info criterion	24.52427
Sum squared resid	6.88E+10	Schwarz criterion	24.61768
Log likelihood	-365.8641	Hannan-Quinn criter.	24.55415
F-statistic	61.33244	Durbin-Watson stat	2.696619
Prob(F-statistic)	0.000000		

4. EXECON – I(0) Tests

Null Hypothesis: EXECON has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	1.354914	0.9983
Test critical values: 1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EXECON)

Method: Least Squares

Date: 12/18/13 Time: 16:43

Sample (adjusted): 1981 2010

Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXECON(-1)	0.115611	0.085328	1.354914	0.1863
C	14627.59	23706.83	0.617020	0.5422

R-squared	0.061530	Mean dependent var	33779.35
Adjusted R-squared	0.028013	S.D. dependent var	105733.7
S.E. of regression	104242.2	Akaike info criterion	26.01116
Sum squared resid	3.04E+11	Schwarz criterion	26.10458
Log likelihood	-388.1674	Hannan-Quinn criter.	26.04105
F-statistic	1.835793	Durbin-Watson stat	2.784297
Prob(F-statistic)	0.186277		

5. EXECON – I(1) Tests

Null Hypothesis: D(EXECON) has a unit root

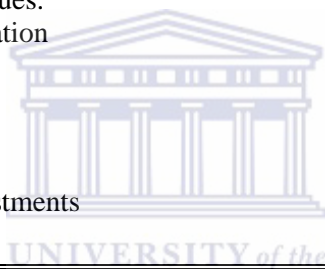
Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.297483	0.0000
Test critical values: 1% level	-3.679322	

5% level	-2.967767
10% level	-2.622989

*MacKinnon (1996) one-sided p-values.
 Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(EXECON,2)
 Method: Least Squares
 Date: 12/18/13 Time: 16:45
 Sample (adjusted): 1982 2010
 Included observations: 29 after adjustments



Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXECON(-1))	-1.230359	0.195373	-6.297483	0.0000
C	41538.37	20559.32	2.020416	0.0534
R-squared	0.594949	Mean dependent var		6739.106
Adjusted R-squared	0.579947	S.D. dependent var		164540.7
S.E. of regression	106641.2	Akaike info criterion		26.05880
Sum squared resid	3.07E+11	Schwarz criterion		26.15310
Log likelihood	-375.8526	Hannan-Quinn criter.		26.08833
F-statistic	39.65830	Durbin-Watson stat		1.823473
Prob(F-statistic)	0.000001			

6. EXSCS Tests I(0).

Null Hypothesis: EXSCS has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=0)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	4.294987	1.0000
Test critical values:		
1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.
 Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(EXSCS)
 Method: Least Squares
 Date: 12/19/13 Time: 10:55
 Sample (adjusted): 1981 2010
 Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXSCS(-1)	0.210168	0.048933	4.294987	0.0002
C	2153.362	8008.337	0.268890	0.7900
R-squared	0.397161	Mean dependent var		21626.43
Adjusted R-squared	0.375631	S.D. dependent var		45758.25
S.E. of regression	36156.80	Akaike info criterion		23.89346
Sum squared resid	3.66E+10	Schwarz criterion		23.98687
Log likelihood	-356.4019	Hannan-Quinn criter.		23.92334
F-statistic	18.44691	Durbin-Watson stat		2.791292
Prob(F-statistic)	0.000190			



7. HEALTH Tests I(0)

Null Hypothesis: HEALTH has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=0)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	0.563894	0.9862
Test critical values: 1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.
 Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(HEALTH)
 Method: Least Squares
 Date: 12/19/13 Time: 11:19
 Sample (adjusted): 1981 2010
 Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HEALTH(-1)	0.039073	0.069291	0.563894	0.5773
C	4266.177	4230.327	1.008475	0.3219
R-squared	0.011229	Mean dependent var		5614.298

Adjusted R-squared	-0.024084	S.D. dependent var	18889.37
S.E. of regression	19115.49	Akaike info criterion	22.61873
Sum squared resid	1.02E+10	Schwarz criterion	22.71214
Log likelihood	-337.2809	Hannan-Quinn criter.	22.64861
F-statistic	0.317977	Durbin-Watson stat	2.610597
Prob(F-statistic)	0.577315		

8. HEALTH Tests I(I)

Null Hypothesis: D(HEALTH) has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.779966	0.0000
Test critical values:		
1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(HEALTH,2)

Method: Least Squares

Date: 12/19/13 Time: 11:45

Sample (adjusted): 1982 2010

Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(HEALTH(-1))	-1.285976	0.189673	-6.779966	0.0000
C	7206.456	3601.927	2.000722	0.0556

R-squared	0.629975	Mean dependent var	1018.908
Adjusted R-squared	0.616270	S.D. dependent var	30290.97
S.E. of regression	18764.03	Akaike info criterion	22.58374
Sum squared resid	9.51E+09	Schwarz criterion	22.67804
Log likelihood	-325.4643	Hannan-Quinn criter.	22.61328
F-statistic	45.96794	Durbin-Watson stat	1.937231
Prob(F-statistic)	0.000000		

9. POP 12-17 I(0) Tests

Null Hypothesis: POP12T17 has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.143811	0.2300
Test critical values:		
1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(POP12T17)
 Method: Least Squares
 Date: 12/19/13 Time: 11:46
 Sample (adjusted): 1981 2010
 Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
POP12T17(-1)	-0.059862	0.027923	-2.143811	0.0409
C	1073593.	403233.3	2.662462	0.0127
R-squared	0.140997	Mean dependent var		218853.5
Adjusted R-squared	0.110318	S.D. dependent var		350081.4
S.E. of regression	330207.1	Akaike info criterion		28.31717
Sum squared resid	3.05E+12	Schwarz criterion		28.41058
Log likelihood	-422.7575	Hannan-Quinn criter.		28.34705
F-statistic	4.595927	Durbin-Watson stat		1.848462
Prob(F-statistic)	0.040875			

10. POP 12-17 I(1) Tests

Null Hypothesis: D(POP12T17) has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.438275	0.0015
Test critical values:		
1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(POP12T17,2)

Method: Least Squares

Date: 12/19/13 Time: 11:48

Sample (adjusted): 1982 2010

Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(POP12T17(-1))	-0.845014	0.190392	-4.438275	0.0001
C	181345.6	78920.71	2.297821	0.0295
R-squared	0.421820	Mean dependent var		-7330.655
Adjusted R-squared	0.400406	S.D. dependent var		462428.3
S.E. of regression	358074.1	Akaike info criterion		28.48134
Sum squared resid	3.46E+12	Schwarz criterion		28.57564
Log likelihood	-410.9794	Hannan-Quinn criter.		28.51087
F-statistic	19.69829	Durbin-Watson stat		1.889699
Prob(F-statistic)	0.000138			

11. POP 18-24 I(0) Tests

Null Hypothesis: POP18T24 has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.237331	0.0002
Test critical values: 1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(POP18T24)

Method: Least Squares

Date: 12/19/13 Time: 11:49

Sample (adjusted): 1981 2010

Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
POP18T24(-1)	-0.986688	0.188395	-5.237331	0.0000
C	17430315	4675615.	3.727919	0.0009
R-squared	0.494855	Mean dependent var		301317.3
Adjusted R-squared	0.476814	S.D. dependent var		25302219
S.E. of regression	18301496	Akaike info criterion		36.34720
Sum squared resid	9.38E+15	Schwarz criterion		36.44062
Log likelihood	-543.2081	Hannan-Quinn criter.		36.37709
F-statistic	27.42964	Durbin-Watson stat		2.006257

12. POP25T34 I(0) Tests

Null Hypothesis: POP25T34 has a unit root

Exogenous: Constant

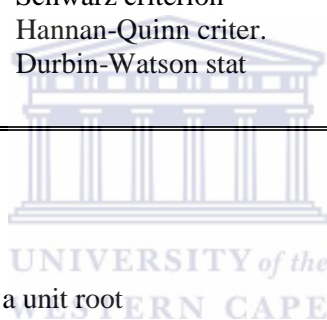
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

	t-Statistic	Prob.*
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Augmented Dickey-Fuller test statistic		0.302025	0.9745
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.
 Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(POP25T34)
 Method: Least Squares
 Date: 12/19/13 Time: 11:51
 Sample (adjusted): 1981 2010
 Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
POP25T34(-1)	0.005316	0.017602	0.302025	0.7649
C	269137.1	275642.5	0.976399	0.3372
R-squared	0.003247	Mean dependent var		350963.3
Adjusted R-squared	-0.032351	S.D. dependent var		273718.1
S.E. of regression	278110.4	Akaike info criterion		27.97376
Sum squared resid	2.17E+12	Schwarz criterion		28.06718
Log likelihood	-417.6065	Hannan-Quinn criter.		28.00365
F-statistic	0.091219	Durbin-Watson stat		2.024121
Prob(F-statistic)	0.764865			



13. POP 25-34 I(I) Tests

Null Hypothesis: D(POP25T34) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=0)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.216894	0.0002
Test critical values:	1% level	-3.679322
	5% level	-2.967767
	10% level	-2.622989

*MacKinnon (1996) one-sided p-values.
 Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(POP25T34,2)
 Method: Least Squares
 Date: 12/19/13 Time: 11:52
 Sample (adjusted): 1982 2010
 Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(POP25T34(-1))	-1.006877	0.193003	-5.216894	0.0000
C	354556.7	85193.30	4.161792	0.0003
R-squared	0.501992	Mean dependent var		5189.483
Adjusted R-squared	0.483547	S.D. dependent var		394610.2

S.E. of regression	283585.3	Akaike info criterion	28.01489
Sum squared resid	2.17E+12	Schwarz criterion	28.10918
Log likelihood	-404.2158	Hannan-Quinn criter.	28.04442
F-statistic	27.21598	Durbin-Watson stat	1.995350
Prob(F-statistic)	0.000017		

14. POP35T44 I(0) Tests

Null Hypothesis: POP35T44 has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	1.376656	0.9984
Test critical values:		
1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(POP35T44)

Method: Least Squares

Date: 12/19/13 Time: 11:52

Sample (adjusted): 1981 2010

Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
POP35T44(-1)	0.026055	0.018926	1.376656	0.1795
C	-17237.58	203801.8	-0.084580	0.9332
R-squared	0.063394	Mean dependent var		258755.8
Adjusted R-squared	0.029944	S.D. dependent var		203763.0
S.E. of regression	200689.0	Akaike info criterion		27.32124
Sum squared resid	1.13E+12	Schwarz criterion		27.41465
Log likelihood	-407.8186	Hannan-Quinn criter.		27.35113
F-statistic	1.895182	Durbin-Watson stat		1.650923
Prob(F-statistic)	0.179528			

15. POP 35-44 I(1) Test

Null Hypothesis: D(POP35T44) has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.978450	0.0048
Test critical values: 1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(POP35T44,2)

Method: Least Squares

Date: 12/19/13 Time: 11:54

Sample (adjusted): 1982 2010

Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(POP35T44(-1))	-0.772684	0.194217	-3.978450	0.0005
C	203497.5	61667.17	3.299932	0.0027
R-squared	0.369572	Mean dependent var		10990.69
Adjusted R-squared	0.346223	S.D. dependent var		254614.9
S.E. of regression	205872.6	Akaike info criterion		27.37437
Sum squared resid	1.14E+12	Schwarz criterion		27.46867
Log likelihood	-394.9284	Hannan-Quinn criter.		27.40391
F-statistic	15.82807	Durbin-Watson stat		2.021666
Prob(F-statistic)	0.000469			

16. POP45T54 I(0)

Null Hypothesis: POP45T54 has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	1.272002	0.9979
Test critical values: 1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(POP45T54)

Method: Least Squares

Date: 12/19/13 Time: 11:57

Sample (adjusted): 1981 2010
 Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
POP45T54(-1)	0.021997	0.017293	1.272002	0.2138
C	22373.31	125293.3	0.178567	0.8596
R-squared	0.054629	Mean dependent var		178642.1
Adjusted R-squared	0.020865	S.D. dependent var		136222.5
S.E. of regression	134793.9	Akaike info criterion		26.52522
Sum squared resid	5.09E+11	Schwarz criterion		26.61863
Log likelihood	-395.8783	Hannan-Quinn criter.		26.55510
F-statistic	1.617990	Durbin-Watson stat		1.925683
Prob(F-statistic)	0.213836			

17. POP45T54 I(1)

Null Hypothesis: D(POP45T54) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=0)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.659102	0.0009
Test critical values:		
1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

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

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(POP45T54,2)
 Method: Least Squares
 Date: 12/19/13 Time: 11:57
 Sample (adjusted): 1982 2010
 Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(POP45T54(-1))	-0.897134	0.192555	-4.659102	0.0001
C	161746.8	42702.14	3.787791	0.0008
R-squared	0.445668	Mean dependent var		4098.724
Adjusted R-squared	0.425137	S.D. dependent var		185016.6
S.E. of regression	140279.1	Akaike info criterion		26.60713
Sum squared resid	5.31E+11	Schwarz criterion		26.70142
Log likelihood	-383.8033	Hannan-Quinn criter.		26.63666
F-statistic	21.70724	Durbin-Watson stat		1.999412
Prob(F-statistic)	0.000076			

18. POP5 I(0)

Null Hypothesis: POP5 has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.720535	0.0824
Test critical values: 1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(POP5)

Method: Least Squares

Date: 12/19/13 Time: 11:58

Sample (adjusted): 1981 2010

Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
POP5(-1)	-0.054879	0.020172	-2.720535	0.0111
C	1176442.	341358.3	3.446355	0.0018
R-squared	0.209069	Mean dependent var		257284.7
Adjusted R-squared	0.180821	S.D. dependent var		295032.7
S.E. of regression	267029.6	Akaike info criterion		27.89245
Sum squared resid	2.00E+12	Schwarz criterion		27.98586
Log likelihood	-416.3867	Hannan-Quinn criter.		27.92233
F-statistic	7.401310	Durbin-Watson stat		2.136905
Prob(F-statistic)	0.011075			

19. POP5 I(1)

Null Hypothesis: D(POP5) has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.680220	0.0008
Test critical values: 1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(POP5,2)

Method: Least Squares
 Date: 12/19/13 Time: 11:59
 Sample (adjusted): 1982 2010
 Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(POP5(-1))	-0.896558	0.191563	-4.680220	0.0001
C	226776.0	75381.73	3.008368	0.0056
R-squared	0.447903	Mean dependent var		-7528.034
Adjusted R-squared	0.427455	S.D. dependent var		401092.0
S.E. of regression	303493.1	Akaike info criterion		28.15058
Sum squared resid	2.49E+12	Schwarz criterion		28.24487
Log likelihood	-406.1834	Hannan-Quinn criter.		28.18011
F-statistic	21.90446	Durbin-Watson stat		2.023839
Prob(F-statistic)	0.000072			

20. POP55T64 I(0)

Null Hypothesis: POP55T64 has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=0)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	3.441540	1.0000
Test critical values:		
1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(POP55T64)
 Method: Least Squares
 Date: 12/19/13 Time: 12:00
 Sample (adjusted): 1981 2010
 Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
POP55T64(-1)	0.059456	0.017276	3.441540	0.0018
C	-118019.6	71117.90	-1.659492	0.1082
R-squared	0.297263	Mean dependent var		121004.7
Adjusted R-squared	0.272165	S.D. dependent var		98224.67
S.E. of regression	83798.65	Akaike info criterion		25.57456
Sum squared resid	1.97E+11	Schwarz criterion		25.66798
Log likelihood	-381.6184	Hannan-Quinn criter.		25.60445
F-statistic	11.84420	Durbin-Watson stat		1.596614
Prob(F-statistic)	0.001835			

21. POP65T74 I(0)

Null Hypothesis: POP65T74 has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.893766	0.7762
Test critical values: 1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(POP65T74)

Method: Least Squares

Date: 12/19/13 Time: 12:01

Sample (adjusted): 1981 2010

Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
POP65T74(-1)	-0.079583	0.089042	-0.893766	0.3791
C	217335.7	187886.6	1.156738	0.2572
R-squared	0.027738	Mean dependent var		52508.87
Adjusted R-squared	-0.006986	S.D. dependent var		196137.5
S.E. of regression	196821.4	Akaike info criterion		27.28232
Sum squared resid	1.08E+12	Schwarz criterion		27.37573
Log likelihood	-407.2348	Hannan-Quinn criter.		27.31221
F-statistic	0.798818	Durbin-Watson stat		2.815800
Prob(F-statistic)	0.379065			

22. POP65T74 I(1)

Null Hypothesis: D(POP65T74) has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-8.848320	0.0000
Test critical values: 1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

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

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(POP65T74,2)
 Method: Least Squares
 Date: 12/19/13 Time: 12:02
 Sample (adjusted): 1982 2010
 Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(POP65T74(-1))	-1.491712	0.168587	-8.848320	0.0000
C	76986.52	33938.30	2.268426	0.0315
R-squared	0.743572	Mean dependent var		3774.414
Adjusted R-squared	0.734075	S.D. dependent var		343718.6
S.E. of regression	177248.6	Akaike info criterion		27.07497
Sum squared resid	8.48E+11	Schwarz criterion		27.16926
Log likelihood	-390.5870	Hannan-Quinn criter.		27.10450
F-statistic	78.29276	Durbin-Watson stat		2.260872
Prob(F-statistic)	0.000000			

23. POP6T11 I(0)

Null Hypothesis: POP6T11 has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=0)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.006983	0.0456
Test critical values:		
1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(POP6T11)
 Method: Least Squares
 Date: 12/19/13 Time: 12:03
 Sample (adjusted): 1981 2010
 Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
POP6T11(-1)	-0.065594	0.021814	-3.006983	0.0055
C	1235002.	341045.8	3.621220	0.0011
R-squared	0.244100	Mean dependent var		218883.5
Adjusted R-squared	0.217104	S.D. dependent var		285196.1
S.E. of regression	252345.5	Akaike info criterion		27.77933
Sum squared resid	1.78E+12	Schwarz criterion		27.87274

Log likelihood	-414.6899	Hannan-Quinn criter.	27.80921
F-statistic	9.041948	Durbin-Watson stat	1.578196

24. POP6T11 I(I)

Null Hypothesis: D(POP6T11) has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.557618	0.0134
Test critical values:		
1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(POP6T11,2)

Method: Least Squares

Date: 12/19/13 Time: 12:04

Sample (adjusted): 1982 2010

Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(POP6T11(-1))	-0.639975	0.179889	-3.557618	0.0014
C	134285.0	65036.51	2.064763	0.0487
R-squared	0.319156	Mean dependent var	-8990.655	
Adjusted R-squared	0.293939	S.D. dependent var	327279.3	
S.E. of regression	275004.4	Akaike info criterion	27.95343	
Sum squared resid	2.04E+12	Schwarz criterion	28.04773	
Log likelihood	-403.3248	Hannan-Quinn criter.	27.98297	
F-statistic	12.65665	Durbin-Watson stat	2.120356	
Prob(F-statistic)	0.001408			

Appendix II: Cointegration Results

1. Cointegration Tests – Education Spending and Population Dynamics

Null Hypothesis: RESEDU has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic based on SIC, MAXLAG=0)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.124437	0.0002
Test critical values: 1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RESEDU)

Method: Least Squares

Sample(adjusted): 1981 2010

Included observations: 30 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESEDU(-1)	-0.967646	0.188830	-5.124437	0.0000
C	-272.9238	2952.426	-0.092441	0.9270
R-squared	0.483965	Mean dependent var	-8.027633	
Adjusted R-squared	0.465535	S.D. dependent var	22116.35	
S.E. of regression	16168.63	Akaike info criterion	22.28387	
Sum squared resid	7.32E+09	Schwarz criterion	22.37729	
Log likelihood	-332.2581	F-statistic	26.25985	
Durbin-Watson stat	1.985459	Prob(F-statistic)	0.000020	

2. Cointegration Tests – Economic Services Spending and Population Dynamics

Null Hypothesis: RESECON has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic based on SIC, MAXLAG=0)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.948105	0.0051
Test critical values: 1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RESECON)

Method: Least Squares

Date: 01/23/14 Time: 12:53

Sample(adjusted): 1981 2010

Included observations: 30 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
----------	-------------	------------	-------------	-------

RESECON(-1)	-0.699032	0.177055	-3.948105	0.0005
C	-2076.683	12059.88	-0.172198	0.8645
R-squared	0.357615	Mean dependent var	-1644.100	
Adjusted R-squared	0.334672	S.D. dependent var	80978.14	
S.E. of regression	66051.95	Akaike info criterion	25.09861	
Sum squared resid	1.22E+11	Schwarz criterion	25.19202	
Log likelihood	-374.4792	F-statistic	15.58754	
Durbin-Watson stat	2.132489	Prob(F-statistic)	0.000483	

3. Cointegration Tests – Health Sector Spending and Population Dynamics

Null Hypothesis: RESHLTH has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic based on SIC, MAXLAG=0)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.575584	0.0000
Test critical values:		
1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RESHLTH)

Method: Least Squares

Date: 01/23/14 Time: 12:57

Sample(adjusted): 1981 2010

Included observations: 30 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESHLTH(-1)	-1.215033	0.184779	-6.575584	0.0000
C	-248.0964	2277.718	-0.108923	0.9140
R-squared	0.606953	Mean dependent var	25.99540	
Adjusted R-squared	0.592916	S.D. dependent var	19549.95	
S.E. of regression	12473.48	Akaike info criterion	21.76494	
Sum squared resid	4.36E+09	Schwarz criterion	21.85835	
Log likelihood	-324.4741	F-statistic	43.23831	
Durbin-Watson stat	2.047244	Prob(F-statistic)	0.000000	

Appendix III: VAR Results

1. VAR Model _ Education

Vector Autoregression Estimates

Date: 01/23/14 Time: 13:16

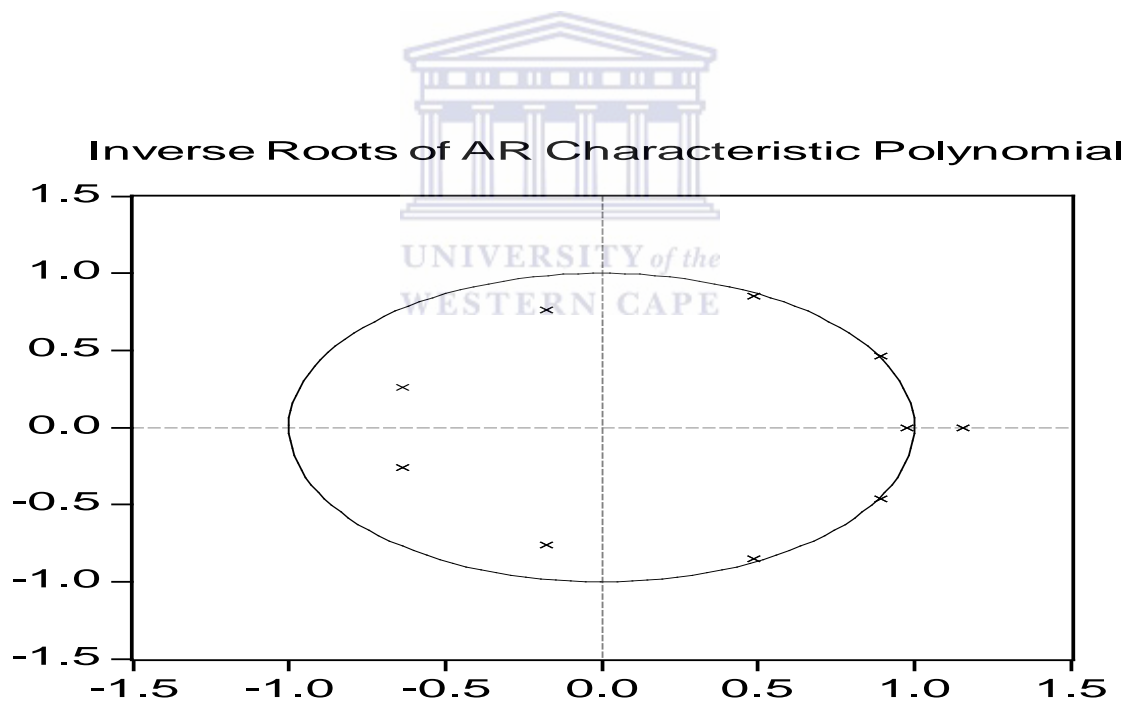
Sample(adjusted): 1982 2010

Included observations: 29 after adjusting endpoints

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

	D(EDUC)	D(POP5)	D(POP6T 11)	D(POP12 T17)	POP18T2 4	D(POP25 T34)	D(POP35 T44)	D(POP45 T54)	POP55T6 4	D(POP65 T74)
D(EDUC(-1))	0.093374 (0.14460) [0.64575]	-3.000158 (4.00287) [-0.74950]	-3.667864 (3.70576) [-0.98977]	-5.425275 (3.13795) [-1.72892]	-2.427425 (3.61767) [-0.67099]	-4.116228 (3.48651) [-1.18062]	-2.441064 (2.45121) [-0.99586]	-1.740250 (1.61278) [-1.07903]	-1.033496 (0.90844) [-1.13766]	-0.739884 (0.45863) [-1.61325]
D(POP5(-1))	-0.600442 (0.08691) [-6.90915]	-1.013174 (2.40579) [-0.42114]	-0.760628 (2.22723) [-0.34151]	0.330103 (1.88596) [0.17503]	0.623103 (2.17428) [0.28658]	-0.527928 (2.09545) [-0.25194]	-0.381373 (1.47322) [-0.25887]	-0.153511 (0.96931) [-0.15837]	-0.059096 (0.54599) [-0.10824]	-0.100462 (0.27564) [-0.36446]
D(POP6T11(-1))	-0.493118 (0.08592) [-5.73946]	-0.710770 (2.37844) [-0.29884]	0.735008 (2.20190) [0.33381]	-2.981032 (1.86452) [-1.59882]	2.353637 (2.14956) [1.09494]	-0.557847 (2.07163) [-0.26928]	0.020847 (1.45647) [0.01431]	-0.132572 (0.95829) [-0.13834]	0.005073 (0.53978) [0.00940]	0.007926 (0.27251) [0.02909]
D(POP12T17(-1))	-0.016437 (0.01010) [-1.62713]	0.069050 (0.27965) [0.24691]	0.074718 (0.25889) [0.28861]	-0.208289 (0.21923) [-0.95011]	-0.061327 (0.25274) [-0.24265]	0.098516 (0.24358) [0.40446]	0.043842 (0.17125) [0.25602]	0.036336 (0.11267) [0.32249]	0.018858 (0.06347) [0.29713]	0.050030 (0.03204) [1.56143]
POP18T24(-1)	0.103170 (0.02313) [4.45980]	0.299672 (0.64040) [0.46795]	0.065648 (0.59287) [0.11073]	0.512125 (0.50203) [1.02012]	0.507855 (0.57877) [0.87747]	0.024199 (0.55779) [0.04338]	-0.033939 (0.39216) [-0.08655]	-0.019335 (0.25802) [-0.07493]	-0.051229 (0.14534) [-0.35249]	-0.016314 (0.07337) [-0.22234]
D(POP25T34(-1))	2.491011 (0.33824) [7.36464]	-1.185004 (9.36346) [-0.12656]	-2.838219 (8.66847) [-0.32742]	0.958108 (7.34026) [0.13053]	-7.126807 (8.46242) [-0.84217]	-1.566419 (8.15560) [-0.19207]	-2.388067 (5.73385) [-0.41649]	-1.469606 (3.77260) [-0.38955]	-1.167321 (2.12501) [-0.54933]	-0.489227 (1.07282) [-0.45602]
D(POP35T44(-1))	2.281206 (0.34900) [6.53648]	4.805669 (9.66125) [0.49742]	1.285891 (8.94415) [0.14377]	7.130364 (7.57370) [0.94146]	-6.370756 (8.73154) [-0.72963]	1.443724 (8.41497) [0.17157]	1.078507 (5.91620) [0.18230]	0.166632 (3.89258) [0.04281]	-0.021606 (2.19259) [-0.00985]	0.521180 (1.10694) [0.47083]
D(POP45T54(-1))	-6.203323 (0.84573) [-7.33485]	-0.413058 (23.4124) [-0.01764]	5.374142 (21.6746) [0.24795]	-4.625962 (18.3536) [-0.25205]	19.33391 (21.1594) [0.91373]	3.654332 (20.3922) [0.17920]	4.690009 (14.3369) [0.32713]	3.575317 (9.43300) [0.37902]	2.734069 (5.31336) [0.51456]	0.725079 (2.68248) [0.27030]
POP55T64(-1)	-0.375574 (0.08583) [-4.37580]	-1.362883 (2.37602) [-0.57360]	-0.467286 (2.19966) [-0.21244]	-2.096310 (1.86262) [-1.12546]	1.609541 (2.14737) [0.74954]	-0.299759 (2.06952) [-0.14485]	-0.020428 (1.45499) [-0.01404]	-0.024711 (0.95731) [-0.02581]	1.137289 (0.53923) [2.10910]	0.034092 (0.27223) [0.12523]
D(POP65T74(-1))	-0.073942 (0.22637) [-0.32663]	-1.738452 (6.26671) [-0.27741]	-2.403742 (5.80157) [-0.41433]	-3.538034 (4.91263) [-0.72019]	-3.473683 (5.66366) [-0.61333]	-2.515644 (5.45832) [-0.46088]	-1.938184 (3.83751) [-0.50506]	-1.288544 (2.52490) [-0.51033]	-0.864550 (1.42221) [-0.60789]	-1.072759 (0.71801) [-1.49407]
C	-8892.439 (20828.2)	1305944. (576585.)	1053474. (533788.)	950028.7 (452000.)	970899.9 (521100.)	1155804. (502207.)	759782.4 (353080.)	532617.9 (232310.)	285999.8 (130854.)	130620.7 (66062.5)

	[-0.42694]	[2.26496]	[1.97358]	[2.10183]	[1.86317]	[2.30145]	[2.15187]	[2.29270]	[2.18564]	[1.97723]
R-squared	0.848252	0.277099	0.335801	0.685142	0.990660	0.365120	0.433279	0.450588	0.996205	0.628296
Adj. R-squared	0.763947	-0.124512	-0.033199	0.510220	0.985471	0.012408	0.118434	0.145359	0.994096	0.421794
Sum sq. resids	2.37E+09	1.82E+12	1.56E+12	1.12E+12	1.48E+12	1.38E+12	6.81E+11	2.95E+11	9.36E+10	2.39E+10
S.E. equation	11477.68	317735.9	294152.2	249081.3	287160.1	276748.6	194570.0	128017.9	72109.15	36404.72
F-statistic	10.06175	0.689969	0.910031	3.916857	190.9182	1.035180	1.376164	1.476230	472.4771	3.042568
Log likelihood	-305.3304	-401.6341	-399.3975	-394.5743	-398.6999	-397.6289	-387.4117	-375.2717	-358.6260	-338.8050
Akaike AIC	21.81589	28.45753	28.30328	27.97064	28.25516	28.18130	27.47667	26.63942	25.49145	24.12448
Schwarz SC	22.33452	28.97615	28.82191	28.48927	28.77379	28.69993	27.99530	27.15805	26.01008	24.64311
Mean dependent	8803.820	253809.2	214886.4	215951.2	14610375	352170.7	260131.0	179822.8	418845.4	52853.66
S.D. dependent	23623.78	299629.2	289387.7	355910.5	2382355.	278481.8	207227.9	138477.4	938485.2	47875.86
Determinant Residual Covariance		1.42E+56								
Log Likelihood (d.f. adjusted)		-2286.288								
Akaike Information Criteria		165.2612								
Schwarz Criteria		170.4475								



2. VAR Model _ Economic Services

Vector Autoregression Estimates

Date: 01/23/14 Time: 13:31

Sample(adjusted): 1982 2010

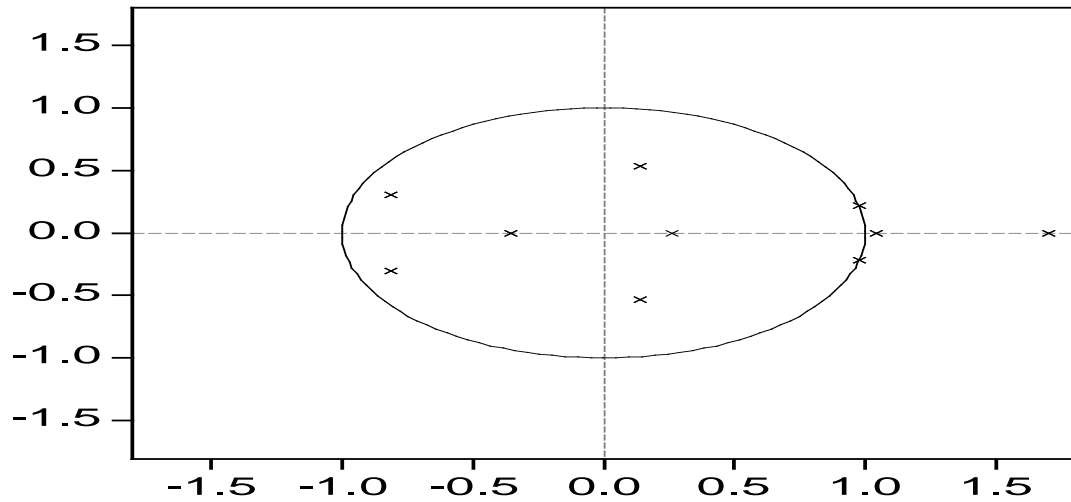
Included observations: 29 after adjusting endpoints

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

	D(EXEC ON)	D(POP5)	D(POP6T 11)	D(POP12 T17)	POP18T2 4	D(POP25 T34)	D(POP35 T44)	D(POP45 T54)	POP55T6 4	D(POP65 T74)
D(EXECON (-1))	-	-	-	-	-	-	-	-	-	-
	1.504103	3.254342	3.057843	2.131658	2.493558	2.832159	2.065433	1.346769	0.773632	0.370617
	(0.19349)	(0.93366)	(0.87184)	(0.87303)	(0.91652)	(0.84364)	(0.56851)	(0.37941)	(0.21194)	(0.11681)
	[-	[-	[-	[-	[-	[-	[-	[-	[-	[-
	7.77335]	3.48557]	3.50736]	2.44167]	2.72068]	3.35706]	3.63306]	3.54964]	3.65020]	3.17289]
D(POP5(-1))	-	-	-	-	0.434619	-	-	-	-	-
	0.185175	1.239587	1.072368	0.221736		0.900522	0.587693	0.305367	0.150273	0.172688
	(0.38384)	(1.85215)	(1.72950)	(1.73188)	(1.81814)	(1.67357)	(1.12778)	(0.75265)	(0.42044)	(0.23172)
	[-	[-	[-	[-	[[-	[-	[-	[-	[-
	0.48242]	0.66927]	0.62004]	0.12803]	0.23905]	0.53808]	0.52111]	0.40572]	0.35742]	0.74526]
D(POP6T11(-1))	0.259072	-	0.064535	-	1.959618	-	-	-	-	-
		1.179512		4.225730		1.373697	0.422160	0.461691	0.193154	0.153369
	(0.34480)	(1.66377)	(1.55360)	(1.55573)	(1.63322)	(1.50336)	(1.01307)	(0.67610)	(0.37768)	(0.20815)
	[[-	[[-	[[-	[-	[-	[-	[-
	0.75136]	0.70894]	0.04154]	2.71624]	1.19985]	0.91375]	0.41671]	0.68287]	0.51143]	0.73682]
D(POP12T1 7(-1))	-	-	-	-	-	-	-	-	-	0.026716
	0.101680	0.108211	0.098505	0.351566	0.198158	0.067568	0.072876	0.040937	0.025796	
	(0.04610)	(0.22245)	(0.20772)	(0.20801)	(0.21837)	(0.20100)	(0.13545)	(0.09040)	(0.05050)	(0.02783)
	[-	[-	[-	[-	[-	[-	[-	[-	[-	[
	2.20559]	0.48645]	0.47422]	1.69018]	0.90746]	0.33616]	0.53803]	0.45286]	0.51085]	0.95997]
POP18T24(- 1)	0.406070	1.236691	0.979489	1.262038	1.230883	0.898888	0.581886	0.388060	0.184124	0.106066
	(0.11207)	(0.54076)	(0.50495)	(0.50565)	(0.53083)	(0.48863)	(0.32927)	(0.21975)	(0.12275)	(0.06765)
	[[[[[[[[[[
	3.62339]	2.28694]	1.93976]	2.49588]	2.31877]	1.83963]	1.76719]	1.76593]	1.49995]	1.56779]
D(POP25T3 4(-1))	-	-	-	-	-	-	-	-	-	-
	7.041777	12.41182	12.65869	3.426317	15.61869	10.04501	9.052588	5.687737	3.561330	1.426042
	(1.63698)	(7.89882)	(7.37579)	(7.38591)	(7.75380)	(7.13727)	(4.80963)	(3.20983)	(1.79304)	(0.98820)
	[-	[-	[-	[-	[-	[-	[-	[-	[-	[-
	4.30170]	1.57135]	1.71625]	0.46390]	2.01433]	1.40740]	1.88218]	1.77198]	1.98619]	1.44307]
D(POP35T4 4(-1))	1.817226	9.145957	5.976009	12.46756	-	6.306031	4.220220	2.322274	1.241062	1.302522
					2.952397					
	(1.50491)	(7.26155)	(6.78071)	(6.79002)	(7.12823)	(6.56144)	(4.42159)	(2.95086)	(1.64838)	(0.90847)
	[[[[[-	[[[[[
	1.20753]	1.25950]	0.88132]	1.83616]	0.41418]	0.96107]	0.95446]	0.78698]	0.75290]	1.43375]
D(POP45T5 4(-1))	13.47302	20.58260	23.21733	1.444016	35.13571	18.58403	16.82310	11.15689	7.014072	2.231973
	(3.88710)	(18.7562)	(17.5143)	(17.5383)	(18.4119)	(16.9479)	(11.4208)	(7.62194)	(4.25769)	(2.34653)
	[[[[[[[[[[
	3.46608]	1.09737]	1.32562]	0.08233]	1.90832]	1.09654]	1.47303]	1.46379]	1.64739]	0.95118]

POP55T64(-	-	-	-	-	-	-	-	-	-	0.297874	-
1)	1.411636	4.686497	3.720919	4.806102	0.956901	3.423974	2.212501	1.476929			0.405727
	(0.41010)	(1.97886)	(1.84782)	(1.85036)	(1.94253)	(1.78807)	(1.20494)	(0.80414)	(0.44920)	(0.24757)	
	[-	[-	[-	[-	[-	[-	[-	[-	[-	[-	[-
	3.44213]	2.36828]	2.01368]	2.59739]	0.49261]	1.91490]	1.83620]	1.83665]	0.66311]	1.63885]	
D(POP65T7	-	0.400450	0.165708	0.144421	-	0.338288	-	-	-	-	-
4(-1))	0.888904				1.749991		0.226646	0.074586	0.144900	0.566609	
	(0.92430)	(4.46000)	(4.16467)	(4.17039)	(4.37811)	(4.02999)	(2.71571)	(1.81240)	(1.01243)	(0.55798)	
	[-	[[[[-	[[-	[-	[-	[-	[-
	0.96170]	0.08979]	0.03979]	0.03463]	0.39971]	0.08394]	0.08346]	0.04115]	0.14312]	1.01547]	
C	-	709508.1	518767.2	664173.3	517792.6	682344.6	397509.3	300897.4	153916.2	74760.07	
	313227.0										
	(100360.)	(484261.)	(452194.)	(452815.)	(475370.)	(437571.)	(294868.)	(196788.)	(109928.)	(60584.3)	
	[-	[[[[[[[[[[
	3.12104]	1.46514]	1.14722]	1.46676]	1.08924]	1.55939]	1.34809]	1.52904]	1.40016]	1.23398]	
R-squared	0.851170	0.554937	0.583973	0.724201	0.993216	0.579336	0.655022	0.655911	0.997662	0.727153	
Adj. R-squared	0.768487	0.307679	0.352847	0.570980	0.989447	0.345633	0.463367	0.464750	0.996364	0.575572	
Sum sq. resids	4.81E+10	1.12E+12	9.76E+11	9.78E+11	1.08E+12	9.13E+11	4.15E+11	1.85E+11	5.77E+10	1.75E+10	
S.E. equation	51667.58	249308.9	232800.4	233120.1	244731.6	225272.1	151805.3	101311.1	56593.46	31190.25	
F-statistic	10.29436	2.244369	2.526640	4.726499	263.5328	2.478946	3.417719	3.431203	768.1816	4.797107	
Log likelihood	-	-	-	-	-	-	-	-	-	-	
Akaike AIC	348.9588	394.6008	392.6140	392.6538	394.0634	391.6607	380.2141	368.4864	351.5996	334.3218	
Schwarz SC	24.82474	27.97247	27.83545	27.83819	27.93541	27.76970	26.98028	26.17148	25.00687	23.81530	
Mean dependent	25.34337	28.49110	28.35408	28.35682	28.45404	28.28833	27.49891	26.69011	25.52550	24.33392	
S.D. dependent	35022.93	253809.2	214886.4	215951.2	14610375	352170.7	260131.0	179822.8	4188454.	52853.66	
Determinant Residual	107381.7	299629.2	289387.7	355910.5	2382355.	278481.8	207227.9	138477.4	938485.2	47875.86	
Covariance		2.71E+58									
Log Likelihood (d.f. adjusted)		-									
Akaike Information Criteria		2362.429									
Schwarz Criteria		170.5123									
		175.6986									

Inverse Roots of AR Characteristic Polynomial



3. VAR Model _ Health

Vector Autoregression Estimates

Date: 01/23/14 Time: 13:34

Sample(adjusted): 1982 2010

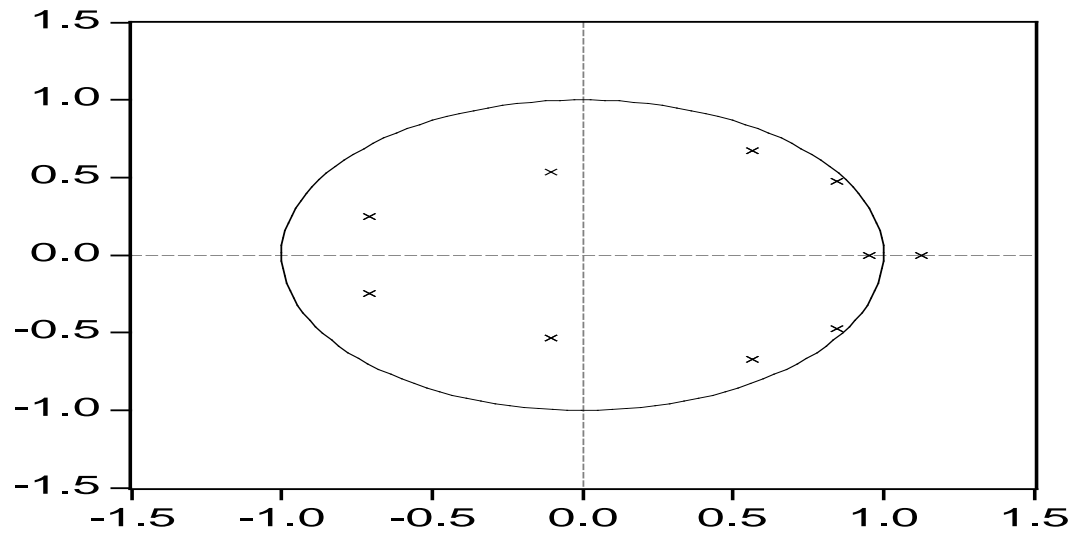
Included observations: 29 after adjusting endpoints

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

	D(HEALTH)	D(POP5)	D(POP6T11)	D(POP12T17)	POP18T24	D(POP25T34)	D(POP35T44)	D(POP45T54)	POP55T64	D(POP65T74)
D(HEALTH(-1))	-0.144243 (0.12995) [-1.10998]	-0.304428 (3.82052) [-0.07968]	-0.799964 (3.57220) [-0.22394]	-1.726708 (3.15928) [-0.54655]	0.125941 (3.44296) [0.03658]	-1.254460 (3.38918) [-0.37014]	-0.576630 (2.36300) [-0.24402]	-0.461521 (1.56059) [-0.29574]	-0.298662 (0.88135) [-0.33887]	-0.249300 (0.45750) [-0.54492]
D(POP5(-1))	-0.138206 (0.08152) [-1.69528]	-1.367373 (2.39680) [-0.57050]	-1.199709 (2.24101) [-0.53534]	-0.327048 (1.98197) [-0.16501]	0.341788 (2.15994) [0.15824]	-1.025730 (2.12620) [-0.48243]	-0.674220 (1.48243) [-0.45481]	-0.362997 (0.97903) [-0.37077]	-0.183853 (0.55291) [-0.33252]	-0.190278 (0.28701) [-0.66296]
D(POP6T11(-1))	-0.051957 (0.07373) [-0.70468]	-1.501206 (2.16768) [-0.69254]	-0.199612 (2.02678) [-0.09849]	-4.323149 (1.79250) [-2.41179]	1.686482 (1.95346) [0.86333]	-1.580255 (1.92294) [-0.82179]	-0.597887 (1.34072) [-0.44595]	-0.569930 (0.88544) [-0.64367]	-0.252841 (0.50006) [-0.50563]	-0.174083 (0.25957) [-0.67065]
D(POP12T17(-1))	-0.008945 (0.00965) [-0.92697]	0.043128 (0.28369) [0.15203]	0.039705 (0.26525) [0.14969]	-0.264300 (0.23459) [-1.12665]	-0.079408 (0.25565) [-0.31061]	0.056451 (0.25166) [0.22432]	0.020196 (0.17546) [0.11510]	0.019087 (0.11588) [0.16471]	0.008423 (0.06544) [0.12870]	0.042284 (0.03397) [1.24471]
POP18T24(-1)	-0.036548 (0.02191) [-0.66499]	0.428309 (0.64408) [0.39486]	0.237790 (0.60222) [1.47510]	0.785646 (0.53261) [1.47510]	0.598989 (0.58043) [1.03197]	0.229789 (0.57136) [0.40218]	0.082164 (0.39837) [0.20625]	0.065190 (0.26309) [0.24779]	-0.000177 (0.14858) [-0.27835]	0.021469 (0.07713) [0.27835]

	1.66828]								0.00119]	
D(POP25T34 (-1))	1.312538 (0.31906) [4.11379]	1.140515 (9.38025) [0.12159]	-0.345205 (8.77056) [- 0.03936]	4.200900 (7.75676) [0.54158]	-4.940609 (8.45326) [- 0.58446]	0.939443 (8.32121) [0.11290]	-0.765094 (5.80171) [- 0.13187]	-0.353853 (3.83160) [- 0.09235]	-0.524810 (2.16391) [0.24253]	-0.058290 (1.12326) [- 0.05189]
D(POP35T44 (-1))	0.563114 (0.31912) [1.76460]	6.918827 (9.38200) [0.73746]	3.799776 (8.77220) [0.43316]	10.76036 (7.75820) [1.38697]	-4.600463 (8.45484) [- 0.54412]	4.206897 (8.32276) [0.50547]	2.744372 (5.80280) [0.47294]	1.346035 (3.83232) [0.35123]	0.674819 (2.16431) [0.31179]	1.013983 (1.12347) [0.90254]
D(POP45T54 (-1))	-2.927001 (0.78568) [- 3.72545]	-6.511321 (23.0988) [- 0.28189]	-1.290090 (21.5974) [- 0.05973]	-13.47809 (19.1010) [- 0.70562]	13.71128 (20.8161) [0.65869]	-3.164765 (20.4909) [- 0.15445]	0.336594 (14.2867) [0.02356]	0.565032 (9.43529) [0.05988]	0.991779 (5.32861) [0.18612]	-0.456595 (2.76602) [- 0.16507]
POP55T64(- 1)	0.141619 (0.08089) [1.75066]	-1.862894 (2.37830) [- 0.78329]	-1.132076 (2.22371) [- 0.50909]	-3.147588 (1.96667) [- 1.60047]	1.251536 (2.14326) [0.58394]	-1.090422 (2.10978) [- 0.51684]	-0.468395 (1.47098) [- 0.31842]	-0.350378 (0.97147) [- 0.36067]	0.940809 (0.54864) [1.71479]	-0.111006 (0.28479) [- 0.38978]
D(POP65T74 (-1))	-1.133148 (0.19800) [- 5.72284]	0.300670 (5.82130) [0.05165]	0.174864 (5.44293) [0.03213]	0.384906 (4.81377) [0.07996]	-1.898375 (5.24602) [- 0.36187]	0.449605 (5.16407) [0.08706]	-0.213193 (3.60049) [- 0.05921]	-0.048687 (2.37786) [- 0.02048]	-0.123305 (1.34290) [- 0.09182]	-0.534992 (0.69709) [- 0.76747]
C	-22360.80 (19481.6) [- 1.14779]	1395045. (572756.) [2.43567]	1159894. (535528.) [2.16589]	1104249. (473625.) [2.33148]	1045176. (516154.) [2.02493]	1273139. (508091.) [2.50573]	830348.3 (354251.) [2.34395]	582628.7 (233957.) [2.49033]	315555.9 (132128.) [2.38826]	151571.8 (68586.0) [2.20995]
R-squared	0.789726	0.254802	0.301598	0.638848	0.990427	0.321124	0.404026	0.417878	0.995958	0.581457
Adj. R-squared	0.672908	-0.159198	-0.086404	0.438208	0.985109	-0.056029	0.072929	0.094477	0.993712	0.348934
Sum sq. resids	2.17E+09	1.87E+12	1.64E+12	1.28E+12	1.52E+12	1.47E+12	7.17E+11	3.13E+11	9.97E+10	2.69E+10
S.E. equation	10972.81	322598.9	301630.9	266764.8	290718.4	286177.0	199528.4	131773.7	74419.62	38630.40
F-statistic	6.760276	0.615464	0.777310	3.184053	186.2294	0.851441	1.220266	1.292136	443.4849	2.500638
Log likelihood	-304.0259	-402.0746	-400.1256	-396.5634	-399.0570	-398.6004	-388.1415	-376.1102	-359.5406	-340.5259
Akaike AIC	21.72592	28.48790	28.35349	28.10782	28.27979	28.24831	27.52700	26.69726	25.55452	24.24316
Schwarz SC	22.24455	29.00653	28.87212	28.62645	28.79842	28.76693	28.04563	27.21589	26.07315	24.76179
Mean dependent	5830.466	253809.2	214886.4	215951.2		352170.7	260131.0	179822.8	418845.4	52853.66
S.D. dependent	19185.92	299629.2	289387.7	355910.5	14610375	2382355.	278481.8	207227.9	138477.4	938485.2
Determinant Residual Covariance	2.53E+55									
Log Likelihood (d.f. adjusted)	-2261.280									
Akaike Information Criteria	163.5365									
Schwarz Criteria	168.7228									

Inverse Roots of AR Characteristic Polynomial



Quintile	Coefficient	Std. Err	z	P> z	95% Conf. Interval
AHH	.008721	.0052817	1.65	0.099	-.0016309 .0190729
SHH	-.388972	.1435841	-2.71	0.007	-.6703918 -.1075523
HHS	-.243525	.0226806	-10.74	0.000	-.2879782 -.1990718
HO	.0671506	.0495003	1.36	0.175	-.0298682 .1641695
EduHH	.4240912	.0604549	7.02	0.000	.3056018 .5425806
HS	-.2278804	.0718138	-3.17	0.002	-.368633 -.0871279
HFv	-.1851168	.0322819	-5.73	0.000	-.2483881 -.1218455
HosD	-.043915	.0084714	-5.18	0.000	-.0605187 -.0273114
<i>_cut1</i>	<i>-3.598971</i>	<i>.5145737</i>			-4.607517 -2.590425
<i>_cut2</i>	<i>-2.425274</i>	<i>.5097193</i>			-3.424305 -1.426242
<i>_cut3</i>	<i>-1.409424</i>	<i>.5056884</i>			-2.400555 -.4182933
<i>_cut4</i>	<i>-.2436745</i>	<i>.5027617</i>			-1.229069 .7417203

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Estimated coefficients from binary logits

Variable	y_gt_1	y_gt_2	y_gt_3	y_gt_4
AHH	0.014 1.80	0.016 2.45	0.006 0.88	-0.003 -0.30
SHH	-0.519 -2.48	-0.243 -1.41	-0.327 -1.81	-0.195 -0.88
HHS	-0.232 -7.61	-0.218 -8.11	-0.243 -8.14	-0.227 -6.21
HO	0.222 2.98	0.122 2.03	-0.019 -0.31	-0.046 -0.56
EduHH	0.490 5.25	0.405 5.40	0.461 6.05	0.410 4.61
HS	0.082 0.81	-0.295 -3.44	-0.340 -3.79	-0.277 -2.56
HFv	-0.144 -3.04	-0.160 -4.12	-0.188 -4.58	-0.291 -5.26
HosD	-0.047 -4.73	-0.039 -4.26	-0.033 -3.33	-0.015 -1.38
<i>_cons</i>	1.916 2.63	1.677 2.78	1.811 2.93	0.936 1.28

legend: b/t

Brant test of parallel regression assumption

	chi2	p>chi2	df
All	63.08	0.000	24
AHH	4.70	0.195	3
SHH	3.07	0.381	3
HHS	1.26	0.740	3
HO	9.90	0.019	3
EduHH	1.95	0.582	3
HS	20.31	0.000	3
HFV	5.83	0.120	3
HosD	9.34	0.025	3

A significant test statistic provides evidence that the parallel regression assumption has been violated.

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Appendix V: Household Socio-Economic Characteristics Questionnaire

HOUSEHOLD SOCIO-ECONOMIC CHARACTERISTICS QUESTIONNAIRE

$$\text{Log Welfare} = a_0 + a_1\text{EDUHH} + a_2\text{AgeHH} + a_4\text{GHH} + a_5\text{HS} + a_6\text{HHS} + a_7\text{HFv} + a_8\text{HosD} + a_8\text{U}$$

- EDUHH = Education of Household Head
- AgeHH = Age of Household Head
- GHH = Sex of Household Head
- HS = Health Status
- HHS = Household Size
- HO = House Ownership
- HFv = Health Facility visited by Household
- HosD = Health Facility Distance

A. Socio-Demographic Information

1. State or residence:

2. City: _____ (1 – Urban; 0 - Rural)

3. Town: _____

4. Sex of Household Head [] 1) Male [] 2) Female

5. Nationality of HH:

6. State of Origin of HH:

7. Age of HH head (Age at last birthday) _____

8. Highest Educational qualification of HH head [] 1) No formal education [] 2) Primary Education [] 3) Secondary education [] 4) Post-Secondary [] 5) Specify other

9. Marital Status of HH Head: [] 1) Single [] 2) Married [] 3) Divorced [] 4) Separated [] 5)Widow/Widower

10. Type of Marriage [] 1) Monogamous [] 2) Polygamous

11. How many of your household members fall in the following age group?

Age group (in years)	Number of males	Number of females
i. 0-4		
ii. 5-14		
iii. 15-64		
iv. 65 and above		

12. Religion [] 1) Christianity [] 2) Islam [] 3) traditional African Religion 4) Please specify other _____

B. Household Characteristics

13. Household Type 1. Nuclear [] 2. Extended [] 3. Not applicable (for bachelor/spinster HH) []

14. Household Size _____

15. Housing Type 1. Barrack Style (Face-me-face-you) 2. Bungalow 3. Compound 4. Storey building 5. Others, specify _____-

16. House Ownership 1. Owner occupied 2. Rented/Leased 3. Inherited 4. Family House

17. Which of the following items do you have in the household, please indicate as many as possible

ITEM	Yes	No
1. Television		
2. Radio		
3. Generator		
4. Well		
5. Borehole		
6. Car (At least one)		
7. Motorcycle		
8. Bicycle		
9.		



C. Sources of Income

18. Primary Occupation of HH Head _____

19. Do you have a secondary occupation? 1. Yes [] 2. No []

20. If yes, please indicate the secondary occupation _____

21. Monthly income of HH Head:
Primary Occupation: _____
Secondary Occupation: _____

22. If married, is spouse of HH head also working? 1. Yes [] 2. No []

23. If yes, primary occupation of spouse _____

24. Secondary Occupation of Spouse _____

25. Monthly income of spouse from primary occupation _____

26. Monthly income of spouse from secondary occupation _____

27. Who determines how income is disbursed in the household? [] 1) Household head only []
2) Joint decision with spouse [] 3) Individual decision on personal income
28. Apart from your occupations, do you have any other source of income?
29. If yes, please indicate other source(s) _____
30. Are other member of the household allowed to work? 1. Yes [] 2. No []



31. Kindly indicate in the table below the other members of the household that work, they kind of work and their monthly contribution of household funding

Member (Son, Daughter, Brother, Sister etc)	Age	Occupation	Occupation Scheme (Full time or Part time)	Monthly Contribution

D. Health-Related Factors

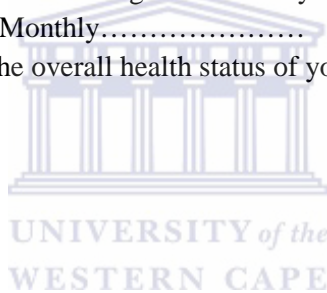
32. If anybody in your household is sick, which of the following places do you first contact for a solution? [] (i) Clinic/Hospital [] [] (ii) Dispensary [] [] (iii) Native doctor/traditional healer [] (iv) Spiritualists [] [] (v) Patent medicine stores (vi) Others, specify:.....

33. What is the distance between your house and clinic or hospital?.....km

34. How much in Naira do you spend on treating members of your household?
 (i) Weeklyor (ii) Monthly.....

35. In general, how would you rate the overall health status of your household?

- Excellent.....1
- Very good2
- Good3
- Fair4
- Poor5



E. Household expenditure

36. Indicate the amount purchased of the following items for household consumption.

Item	Item purchased last week or month or last year for household consumption		Purchased value (N)
	Yes = 1, No = 2	Please indicate whether for a week=1 or month=2 or year=3	
i. Salt/Potash/Maggi			
ii. Groundnut oil			
iii. Palm oil			
iv. Other oils, specify 1.			
v. Fish (fresh/dried/smoked)			
vi. Meat (beef/mutton, etc.)			
vii. Sugar			
viii. Bread			
ix. Cigarettes, tobacco, kola nuts			
x. Drinks (beer, local sweet drinks, minerals)			
xi. Shoes (leather, plastic, slippers)			
xii. Clothing (fabric and clothing)			
xiii. Purchase of motor vehicles			
xiv. Purchase of motor cycles			
xv. Purchase of bicycles			
xvi. Repairs of vehicles/bicycles			
xvii. Home repairs (painting, roofs, plastering)			
xviii. Kitchen utensils (pots, cups, cutlery, plates, spoons, etc.)			
xix. Furniture (beds, tables, chairs, cartons, etc.)			
xx. Petrol for vehicles			
xxi. Kerosene			
xxii. Detergents (soaps)			
xxiii. Pomades			
xxiv. Toothpaste			
xxv. Remittances/Gifts/Donations ^{38 39}			
xxvi. Festivals			
xxvii. Funerals			
xxviii. Electricity bills			
xxix. Transportation (money spent on transport)			
xxx. Debts			
xxxi. Total			

Appendix VI: Harmonized Nigeria Living Standards Survey (HNLSS) Questionnaire

