Government Expenditure and Economic Growth: Evidence from Selected Emerging African Economies:1995-2016

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DECLARATION

This is to declare that this research work titled, Government expenditure and economic growth: Evidence from selected emerging African economies: 1995-2016 was carried out by Okeke, Ijeoma Chinwe; Registration No: 2014417004F. To the best of my knowledge, this work is original and has not been previously submitted to this University or other institution.

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APPROVAL

We hereby certify that this dissertation titled Government expenditure and Economic growth: Evidence from selected emerging African economies by Okeke, Ijeoma Chinwe with Registration No: 2014417004F, satisfied the standard in partial fulfillment of the requirements for the award of Doctor of Philosophy (Ph.D) degree in Banking and Finance, Faculty of Management Sciences, Nnamdi Azikiwe University, Awka.

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I dedicate this work and the completion of my Ph.D programme to the Almighty God, for the courage, strength and abundant grace to successfully complete this programme.

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ABSTRACT

The study examined the relationship between government expenditure and economic growth in selected African economies- Egypt, Kenya, Nigeria and South Africa for the period 1995-2016. Government expenditure is an important factor that determines the economic growth of nations. The level of economic growth in African nations has not been progressive despite the considerable scope of government expenditure, over the years. The specific objectives of the study were to determine the relationship between government expenditure on education, health, defence, infrastructure and economic growth using gross domestic product (GDP) real growth rate as dependent variable and government expenditure on education, health, defence, infrastructure as independent variables .The study was anchored on Keynesian theory. The study used secondary data obtained from World Bank data base, UNESCO statistical book and the Central Banks publication of respective selected countries. The data were subjected to ADF stationarity test, Johansen co-integration test , Auto regressive distributed lag (ARDL) and Granger causality test analysis over the period 1995 – 2016. The findings of the study showed that there is negative and insignificant relationship between total Government expenditure on education and economic growth in the selected emerging African economies;a positive and significant relationship between total Government expenditure on Health and economic growth in the selected emerging African economies, a positive and significant relationship between total government expenditure on Defence and economic growth in the selected emerging African economies and a negative and insignificant relationship between government expenditure on Infrastructure and economic growth in the selected emerging African economies. The study indicated that Government expenditure on education, defence and infrastructure did not granger cause economic growth in the selected emerging African economies. However government expenditure on health granger caused economic growth of the selected African economies. The study recommended among others that allocation of government spending should be based on the needs assessment and the productivity of individual sectors of economies in African countries .

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Government expenditure is an important factor that determines the economic growth of nations. Studies on government expenditure and economic growth have provided insight on why economies grow at different rates over time. Government expenditure is an important instrument for government to control the economy. It plays an important role in the functioning of an economy whether developed or underdeveloped. Government expenditure was born out of revenue allocation which refers to the redistribution of fiscal capacity between the various levels of government or the disposition of responsibilities between tiers of the government (Okoro, 2013).

Government expenditure is important in achieving macroeconomic objectives in an economy, and also determines the economic direction of a country. It shows the way the economy is directed and what it intends to achieve. Government expenditure includes all government consumption, investment and transfer payments. Government expenditure is a fundamental tool for the efficient running of an economy.The link between government expenditure components and economic growth is a critical subject of analysis as the two are interrelated (Agbonkhese & Asekome, 2014).

The most crucial functions of government expenditure is to maintain reasonable degree of price level stability and an appropriate rate of economic growth that will enhance the economy to achieve full potential and stabilization. Economic stabilization is achieved when government expenditure, through its fiscal role, succeeds in maintaining an appropriate rate of economic

growth. Most economic direction today is subject to government intervention in undertaking fundamental roles of allocation, stabilization, distribution and regulation which is socially acceptable. Economic growth brings about a better standard of living of the people and this most at times is brought about by improvement in availability of infrastructure, access to food, health, housing, education, good roads etc. These improvements are very important in stimulating economic activities as well as addressing the nation's human capital development (Iheanacho, 2016).

An inclusive and long-term economic growth has become a concern for many policymakers for decades and government spending has been debated whether it is able to accelerate economic growth. Government expenditure has been used extensively as fiscal policy by the government in many countries, but its effect on economic growth is questionable (Hasnul, 2016).

There has been increased contention among development economists as to the relationship between public expenditure and economic growth (Jerono, 2009). Government expenditure has been seen to boost productivity, but it has also been seen as an obstruction to development because of the way it is financed. Government also mediates, particularly in emerging economies to achieve macroeconomic objective such as economic growth and development, full employment, price stability and poverty reduction.

Government expenditure is an important instrument for a government to control its national economy. Some scholars regard government expenditure as a growth enhancer in social and economic infrastructural developments such as in transport, electricity, telecommunication,

water, sanitation, education and health (Olukayode, 2009).In most emerging economies, government expenditure plays a key role in facilitating accelerated economic growth. Notwithstanding the importance of government monetary and fiscal policies which include taxation and expenditure, have become a strong and essential instruments of economic growth of a country (Chipaumire, Ngiranda, Method & Ruswa, 2014*)*.The Keynesians argue that government spending can positively impact growth when the government borrows from the private sector and pays back through various expenditures such as infrastructural development. This is based on the argument that the increase in government expenditure will inject new purchasing power for the consumers and thereby stimulating aggregate demand. There has been also the emergence of the endogenous growth theory which predicts that government expenditure and taxation will have both temporary and permanent effects on economic growth. Bogdanov (2010) points out that the emergence of the endogenous growth theory has encouraged specialists to question the role of other factors in explaining the economic growth phenomenon.

The relationship between government expenditure and economic growth has continued to generate argument among scholars in economic literature (Inuwa, 2012). According to Inuwa, the nature of the impact of government expenditure on economic growth is inconclusive. Some authors or researchers believe that the impact of government expenditure on economic growth is negative or insignificant, others believe that the impact is positive and significant (Alexiou, 2009). Some economists have argued that increase in government expenditure can be an effective tool to stimulate aggregate demand for a stagnant economy and to bring about major effects on the private sector. However, government expenses on capital projects like roads, airports, education, telecommunication and electricity, which are grouped under administrative, economic, community services etc are generally referred to as capital expenditure while,

expenses on wages and salaries, supplies and services, rent, pension, interest payment, social security payment are referred to recurrent expenditure (Muritala & Taiwo, 2011).

In Nigeria, government expenditure has continued to rise due to the huge receipts from production and sales of crude oil and the increased demand for public (utilities) goods like roads, communication, power, education and health. Besides, there is increasing need to provide both internal and external security for the people and the nation. Available statistics shows that total government expenditure (capital and recurrent) and its components have continued to rise in the last three decades (Okoro, 2013).

For instance, government total recurrent expenditure increased drastically from ₦4, 805.20 million in 1980 to ₦3, 109,440.00 million 2010. It then rose to ₦2, 651,980.00 million in 2016**.** A corresponding increase in expenditure was shown in government capital expenditure which rose from ₦10, 163.40 million in 1980 to ₦883, 870.00 million 2010, and to ₦1.818, 350.00 million in 2016. Unfortunately, rising government expenditure had no proportionate economic growth and development. Nigerian level of poverty is still high. Between 2006 and 2016, Nigeria's GDP grew at an average rate of 5.7 percent per year, as volatile oil prices drove growth to a high of 8 percent in 2006 and real growth rate percentage of GDP to be -1.6 in 2016. (World Bank,2017).Thus, there is an inverse relationship between the government expenditure and economic growth rate in Nigeria.

However in Kenya, the trend of government expenditure growth was fairly steady within the period of study from 1995 to 2016. The Kenyan government spends substantial amounts of money annually on physical infrastructure, education, health care, economic services, public

order and national security, defense and general administration. During the same period, the rate of growth of the GDP was cyclical, depicting no clear pattern and responsiveness to the changes in government expenditure, Despite the government expenditure increase over time, Making reference to economic theory which stipulates that when there is an increase in government expenditure in these sectors, it is expected that the economy will exhibit a positive economic growth, but this does not seem to happen in the case of Kenya considering the real growth rate within the period of study (1995-2016), The average growth rates declined in the 1980s to 4.2 per cent and in the 1990s to 2.2 per cent. real growth rate declined to 6.12 per cent in 2011, 4.45 per cent in 2012, 5.74 per cent in 2013, 5.30 per cent in 2014 and 5.8% in 2016, With an average economic growth of only 4.37 per cent over 2000–2016(World Bank 2017).

As a developing economy, South Africa has done significantly well in terms of improving its economic outlook since independence and most of the country's macroeconomic policies have been towards bridging the socioeconomic gap and creating an enabling environment for all-inclusive growth. Some of the remarkable achievements since independence includes: earning its place as the second largest economy in Africa with investment opportunities for foreign investors, improved infrastructural development, sophisticated financial institutions and accountability for its private institutions, rated as upper middle income country with a GDP ratio of three hundred and fifty billion US dollars and per capita income of about six thousand, four hundred and eighty-three US dollars (World Economic Forum Report, 2015), member of BRICs and one of the emerging markets in the world, open and engaging more in international trade, increased government expenditure in terms building human capital development amongst others. The largest sector of the economy according to South African Reserve Bank (2016) is services which accounts for around 73 percent of GDP. Within services, the most important are finance,

real estate and business services: 21.6 percent, government services: 17 percent, wholesale, retail and motor trade, catering and accommodation: 15 percent. Then transport, storage and communication: 9.3 percent. Manufacturing accounts for 13.9 percent; mining and quarrying for around 8.3 percent and agriculture for only 2.6 percent. Based on the growth trends in term of GDP, it has been from 4.1% in 1970 with a sharp increase to 6.6% in 1980 and decreased to -2.14% in 1992. The 1994 political transition in the country helped the GDP to growth to about 3.23% but was estimated to be at 0.52% in 1998. By 2003, the country recorded another growth increase of 5.60% which later decreased to 1.89% in 2013. The GDP real growth rate is 0.3 percent in 2016. Government expenditure as percentage of GDP has been moving around 18% and 20% from 1970 to 1980. In 1990, the total government expenditure as percentage of GDP was at 20% but dropped to 18% in 1999; increased to 21% by 2009 with an expected increase of 7.1% for another three years from 2016.

However, in Egypt the economic growth rate fell from 10.1% in 1980 to 4.3% in 2016 with the government expenditure increasing astronomically over the period from almost 100Billion EGP to 814Billion EGP in 2016, showing that the proportion of economic growth fell within the period under review while the proportion of government expenditure was otherwise (Central Bank of Egypt, 2017). Thus, government expenditure growth rate has been greater than GDP growth in the same period for the above countries under study.

Based on the foregoing, the study intends to investigate whether increasing government spending induces economic growth performance in emerging African countries. Although the goal of the study is similar to those of previous studies in this area of research, it differs in some areas like the countries under study and the variables to be used. This study, examines the effects of

different components of government expenditure, which includes Education, Health, Defence and infrastructural expenditure on economic growth. The main interest of the study is to investigate the effect of each component of government expenditure separately. The countries included in this study have similar economic structure, background, stage of development similar institutional arrangements and culture.

1.2 Statement of the Problem

The basic question in growth theory is whether increasing government expenditure promotes economic growth. However, the empirical evidence is inconclusive on the effect of government expenditure on economic growth of African economies, for instance Eggoh, Houeninvo and Sossou (2015) in their study concluded that public expenditures on education and health have a negative impact on economic growth, however this study did not conform to the result from similar study of Obialor (2017) who examined the effect of government human capital investment on the economic growth of three Sub-Sahara African countries of Nigeria, South Africa and Ghana from 1980 to 2013. The results found that two out of the three variables; Health , and Education , show significant positive effect on growth only in Nigeria, while literacy ratio is insignificantly positive in all countries. What would have accounted for the divergency in findings? It is against this background of seeming contradictions that the study seeks to analyse the relationship between government expenditure and economic growth in Emerging Africa countries. Many of the researchers observed that the government allocated more fund to the sectors of the economy that are less productive and allocate less to sectors that is supposed to boost the economy. How true is this observation?

The level of economic growth in African countries has not been impressive despite the considerable scope of Government expenditure. It is often established that there is need to appraise the relative trend in government expenditure across emerging economies and to assess the possible input of each sector to economic growth as this will boost allocation efficiency.Lastly, Africa is divided into four regions: East, West, North and South. Limited research works available were carried out without considering the above-mentioned regions within Africa .This study with its various modifications will focus on four selected economies in Africa, chosen from the four geographical regions of Africa, using time series data set specifically from the selected African economies (East, West, North and South Africa).

Thus, the aim of this research is to examine the nature of relationship which exists between government expenditure and economic growth in emerging Africa countries, with particular interest on government expenditures on Education, Health, Defence and infrastructure, and it's relationship with economic growth proxied by GDP real growth rate.

1.3 Objectives of the Study

The broad objective of this study is to ascertain the relationship between government expenditure and economic growth of selected emerging economies in Africa. The specific objectives are as follows:

1. To determine the relationship between government expenditure on education and economic growth of the selected emerging economies in Africa.
2. To ascertain the relationship between government expenditure on health and economic growth of the selected emerging economies in Africa.

3. To explore the relationship between government expenditure on defence and economic growth of the selected emerging economies in Africa.
4. To assess the relationship between government expenditure on infrastructure and economic growth of the selected emerging economies in Africa.
5. To examine the direction of causality between government expenditure and economic growth of selected emerging economies in Africa.

1.4 Research Questions

Based on the objectives stated, the following research questions are posed for the study:

1. How does government expenditure on Education relate to economic growth of selected emerging economies in Africa?
2. To what extent has government expenditure on Health related to economic growth of selected emerging economies in Africa?
3. How does government expenditure on Defence relate to economic growth of selected emerging economies in Africa?
4. To what extent has government expenditure on infrastructure related to economic growth of selected emerging economies in Africa?
5. What is the direction of causality relationship between government expenditure and economic growth of selected emerging economies in Africa?

1.5 Research Hypotheses

The following research hypotheses was raised in line with the objectives and research questions;

Ho_1: Government expenditure on education has no significant relationship with the economic growth of selected emerging economies in Africa.

Ho_2: Government expenditure on health does not exert positive and significant impact on economic growth of selected emerging economies in Africa.

Ho_3: Government expenditure on defence is not significantly related to economic growth of selected emerging economies in Africa.

Ho_4: Economic growth of selected emerging economies is not a significant function of Government expenditure.

Ho_5: There is no causality between government expenditure and economic growth of the selected emerging economies in Africa.

1.6 Scope of the Study

This study concentrated on the selected emerging Africa countries, over the period (1995 – 2016), representing a 22 year period. The choice of the period is informed by different economic developments in the selected African economies which includes; 1997 Stabilization policy and open door policy in Egypt, 2004 National economic empowerment development strategy of Nigeria and 1990 science and Technology infrastructural development programme in Kenya. The study was interested on what happened during the democratic and military dispensation of the selected African economies. The data base used is the government expenditure, on education, health, defence and infrastructure of the selected countries (Nigeria, Kenya, Egypt and South Africa). The selection of the countries was based on the emerging

economies in the east, west, north and south geographical areas of Africa. The annual dataset for this study were derived from Nigeria bureau of statistics, UNESCO statistical books, International Monetary Fund World Economic outlook and World Bank databank.

1.7 Limitations of the Study

The accomplishment of any econometric analysis ultimately relies on the availability of appropriate and accurate data. This study will be conducted using secondary data from both local and foreign sources. The availability of published data for all variables involved in the model is the decisive factor in the choice of a time period. The results of this study might be affected by the quality of the data available, and it should be acknowledged that, different publications reported different figures in the same period for the same variable. Data obtained from bureau of statistics are not consistent with the data from the World Bank . As mentioned, difficulties in obtaining quality data mean that more than one source will be employed in the research.

1.8 Significance of the Study

This research work is expected to be of great importance to the following:

1. Governments: Government of emerging African countries will find the outcome of the study useful in packaging the best structure of their annual yearly budgets to achieve optimal effect on the economy
2. Academic/ Education analyst: the academics will find this study useful in contributing significantly to the volume of literature available in the area of effects of government expenditure on economic growth. The result of the study will also be of benefit to education analysts and institutions in examining the effectiveness of government expenditure and economic growth.

3. Policy Makers: The study will also help policy makers to design growth-oriented programmes and carry out fiscal changes that are growth enhancing. Hence, the need for this type of knowledge in decision making assumes great importance on different sectoral allocation, as one of government's recent priorities is to encourage and promote a sustainable level of growth and full employment.
4. General Public: This study will enlighten the public on the relationship between productive and unproductive government expenditure and the economic growth in African countries

1.9 Definition of Terms

The following key terms which features in the study are defined as follows;

Defence sector: This is the sector of the economy that is concerned with the military and the entire security of a country.

Economic growth: Economic growth is the increase in the goods and services produced by an economy, typically a nation, over a long period of time. It is measured as percentage increase in real gross domestic product (GDP) which is gross domestic product (GDP) adjusted for inflation. GDP is the market value of all final goods and services produced in an economy or nation.

Education sector: This is the sector of the economy that facilitates learning, acquisition of knowledge, skills, values, beliefs, and habits. Educational methods include research and development.

Emerging Economy: An emerging economydescribes a nation's economy that is progressing toward becoming more advanced, usually by means of rapid growth and industrialization. These countries experience an expanding role both in the world economy and on the political frontier.

Government expenditure: Government spending or expenditure includes all government consumption, investment, and transfer payments. In national income accounting the acquisition by governments of goods and services for current use, to directly satisfy the individual or collective needs of the community, is classed as government final consumption expenditure. Government acquisition of goods and services intended to create future benefits, such as infrastructure investment or research spending, is classed as government investment (government gross capital formation). These two types of government spending, on final consumption and on gross capital formation, together constitute one of the major components of gross domestic product. Government expenditure comprises and recurrent and capital expenditure (wikipedia).

Health Sector: The healthcare sector is the sector of the economy made up of products and services related to health and medical care. It includes, biotechnology, health insurance providers, pharmaceuticals, management of clinics and hospitals, provision of home health products and services.

Infrastructures: Infrastructure is the fundamental facilities and systems serving a country, city, or other area, including the services and facilities necessary for its economy to function. It typically characterises technical structures such as roads, bridges, tunnels, water supply, sewers, electrical grids, telecommunications (including Internet connectivity and broadband speeds), transportation and so forth, and can be defined as "the physical components of interrelated systems providing commodities and services essential to enable, sustain, or enhance societal living conditions.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Conceptual Review

2.1.1 Fiscal Policy

Fiscal policy involves the use of government spending, taxation and borrowing to influence the pattern of economic activities and also the level and growth of aggregate demand, output and employment (Ugwuanyi & Ugwunta, 2017).

The term fiscal policy has normally been associated with the use of taxation and public expenditure to influence the level of economic activities. Fiscal policy pertains to the use of government expenditures and taxes to direct macroeconomic outcomes. Almost all economic activities are affected directly or indirectly by the government's fiscal policies. Fiscal policy entails government's management of the economy through the manipulation of its income and spending power to achieve certain desired macroeconomic objectives (goals) amongst which is economic growth (Medee & Nembee, 2011). Olawunmi and Tajudeen (2007) opined that fiscal policy has conventionally been associated with the use of taxation and public expenditure to influence the level of economic activities. Fiscal policy serves as an important tool to influence the aggregate demand (The Strategist, 2013). Depending upon existing situation of the economy, government can employ either expansionary or contractionary fiscal policy. Expansionary fiscal policy increases the aggregate demand whereas contractionary or deflationary fiscal policy reduces the aggregate demand. Changes in the level, timing and composition of government spending and taxation have an important effect on the economy.

In summary, government through its fiscal policy can promote macroeconomic stability and economic growth while encouraging efficiency and equity.

The Strategist (2013) noted the major objectives of fiscal policy as follows:

Full employment*:* It is very important objective of fiscal policy. Unemployment reduces the level of production, and hence the level of economic growth. It also creates many problems to the unemployed people in their day-to-day life. So, countries try to remove unemployment and attain full employment. Full employment refers to that situation, where there is no involuntary unemployment in the economy. To attain this objective, government tends to:

i. Increase its spending;

ii. Lower the personal income taxes;

iii. Lower the business taxes, or,

iv. Employ a combination of increasing government spending and decreasing taxes.

2.1.2 Government Expenditure

Government expenditure refers to spending made by the government of a country on collective needs and wants such as pension, health services, salaries, provision of infrastructure, etc. Government expenditure is usually broadly categorized into recurrent expenditure and capital expenditure. While the former refers to government's purchase of current goods and services (labour, consumables, wages and salaries, etc.), the latter include investments in infrastructure (roads, bridges, railway, schools, hospitals, etc) and all other expenditures that might contribute to development. In other words, while recurrent expenditure refers to financial outlays necessary for the day-to-day running of government businesses, capital expenditure refers to investment outlets that increase the assets of the state (Agbonkhese & Asekome, 2014).

2.1.2.1 Classification of Government Expenditure

According to Akrani(2011) Classification of government expenditure refers to the systematic arrangement of different items on which government incurs expenditure. Different economists have looked at government expenditure from different point of view. The following classification is based on these different views.

1. Functional Classification: Some economists classify government expenditure on the basis of functions for which they are incurred. The government performs various functions like defense, social welfare, agriculture, infrastructure and industrial development. The expenditure incurred on such functions fall under this classification.

2. Revenue and Capital Expenditure: Revenue expenditure is current or consumption expenditures incurred on civil administration, defense forces, public health and education, maintenance of government machinery. This type of expenditure is of recurring type which is incurred year after year. On the other hand, capital expenditures are incurred on building durable assets, like highways, multipurpose dams, irrigation projects, buying machinery, infrastructure and equipment.

3. Transfer and Non-Transfer Expenditure: Pigou (1928), cited in http://en.m.wikipedia.org>wiki>Pigou has classified public expenditure as Transfer expenditure and Non-transfer expenditure.

Transfer Expenditure:- Transfer expenditure relates to the expenditure against which there is no corresponding return.

Such expenditure includes public expenditure on:

i. National Old Age Pension Schemes,

ii. Interest payments,

iii. Subsidies,

iv. Unemployment allowances,

v. Welfare benefits to weaker sections, etc.

By incurring such expenditure, the government does not get anything in return, but it adds to the welfare of the people, especially those who belong to the weaker or poorer sections of society. Such expenditure basically results in redistribution of money incomes within the society.

Non-Transfer Expenditure: The non-transfer expenditure relates to expenditure which results in creation of income or output.

The non-transfer expenditure includes development as well as non-development expenditure that results in creation of output directly or indirectly.

i. Economic infrastructure such as power, transport, irrigation, etc.

ii. Social infrastructure such as education and health.

iii. Internal law and order and defense.

iv. Public administration, etc.

4. Productive and Unproductive Expenditure: This classification was made by Classical economists on the basis of creation of productive capacity.

Productive Expenditure: Expenditure on infrastructure development, public enterprises or development of agriculture increase productive capacity in the economy and bring income to the government. Thus they are classified as productive expenditure.

Unproductive Expenditure: Expenditures in the nature of consumption such as defence, interest payments, expenditure on law and order, public administration, do not create any productive asset which can bring income or returns to the government. Such expenses are classified as unproductive expenditures.

5. Development and Non-Development Expenditure: Modern economists have modified this classification into distinction between development and non-development expenditures. Development Expenditure: All expenditures that promote economic growth and development are termed as development expenditure. These are the same as productive expenditure.

Non-Development Expenditure: Unproductive expenditures are termed as non development expenditures.

6. Grants and Purchase Price: This classification has been suggested by economist Hugh (1946). Grants are those payments made by a public authority for which there may not be any quid-pro-quo, i.e., there will be no receipt of goods or services. For example, old age pension, unemployment benefits, subsidies, social insurance, etc. Grants are transfer expenditures. Purchase prices are expenditures for which the government receives goods and services in return e.g. salaries and wages to government employees and purchase of consumption and capital goods.

7. Classification According to Benefits: Public expenditure can be classified on the basis of benefits they confer on different groups of people.

i. Common benefits to all: Expenditures that confer common benefits on all the people. For example, expenditure on education, public health, transport, defense, law and order, general administration.
ii. Special benefits to all: Expenditures that confer special benefits on all. For example, administration of justice, social security measures, community welfare.
iii. Special benefits to some: Expenditures that confer direct special benefits on certain people and also add to general welfare. For example, old age pension, subsidies to weaker sections of the society, unemployment benefits.

8. Hugh (1946), cited in http://en.m.wikipedia.org>wiki>Hughclassified public expenditure as follows;

i. Expenditures on political executives: i.e. maintenance of ceremonial heads of state, like the president.
ii. Administrative expenditure: to maintain the general administration of the country, like government departments and offices.
iii. Security expenditure: to maintain armed forces and the police forces.
iv. Expenditure on administration of justice: include maintenance of courts, judges, public prosecutors.
v. Developmental expenditures: to promote growth and development of the economy, like expenditure on infrastructure, irrigation, etc.
vi. Social expenditures: on public health, community welfare, social security, etc.
vii. Public debt charges: include payment of interest and repayment of principle amount.

2.1.2.2 Government Expenditure in Nigeria

Government expenditure in Nigerian remains the key factor that drives its economic direction. It is also a management tool used to put the economy on a long-term sustainable growth and development trajectory. The pattern of government expenditure in Nigeria over the years has to a large extent been driven by crude oil endowment, which is reflected in the generated revenue (Akanbi, 2014). The evolution of government expenditure in Nigeria by trends over the years with regard to the patterns of capital, recurrent and total government expenditure shows that in the 70s (a period of massive physical infrastructure building), capital expenditure was on the rise, reaching its peak in 1980 at about a 55 percent share, while recurrent expenditure fell to about a 45 percent share of total government spending. Thereafter, a reverse trend ensued, with capital

spending reaching a trough of about 41 percent and recurrent spending peaking at about 59 percent. From 1990, the rising trend in capital spending and falling trend in recurrent spending converged with equal shares in 1998, which happened to be the end of the deregulation period (Akanbi, 2014).

Government spending in Nigeria has continued to rise due to the huge receipts from production and sales of crude oil, and the increased demand for public (utilities) goods like roads, communication, power, education and health. There is increasing need to provide both internal and external security for the people and the nation. Available statistics show that total government expenditure (capital and recurrent) and its components have continued to rise in the last four decades. For instance, government total recurrent expenditure increased from ₦4, 805.20 million in 1980 to ₦36,219.60 million in 1990 and further to ₦1, 589,270.00 in 2007. However, in 2016 the recurrent expenditure increased to₦2,651,980.00 million. On the other hand government capital expenditure rose from ₦10, 163.40 million in 1980 to ₦24, 048.60 million in 1990. Capital expenditure stood at ₦239, 450.90 million and ₦759, 323.00 million in 2000 and 2007 respectively. In 2016, the capital expenditure grew to ₦1,818,350.00 million. The growth proportion of the recurrent and capital expenditure is disproportional as the rate of growth in the Nigerian. Recurrent expenditure increases at high altitude compared to the capital expenditure. For instance, in 1990 ₦36,219.60 million was apportioned for recurrent expenditure while the capital expenditure was ₦24,048.60 million. The gap between the recurrent and capital expenditure was less than 55%. However, the various components of capital expenditure have risen between 1985 and 2016(CBN, 2016).

It could also be deduced that the current state of Nigeria's economy could be partly linked to the pattern of expenditure of her government. Intuitively, for a developing nation, capital expenditure (particularly in capital projects or infrastructure) ought to constitute significant proportion of her total expenditure, to lay the foundation for economic growth and sustainable development, but this has not been the case in Nigeria. Hence, the predominance of recurrent expenditure over capital expenditure has however weakened the absolute effect of government expenditure on the nation's economy.

2.1.2.3 Government Expenditure in Kenya

Kenya's government expenditures are divided into three main categories: i) the Central government budget, ii) the Constituency Development Fun (CDF), and iii) the Local Authority Transfer Fund (LATF). The CDF was created to make sure that a share of the Kenya's expenditure is channeled for constituencies to finance development projects. The CDF must be at least 2.5% of the Kenyan government ordinary revenue. The LATF was established to improve service delivery and financial management, and to reduce the outstanding debt of local authorities. LATF transfers 5% of central income tax revenues to local authorities to supplement revenues raised locally through land taxes, single business permits and other sources. Data for the Central government budget was drawn from audited accounts of the Kenya National Audit Office; for Votes "50 Public Debt (CFS)" and "51 Pensions and Gratuities (CFS)" the data comes from the Consolidated Fund Services. The entire expenditure by government is drawn from the consolidated fund maintained by the National Treasury under the docket of the Ministry of Finance (National Treasury as per current administration). Although the counties are expected to have their own finance departments they still depend on the National Treasury since the major revenues are collected by the Kenya Revenue Authority. The National government is required to

spend in accordance with the voted provision. There exist numerous categories of National government expenditures, and these encompass the purchase and availing of goods and services (government consumption), government purchases of goods and service intended to create future benefits such as infrastructure investment or research and development, spending investment (government investment) and money transfers (Constitution of Kenya, 2010).

The expenditure in Kenya, can be broadly classified in terms of purpose as recurrent and development expenditure. Recurrent expenditure refers to expenditure of recurrent expenses that are less discretionary and are made on ongoing programmes or activities. Recurrent expenditure may affect private investment through its effects on peoples' ability and willingness to work, save and invest. Development expenditure refers to expenditure that is generally more discretionary and is made on new programmes and activities that are yet to reach their final desired state of completion. It consists of investment in such schemes as construction of railways, roadways and communication systems, irrigation and power projects, which raise economic growth both directly and indirectly through encouragement of further private investment (Agenor, 2007). In Kenya, various government expenditure reforms have been implemented. The reasons for the reforms were to raise and sustain the economic growth rate of the country. The public sector contributes to GDP growth rate through provision of government services such as education, health and administration, and productive activities in areas of agriculture, manufacturing, transport and communication and trade. In the Republic of Kenya report (2002), "the main government expenditure strategy has been restructuring overall expenditure by directing more resources to activities that promote faster economic growth". To realize this objective, a number of reforms on policy such as bringing down the level of spending

by the government have been undertaken as a means of devoting more resources for developmental purposes.

The movements of recurrent and development (capital) expenditure were converging and these were the years Kenya recorded an upward growth performance at the early years of independence. For instance, there was an upward trend in development expenditure, reaching 36% of public expenditure in 1970 compared to 17% in 1963. This increase was attributed to increase in the construction costs. During the period of 1963 to 1970, the country's rebuilding processes facilitated large amounts of money to be spent on infrastructure and services. The huge expenditure on electricity, roads, telecommunications and airport expansion, resettlement, nationalization and agricultural development contributed to the increase in development expenditure. However, the proportion of development expenditure remained, on average 32 % of total expenditure from 1972-1979, but began to decline thereafter and stagnated at about 19% of total government expenditure between 1982 -1996. A sharp decrease to less than 5 percent between 1999 and 2002 was witnessed. According to M'Amanja and Morrissey (2005), the decrease in development expenditure was attributed to the austerity measures of World Bank via Structural Adjustment Programme (SAP's) or through International Monetary Fund (IMF's) stabilization programmes. Since most recurrent expenditure is fixed the only lee way the government had in the wake of these austerity measures was its development budget. However, development expenditure showed an upward trend between 2003 and 2016 because of increased infrastructural expenditure in areas of roads, telecommunication, health and education, rehabilitation of airport in Nairobi, Mombasa and Kisumu.

2.1.2.4 Government Expenditure in South Africa

In South Africa, the achievement of long-term economic growth is a national priority. The size of government expenditures and its effect on long-run economic growth, and vice versa, has been an issue of sustained interest (Loizides & Vamvoukas, 2005). The extensive capital expenditure program the government is currently undertaking is aimed at improving and increasing both the efficiency and network of country-wide infrastructure needs of the economy. The planned rate of growth of the capital budget of government at between 15% and 20% per year is unprecedented in South African history. South Africa, being a middle-income country, provides an excellent case study on the impact of government expenditure on growth in aiding such transition to economic growth.

In 1960, real per capita government expenditure in the Republic of South Africa was R 1,703 at constant 2000 prices (Alm & Embaye, 2010). But in 2007, the real per capita spending had tripled to R 7,959, and during the same period, real per capita gross domestic product (GDP) increased from R 15,938 to R 25,414 at constant 2000 prices, or by only 60% (Alm & Embaye, 2010). In the 2012 National Budget Speech, The Minister of Finance Mr. Lungile Fuzile announced that national spending would exceed R1.1 Trillion for the first time in history (South Africa Budget Speech, 2012) which was about 32% of GDP. This measure was in response to the global recession, and the government hiked its expenditure to keep South Africa afloat and prevent it from sinking into a deep hole. This also constituted key reason for the inclusion of South Africa as a key African country of study on the subject matter.

2.1.2.5 Government Expenditure in Egypt

Government expenditure in Egypt is public expenditure on goods and services and is a major component of their GDP. Government spending policies like setting up budget targets, adjusting taxation, increasing public expenditure and public works are very effective tools in influencing their economic growth. Government Spending in Egypt remained at 813 EGP Billion in the first quarter of 2015 from 771 EGP Billion in the fourth quarter of 2014. Government Spending in Egypt averaged 380.05 EGP Billion from 2001 until 2016, reaching an all time high of 813 EGP Billion in the second quarter of 2016 (Central Bank of Egypt,2017).

2.1.2.6 Government expenditure on education

Education plays an important role in human capital development which is a key to scientific and technological advancement. Education is also regarded as a sustainable route to economic prosperity, it combats unemployment, confirms sound foundation of social equity, awareness and cultural vitality. It raises the productivity and efficiency of individuals and produces skilled manpower capable for leading the economy towards the path of economic development (Mekdad, Dahmani & Louaj, 2014)

Government expenditure on education includes direct expenditure on educational institutions as well as educational-related public subsidies given to households and administered by educational institutions. This indicator is shown as a percentage of GDP and of total government spending, divided by primary, primary to post-secondary non-tertiary and tertiary levels. Public entities include ministries other than ministries of education, local and regional governments, and other public agencies. Public spending includes expenditure on schools, universities and other public

and private institutions delivering or supporting educational services. Education expenditure covers expenditure on schools, universities and other public and private institutions delivering or supporting educational services.

According to Obi, Ekesiobi, Dimnwobi and Mgbemena(2016) Expenditure on education is regarded as investment in human capital because it helps in skill formation and thus raises the ability to work and produce more. Government education spending is of great importance to national development and plays a critical role in promoting growth and knowledge deepening.

2.1.2.7 Government expenditure on health

According to WHO (2010), Public health expenditure consists of recurrent and capital spending from government (central and local) budgets, external borrowings and grants (including donations from international agencies and nongovernmental organizations), and social (or compulsory) health insurance funds. Total health expenditure is the sum of public and private health expenditure. It covers the provision of health services (preventive and curative), family planning activities, nutrition activities, and emergency aid designated for health but does not include provision of water and sanitation. Aranda (2010) noted that the major reason for health expenditure is the expectation of improved health status, and that health status is governed by health investment. The demand for health care is derived from the demand for health itself. Both health care expenditure and improved health status are means to an end; the end is increased productivity and national development. Clement, Coady, Shang and Tyson (2011) identified demographic and non-demographic factors that affect health care expenditure. The demographic

factors include changes in age distri-bution within the population while the non-demographic factors include rising incomes, health technology innovation, health policies and institutions.

2.1.2.8 Government expenditure on defence

Defence spending is the share separated by states from their national income in order to provide its security against internal and external threats. Defense spending are composed of production (or import from other countries) of tools and vehicles used in defense, repair and maintenance costs for the tools and vehicles, expenditures for research and developments activities and the military and civilian staff employed in defense field. Governments arrange the share they separate for defense spending by taking the welfare of their country into consideration. national security allows for productive economic activities to be carried out without fear of foreign appropriation(Korkmaz 2015) . Governments have also had a prominent role in financing the military sector. Endogenous growth theory provides a foundation for the relationship between the share of military expenditure and longrun economic growth, predicting an inverse hump-shaped link (Pieroni, 2009). Thus defense spending is expected to provide national security and subsequently enhance economic growth in the long-run."(Hirnissa & Baharom, 2009).

The Classical school of thought contends that an increase in military expenditure is likely to retard economic growth. This argument is based on the premise that higher military spending implies a lower level of private investment and domestic savings, and lower consumption due to lower aggregate demand. This can be specifically explained as follows. A higher level of military spending will lead to an increase in the interest rate, which will crowd out the private investment. The Keynesian school of thought contends that an increase in the military burden stimulates

demand, increases purchasing power and national output, and creates positive externalities (Narayan & Singh, 2007).

According to Ali and Ather (2014) defence spending is one of the major concerns of developing as well as developed countries because a lion share of their budget is absorbed by defense sector. Charles-Anyaogu (2012) opined that expenditure on defence is a necessity for safe guarding and protecting the nation from outside and internal aggressions . Especially in countries where the probability of internal conflict & external threats is high. Military expenses in developing countries are a major issue, because the governments are responsible for most parts of expenses & according to existing needs they should allocate their resources somehow achieve to optimum results. So the government's purpose from this expense is for obtaining a suitable result from employed resources.

According to Mohammadi, Maleki and Gashti (2012) Military expenses can be effective on economic growth through various means:

1. Creation of aggregate demand by military expenses which will add on utilization rate from country's economic capacities.

2. Existence of mandatory substitution's effects which military expenditure can cause the budget deficit & the effects of obligatory substitution in government budget which can reduce the other government expenditure.

3. Increasing of public sector's share which its efficiency is less than the other sectors.

4. If military expenses be associated with production policy of military facilities which it is requiring to creation of heavy industrial bases, may be caused to create a kind of industrialization strategy replacing to import that reduce the needed financial resources in order to increasing of

exports and strengthen of agricultural sector, this strategy is usually harmful for developing countries.

5. Strong military can effect the economiy. For example discipline and order which is created in the community, also where the military sector leading to civilian projects and the industrial technology impact of advanced facility production on other industries is like them.

2.1.2.9 Government expenditure on infrastructures

Government acquisition intended to create future benefits, such as infrastructure investment or research spending, is called gross fixed capital formation, or government investment, which usually is the largest part of the government. Acquisition of goods and services is made through production by the government (using the government's labour force, fixed assets and purchased goods and services for intermediate consumption) or through purchases of goods and services from market producers. In economic theory or in macroeconomics, investment is the amount purchased per unit of time of goods which are not consumed but are to be used for future production (i.e. capital). Examples include railroad or factory construction. Infrastructure spending is considered government investment because it will usually save money in the long run, and thereby reduce the net present value of government liabilities.(wikipedia)

According to Srinivasu and Srinivasa-Rao (2013), infrastructure can simply be defined as the stock of basic facilities and capital equipment essential for productive activity and the functioning of a country. Although there is no consensus on how infrastructure should be defined, a common feature of all the definitions is the idea that infrastructure refers to capital goods provided with a long-term perspective, and comprising strong public involvement (Baldwin & Dixon, 2008).

Economists and urban planners distinguish between two components of infrastructure, namely, economic and social infrastructure (Snieska & Simkunaite, 2009). They define economic infrastructure as infrastructure that promotes economic activity, such as, roads, highways, electrical lines, railroads, airports, seaports, telecommunications, electricity, water supply and sanitation. Social infrastructure, however, has to do with the human capital aspect of an economy. It is believed to be infrastructure that promotes health, educational and cultural standards of the population, which includes schools, universities, libraries, clinics, hospitals, parks and statues (Fedderke & Garlick, 2008). According to Bertoldi (2010) infrastructure investment creates the potential for economic linkages. It does this by enabling the private sector, individuals and government to respond to new types of demand in a variety of places and to enlarge markets.

2.1.3 Economic Growth

Economic growth is an increase in the capacity of an economy to produce goods and services, compared from one period of time to another. It can be measured in nominal or real terms, the latter of which is adjusted for inflation. In simple terms, economic growth refers to an increase in aggregate productivity. Economic growth represents the expansion of a country's potential GDP or output. According to Palmer (2012), economic growth refers to an increase in the productive capacity of an economy as a result of which the economy is capable of producing additional quantities of goods and services. Economic growth is the increase in the market value of the goods and services produced by an economy over time. It is conventionally measured as the percent rate of increase in real gross domestic product, or real GDP.

Economic growth has provided insight into why state grow at different rates over time; and this influence government in her choice of tax rates and expenditure levels that will influence the growth rates. Economic growth is important if businesses are to grow and prosper. It translates to growth in the output of the economy as a whole. Growth in this case is measured as the change in the gross domestic product (GDP) of a country over one year. To allow for comparisons over time this figure is adjusted to allow for inflation. Over time real economic growth leads to major progresses in living standards, expanding existing markets and opening new ones. The real economic growth of one country relative to another is an important indicator of business opportunity (Wagner, 1977). According to Khorravi and Karimi (2010), classical studies estimate that economic growth is largely linked to labour and capital as factors of production. When the economy is growing positively, businesses will need to hire more people to help to cope with the increase in production and services. The increase is necessary to meet the increasing demand of the consumers. If however the economic growth is negative, businesses will have to cut costs and take measures to reduce the chances of making losses because consumers demand less goods and services (Gorodnichenko, 2010). Economic growth is the increase in the market value of the goods and services produced by an economy over time. Economic Growth is usually calculated in real terms – i.e., inflation-adjusted terms – to eliminate the distorting effect of inflation on the price of goods produced. In economics, "economic growth" or "economic growth theory" typically refers to growth of potential output, i.e., production at "full employment". Economic growth is generally distinguished from development economics. The former is primarily the study of how countries can advance their economies. The latter is the study of the economic aspects of the development process in low-income countries. Since economic growth is measured as the annual percent change of gross domestic product (GDP), it has all the advantages and drawbacks of that measure.

Economic growth indicates the wealth of a nation since a country with a growing economy is a country that is getting richer. The more the country can produce in terms of goods and services, the more income it can generate for its people and the people have more money to spend, they will be able to demand for more goods and services. Due to the increase in demand, businesses will produce more which lead to even greater wealth. However, a country with a negative growth is one that gets poorer over time i.e when production of goods and services fall and less income is generated.

Measuring economic growth involves quantifying the increase in welfare and to present it with numerical precision these large-scale economic and social changes. Some of criteria used to measure economic growth include the National Income approach which is measured by either taking a country's Gross Domestic Product (GDP) or Gross National Product (GNP). To get the economic growth, the National income should then be divided by the total population to get the Per Capita Income which is per head measure of the total worth of all goods and services produced in an economy. Physical Capital Accumulation also measures economic growth. It was observed that accumulation of physical capital constitute a critical engine of economic growth. Physical capital includes roads, building machines, factories and bridges. Physical capital accumulates quickly due to high investments in turn driving up the economy's growth rate as the economy itself converges towards a steady-state growth path (M'Amanja & Morrissey, 2005).

2.1.3.1 Causes of Economic Growth

Economic growth is caused by many factors , which includes the following

Economic resources: The first is a discovery of new or better economic resources. An example of this is the discovery of gasoline fuel; prior to the discovery of the energy-generating power of gasoline, the economic value of petroleum was relatively low. Gasoline became a "better" and more productive economic resource after this discovery.

Labour force: The Second way to generate economic growth is to grow the labor force. More workers generate more economic goods and services.

High level Technology: A third way to generate economic growth is to create high level technology or other capital goods. The rate of technical growth and capital growth is highly dependent on the rate of savings and investment, since savings and investment are necessary to engage in research and development.

Increased specialization: The fourth method is increased specialization. This means labourers become more skilled at their crafts, raising their productivity through more practice. Savings, investment and specialization are the most consistent and easily controlled methods.

2.1.4 Emerging Economy

An emerging economy is a country that has some characteristics of a developed market, but does not meet standards to be a developed market. This includes countries that may become developed markets in the future or were in the past. The four largest emerging and developing economies by either nominal or PPP-adjusted GDP are the BRIC countries:Brazil, Russia, India and China,(Wikipedia).

According to Kvint (2008), an emerging economy may be defined as "an economy transitioning from a dictatorship to a free market-oriented economy, with increasing economic freedom, gradual integration within the global marketplace, an expanding middle class, improving standards of living and social stability and tolerance, as well as an increase in cooperation with multilateral institutions. Economy Watch (2010) defined emerging market economies as economies with low per capital income. The emerging economies constitute approximately 80% of the global population as well as 20% of the world economies. The word was invented in 1981 by Antiole Agtmeal which served at the international finance corporation of the World Bank, he added that emerging market economies have indispensable description of trade liberalization and make available or exposed their economies at a global stage.

Williams (2011) portrayed an emerging market economy as an economy that is a complement with the description of fast economic growth, increased foreign investment and increased international political influence.

2.1.4.1Characteristics of Emerging Economy

Even though every emerging economy is a unique one, most common characteristics of emerging economies could be summarized in the following way (Miller, 1998):

1. Physical characteristics in terms of an inadequate commercial infrastructure as well as inadequacy of all other aspects of physical infrastructure (communication, transport, power generation).

2. Sociopolitical characteristics which include, political instability, inadequate legal framework, weak social discipline, and reduced technological levels, besides (unique) cultural characteristics.

3. Economic characteristics in terms of limited personal income, centrally controlled currencies with an influential role of government in economic life.

2.2 Theoretical Framework

Several theories explaining government expenditure in relation to economic growth. Among them are:

2.2.1 Wagner's Theory

Among the pioneer literatures on public expenditure was from one German economist called Adolph Wagner. The literature opines that the growth of public spending is a natural consequence of economic growth. Specifically, he also viewed public expenditure as a behavioral variable that positively responded to the dictates of a growing economy (Wagner, 1977). The Wagner law is accepted to an extent because it attempts to explain public expenditure and economic growth. The law is faulted because of its inherent assumption of viewing the state as separate entity capable of making its decisions ignoring the constituent‘s populace who in actual fact can decide against the dictates of the Wagner Law.

2.2.2 Musgrave Rostow's Theory

This theory asserts that in early stages of economic growth, public expenditure in the economy should be encouraged, Musgrave (1959). The theory further states that during the early stages of

growth there exists market failures and hence there should be robust government involvement to deal with these market failures. This theory is faulted because it ignores the contribution to development by the private sector by assuming the government expenditure is the only driver of economic growth.

2.2.3 Keynesian Theory

Keynesian (1936) postulated a growth theory where public spending is seen as an exogenous factor in determining growth through its multiple effect on aggregate demand. Keynes analysis is made using a conceptual AD-AS framework in an open economy.

$Y = C + I + G + NX$

Where Y is Aggregate Output,

I is Investment,

G is Autonomous Government expenditure,

NX is Net Exports (exports minus imports)

C is Autonomous Consumption .

From the above-stated equation, all the variables are positively related to Output. This means that, any change in Government Spending will affect Output depending on the strength of the multiplier.

Keynes also explained the effect of government spending on economic growth in three propositions.

i. A rise in government expenditure will induce aggregate output to increase. But the extent of the rise will depend on the quantum of the expenditure multiplier.

ii. The size of the expenditure multiplier will cause a tax increase to negatively affect aggregate output.

iii. Either an increase in government expenditure or a reduction in taxes will cause aggregate output to increase by the size of the expenditure multiplier all other things being equal.

However; one of the greatest limitations of Keynesian theory is that it fails to adequately consider the problem of inflation which might be brought about by the increase in government spending.

2.2.4 The Peacock and Wiseman Theory

This theory was advanced by Peacock and Wiseman in a study of public expenditure in the UK for the period 1890 – 1955. It is based on the premise that the populace is naturally tax averse while the government on the other hand has an inherent appetite for expenditure. During times of shock like calamities and war, the government would expeditiously increase public expenditure. This would necessitate moving taxes upwards, the researchers argued, and the populace (tax payers) would allow and condone such an increase in tax. This scenario is referred to as displacement effect, which though meant to be a short term phenomenon would normally assume a long term trend (Wiseman & Peacock, 1961). One of the shortcomings of this theory is that it sidelines the fact that government can finance an upward displacement in public expenditure using other sources of finance such as donor funds, external borrowing or even sale of government fixed asset and this, needless to say, may not affect taxes in an upward trend.

2.2.5 Ernst Engel's Theory of Public Expenditure

Ernst Engel (1821-1896) was also a German economist writing almost the same time as Adolph Wagner. Engel pointed out over a century ago that the composition of the consumer budget changes as family income increases. A smaller share comes to be spent on certain goods such as

work clothing and a larger share on others, such as for coats, expensive jewelries etc. As average income increases, smaller changes in the consumption pattern for the economy may occur. At the earlier stages of national development, there is need for overhead capital such as roads, power installations, pipe-borne water etc. But as the economy developed, one would expect the public share in capital formation to decline over time. Individual expenditure pattern is thus compared to national expenditure and Engel's finding is referred to as the declining portion of outlays on foods.

2.2.6 Theory Adoption

Based on the stated shortcomings of different government expenditure and economic growth theories, the study adopted the Keynesian theory that postulates, an increase in government expenditure to foster economic activities to a desired direction. The Keynesian theory recognizes the fact that increase in government expenditure creates a multiplier effect of increasing funds in the economy that will create more jobs, more productivity and in the long run boost the economic activities to cause improvement and growth of the GDP of countries. Thus, the Keynesian theory capturers the apriori expectation of government expenditure on economic growth.

2.3 Empirical Review

The empirical review was conducted based on the objectives as outlined in chapter one of the study to throw more light on various views on the relationships between the variables under consideration.

2.3.1 Government Expenditure and Economic Growth

Odo, Igberi and Anoke(2016) in their study examined the long run and causal relationship between public expenditure and economic growth in South Africa from 1980 to 2014. The authors employed co integration test, vector error correction model and Granger causality test in estimation of the variables specified in the regression model. The results from the estimations indicated a stable long run relationship between the dependent and independent variables, a negative insignificant relationship between total government expenditure and economic growth, a positive significant relationship between economic growth and total revenue, and significant positive relationship between inflation and economic growth. The pair wise Granger causality showed a one way causality running from national income (RGDP) to total government expenditure in confirmation of the application of Wagner's theory in the economy. In view of the above results the study concludes that a stable long run relationship exists between public expenditure and economic growth in South Africa within the period of the study and that the growth in national income leads to increase in government expenditure as implied by Wagner's hypothesis in South Africa.

Iheanacho (2016) examined the long and short run relationship between public expenditure and economic growth in Nigeria over the period of 1986-2014, using Johansen cointegration and error correction approach. The result shows that recurrent expenditure is the major driver of economic growth in Nigeria.

Aigheyisi (2013) explored the relative impacts of federal capital and recurrent expenditures on Nigeria's economy in the 1980–2011 period. He investigated the effect of total government expenditure (GOVEXP) on gross domestic product (GDP) using multiple linear regression

analysis. The estimation result strongly supports Ram's growth accounting model. GOVEXP was thereafter disaggregated into capital expenditure (CAPEXP) and recurrent expenditure (RECEXP) and the impacts of these on GDP were investigated by exploiting the cointegration and error correction mechanism. The cointegration test result indicates the existence of a long-run relationship between the variables.

Ezirim, Moghalu and Elike (2008)examined the relationship between public expenditure growth and inflation in the United States of America using the co integration analysis and Granger causality model applied to time series annual data from 1970 – 2002. The results indicated that public expenditure and inflation are cointegrated and thus there exist a long-run equilibrium relationship between the two variables, there is also a bi-causational relationship between public expenditure growth and inflation in the United States of America. Inflation significantly influences public expenditure decisions in the United States of America. Public expenditure growth was seen to aggravate inflationary pressures in the country, where reduction in public expenditure tends to reduce inflation.

Akwe (2014) examined the causal relationship between public social expenditure (education and health) and economic growth in Nigeria for the period of 1990 to 2009 by applying the Vector Error Correction (VEC) Model Based Causality. The study used stationarity, co-integration and causality test of data and variables. The work found out that there is a unidirectional causality running from economic growth to health expenditure, which supports the Wagner's Law. The study also discovered that causality runs from economic growth to education and aggregate social expenditure. The study concluded that public social expenditure amplify economic growth at bivariate (aggregated) levels.

Dandan (2011) examined the impact of public expenditures on economic growth using a time series data on Jordan for the period 1990-2006. Using different regression models .The study found that the government expenditure at the aggregate level has positive impact on the growth of GDP which is compatible with the Keynesian theory. It also found that interest payment had no influence on GDP growth.

Olurankinse and Alimi (2014) examined the causal relationship between government spending and national income in a panel of three African countries – Nigeria, Ghana and South Africa - during the period 1970 to 2012 using Johansen Fisher Panel Cointegration Test and then on a country-by-country basis using time series Johansen-Juselius co integration techniques. The panel cointegration results indicated a long run relationship between government spending and national income in the whole panel. The Johansen-Juselius cointegration test suggested an existence of long run relationship between government spending and national income only for Ghana as predicted by Wagner, thus suggesting government spending is not an important factor in economic growth in the long run in Nigeria and South Africa. The result from the causality test shows that there is a bi-directional causality that runs from national income to government expenditure and vice versa for Nigeria and South Africa. However, for Ghana, there was a uni-directional causality that runs from government expenditure to national income and there is no feed-back mechanism. They concluded that Government spending enhances National Income enormously and vice-versa in the short run for Nigeria and South Africa.

Mulinge (2016) purposed in his study to find out the effect of recurrent public expenditure on economic growth in Kenya from 1980-2014. The specific objectives of the study were to disaggregate recurrent public expenditure into, government expenditure on social services, government expenditure on general public administration, government expenditure on debt and

to find out the impact on economic growth in Kenya. These disaggregates were the independent variables, while real gross domestic product was the dependent variable. The study used time series data covering the period 1980 – 2014. It employed Augmented Dickey Fuller test for unit root tests before using autoregressive distributed lag approach to test cointegration. The study findings indicated that there was a long-term relationship between recurrent public expenditure and economic growth in Kenya. Recurrent public expenditure on government social services and government expenditure on debt showed a positive relationship towards growth while government recurrent expenditure on administration showed a negative relationship. but, government expenditure on debt and administration were statistically insignificant while government recurrent expenditure on social services was statistically significant in driving economic growth.

Egbetunde and Fasanya (2013) analysed the impact of public expenditure on economic growth in Nigeria during the period 1970 to 2010 making use of annual time series data. The study employed the bounds testing (ARDL) approach to examine the long run and short run relationships between public expenditure and economic growth in Nigeria. Their findings indicated the impact of total public spending on growth to be negative. Recurrent expenditure however was found to have significant positive impact on growth.

Abdel-Latif and Mishra (2016) explored how fiscal policy - represented by acceleration in government spending exerts asymmetric effects on economic growth in the context of a developing country, Egypt in particular. The research found that nothing can guarantee linearity between the growth impact of increasing and decreasing government expenditures. Using a non-linear ARDL model on Egypt data at both aggregated and disaggregated levels for the period

1980-2013, this paper provides new evidence of a non-linear relationship between government spending and economic growth. Ugwuanyi and Ugwunta (2017) in their study sought to determine the effect of fiscal policy on the economic growth of sub-Saharan African Countries. The ex-post facto research design was adopted which enabled the study to make use of secondary data from sub-Saharan African Countries in a panelleast squares. The result revealed that Government productive and unproductive expenditures, distortionary tax (a proportional tax on output at rate) and non-distortionary taxes have significant effects on the economic growth of sub-Saharan African countries.

The study by Hakro (2009) on panel regression of a sample of 21 Asian countries covering data for period of 1981 to 2005, found a positive relationship between government expenditure and GDP per head growth. Moreover investment, physical capital and labour force growth rate were positively related to GDP growth per head but unemployment negatively affected GDP per head growth.

Asghar, Azim and Rehman (2011) in their study used Johansen co integration to examine long run relationship of effect of government spending in social sectors on economic growth during the period 1974-2008 in Pakistan. The results of the study revealed the existence of positive relationship between government expenditure on human capital and economic and community services and economic growth. The government expenditure on law and order and subsidies appear to be negatively related to economic growth. Nkwatoh (2012) analysed the relationship and direction of causality between government expenditure and economic growth in Nigeria using annual data from 1961 to 2009. Using co integration and Granger causality test. The result of the Johansen bivarate/multivariate co integration revealed that there was no long run relationship

among the stationary variables. Government expenditure causes economic growth at a bivarate level supporting Keynesian theory that increased government expenditure amplifies economic growth.

Danladi, Akomolafe, Olarinde and Anyadiegwu (2015) used Johansen co integration test and auto regressive distributed lag and found that the structure and size of government expenditure determines the pattern of growth in the economy. In their paper on government expenditure and its effect on economic growth for the period 1980-2013. Secondary data was obtained from World Bank. The Keynesian aggregate expenditure was adopted as a framework to explain the role of government spending on output. From the analysis and findings, they reported that government spending significantly and positively affected the economic growth of the country. Gregorious and Ghosh (2007) made use of the heterogeneous panel data to study the impact of Government expenditure on economic growth. Their results suggest that countries with large government expenditure tend to experience higher economic growth.

Olorunfemi (2008) studied the direction and strength of the relationship between public investment and economic growth in Nigeria, using time series data from 1975 to 2004 and an auto regressive model, he observed that public expenditure impacted positively on economic growth and that there was no link between gross fixed capital formation and Gross Domestic Product. He affirmed that from disaggregated analysis, the result reveal that only 37.1% of government expenditure is devoted to capital expenditure while 62.9% share is to current expenditure.

Adamu and Hajara (2015) examined the impact of public expenditure on economic growth in Nigeria using time series data for the period 1970-2012. Secondary data were sourced from the CBN, NBS, journals, text books etc. The adopted model was fitted with three variables: real GDP, capital and recurrent expenditure, using ordinary least square, Philip-Perron unit root test and Pairwise Granger causality methodology. Empirical findings from the study showed that there is positive relationship between capital expenditure and economic growth while recurrent expenditure had a significant positive impact on economic growth.

Tajudeen and Ismail (2013) analysed the impact of public expenditure on economic growth in Nigeria during the period 1970 to 2010 making use of annual time series data. The study employed the bounds testing (ARDL) approach to examine the long run and short run relationships between public expenditure and economic growth in Nigeria. Their findings indicated the impact of total public spending on growth to be negative. Recurrent expenditure however was found to have little significant positive impact on growth.

Fattah (2016) examined the impact of fiscal space on economic growth in Egypt over the period from 1982 to 2015 using a vector autoregressive (var) model. The results of the empirical model confirmed that fiscal space has a positive impact on the growth rate in Egypt. Olukayode (2009) investigated the impacts of government expenditure on economic growth in Nigeria using time series data from 1977 to 2006. The results showed that all the expenditures have positive effects on economic growth.

Liu, Hsu, and Younis (2011) employed Granger causality test to examine the causal relationship between economic growth and government spending and their result further supports Keynes'

postulation. Thus, in the United State of America, keyne's postulation has a stronger position than Wagner's. Dada (2017) examined the behaviour of government spending and economic growth in six ECOWAS countries using ARDL and VAR-based modified granger non-causality approach. Secondary data covering1981-2013 was sourced on key variables. The result of Johansen and ARDL bound test advocate a long run equilibrium relationship between government spending and economic growth in all the six countries. The causality test result suggests that bidirectional causality exists for Gambia, Cote d'ivoire, Senegal and Burkina Faso while unidirectional causality running from economic growth to government spending was found for Nigeria and Ghana.

Komain and Brahmasrene (2007) examined the association between government expenditures and economic growth in Thailand, by employing the granger causality test. The results revealed that government expenditures and economic growth are not cointegrated. Moreover, the results indicated a unidirectional relationship, as causality runs from government expenditures to growth. The results showed a significant positive effect of government spending on economic growth.

Emerenini and Okezie (2014) investigated the relationship between Nigeria's total expenditure and economic growth from 1980- 2012. Their study made a modest contribution to the debates by empirically analyzing the relationship between Nigeria total government expenditure and its contribution to economic growth, using time series data from 1980 to 2012, obtained from the Central Bank of Nigeria Annual Report and Statement of Account and Federal Office of Statistics. They employed the Engle-Granger two step modeling (EGM) procedure to co-integration based on unrestricted Error Correction Model and Pair wise Granger Causality tests.

From the analysis, they found that GDP and total government expenditure are cointegrated. Based on the result of granger causality, the paper concluded a very weak causality exist between the two variables used in the study.

Nwogwugwu, Ezenekwe and Kalu (2010) examined the causal relationship between public expenditure and economic growth in Nigeria. Annual series data between 1970 to 2012 were used and the VAR technique applied to bring evidence regarding this important issue. The empirical results showed that per capita real total expenditure was inflationary both in the short-term and long-term. Evidence have shown that the capital expenditure implications of recurrent spending pre-dominates, and this portends that a significant part of capital budget is for meeting the infrastructure needs of recurrent operation especially political exigencies.

Biyase and Zwane (2015) aimed to investigate whether Wagner's law holds in African countries. Panel data for 30 African countries was used for the period, 1990 to 2005. The models used include the pooled ordinary least square (OLS), fixed effect model (FE) the random effect model (RE). Based on the results of the models, the study confirms that there is a strong support for Wagner's law in African countries under investigation. Anning, Haisu and Riti (2017) in their study set to investigate the government spending and economic growth in Ghana. they apply the autoregressive distributed lag (ARDL) bounds testing approach to co-integration and the vector error correction model (VECM)-Granger causality test to evaluate both long- and short-run parameters including the direction of causation with data spanning from 1980 and 2015. The Granger causality tests indicated causal independence between government spending and economic growth within the time framework of the study in the economy of Ghana.

Usman, Agbede and Bako (2016) examined the relationship between government expenditure and economic growth in Nigeria using a co-integration and error correction model for the period 1970-2010. A time-series data was obtained from the Central Bank of Nigeria for the analysis. From the long-run analysis, the results revealed a positive and significant linear relationship between the two categories of government expenditure and economic growth (measured by real GDP), whereas on the short-run, economic growth had a positive and significant linear relationship with recurrent expenditure and negative but significant relationship with capital expenditure.

Cooray (2009) investigated the role of the government in economic growth by extending the neoclassical production function to incorporate two dimensions of the government - the size and the quality dimensions. The empirical results indicate that both the size and quality of the government are important for economic growth. It is argued that investing in the capacity for enhanced governance is a priority for the improved growth performance of the countries examined. Nwaeze, Njoku and Nwaeze (2014) used ordinary least square and multiple regression technique to examine the nature and impact of Federal Government Expenditure on Nigeria's economic growth for the period 1992 – 2011. Real Gross Domestic Product, proxy for economic growth was adopted as the dependent variable while total recurrent expenditure and total capital expenditure constitute the independent variables. The results of this study show that the Federal Government Expenditure has a positive and insignificant impact on the economic growth of Nigeria for the period under study.

Simiyu (2015) Studied the relationship between economic growth and public expenditure on Health, Education, Military and Infrastructure in Kenya. The study used a time series data

collected between 1963 - 2012. Johansen Cointegration Test and Vector Error Correction Model (VECM) was applied on the time series data to estimate the short-run and long-run relationships between public expenditures and economic growth in Kenya. The result suggests that public expenditure components and economic growth co-move towards a long run equilibrium with a speed of adjustments of approximately 3.6% after short run fluctuations in the equilibrium. These findings suggested that the Government of Kenya switched military expenditures for health expenses in Kenya, but not vice versa.

Taiwo and Agbatogun (2011) analyzed the implications of government spending on the growth of Nigeria economy over the period 1980 – 2009. Using Johansen Cointegration, unit root test and error correction model, it was discovered that total capital expenditure, inflation rate, degree of openness and current government revenue are significant variables to improve growth in Nigeria. Mansouri (2008) used augmented Dickey-Fuller, error correction model and log –linear regression to study the relationship between fiscal policy and economic growth in Egypt, Morocco and Tunisia. The spans of data for each country are: 1970-2002 for Morocco, 1972-2002 for Tunisia and 1975-2002 for Egypt. The empirical results showed that 1 percent increase in public spending raised the real GDP by 1.26 percent in Morocco, 1.15 percent in Tunisia and 0.56 percent in Egypt. The results also indicated existence of long-run relationships for all the three countries. Morley and Perdikis (2007) examined the combined effects of growth in government expenditure, exports, investment and labour supply on economic growth in Egypt. Using cointegration and error correction models, the result found a long-run relationship between the variables, but less evidence of one in the short run. To account for the important policy reforms in period of study, dummy variables were added which show that the reforms

significantly affected the relationship between government expenditure and growth in a positive direction, but had a negative effect on exports and growth.

2.3.2 Government Expenditure on Education and Economic Growth

Eggoh, Houeninvo and Sossou (2015) studied the relationship between human capital (measured by education and health related variables) and economic growth for a large sample of 49 African countries over the period from 1996 to 2010. Using traditional cross-section and dynamic panel techniques, they found that public expenditures on education and health have a negative impact on economic growth, whereas human capital stock indicators have a slight positive effect. Furthermore, the empirical investigations suggest that education and health spending are complementary. Then, public investment in education and health should be jointly increased and their efficiency in order to expect positive impact of human capital on growth in African countries.

Odior(2014) examined the likely impact of government expenditure policy on education and poverty reduction in Nigeria. The specific objective of the study is to explore or simulate how government expenditure on education would help to meet the Millennium Development Goals (MDG) of the United Nations in terms of improving education service and reduce poverty in Nigeria. An integrated sequential dynamic computable general equilibrium (CGE) model was used to simulate the potential impact of increase in government expenditure on education in Nigeria. It was found that the re-allocation of government expenditure to education sector is important in determine economic growth and the reduction of poverty in Nigeria.

Otieno(2016) aimed at exploring the relationships between the amount of investments in education and economic growth. It was guided by the following specific objectives; to examine the impact of physical capital formation on economic growth and to investigate the contribution of labor input on economic growth. This study used time series techniques to investigate the relationship between government education expenditure per worker and economic growth in Kenya during the period 1967 to 2010.The data was collected from Kenya National Bureau of Statistics and the World Bank. The study used the multiplicative Cobb- Douglas production function where human capital was treated as an independent factor of production in the human capital augmented growth model. Unit root and Granger-causality tests were carried out to make adequate allowance for the dynamic relationship, on stationary, and spurious regression problems. The empirical results showed that education expenditure per worker has a positive and significant impact on economic growth both in the long run and short run.

Omojimite(2010)examined the notion that formal education accelerates economic growth using Nigerian data for the period 1980-2005. Time series econometrics (cointegration and Granger Causality Test) are applied to test the hypothesis of a growth strategy led by improvements in the education sector. The results show that there is cointegration between public expenditures on education, primary school enrolment and economic growth. The tests revealed that public expenditures on education Granger cause economic growth but the reverse is not the case. The tests also revealed that there is bi-directional causality between public recurrent expenditures on education and economic growth. No causal relationship was established between capital expenditure on education and growth and primary school enrolment and economic growth.

Obi and obi (2014) focused on the impact of education expenditure on economic growth as a means of achieving the desired socio-economic change needed in Nigeria. The study used time series data from 1981 to 2012. The Johansen's co-integration analysis and ordinary least square (OLS) econometric techniques were used to analyze the relationship between gross domestic product (GDP) and recurrent education expenditure. Findings indicate that though a positive relationship subsists between education expenditure and economic growth, but a long run relationship does not exist over the period under study.

Oriakhi and Ameh(2014) evaluated the influence of government expenditure on the education sector in Nigeria. Hence, it is also intended to examine the effect of education expenditure on the level of literacy in Nigeria. Using a time series Linear forecasting model, this paper evaluates the effects of the allocation to the education sector by the government and its development. The use of co-integration in this work shows there is a long-run relationship between the variables and they are statistically significant. The Granger Causality test shows that the various variables granger causes literacy rate in Nigeria.

Hussin(2012) studied the long-run relationship and causality between government expenditure in education and economic growth in Malaysian economy. Time series data is used for the period 1970 to 2010 obtained from authorized sources. In order to achieve the objective, an estimation of Vector Auto Regression (VAR) method is applied. Findings from the study show that economic growth (GDP) positively cointegrated with selected variables namely fixed capital formation (CAP), labor force participation (LAB) and government expenditure on education (EDU).

Dauda (2010) employed Johansen co-integration technique and error correction methodology to investigate the relationship between investments in education and economic growth in Nigeria, using annual time series data from 1977 to 2007. The results indicate a long-run relationship between investment in education .and economic growth.

Lawal and Wahab (2011) considered the relation that is established between education and economic growth in Nigeria, using OLS techniqueon time series data collected from 1980 and 2008. Education is seen here as representing one of the primary components of human capital formation, which is an important factor in modelling the endogenous growth. It was discovered that education investments have direct and significant impact on economic growth in Nigeria. Chude and Chude (2013) also investigated the effects of public expenditure in education on economic growth in Nigeria over a period, from 1977 to 2012, with particular focus on disaggregated and sector expenditures analysis. The study used Ex-post facto research design and error correction model to examine the long and short run effects of public expenditure on economic growth in Nigeria. The results indicate that the total expenditure on education is highly and statistically significant, and have positive relationship on economic growth in Nigeria in the long run using a disaggregated analysis on government expenditure and economic growth in Nigeria.

Odeleye (2012) examined the impact of education on economic growth using primary and secondary annual data ranging from 1975 to 2007. The findings show that only recurrent expenditure has significant effects on economic growth as the academic qualifications of teachers also have significant effect on students' academic performance. Torruam and Abur(2014) investigated the Impact of public expenditure on tertiary education and economic growth in Nigeria using time series data for the period 1990- 2011.The econometric methodology employed was cointegration and error

correction technique. The study concludes that public expenditure on tertiary education has positive impact on economic growth in Nigeria.

Omodero and Azubuike(2016) reviewed government expenditure on education and economic development in Nigeria from 2000–2015. The specific objective is to examine the extent to which the Nigerian GDP affects the government expenditure on education, social and community services and the number of school enrolment within the period being reviewed. Secondary data employed were from the EFA 2015 report and CBN bulletin published in 2016. Multiple regression analysis and student t-test were the statistical tools applied, with the use of SPSS for both data analysis and to test the hypotheses formulated for the study at 5% level of significance. The result indicated that expenditure on education is significant and impacts on the economy.

Mallick, (2016) investigated dynamics of expenditure on education and economic growth in selected 14 major Asian countries by using balanced panel data from 1973 to 2012. The results of Pedroni cointegration state the existence of long-run equilibrium relationships between expenditure on education and economic growth in all the countries. The results revealed a positive and statistical significant impact of education expenditure on economic development of all the 14 Asian countries (Bangladesh, China, Hong Kong, India, Japan, Nepal, Pakistan, Malaysia, The Philippines, Saudi Arabia, Singapore, Sri Lanka, Thailand, and Turkey). Further, the panel vector error correction (PVECM) presents unidirectional Granger causality running from economic growth to expenditure on education both in the short- as well as in the long-run. But, expenditure on education only Granger causes economic growth in long-run in all the countries.

Huang (2009) used cointegration, vector error correction model and granger causality to analyse causality between economic growth and higher education in China from 1972 to 2007. The result shows that there is a long-term relationship between higher education and GDP of the nation. Pradhan (2009) studied the relationship between higher education and economic growth by using error correction model in India from 1951 to 2002. He found unidirectional causality between education and economic growth.

Chaudhary. (2009) analysed the role of higher education in economic growth by using Johansson Cointegration and Toda-Yamato causality approach in VAR analysis for Pakistan from 1972 to 2005. They found only unidirectional causality running from economic growth to higher education. Shuaib, Ahmed and Kadiri (2015) examined the impact of innovations and transformations in teaching and learning on educational systems in Nigerian economic growth. The paper employed the characteristics of each time series by testing their stationarity using augmented dickey fuller (adf) tests, including co-integration tests and error correction model, to enable the researcher to ascertain both short run and long run equilibrium. The results of the findings revealed that total government expenditure on education proxied for teaching and learning has direct relationship with economic growth.

Musaba, Chilond and Matchaya (2013) examined the impact of government sectoral expenditure on economic growth in Malawi. Using time series data from 1980 to 2007, cointegration analysis in the context of error correction model was employed to estimate the growth effects of government expenditures in agriculture, education, health, defense, social protection and transport and communication. The short run results showed no significant relationship between government sectoral expenditure and economic growth. The long run results showed a

significant positive effect on economic growth of expenditure on agriculture and defense. The expenditures on education, health, social protection and transportation and communication were negatively related to economic growth.

Jerono (2009) used ordinary least square to conduct a study on the impact of government spending on economic growth in kenya and found that expenditure on education had a positive relationship with economic growth; The study also asserted that a mere expenditure growth does not necessarily bring potential to stimulate growth, as GDP growth is dependent on other factors . Ohwofasa, Obeh and Atuma (2012) investigated the relationship between government expenditure in the education sector and economic growth in Nigeria using time series data from 1986 to 2011. The study employed Johasen co-integration technique and error correction method. The co-integration result showed that long run relationship exists between the variables.

Torruam, Chiawa and Abur (2014) investigated the Impact of public expenditure on tertiary education and economic growth in Nigeria using time series data for the period 1990-2011.The econometric methodology employed was cointegration and error correction technique. The study concluded that public expenditure on tertiary education has positive impact on economic growth in Nigeria.

Kairo, Mang, Okeke and Aondo (2017) empirically studied the relationship between human capital development and government expenditure. Data were collected over the period 1990-2014. ARDL and impulse response function were adopted for the estimation. The Bound Test was used to determine that a long run relationship exists between HDI and GOVEXP. The results demonstrated that both in the long and short run, government spending has remained positive but

to a very large extent insignificant to human capital development in Nigeria. Ayuba (2014) examined the causal relationship between public social expenditure (education and health) and economic growth in Nigeria for the period of 1990 to 2009 by applying the Vector Error Correction (VEC) Model Based Causality. The study discovered that causality runs from economic growth to education and aggregate social expenditure. The study concluded that public social expenditure amplify economic growth at bivariate (aggregated) levels.

Otieno (2016) aimed at exploring the relationships between the amount of investments in education and economic growth. The study used time series to investigate the relationship between government education expenditure per worker and economic growth in Kenya during the period 1967 to 2010. The study used the multiplicative Cobb- Douglas production function where human capital was treated as an independent factor of production in the human capital augmented growth model. Unit root and Granger-causality tests were carried out to make adequate allowance for the dynamic relationship. The empirical results showed that education expenditure per worker has a positive and significant impact on economic growth both in the long run and short run. These results justified that it is worth investing in education since it contributes to economic growth.

Dauda (2010) examined the effect of investment spending in education on economic growth in Nigeria using thirty-one (31) years time series data from 1977 to 2007. The study employs cointegration and error correction techniques. The result shows positive and significant effect of educational expenditure on economic growth.

2.3.3 Government Expenditure on Health and Economic Growth

Aboubacar and Xu (2017) examined the nexus between health care expenditure and economic growth in Sub-Saharan Africa over the period 1995-2014. They used the system General Method of Moments (GMM) technique to estimate the results. The findings reveal the existence of a positive and a statistically significant relationship between the two variables. Eneji, Juliana and Onabe (2013) used regression analysis and granger causality test to study healthcare expenditure and national productivity in Nigeria from 1999-2012. Public health care expenditure was considered as the explanatory variable for health status, productivity and poverty reduction. They found out that, the causal relationship is weak in the Nigeria scenario.

Mehrare and Musai (2011) examined the relationship between health expenditure and economic growth for Iran over period 1979-2008 by employing Gregory-Hensen (1996) cointegration techniques which allows the presence of potential structural breaks in data. The authors find the presence of a long run relationship between health expenditure and the income elasticity for health care spending is greater than one during the period under study. The results also suggest one-way causality relationship running from GDP to health expenditure, thereby concluding that health expenditure does not granger caused economic growth.

Another study by Mehrara and Musai (2011) examines the Granger causality tests between health expenditure and economic growth among 11 oil exporting countries during the period 1971-2007 by using panel unit root tests and panel cointegration techniques. The results suggest strong causality running from revenues and economic growth to health expenditure in the oil exporting states. Also, health expenditure does not have any significant effects on GDP in both short and longrun. Bakare and Olubokun (2011) in their paper investigated the relationship

between health care expenditures and economic growth in Nigeria. The ordinary least square multiple regression analytical method was used to examine the relationship between health care expenditures and economic growth. The data analysis showed a significant and positive relationship between health care expenditures and economic growth.

Odior (2014) conducted a study on the relationship between health and economic growth by using an integrated sequential dynamic computable general equilibrium (CGE) model over the period 2004-2015 to investigates the impact of government expenditure on health on economic growth. The findings suggest that the re-allocation of government expenditure to health sector is significant in explaining economic growth in Nigeria.

Dauda (2011) examines the relationship between health expenditure and economic growth for Nigeria spanning from 1970-2009 by employing descriptive statistics, Johansen cointegration technique and error correction model (ECM), the author suggest that health expenditure is positive and statistically significant but the coefficients of the second and third lags are negative and statistically significant. The results of error correction model is statistically significant and has expected negative sign with the coefficient of 40% implying that the speed of adjustment to is 40%.

Ogungbenle, Olawumi and Obasuyi (2013) analyzed the relationship existing among life expectancy, public health spending and economic growth in Nigeria. A vector Autoregressive (VAR) model approach was employed in analyzing the data. The results of the study revealed that there is no bi-directional causality between life expectancy and public health spending in Nigeria. In the same vein, the study also revealed that there is no bi-directional causality between

life expectancy and economic growth in Nigeria over the years. However, the study confirmed that there is bi-directional causality between public health spending and economic growth in Nigeria. Bakare and Sanmi (2011) used ordinary least square (OLS) multiple regression for annual time series data for Nigeria covering 1974-2008, the results show a significant and positive relationship between health expenditure and economic growth. Ogundipe and Lawal (2011) examined the impact of health expenditure on economic growth in Nigeria. Using the OLS technique, they found a negative effect of total health expenditure on growth.

Eggoh, Houeninvo and Sossou(2015) in their paper provides new empirical evidence concerning the relationship between human capital (measured by education and health related variables) and economic growth for a large sample of 49 African countries over the period from 1996 to 2010. Using traditional cross-section and dynamic panel techniques, they found that public expenditures on education and health have a negative impact on economic growth, whereas human capital stock indicators have a slight positive effect.

Odubunmi, Saka and Oke (2012) examined the relationship between health care expenditure and economic growth in Nigeria for the period 1970-2009. They employed the multivariate cointegration technique proposed by Johansen and found the existence of at least one cointegrating vector describing a long run relationship among economic growth, foreign aids, health expenditure, total saving and population. The cointegrating equation however shows some deviations in terms of the signs of the coefficients of foreign aids and health expenditure which they attributed to some diversification of foreign aids to other uses or inadequate allocation to health services .

Onisanwa (2014) examined the impact of health on Economic growth in Nigeria. The Cointegration, and Granger Causality techniques were used in analysing Quarterly time series data of Nigeria for the period of 1995-2009. The study finds that GDP is positively influenced by health indicators in the long run and health indicators cause the per capita GDP. It reveals that health indicators have a long run impact on economic growth. Thus, the impact of health is a long run phenomenon. Yaqub and Umoru (2013) while investigating the impact of public health spending on infant and under- 5mortalities as well as life expectancy. Using the two-stage-least squares in addition to the ordinary least squares techniques, because of the possibility of reverse causality, revealed that public health expenditure has negative effect on infant mortality and under-5 mortalities when the governance indicators are included, with a reversed signs without the governance indicators. They argued that as the level of corruption goes down and value of the corruption perception index rises, there is an improvement in health status since infant and under-5 mortalities decline and life expectancy rises. Thus, simply increasing public expenditure on health is less likely to lead to improvement in health status unless corruption issue is addressed.

Akrani (2011) while investigating the impacts of different health indicators on Economic growth in Pakistan, employs the Cointegration, Error Correction and Granger Causality techniques on the time series data of Pakistan for the period of 1972-2006. They find that Per capita GDP is positively influenced by health indicators in the long run and health indicators cause the per capita GDP. However, in the short run the health indicators fail to put significant impact on per capita GDP. This found that impact of health is only a long run phenomenon and in the short run there is no significant relationship between health variables and economic growth. It is not clear whether there exists a causal relationship between economic development and health care

spending in Nigeria. Nigeria like most developing nations favours spending on other sectors of the economy at the detrimental of the health.

Mohammadi and Maleki(2012) studied on the effect of governmental expenditure composition on the Economic development of economic cooperation organization countries (ECO) in the period 1995-2009. In the article the most emphasis is on three types of public expenditure, health expenditure, education and defense. The used method has been dynamic panel data method & generalized method of moments (GMM). The findings showed that the health expenditure by governmental statistically has Significant and negative effect on growth, educational expenditure by governmental statistically has Significant and positive effect also the governmental defense expenditure has significant & statistically has positive effect on the economic development of ECO countries.

Hartwig (2010) conducts causality testing for a panel of 21 OECD countries using panel Granger causality test over the period 1970-2005, the author find that health capital formation fosters long term economic growth in all the OECD countries under study. Baltagi and Moscone (2010) estimates a regression equation for health care expenditure as a function of GDP and other control variables using data on 20 OECD countries over the period 1971-2004 by using maximum likelihood estimation (spatial MLE) techniques to estimate and test fixed effects and spatially correlated errors. The authors find that health care expenditure is a necessity rather than a luxury with an elasticity much smaller than that estimated in previous studies.

Bedir (2016) used Granger causality test to analyse the effect of health care expenditures on the economic growth of developing countries for the period of 1995 to 2013. According to the

analysis of the results, a two way causality is found for the Czech Republic and Russian Federation. The evidence from the Egypt, Hungary, Korean Republic, South Africa, and the Philippines supports the health view over the income view, while the evidence from Greece, Poland, the United Arab Emirates, China, Indonesia, and the Korean Republic supports the income view over the health view. The empirical results have indicated that income is an important factor in explaining the difference in healthcare expenditures among countries.

Bakare and Olubokun (2011) investigated the relationship between health care expenditures and economic growth in Nigeria. The ordinary least square multiple regression analytical method was used to examine the relationship between health care expenditures and economic growth. The data analysis showed a significant and positive relationship between health care expenditures and economic. Ebiringa and Charles-Anyaogu (2012) evaluated the impact of expenditures' some priority sectors on the economic growth. A Cochrane-Orcutt and ECM method was adopted to measure the long run effect of selected macroeconomic variables economic growth. The result shows that expenditure on telecommunication, Defence and security, Education and Health Sector have made positive impact on Nigeria's economic growth. But transportation and agricultural expenditures have impacted negatively in the economic growth in Nigeria.

Muthui and Maingi(2013) studied the impact of public expenditure composition on economic growth in Kenya from 1964 to 2011. The specific objectives of the study were to investigate the impact of government expenditure on components: education, infrastructure, health, defense and public order and security on economic growth in Kenya. This study employed use of annual Kenyan data for the period 1964 to 2011 for all the variables. The study conducted Stationarity

Test, Causality Test, Cointegration Tests before using vector error correction model to estimate the data. The survey showed that though government expenditure on education is positively related to economic growth it does not spur any significant change to growth. Based on this, investing in more and better-distributed education in the labor force will help create conditions that could lead to higher productivity and higher economic growth. On health while an increased expenditure on improving health might be justified purely on the grounds of its impact on labor productivity. This supports the case for investments in health as a form of human capital.

Kurt(2015) in his paper tested the direct and indirect (external) effects of health expenditures on economic growth using the Feder–Ram model. It uses aggregate and manufacturing industrial production as total output, total government health expenditures, general government cure and pharmaceutical products health expenditures, general government medicine and health expenditures series belonging to the economy of Turkey between the 2006- 2013 period using seasonally adjusted and real monthly data. The results obtained from the study have shown that in general, the direct impact of government health expenditures on economic growth in Turkey is positive and significant and its indirect impact is negative and significant.

Nyamwange (2013) examined the effect of per capita gross domestic product (GDP per capita) on public healthcare expenditure (PHCE) in Kenya. The study used estimates of public recurrent & development expenditures (1982 - 2012). The study employed OLS regression and checks for co-integration on the long-run relationship between PHCE and GDP per capita, as well as other tests of Granger causality, unit root presence and stationarity. The study attempted to determine the properties of healthcare in Kenya, and found that healthcare in Kenya was a necessary good

and had an elasticity of 0.024% to GDP per capita. This means that for every 1% increase in GDP per capita, PHCE should increase by 0.024%.

Abu and Abdullah (2010) used co integration and error correction model to investigate the relationship between government expenditure and economic growth in Nigeria from the period ranging from 1970 to 2008.They used disaggregated analysis in an attempt to unravel the impact of government expenditure on economic growth. Their results reveal that government total capital expenditure, total recurrent expenditure and Education have negative effect on economic growth. On the contrary, government expenditure on transport, communication and health result in an increase in economic growth. Gisore (2014) used Levin-Lin Chin model to investigate empirically how government expenditure contributes to economic growth in East Africa. This study focused on disaggregated expenditure over the period from 1980 to 2010. The findings showed that expenditures on health and defense had positive and statistically significant effect on economic growth. In contrast, education and agriculture expenditure were insignificant. This study suggested that for East Africa, the policy of increasing spending on health and defence budget to promote economic growth will be appropriate, but fewer funds should be channeled towards other sectors.

Aboubacar and Xu (2017) examined the nexus between health care expenditure and economic growth in Sub-Saharan Africa over the period 1995-2014. General Method of Moments (GMM) technique was used to estimate the results. The findings reveal the existence of a positive and a statistically significant relationship between the two variables, precisely; health expenditure has a significant impact on the economic growth of the region. Regarding the control variables, while the effect of official development assistance on economic growth is insignificant, foreign direct

investment, the active population and gross domestic savings appear as key determinants of economic growth in the region.

Obialor (2017) examined the effect of government human capital investment on the economic growth of three Sub-Sahara African (SSA) countries of Nigeria, South Africa and Ghana from 1980 to 2013. The objective of his study is to analyze the growth effect of three government human capital investment variables of health, education and literacy rate on the economies of these countries; The results indicate that two out of the three human capital proxy variables; Health (GIH), and Education (GIE), show significant positive effect on growth only in Nigeria, while literacy ratio (LR) is insignificantly positive in all countries. This study concludes that in spite of the above result, the SSA countries' economies still exhibit the potentials for enhanced economic growth in the long run judging from the VECM test results.

2.3.4 Government Expenditure on Defence and Economic Growth

Ali and Ather(2014) investigated the impact of defence burden on economic growth in Pakistan economy over the period 1980-2013. A three equations model is estimated through two stage least square (2SLS) method in order to investigate the direct and indirect impact of defense burden on economic growth. The findings of the model showed that defense expenditure directly as well as indirectly retard economic growth in Pakistan.

Ajefu(2015) examined the relationship between defense burden and real gross domestic products in Nigeria, using annual time series data. This study used Johansen's Cointegration approach to investigate the relationship between government's military expenditure (defence burden) and real

gross domestic products, among other variables. The study discussed the long run relationship between military expenditure and economic growth using Johansen cointegration approach. The key variables used in the study include: military burden (military expenditure), real GDP, real education expenditure, real health expenditure. The results of the study showed that increased defense burden is harmful to the Nigerian economy, and there exists a negative long-run relationship between defense burden and increase in the growth of real gross domestic products, the impact of defense burden remains negative both in the short-run and long-run respectively.

Phiri(2017)Using annual data collected from 1988 to 2015, this study provides evidence of a non-linear relationship between military spending, economic growth and other growth determinants for the South African economy. The empirical study is based on estimates of a logistic smooth transition regression (LSTR) model and our empirical results point to an inverted U-shaped relationship between military spending and economic growth for the data. Furthermore, our empirical results suggest that the current levels of military spending, as a component of total government expenditure, are too high in the South African economy and need to be transferred towards more productive non-military expenditure in order to improve the performance of economic growth and other growth determinants.

Lee and Chen (2007) paper used up-to-date data for 27 OECD countries and 62 non-OECD countries for the 1988–2003 period. The long-run panel regression parameter results, such as the fully modified OLS, indicate that a positive relationship between GDP and ME only holds for OECD countries, whereas a negative relationship from ME to GDP only exists in non-OECD countries. Olofin (2012) examined the relationship between the components of defense spending and poverty reduction in Nigeria between 1990 and 2010. Four models were estimated using

Dynamic Ordinary Least Square (DOLS) method, two in which poverty index constructed from human development indicators serves as dependent variable and the others in which infant mortality rate serves as dependent variable. The result show that military expenditure per soldier, military participation rate, trade, population and output per capita square were positively related to poverty indicator and, military expenditure, secondary school enrolment and output per capita were negatively related to poverty level. The findings confirm the trade off between the well-being and capital intensiveness of the military in Nigeria, pointing to the vulnerability of the poor among the Nigerians.

Apanisile and Okunlola (2014) examined the effect of military expenditure on output in Nigeria both in the short-run and in the long-run period. In addition, it verified whether military expenditure is an economically non-contributive activity using ARDL bounds testing approach to co-integration. Results showed that military spending has negative and significant effect on output in the short-run but positive and significant effect in the long-run. Labour and capital have positive and significant effects both in the long-run and short-run.

Wijeweera and Webb (2010) study used a panel co-integration in the five South Asian countries of India, Pakistan, Nepal, Sri Lanka and Bangladesh over the period of 1988–2007. They found that a 1% increase in military spending increases real GDP by only 0.04%, military spending in these countries has a negligible impact upon economic growth. Mosikari(2014) investigated the relationship between defence expenditure and economic growth in South Africa. by estimating an econometric model of the South African military expenditure in considering pure economic factors. The period of the study covers from 1988 to 2012. On the basis of determining the long term equilibrium the application of Johansen cointegration and Engel-Granger were applied. At

the later stage the technique of Granger causality was performed on variables of interest in the study. The study concludes that there is long run relationship between defence expenditure and economic growth. Also for causal analysis military expenditure seem to granger cause gross domestic product per capita at 5 percent significance level.

Dunne and Tian (2013) employed an exogenous growth model and dynamic panel data methods for 106 countries over the period 1988–2010. They found that military burden has a negative effect on growth in the short and long run. Jefferey and Edward (2008) using cross national panel regression and causal analysis of Developed and Less Developed countries from 1990 – 2003 showed that military expenditure per soldier inhibit the growth of per capital GDP, net of control variables with the most pronounced effects in Less Developed Countries. The inhibition is manifested in the slowing down of the expansion of the labor force. According to the duo, labor intensive militaries may provide a pathway for upward mobility, but comparatively capital intensive military organization limit entry opportunities for unskilled and under, or unemployed people. They equally argued that deep investment in military hardware also reduce the investment capital available for more economic productive opportunities.

The work of Duella (2014) showed a uni-directional causality between economic growth and military spending. He examined the causal relationship between aggregate government spending and economic growth in Algeria for the period 1980-2010, using the Johansen's co-integration procedure and VECM. Aikaeli and Mlamka(2011) sought to explore the impact of military spending on Africa's economic growth through an investigation of the status quo across 48 African states. OLS estimation technique is used to analyze cross sectional data; with a view to

the two scenarios: low military spending and high military spending contexts. In both cases it is consistently found that high military spending is counter economic growth in Africa.

Korkmaz (2015). Selected ten countries in Mediterranean and analysis with panel data was performed for years 2005-2012, in order to examine the effect of military spending of these countries on economic growth and unemployment. it is seen that the variables of GDP and unemployment is 10% statistically significant for 10 Mediterranean countries. While military spending effect economic growth negatively it affects unemployment positively.

Tiwari and Shahbaz (2011) investigated the effect of defence spending on economic growth using ARDL bounds testing approach to co-integration in augmented version of Keynesian model for Indian economy. They found out that there is long run relationship between the variables, and also there is positive effect of the defence spending on economic growth (also negative impact after a threshold point). Furthermore, there study also showed that there is bidirectional causal relationship between defence spending and economic growth using variance decomposition approach.

Hirnissa and Baharom (2009) tested the robustness of the causal effect and long-run relationships between military expenditure and economic growth in ASEAN-5 countries from the year 1965 to 2006, using auto regressive distributed lag model (ARDL). They concluded that only three out of five countries analyzed exhibited long run relationship. Arif and Rashid (2012), using a unit root, cointegration and exogeneity tests between military expenditure and economic growth in 14 developing countries for the period 1981-2006 considering panel data analysis. According to

them, military expenditure is an exogenous variable and it influences economic growth in these countries.

Chang, Huang and Yang (2011) applied GMM method to panel data of 90 countries spanning over 1992–2006. Their results indicate military spending leads negatively economic growth for the panels of low income countries. Of four different regional panels, a negative but stronger causal relationship from military expenditure to economic growth is found for the Europe and Middle East–South Asia regions. Chang, Lee and Hung (2013) study revisits the causal linkages between military spending and economic growth in China and G7 countries (i.e. Canada, France, Germany, Italy, Japan, the UK, and the USA) by focusing country-specific analysis for the period 1988–2010. Their results find evidence of the military spending–growth detriment hypothesis for both Canada and the UK, and one-way Granger causality running from economic growth to military spending for China. They found a feedback between military spending and economic growth in both Japan and the USA. Loto (2011) investigated the impact of sectoral government expenditure on economic growth in Nigeria for the period 1980-2008. He applied Johansen cointegration technique and error correction model and the results showed that in the short run expenditures on agricultures and education were negatively related to economic growth. However, expenditures on health, national security, transportation, and communication were positively related to economic growth, though the impacts were not statistically significant.

Wadad and Kamel (2009) examined the nature of government expenditure and its impact on sustainable economic growth in Lebanon using multivariate co integration analysis. They found a short-run negative correlation between education and economic growth. They found that in the long-run, educational spending was statistically significant and determinant of economic growth

but found spending on defense to be insignificant both in the short–run and the long-run. Mudaki and Masaviru (2012) investigated the impact of public spending on education, health, economic affairs, defense, agriculture, transport and communication on economic growth with data spanning from 1972 to 2008. The data was differenced to make it stationary then linearized for estimation using ordinary least squares. The findings showed that expenditure on education was a highly significant determinant of economic growth while expenditure on economic affairs, transport and communication were also significant albeit weakly. In contrast, expenditure on agriculture was found to have a significant though negative impact on economic growth. Outlays on health and defence were all found to be insignificant determinants of economic growth. The findings did not conform to apriori expectations.

2.3.5 Government Expenditure on Infrastructure and Economic Growth

Adepeju (2016) investigated government spending on infrastructure and its relationship with economic growth in Nigeria. This study is based on Agency, New Public Management, Institutional, Economic growth ánd Keynesian theories. Both primary and secondary data are used. For the primary data, a sample of two hundred and forty- two respondents are utilised for the study. Statistical random sampling was used for the sample selection. The secondary data comprise of actual annual spending on selected infrastructure and annual Gross Domestic Products for 2010 to 2015 for Lagos State Nigeria. The data analysis was done with One-Sample T-Test, t. Pearson rank coefficient of correlation, r and Descriptive statistics. The results indicate that spending on road and transport infrastructure have significant relationship with economic growth. However, there is an inverse, not significant relationship between spending on agriculture and economic growth.

Ekpung(2014) analyzed the trends analysis of public expenditure on infrastructure and economic growth in Nigeria, from 1970 to 2010. The objective of the study is to examine the trend in public expenditure on infrastructure in Nigeria between 1970 to 2010; to compare the trend in public expenditure between the various regimes in Nigeria between 1970 to 2010; to evaluate the relationship between expenditure on infrastructure and long-run economic growth; access the factors that influence public expenditure growth in infrastructure; Findings shows that the response of rate of urbanization, openness, government revenue, external reserves, population density and type of government to public expenditure is high, particularly in the short-run and with a higher adjustment toward long-run static equilibrium. On the contrary, the Vector Error Correction (VEC) show that the level of public infrastructure (road construction, water supply, electricity supply, transport/ telecommunication and housing/ environment is very low, particularly in the short-run and with a weak adjustment toward long-run static equilibrium.

Hammam (2010) examined the significance of several economic growth determinants to gauge their impact on Egypt's economic growth. The research used annual time series analysis to assess the significance of several important variables on economic growth in Egypt for the period 1985-2007, and applied Ordinary Least Square method of estimation, with an autoregressive specification. The estimation results revealed positive and significant effect of gross fixed capital formation, foreign direct investment, investment in infrastructure, household consumption expenditure, exports and taxes on international trade on economic growth in Egypt, while the government consumption expenditure shows negative and significant effect on Egypt's economic growth. The main policy implications in their study are the catalytic effects of gross fixed capital formation on economic growth as represented by the public and private investment, in addition,

the significance of foreign direct investment in transferring technology, and providing source of finance, where the investment in infrastructure is considered a corner stone for attracting both domestic investments and foreign direct investments and boosting economic development in Egypt.

Annabelle (2015) seeked to identify the conditions under which raising public investment can sustainably lift growth without deteriorating public finances for the period 1997 to 2014. To do so, it relies on a range of simulations using three different macro-structural models. According to the simulations, OECD governments could finance a ½ percentage point of GDP investment-led stimulus for three to four years on average in OECD countries without raising the debt-to-GDP ratio in the medium term, provided projects are sound. African Development Bank Group (2012) conducted pairwise Granger causality tests between economic growth, economic infrastructure investment, and employment in South Africa for the period 1960-2009 using bivariate vector autoregression (VAR) model with and without a structural break. The result indicated that there is a strong causality between economic infrastructure investment and GDP growth that runs in both directions implying that economic infrastructure investment drives the long term economic growth in South Africa while improved growth feeds back into more public infrastructure investments. They also found a strong two way causal relationship between economic infrastructure investment and public sector employment reflecting the role of such investments on job creation through construction, maintenance and the actual operational activities, while increased employment could in turn contribute to further infrastructure investments indirectly through higher aggregate demand and economic growth.

Fouladi (2010) studied government expenditure effect on GDP and employment using computable generalized equilibrium model (CGE). He opined that efficiency of government expenditure depends on the kind of expenditure. The paper divides government expenditures into two categories, namely consumption and investment expenditure. Investment expenditure was studied in five sectors: agricultural, gas and oil, construction, industry and mineral and service. The results confirm that government expenditure influences economy in different ways, depending on types of costs. Increasing the government consumption expenditure causes reduction in production, employment and investment. Government investment expenditure has different effects on economy that depends on which area they will be spent.

Muthui, kosiembi , Maingi, and Thuku(2013)studied the impact of public expenditure composition on economic growth in Kenya from 1964 to 2011. The specific objectives of the study were to investigate the impact of government expenditure on components: education, infrastructure, health, defense and public order and security on economic growth in Kenya. The study conducted Stationarity Test, Causality Test, Cointegration Tests before using vector error correction model to estimate the data. The survey showed that though government expenditure on education is positively related to economic growth it does not spur any significant change to growth. On health while an increased expenditure on improving health might be justified purely on the grounds of its impact on labor productivity.

Mabugu (2009) provided an analysis of the impact of increasing public infrastructure investment in South Africa. A CGE model of the economy was developed and used to run and quantify the effects of ten per cent simulated increases in water, health, electricity, communications, and roads and transport spending above the indicated baseline. Findings of the analysis reveal that

increases in public infrastructure investment, above those budgeted for, increases GDP. In another study, Ngandu, Garcia and Arndt (2010) analysed the economic impact of planned infrastructural investment programme on the South African economy using a multiplier analysis, multiplier decompositions, and structural path analysis. Making use of the social account matrix (SAM) for South Africa from 2003, the analysis results show that planned infrastructure programmes stimulate production activities and households at all income levels

Okoro (2013) examined government spending and economic growth in Nigeria using time series data of a 32year period (1980-2011). He employed the ordinary least square multiple regression analysis to estimate the model specified. Real gross domestic product (rgdp) was adopted as the dependent variable while government capital expenditure (gcexp) and government recurrent expenditure (grexp) represents the independent variables, with the application of Granger causality test, Johansen co-integration test and error correction mechanism, the result shows that there exists a long-run equilibrium relationship between government spending and economic growth in Nigeria. The policy implication is that that both the short-run and long-run expenditure has significant effect on economic growth of Nigeria.

Oni, Aninkan and Akinsanya (2014) investigated the joint effects of capital and recurrent expenditures of government on the economic growth of Nigeria using the ordinary least square method for estimating multiple regression models covering 1980-2011 time periods. The regression results showed that both capital and recurrent expenditures impacted positively on economic growth during the period of study. The recurrent expenditure has a stronger and more accelerating effect on growth than capital expenditure.

Mbanda and Chitiga (2013) performed a dynamic computable generalized equilibrium (CGE) analysis to investigate the impacts of increasing public economic infrastructure investment on economic growth and employment in South Africa, financing infrastructure investment through a government deficit, direct tax on firms and thirdly, a combination of both. Variables used for the model capture factors such as economic infrastructure, economic growth, unemployment, the wage rate, labour demand, formal and informal labour and spill over effects. Findings of the study reveal that increasing public infrastructure investment has an overall positive impact on the economy. The study indicates that increasing public infrastructure investment also increases, among other things, GDP and employment in South Africa regardless of which method is used to fund infrastructure investment increases. The study further finds that private investment suffers crowding out effects.

Kumo (2012) found a bi-directional relationship between economic infrastructure investment and economic growth when conducting a pairwise Granger causality test between economic growth, economic infrastructure investment, and employment in South Africa for the period 1960 to 2009 using bivariate VAR, VECM and ARDL approaches. The variables in question were economic infrastructure investment as measured by total public sector fixed capital formation, economic growth as measured by GDP, and public and private sector employment. A long and short run analysis with additional variables through the use of ARDL approaches indicates the presence of a steady-state long run equilibrium relationship between economic growth, economic infrastructure, formal employment and exports and imports of goods and services.

Akpokerere and Ighoroje (2013) investigated the effect of government expenditure on economic growth in Nigeria using ordinary least square analysis and a disaggregated approach, they observed that rising government expenditure has not translated to meaningful development as

Nigeria is still being ranked among the world poorest countries. The data for the period (1977 - 2009) was used. Their estimation reviews that government total capital expenditure, total recurrent expenditures, government expenditure on education and power have negative effect on economic growth and are significant in explaining this relationship, which is contrary, rising government expenditure on transport, communication and health results to an increase in economic growth.

2.4 Summary of Empirical Review

Table 2.1 Summary of Empirical Review

S/n	Author	Year	Title	Theoretical framework	Methodology	Findings
1	Muthui, J., Kosiebei,K., Maingi, M. and Thuku, T.	2013	The impact of public expenditure components on economic growth in Kenya.	Keynesian theory	Vector Error correction model. Dependent Variable: GDP Independent variable: Government expenditure on education, health, defence and infrastructure	Components of Government expenditure is positively related to economic growth
2	Oriakhi, D. and Ameh, G.	2014	Government expenditure and the development of the Education sector in Nigeria.	Theory of expenditure Limitation. Theory of increasing state of activity.	Time series linear forcasting model. Cointegration test and granger causality test.	There is long run relationship between the variables and they are statistically significant.
3	Omojimite, B.	2010	Education and Economic growth in Nigeria.		Cointegration and granger causality test	There is cointegration between public expenditure and economic growth. No causal relationship was established.
4	Azubuike, J.U. and Omodero, C.O.	2016	Empirical review of government expenditure on education and economic development in Nigeria.	Human capital theory	Multiple regression.	There is significant relationship between government expenditure and economic growth and it impacts the economy.

5	Obi, Z.C. and Obi, C.O.	2014	Impact of Government expenditure on education in Nigeria.	Human capital theory.	Johansen's cointegration analysis and ordinary least square.	Positive relationship between education and economic growth at short run.
6	Odo, S.I., Igberi,C., Udude,C. and Chukwu, B.C.	2016	Public expenditure and economic growth in south Africa	Wagner's Theory	Co- Integration test. Vector error correction. Granger causality	Negative and Insignificant relationship between government expenditure and economic growth
7	Danladi, J.D.,Akomolafe, K., Olarinde,O. and Anyadiegwu.	2015	Government expenditure and it's implication for economic growth in Nigeria.	Keynesian Theory	Auto regressive distributed lag	Government spending is significantly and positively impacted economic growth.
8	Kapunda,S. M. and Topera,J.S.	2013	Public expenditure composition and economic growth in Tanzania	Neoclassical theory	Ordinary Least square	Health, agriculture, general public service, and infrastructure influence growth positively but not significantly
9	Gisore, N.,Kiprop,S., Kalio, A. and Ochiong, J.	2014	Effect of government expenditure on economic growth in east Africa	Musgrave and Rostow theory	Levin-Lin- Chu Technique	Expenditure on health and defence has positive significant effect on growth while expenditure on education and agric is insignificant

10	Mallick, L., Das,P. and Pradhan,k.	2016	Impact of educational expenditure on economic growth in major Asian countries	Human Capital theory	Pedroni cointegration and panel vector error correction	Expenditure on education has positive impact on the economic growth
11	Ekpung, G.E.	2014	Trend analysis on public expenditure on infrastructure and economic growth in Nigeria	Rostow theory of economic growth	Co integration, Regression and vector error correction model	Public Expenditure on infrastructure has significantly influenced growth
12	Aigheyisi, O.S.	2013	The relative impact of federal recurrent and capital expenditures on Nigerian economy	Peacock and wiseman theory	Ordinary least square. Error correction model. Multiple linear regression analysis	The short run impact of the explanatory variables is statistically insignificant.recurrent expenditure has greater impact than capital expenditure on the economic growth
13	Mulinge, J.K.	2016	Effects of recurrent public expenditure on economic growth in Kenya		Regression analysis. Cointegration test	Long term relationship between recurrent government expenditure and economic growth.Government expenditure on social

						services have significant and positive relationship whilegovernment expenditure on administration is negative and insignificant
14	Olurankinbe F. and Alimi, S.	2014	Government Spending and National Income. Panel analysis for Nigeria, Ghana and South Africa	Wagner Theory	Panel Co cointegration test	Bi-Directional Causality Between the Variables. for Nigeria and South Arican Government Spending and Enhance National income . in Ghana government spending does not enhance National income.
15	Mudaki, and Masaviu, W	2012	Does the composition of Public expenditure matter to economic growth for Kenya?		Ordinary least square	Expenditure on education is highly significant to economy growth. Expenditure on economy often transport and communication has weak significant. Agriculture is significant to the economy. Defence insignificant determinant to economy growth

16	Taiwo A.S, and Agbatogun K.K.	2011	Government expenditure in Nigeria: A sine quanon for economic growth and development	Classists Model Keynesian Model	Johansen conintegration, error correction model	Total government expenditure, inflation rate, degree of openness and current government revenue are significant variables to improve growth in Nigeria.
17	Okorie C.G, and Odim O.U, Ogueze	2015	Investment finance and economic growth in Nigeria	Keynesian	Error correction model	Increase in private sector credit leads to economic growth in Nigeria.
18	Biyase, M. and Zwane, T.	2015	Economic growth and government expenditure in African	Wagners law	Ordinary least square fixed effect model random effect model	The pooled ordinary shows that economic growth has the expected positive sign, but does not enter the government spending regression significantly.
19	Ezirim, B.C, and Muoghalu, M. and Elike, U.	2008	Inflation Versus Public Expenditure Growth In The United State of America	Keynesian Theory	Cointegration analysis and granger causality model	The result indicate that public expenditure and inflation are cointegrated, and thus theme exist a long run equilibrium relationship between the two variables

20	Odo, S.I Nwachukwu J.O. Agbi, P. Okoro T.O	2016	Analysis of government Expenditure and economic growth in Nigeria.	Keynesian Theory of Government Expenditure.	Johansen Cointegration test. Error correction mechanism pairwise granger causality.	Negative relationship between government capital expenditure and economic growth positive correlation was found away government recurrent expenditure inflation and economic growth
21	Chude, N.P, and Chude, D.I,	2013	Impact Government Expenditure on Economic Growth in Nigeria 1977-2012.	Endogenous growth theory,	Error correction Model (Ecm). Rgdo = (Tedu)…(2) Yt = B0 + B1xt + Mt … (3) Where Yt = Dependent Variable (Rgdp). X = Education Expenditure	Total Expenditure Education and statistically significant and have positive relationship on Economic growth in Nigeria in the long Run.
22	Abu, N., and Abdullahi, U.	2010	Government Expenditure and Economic Growth in Nigeria, 1970-2008.	Keynesian Theory neoclassical theory	Multiple regression, the model expresses economic growth (gry) as a function of various levels and components of government expenditure that include total capital expenditure (tcap), total recurrent expenditure (trec), expenditures on defense (def), agriculture (agr), transport and communication (traco), education (edu) and health (hea). in addition,	The results reveal that government total capital expenditure (tcap), total recurrent expenditures (trec), and government expenditure on education (edu) have negative effect on economic growth. on the contrary, rising government expenditure on transport and communication (traco), and health (hea)

						results to an increase in economic growth.
23	Agbonkhese, A., Oni, P., Asekome, M. and Ozemhoka, P.	2014	Impact of Expenditure on the Growth	Keynesian Theory	Ordinary least Square	Implied that independent variables have no major impact on economic growth or Gross Domestic Product
24	Taiwo, A. Samuel and Agbatogun, K.	2011	government expenditure in nigeria: a sine qua non for economic growth and development.	Model Classist Model and Keynesian Model	Johansen Cointegration testError correction model Rgdp = F(Rtcap, Rtre, Exr, Inf, Ropen, Rcr)	Total capital expenditure, inflation rate degree of Government recurrent Government revenue are Significant Variables For improving economic growth
25	Iheanacho, E.	2016	The Contribution of Government expenditure on economic growth of Nigeria 1986-2014	Keynesian, Wagner Peacock and Wiseman	Error correction model. Johansen Cointegration Approach.	Negative and significant long run effect capital expenditure on economic growth in Nigeria
26	Okoro, A. S.	2013	Government		Ordinary Least Square, Multiple	The Result shows that

		Spending and Economic Growth In Nigeria (1980-2011)		regression	there exists a long-run equilibrium Relationship Between Government Spending and Economic Growth In Nigeria

2.5 Gap in Literature

From the empirical reviews, majority of the studies done on the effect of government expenditure on economic growth revealed the following gaps:

2.5.1 Time coverage

The period of study for most of the previous studies conducted are not current.

Most of the researchers focused on single country analysis: Okoro (2013), Iheanacho (2016), Oni et al (2014), Akpokere and Ighoroje (2013), and Tajudeen and Ismaila (2013) studied Nigerian Economy. Jerono (2009), Kenyan Economy. Fattah (2016) studied Egypt Economy. Odo *et al* 2016 studied South Africa Economy.

2.5.2 Geographical coverage

There was limited comparative work within the geographical locations on the African continent. To the best of researcher's knowledge, there were very limited works on the Egypt economy.

2.5.3 Nature of findings

There were disagreements in some of the results obtained by various researchers particularly when compared with the apriori expectations. The variables of study for most of the works focused on individual sectors like education, health, agriculture and defense,

2.5.4 Methodological gap

The methodologies adopted in most of the previous works were not robust enough to cross examine the research data. To the best of researcher's knowledge, majority of the works

considered government capital and recurrent expenditure effect on economic growth .without inculcating different components of government expenditure.The analytical methods adopted in most cases for data are basically VAR, cointegration and granger causality methods for both time series and panel data series .

Based on the above gaps, this research work tends to fill it up with the following:

Present a more current work on the subject (1995-2016) covering 22 years, as most earlier works covered less than that .Undertake a panel study of selected emerging economies within the east, west north and south African region .Use more prominent government expenditure measurement parameters. The variables used include: government expenditure on education, government expenditure on health, government expenditure on infrastructure and government expenditure on defense.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

According to Onwumere (2009), a research design is a kind of design that guides the researcher in his or her investigation and analyses. The *ex-post facto* research design using correlational techniques was used on this study. According to Simon and Goes (2013), *ex- post facto* research is a type of research which is based on a fact or event that has already occurred and at the same time employs the research and basic logic of enquiry like the experimental method. It is mostly used when the reported figures or proxies for the variables of the study are not susceptible to manipulations. The choice of the *ex post facto* is based on the fact that it does not include any form of manipulation or measurement before the event and it is good explanatory instruments that take place in the dependent variable. The reported figures or proxies for the variables of interest are secondary data from recognized sources and they are information in public domain and are easily verifiable.

3.2 Sources and Nature of Data

The data used in this study were obtained from secondary sources. The secondary data employed in the work consist of time series annual data covering the period 1995-2016. This research sourced its data from the International Monetary Fund (IMF) , World Bank Data websites, for

African countries, UNESCO statistical book, Central Bank of Nigeria statistical bulletin and national bureau of statistics of different African countries . Other sources of secondary data are from journals, projects, thesis and web information.

3.3 Model Specification and Validity

The models for this work were structured in a way to empirically show the effect of government expenditure on economic growth in emerging Africa economies. This is in line with approach adopted by Muthui, *et al* (2013).

GDPt = f [(gdfn, ghlth, gedu, gtrnc, gpos)]……..……(i)

Mathematically the equation (i) is stated as :

$GDPt = \beta o + \beta_{1gdfn} + \beta_{2ghlth} + \beta_{3gedu} + \beta_{4gtrnc} + \beta_{5gpos+} \mu t$……(ii)

Gdpt= Gross domestic product

gedu = Expenditure on education

gpos = Expenditure on public order and security

ghlth = Expenditure on health

gtrc = Expenditure on infrastructure

gdfn = Expenditure on defense

Ut =Error term (causes of economic of economic growth not explained by variables in the model)

For this study the functional form of the adopted model is :

Restatement in a multiple regression function form is stated thus;

GDP = f(edu, health, defence, infrac)……(iii)

The functional form of the model explains direct function of the dependent variable on the independent variables

The regression models take the form

$Y = \beta_0 + \beta_1 x_1 + U$ ……(iv)

Statement in a multiple regression form is stated thus;

$GDP = \beta_0 + \beta_1 EDU + \beta_2 HEALTH + \beta_3 DEFENCE + \beta_4 INFRAC + U$ …… (v)

Where ,

GDP - Real growth rate (% of GDP)

EDU - Government expenditure on education (% of GDP)

HEALTH - Government expenditure on health (% of GDP)

DEFENCE- Government expenditure on defence (% of GDP)

INFRAC - Gross fixed capital formation (% of GDP)

β_0 - Constant coefficient of the model

β_{1-} Regressor parameters

μ_{t-} Error terms

The log- linear function of the model takes the form:

$$Log_sGDP = Log_e\beta_0+\beta_1 Log_{eEdu}+\beta_2 Log_{ehealt} + \beta_{0n} Log_e defence + \beta_{0n} Log_e infrac + U_t \text{……..(vi)}$$

The random error term, U, is added to make the model probabilities rather than deterministic. It is also known as the stochastic variable. It is assumed that for any given set of values of $x_1, x_2, \ldots x_n$, the random error U has a normal probability distribution with mean equal to zero and variance equal to δ^2. The random errors are independent (in a probabilistic sense).The value of the coefficients, b_i determines the contribution of the independent variable x_i, given that the other x variables are held constant, and b_o is the Y-intercept. The coefficients, b_o, b_i, b_n are usually unknown because they represent population parameters.

3.4 Descriptions of Variables

Dependent variable:

Economic Growth, Gross domestic product real growth rate (% GDP) – This is the percentage growth rate of GDP at market prices based on constant local currency. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

Independent variables:

Government Expenditure on Education (% of GDP)- Government expenditure on education as % of GDP is the total public expenditure (current and capital) on education expressed as a

percentage of the Gross Domestic Product (GDP) in a given year. Public expenditure on education includes government spending on educational institutions (both public and private), education administration, and transfers/subsidies for private entities (students/households and other privates entities).

Public Expenditure on Health (% of GDP) - Public health expenditure consists of recurrent and capital spending from government (central and local) budgets, external borrowings and grants (including donations from international agencies and nongovernmental organizations), and social(or compulsory) health insurance funds.

Public Expenditure on Defence (% of GDP): This includes all current and capital expenditures on the armed forces, including peacekeeping forces; defense ministries and other government agencies engaged in defense projects; paramilitary forces, they also include military and civil personnel, including retirement pensions of military personnel and social services for personnel; operation and maintenance; procurement; military research and development.

Public Expenditure on Infrastructure , Proxied by Gross fixed capital formation (% of GDP): Gross fixed capital formation (formerly gross domestic fixed investment) includes land improvements , plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. This is the share of public funds over the total government expenditure directed to activities such as, construction of air and seaports, construction of highways, fiber optic cable connection lay outs.

3.5 A priori Expectations

Government expenditure on education, health, defence, and infrastructure are expected to contribute positively to economic growth. The a-priori sign are shown in table 3.1.

Table 3.1: The *a priori* Signs of the Variables

Variable	Definition of Variable	*Apriori* Sign
EDU	Total Government Expenditure on Education	+
HEALTH	Total Government Expenditure on health	+
DEFENCE	Total Government Expenditure on defence	+
INFRAC	Total Government Expenditure on infrastructure	+

3.6 Technique of Data Analyses

An analytical technique is a method that is used to determine the relationships between variables. The regression analysis will be applied to a series of data gathered from the emerging African countries to test all the hypotheses stated in section one. The signs of the coefficients will be relied upon in describing the direction and strength of linear relationship between the dependent variable (GDP) and independent variables (government expenditure on education, health, defence, and infrastructure) while the t - statistic and p-value were relied upon in determining the impact and significance between the variables.

The Classical Linear Regression Model (CLRM) which represents the foundational model for most higher and vigorous econometric analyses shall form the most fundamental technique of

data analyses for this work. The auto regressive distributed lag (ARDL) method was used as it captures the required robustness and flexibility required for a panel data research work. Regression analyses is basically concerned with the study of the dependence of one variable (dependent variable) on one or more other explanatory or independent variables (regressors) with the view to finding out or estimating/predicting the mean or average value of the former in terms of known or repeated values of the latter (Gujarati & Porter, 2010).

In specific terms, regression analysis explains the variation in an outcome (dependent variable) Y, as it depends on a predictor (independent explanatory) variable X. it is a correlation based test. Correlation is one of the most common and useful statistics. It describes the degree of relationship between two variables.

Decision Rule : At 0.05 level of significance, reject null hypothesis(Ho) if the probability of test statistics (H) is less than 5% significant level; Otherwise do not reject Ho.

3.6.1 Normality Test

The normal probability plot is a graphical technique to identify substantive departures from normality. This includes identifying outliers, skewness and kurtosis. Normal probability plots are made of raw data, residual from model fits and estimated parameter.

3.6.2 Test for Stationarity

In statistics, the Dickey–Fuller, tests the null hypothesis of whether a unit root is present in an autoregressive model. The alternative hypothesis is different depending on which version of the test is used, but is usually stationarity or trend-stationarity. It is named after the statisticiansDavid Dickey and Wayne Fuller, The problem of stationarity lies with the fact that spurious regression commonly arises where the non-stationary series are used. Analyses and decisions based on such assumption of correlation in the light of spuriousness would not be quite dependable.

Using the Augmented Dickey Fuller (ADF) Test (Fuller, 1976; Dickey & Fuller, 1979) the model is as follows:

$Y: = Py_{t-1} + e_t$

Where $P = 1$

However, we regress Y_t on its (one period) lagged value Y_{t-1} and find out if estimated p is statistically equal to 1.

3.6.3 Test for Serial Correlation

To estimate equation for statistical inference (*e.g.* hypothesis tests and forecasting), the researcher should generally examine the residuals for evidence of serial correlation. EViews provides several methods of testing a specification for the presence of serial correlation.

The Durbin-Watson Statistic

EViews reports the Durbin-Watson (DW) statistic as a part of the standard regression output. The Durbin-Watson statistic is a test for first-order serial correlation. More formally, the DW statistic

measures the linear association between adjacent residuals from a regression model. The Durbin-Watson is a test of the hypothesis $\rho = 0$ in the specification:

$$u_t = \rho u_{t-1} + \epsilon_t$$

If there is no serial correlation, the DW statistic will be around 2. The DW statistic will fall below 2 if there is positive serial correlation (in the worst case, it will be near zero). If there is negative correlation, the statistic will lie somewhere between 2 and 4.

Positive serial correlation is the most commonly observed form of dependence. As a rule of thumb, with 50 or more observations and only a few independent variables, a DW statistic below about 1.5 is a strong indication of positive first order serial correlation.

3.6.4 Test for Heteroscedasticity

This is when the assumption of homoscedasticity is debased by the variables in the model.

The model procedure now provides two tests for heteroscedasticity of the errors: White's test and the modified Breusch-Pagan test. Both White's test and the Breusch-Pagan are based on the residuals of the fitted model. For systems of equations, these tests are computed separately for the residuals of each equation. The residuals of an estimation are used to investigate the heteroscedasticity of the true disturbances. The option tests the null hypothesis.

3.6.5 Test for Multicollinearity

This is said to exist when the same explanatory variable is unintentionally used twice in a regression and in such a case the model parameters cannot be estimated. This can be corrected by

ignoring it, dropping one of the collinear variables or by transforming the highly correlated variables (Brooks, 2014).

3.6.6 Test for Ramsey Reset Specification

In statistics, the Ramsey Regression Equation Specification Error Test (RESET) test is a general specification test for the linear regression model. More specifically, it tests whether non-linear combinations of the fitted values help explain the response variable. The intuition behind the test is that if non-linear combinations of the explanatory variables have any power in explaining the response variable, the model is mis-specified in the sense that the data generating process might be better approximated by a polynomial or another non-linear functional form.

3.6.7 Cointegration Tests

In principle, testing for Cointegration is similar to testing the linear regression residuals (ϵ_t) for stationarity.

$$X_{1,t} = \alpha + \beta_2 X_{2,k} + \beta_3 X_{3,k} + \cdots + \beta_k X_{k,t} + \epsilon_t$$

So, to establish a cointegration relationship, you would first run a regression model for your variables and test the residuals for stationarity. When time series variables are non-stationary, it is interesting to see if there is a certain common trend between those non-stationary series. If two non-stationary series X_t~I(1), Y_t ~I(1) has a linear relationship such that $Z_t = m+a.X_t+\beta.Y_t$ and Z_t ~I(0), (Z_t is stationary), then we call the two series X_t and Y_t are cointegrated.

Two broad approaches to test for the cointegration are Engel and Granger (1987) and Johansen (1988).

3.6.8 Pairwise Granger Causality Test

This work also carried out pairwisw causality test in testing the hypothesis. Granger causality is a way to investigate **causality** between two variables in a time series. The method is a probabilistic account of causality; it uses empirical data sets to find patterns of correlation. This test is popularized by Granger , (1969) who assumed that the current values of a variable (Y) is conditioned on the past values of another (X) or the other way round. This test shows whether a bidirectional or unidirectional causality exists between the variables of interest.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

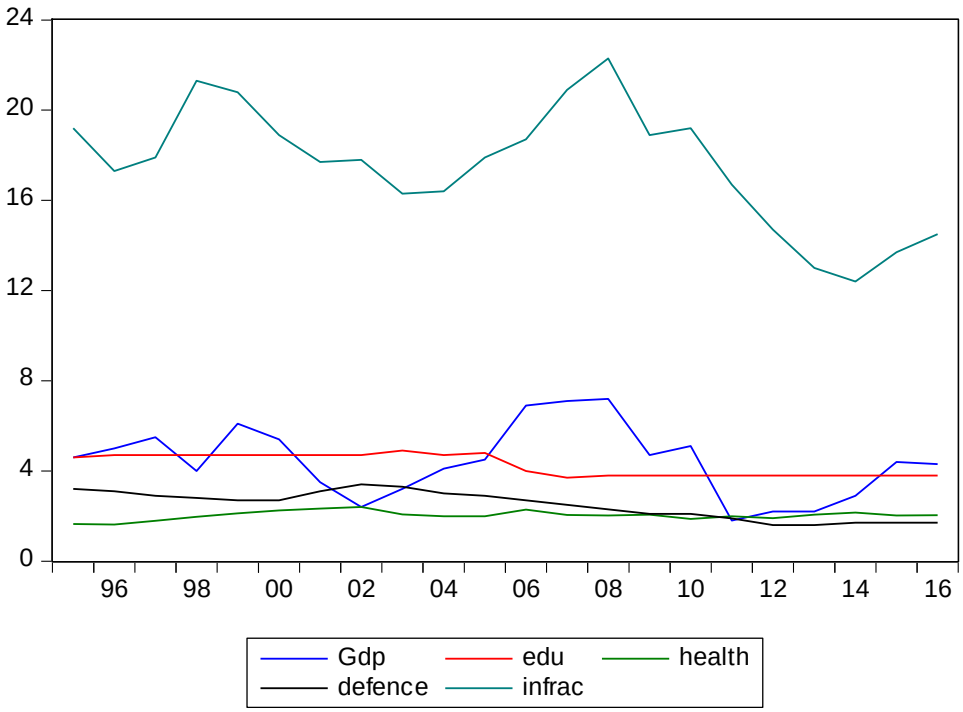
This chapter presents the datasets collected from the World Bank statistical database, UNESCO institute of statistics and United nations statistical division statistical year book, for the periods under study (1995-2016). The datasets are presented in descriptive forms. In addition, the results of various econometric and statistical methods of estimations adopted in line with the objectives of the study are also contained in this chapter. The tests of the formulated equations and hypotheses are also presented with conclusion drawn against the background of the formulated models and apriori expectations. The various diagnostic, standard and validity tests conducted are shown in this chapter.

4.1 Data presentation

4.1.1 Egypt's Government expenditure and GDP between 1995 –2016

In Appendix 1.1. Considering the period under study the real growth rate has not been steady, it has been fluctuating. There was a drastic drop in the year 2011 to 1.8% where it recorded the least growth rate. Egypt recorded high positive growth rate in the year 2007 and 2008 of 7.1% and 7.2% respectively. In the year 2015 and 2016 the real growth rate increased to 4.4% and 4.3%. In respect to government expenditure on education percentage of GDP the expenditure was fairly stable , but dropped in the year 2007.government expenditure on health percentage of GDP in Egypt had steady growth between 1995 and 2002, the expenditure fluctuated between 2003 and 2016.

Government expenditure on defence percentage of GDP in Egypt in 1995 was 3.2, it dropped drastically to 1.7% in the year 2016 showing that the government does not spend much on defence in present years. Government expenditure on infrastructure percentage of GDP was 19.2 in the year 1995 afterwards it increased to 21.3 in 1998 and it started decreasing in subsequent years, by 2016 the expenditure on infrastructure was 14.5.

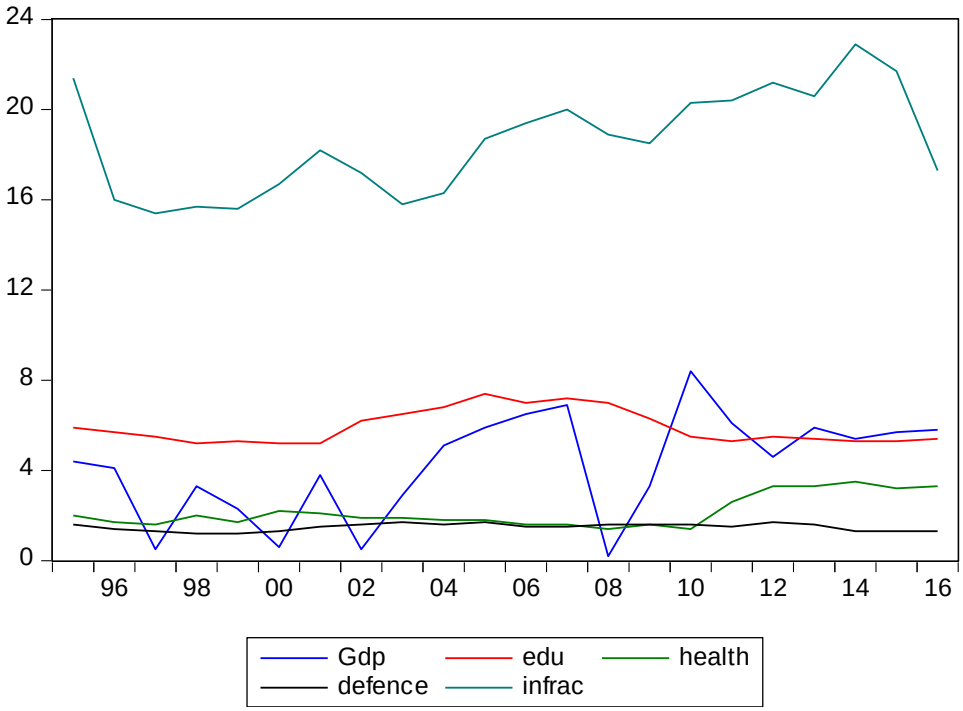


Source*: WorldBank data 2017*
UNESCO institute of statistics.
United nations statistical division statistical year book.2017

Fig 4.1. Graphical Data Presentation For Egypt Selected Variables

4.1.2Kenya's Government expenditure and GDP between 1995 –2016

Appendix 1.2, shows trend in the various components of government expenditure. Real growth rate was 4.4 in 1995,afterwards the rate declined . The growth rate between 1995 and 2011 was not steady. The year ,1997, 2000,2002 recorded very low growth rate of ,0.5,0.5,0.2 respectively. The growth rate increased in 2010 at the rate of 8.4 percent which was the highest in the period of study. In the year 2016 the real GDP growth rate was 5.8 In the trend of government expenditure on education percentage of GDP in Kenya , it declined from 1995 to 2001, it rose again from 2002 to 2005, from 2006 at the rate of 7% it dropped drastically by 2016 at the rate of 5.4% Following the trend of government expenditure on health percentage of GDP, was 2 in the year 1995.The government expenditure on health rose between 2011 and 2016. The government expenditure on defence decreased severely between 1995 and 2016 at the rate1.6 and 1.3 respectively, probably as a result of civilian era. Government expenditure on infrastructure percentage of GDP in Kenya 1995 and 2009. There was an increase between 2010 and 2015 and it declined to 17.3% in 2016.

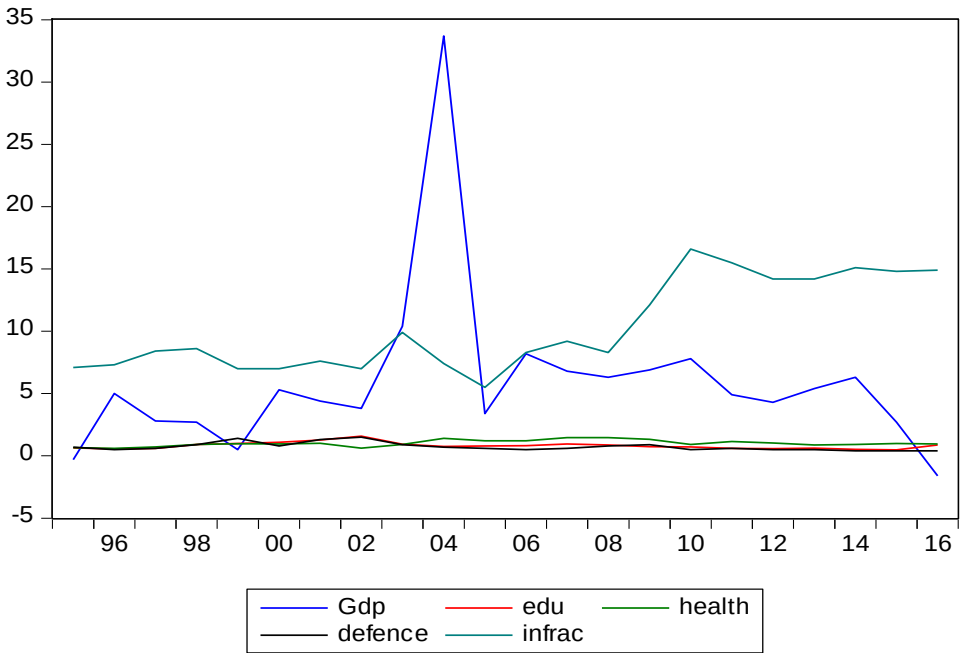


Source*: World Bank data 2017*
UNESCO institute of statistics.
United nations statistical division statistical year book.2017
Fig 4.2 Graphical Data Presentation For Kenya Selected Variables

4.1.3 Nigeria's Government expenditure and GDP between 1995 –2016

Appendix 1.3 , shows that the real growth rate of GDP in Nigeria recorded negative growths in years 1995 and 2016 of -0.3%, and -1.66 respectively. Nigeria recorded the highest percentage growth of 33.7% in 2004 and farther drop to3.4% in 2005. The least positive percentage growth 0.5 was recorded in 1999 while the highest negative decline of 10.8% was recorded in 1997. This implies that the country has not maintained a steady .budgetary increase in allocations to the productive sector of the economy all through the period. Nigeria government expenditure on education percentage of GDP was 0.63% in 1995, it further declined drastically to 0.5% in

2016.The data for government expenditure on health percentage of GDP recorded increase between 1995 and 1999, it further declined in 2000 and recorded another increase between 2005 and 2008, it fluctuated between 2009 and 2015 and declined to 0.96 in 2016. Table 4.3 also reports that government expenditure in defence percentage of GDP fluctuated between 1995 and 2011, declined to 0.4% in 2016. Table 4.3 also shows that Nigeria recorded 7.1% in 1995 on the government expenditure on infrastructure. It fluctuated between 1995 and 2016. The highest was recorded in the year 2010 at 16.6% and the lowest was recorded in the year 2005.



Source*: World Bank data 2017*
UNESCO institute of statistics.
United nations statistical division statistical year book.2017

Fig 4.3 Graphical Data Presentation For Nigeria Selected Variables

4.1.4 South Africa's Government expenditure and GDP between 1995 –2016

Appendix 1.4 ,shows that the real growth rates percentage of GDP for South Africa recorded negative growths in year 2009 of 1.5, and recorded positive growth rates from 1995 to 2007, and 2010 to 2016 . South Africa recorded the highest positive percentage growth of 5.6 % in 2006 and the least growth in year 2016 of 0.3%. The highest negative drop in growth of -1.5% is in 2009.

Table 4.4 also report fluctuations on government expenditure on education percentage of GDP between 1995 and 2009 and maintained a steady percentage of 6% between 2013 and 2016. The data on government expenditure on health percentage of GDP for 1995 was 3.4% and it increased to 4.2% in 2016 . Table 4.4 also show that south Africa recorded 2.1% on government expenditure on defence percentage of GDP in 1995 . The rate steadily declined from 1995 to 2016 at 1.1%. the government expenditure on infrastructure percentage of GDP recorded fluctuations within the period of study(1995-2016). The government expenditure on infrastructure percentage of GDP recorded the highest rate in 2008 and lowest in 2002.

Source*: WorldBank data 2017*
UNESCO institute of statistics.
United nations statistical division statistical year book.2017

Fig 4.4 Graphical Data Presentation For South Africa Selected Variables

4.2.: Descriptive Statistics

This data were subjected to descriptive statistics using the Jarque-Bera Normality test. This requires that for a series to be normally distributed; the histogram should be bell-shaped and the Jarque-Bera statistics would not be significant. According to Brooks (2014), the p-value given at

the bottom of the normality test tables are expected to be greater than the chosen level of significance to accept the Null hypothesis, that the series is normally distributed.

Table 4.1: Descriptive Statistics for Egypt Data

	GDP	EDU	HEALTH	DEFENCE	INFRAC
Mean	4.413636	4.263636	2.030455	2.500000	17.56818
Median	4.450000	4.300000	2.035000	2.700000	17.85000
Maximum	7.200000	4.900000	2.400000	3.400000	22.30000
Minimum	1.800000	3.700000	1.620000	1.600000	12.40000
Std. Dev.	1.583635	0.470608	0.193993	0.605530	2.692916
Skewness	0.124542	0.009554	-0.240320	-0.225228	-0.260628
Kurtosis	2.225862	1.089510	3.081574	1.638219	2.356228
Jarque-Bera	0.606222	3.346144	0.217863	1.885912	0.628971
Probability	0.738517	0.187670	0.896792	0.389475	0.730164
Sum	97.10000	93.80000	44.67000	55.00000	386.5000
Sum Sq. Dev.	52.66591	4.650909	0.790295	7.700000	152.2877
Observations	22	22	22	22	22

Source: Computation by researcher using E-view 9.5

The descriptive statistics in table 4.1 shows averages like mean, median and mode for all the observations. The result also indicates the spread and variations in the series using the standard deviation which is high. The descriptive result also displays kurtosis which shows the degree of peakedness together with the skewness which is a reflection of the degree of or departure from symmetry of the given series. With all the variables showing an average kurtosis below 3, there is evidence that they are all leptokurtic, which indicates a normal distribution.

Table 4.2: Descriptive Statistics for Kenya Data

	GDP	EDU	HEALTH	DEFENCE	INFRAC
Mean	4.190909	5.913636	2.159091	1.481818	18.55455
Median	4.500000	5.500000	1.900000	1.500000	18.60000
Maximum	8.400000	7.400000	3.500000	1.700000	22.90000
Minimum	0.200000	5.200000	1.400000	1.200000	15.40000
Std. Dev.	2.291788	0.746608	0.698747	0.165145	2.293412
Skewness	-0.351907	0.755150	0.882451	-0.353087	0.154356
Kurtosis	2.259031	2.045983	2.242328	1.763175	1.798865
Jarque-Bera	0.957357	2.925224	3.381532	1.859383	1.409858
Probability	0.619602	0.231630	0.184378	0.394675	0.494144
Sum	92.20000	130.1000	47.50000	32.60000	408.2000
Sum Sq. Dev.	110.2982	11.70591	10.25318	0.572727	110.4545
Observations	22	22	22	22	22

Source: Computation by researcher using E-view 9.5

The descriptive statistics in table 4.2 display averages like mean, median and mode for all the observations. The result also indicates the spread and variations in the series using the standard deviation which is high. The descriptive result also displays kurtosis which shows the degree of peakedness together with the skewness which is a reflection of the degree of or departure from symmetry of the given series. With all the variables showing an average kurtosis below 3, there is evidence that they are all platykurtic which, indicates a normal distribution.

Table 4.3: Descriptive Statistics for Nigeria Data

	GDP	EDU	HEALTH	DEFENCE	INFRAC
Mean	5.895455	0.810909	1.013182	0.727273	10.27273
Median	4.950000	0.770000	0.970000	0.600000	8.500000
Maximum	33.70000	1.580000	1.470000	1.500000	16.60000
Minimum	-1.600000	0.470000	0.600000	0.400000	5.500000
Std. Dev.	6.817169	0.263961	0.254510	0.318002	3.594597
Skewness	3.178780	1.185780	0.266523	1.209166	0.508916
Kurtosis	13.95043	4.453994	2.381340	3.514656	1.634808
Jarque-Bera	146.9697	7.093528	0.611305	5.603770	2.658087
Probability	0.000000	0.028818	0.736643	0.060696	0.264730
Sum	129.7000	17.84000	22.29000	16.00000	226.0000
Sum Sq. Dev.	975.9495	1.463182	1.360277	2.123636	271.3436
Observations	22	22	22	22	22

Source: Computation by researcher using E-view 9.5

The descriptive statistics in table 4.3 shows averages like mean, median and mode for all the observations. The result also indicates the spread and variations in the series using the standard deviation. The descriptive result also displays kurtosis which shows the degree of peakedness together with the skewness which is a reflection of the degree of or departure from symmetry of the given series. With all the variables showing an average kurtosis above 3, there is evidence that they are all platykurtic which, indicates a normal distribution.

Table 4.4: Descriptive Statistics for South Africa Data

	GDP	EDU	HEALTH	DEFENCE	INFRAC
Mean	2.877273	5.522727	3.686364	1.350000	18.40909
Median	2.950000	5.600000	3.600000	1.350000	18.50000
Maximum	5.600000	6.400000	4.300000	2.100000	23.50000
Minimum	-1.500000	4.900000	3.200000	1.100000	15.20000
Std. Dev.	1.741355	0.449266	0.389500	0.266815	2.219161
Skewness	-0.544917	0.121336	0.273337	1.062307	0.362402
Kurtosis	3.244223	1.766799	1.494741	3.899296	2.400903
Jarque-Bera	1.143435	1.448034	2.350935	4.879156	0.810569
Probability	0.564555	0.484801	0.308675	0.087198	0.666787
Sum	63.30000	121.5000	81.10000	29.70000	405.0000
Sum Sq. Dev.	63.67864	4.238636	3.185909	1.495000	103.4182
Observations	22	22	22	22	22

Source: Computation by researcher using E-view 9.5

The descriptive statistics in table 4.4 shows averages like mean, median and mode for all the observations. The result also indicates the spread and variations in the series using the standard deviation. The descriptive result also displays kurtosis which shows the degree of peakedness together with the skewness which is a reflection of the degree of or departure from symmetry of the given series. With all the variables showing an average kurtosis less than 3, there is evidence that they are all leptokurtic which, indicates a normal distribution.

Table 4.5: Panel Descriptive Statistics

	GDP	EDU	HEALTH	DEFENCE	INFRAC
Mean	4.344318	4.127727	2.222273	1.514773	16.20114
Median	4.250000	4.900000	2.000000	1.500000	17.10000
Maximum	33.70000	7.400000	4.300000	3.400000	23.50000
Minimum	-1.600000	0.470000	0.600000	0.400000	5.500000
Std. Dev.	3.870753	2.082975	1.049396	0.738987	4.395570
Skewness	4.935659	-0.694223	0.432346	0.781876	-0.849466
Kurtosis	38.83713	2.098259	2.043248	3.155177	2.902640
Jarque-Bera	5066.390	10.05005	6.097910	9.054470	10.61812
Probability	0.000000	0.006571	0.047408	0.010811	0.004947
Sum	382.3000	363.2400	195.5600	133.3000	1425.700
Sum Sq. Dev.	1303.497	377.4741	95.80715	47.51080	1680.930
Observations	88	88	88	88	88

Source: Computation by researcher using E-view 9.5

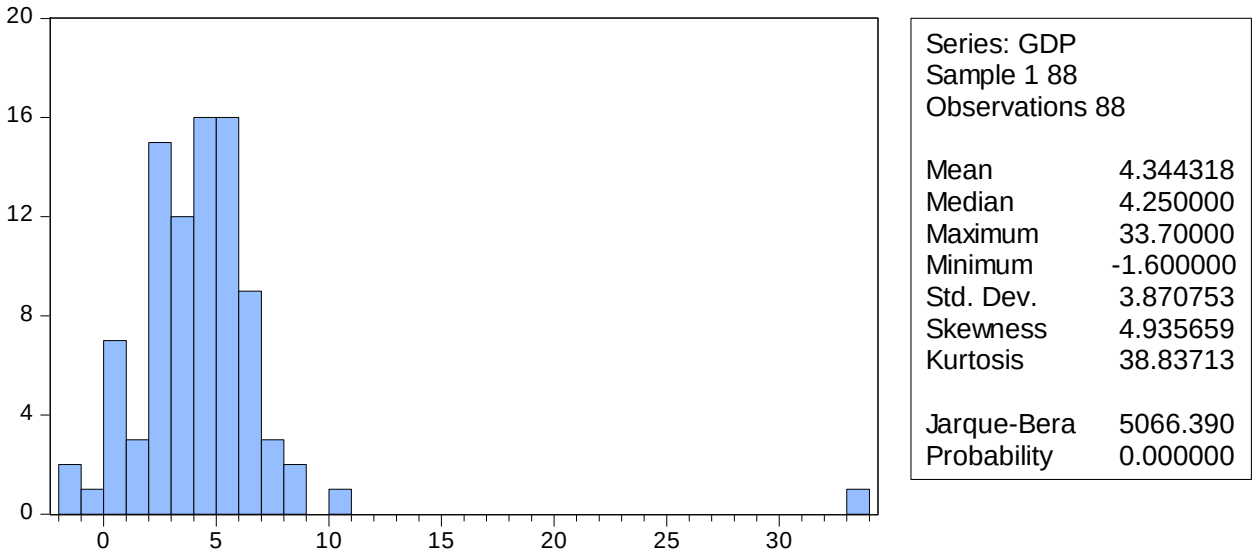
The result of table 4.5 displays an even spread and variations for the series in mean and median as well as the standard deviation. The panel mean, median, maximum and Standard Deviation for the entire variables show positive and healthy trend. Significantly, kurtosis which shows the degree of peakedness is also shown along with the skewness which is a reflection of the degree or departure from symmetry of the given series. With all the variables having kurtosis above 3 and high standard deviation, there is strong evidence to believe they are platykurtic. The Jarque-Bera and the probability of the pooled panel data show strong sign of normality considering the spread among the variables and a significant p-value of 0.00 which is less than the chosen significant level of 5%. The implication of this is that the observed out-linear in the individual country descriptive statistics of Egypt, Kenya, Nigeria and South-Africa have been corrected through the panel pool effect and the result from such a process can be adequately relied upon.

Table 4.6: Panel Covariance Matrix

	GDP	EDU	HEALTH	DEFENCE	INFRAC
GDP	14.81247	-1.938422	-0.811885	-0.164746	-2.751300
EDU	-1.938422	4.289479	1.445045	0.700431	6.774321
HEALTH	-0.811885	1.445045	1.088718	0.110262	2.816986
DEFENCE	-0.164746	0.700431	0.110262	0.539895	1.369756
INFRAC	-2.751300	6.774321	2.816986	1.369756	19.10148

Source: Computation by researcher using E-view 9.5

From table 4.6, covariance matrix table, the result indicates significant covariance between GDP and INFRAC . Similarly, significant covariance is observed between INFRAC and DEFENCE, EDU, and GDP. Hence, any suspicion of possible multicollinearity could be dealt with by dropping variable insensitive



Source: Computation by researcher using E-view 9.5

Figure 4.5 - Panel Data Test for Normality

The histogram in figure 4.5, Jarque-Bera of 5066.390 and the p-value of the panel series at 0.0000000 is significant at the 5% level of significance showing strong Normality in the distribution.

4.3: Test for Stationarity

The test for stationarity requires that the variables in the series model must be stationery at a given level and p-value must be significant at that level. Stationarity is attained where the test statistics is most negative and greater than the critical value of the chosen level of significance.

Table 4.7: Unit Root Tests for Egypt Data

Variables	ADF Test Statistics	Critical Values @ 5%	P-value	Order of Integration
GDP	-4.593731	-3.020686	0.0019	**I(1)**
EDU	-4.115185	-3.020686	0.0052	**I(1)**
HEALTH	-4.567633	-3.020686	0.0020	**I(1)**
DEFENCE	-3.193493	-3.021997	0.0159	**I(1)**
INFRAC	-3.588818	-3.020686	0.0159	**I(1)**

Source: Researcher's E-view 9.5 Computation.

Table 4.7 reports the tests for stationarity properties of the series following the Augumented Dickey Fuller (ADF) statistics. All the variables were found to be stationery at order one (1) . At both level and First difference as reported, the ADF Statistics for all the respective variables were all negative as the critical values at 5% significance level. The reported p-values were all less than 0.05 or 0.10 chosen level of significance for which cause, the Null Hypothesis of the presence of unit root in all the variables is convincingly rejected. For the purposes of Cointegration analysis and tests, it is also interesting to state that the variables are almost integrated of the same order.

Table 4.8: Unit Root Tests for Kenya Data

Variables	ADF Test Statistics	Critical Values @ 5%	P-value	Order of Integration
EDU	-6.090665	-3.029970	0.0001	**1(2)**
HEALTH	-4.312264	-3.020686	0.0034	**I(1)**
DEFENCE	-4.128544	-3.020686	0.0051	**I(1)**
INFRAC	-4.126981	-3.0200686	0.0051	**I(1)**
GDP	-5.815500	-3.020686	0.0001	**I(1)**

Source: Researcher's E-view 9.5 Computation

Table 4.8 reports the tests for stationarity properties of the series following the Augumented Dickey Fuller (ADF) statistics. All the variables were found to be stationery at order one except EDU was stantionary at order two. At both First and second difference as reported, the ADF Statistics for all the respective variables were all negative as the critical values at 5% significance level. The reported p-values were all less than 0.05 or 0.10 chosen level of significance for which cause, the Null Hypothesis of the presence of unit root in all the variables is convincingly rejected. For the purposes of Cointegration analysis and tests, it is also interesting to state that the variables are almost integrated of the same order.

Table 4.9: Unit Root Tests for Nigeria Data

Variables	ADF Test Statistics	Critical Values @ 5%	P-value	Order of Integration
EDU	-3.743599	-3.020686	0.0115	**I(1)**
HEALTH	-4.913903	-3.020686	0.0009	**I(1)**
DEFENCE	-5.353559	-3.020686	0.0004	**I(1)**
INFRAC	-4.314099	-3.020686	0.0034	**I(1)**
GDP	-3.829558	-3.012363	0.0091	**1(0)**

Source: Researcher's E-view 9.5 Computation

Table 4.9 reports the tests for stationarity properties of the series following the Augumented Dickey Fuller (ADF) statistics. All the variables were found to be stationery at order one (1) except GPD was stationary at level. At both level and First difference as reported, the ADF

Statistics for all the respective variables were all negative as the critical values at 5% significance level. The reported p-values were all less than 0.05 or 0.10 chosen level of significance for which cause, the Null Hypothesis of the presence of unit root in all the variables is convincingly rejected. For the purposes of Cointegration analysis and tests, it is also interesting to state that the variables are almost integrated of the same order.

Table 4.10: Unit Root Tests for South Africa Data

Variables	ADF Test Statistics	Critical Values @5%	P-value	Order of Integration
EDU	-3.327687	-3.020686	0.0272	**I(1)**
HEALTH	-3.900593	-3.020686	0.0082	**I(1)**
DEFENCE	-4.430796	-3.020686	0.0026	**I(1)**
INFRAC	-3.059437	-3.020686	0.0464	**I(1)**
GDP	-5.175429	-3.020686	0.0005	**I(1)**

Source: Researcher's E-view 9.5 Computation

Table 4.10 reports the tests for stationarity properties of the series following the Augmented Dickey Fuller (ADF) statistics. All the variables were found to be stationery at order one (1). At first difference as reported, the ADF Statistics for all the respective variables were all negative as the critical values at 5% significance level. The reported p-values were all less than 0.05 or 0.10 chosen level of significance for which cause, the Null Hypothesis of the presence of unit root in all the variables is convincingly rejected. For the purposes of Cointegration analysis and tests, it is also interesting to state that the variables are almost integrated of the same order.

Table 4.11: Panel Unit Root Result

Variables	LLandC Test Statistics	Critical Values @ 5%	P-value	Order of Integration
EDU	-5.644	-2.46237	0.0069	**I(1)**
HEALTH	-6.500	-2.40901	0.0080	**I(1)**
DEFENCE	-7.463	-4.75805	0.0000	**I(1)**
INFRAC	-7.228	-3.17083	0.0008	**I(1)**
GDP	-5.011	-2.07235	0.0191	**I(0)**

Source: Researcher's E-view 9.5 Computation

The Levin, Lin and Chu (LLC) statistics is used to tests for statinarity of the panel data series. All the panel variables were found to be stationery at first difference level (1) except GDP that was stationary at level. At level and first difference levels as reported, the variable p-value were all less than the 5% chosen significance level and thus we reject the Null hypothesis of the presence of unit root and accept the alternative that there is no unit root and stationarity is attained by all the variables at the first difference levels.

4.4 Tests for Cointegration

Brooks (2014) holds that cointegration is used in Finance to model long-run equilibrium relationship and this is further supported by Woolbridge (2006). This forms the basis for our adoption of cointegration method to test for the existence of long-run equilibrium relationship before we can proceed with our regression analysis.

i.) Individual Country Cointegration Tests

ii.) Panel Data Pooled Cointegration Results

Table 4.12: Cointegration Test Result for Egypt @ 5% level

Date: 08/29/18 Time: 14:04
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments
Trend assumption: Linear deterministic trend
Series: GDP EDU HEALTH DEFENCE INFRAC
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.842027	101.8415	69.81889	0.0000
At most 1 *	0.799810	64.93485	47.85613	0.0006
At most 2 *	0.655378	32.76512	29.79707	0.0221
At most 3	0.423890	11.45895	15.49471	0.1848
At most 4	0.021261	0.429815	3.841466	0.5121

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.842027	36.90668	33.87687	0.0211
At most 1 *	0.799810	32.16973	27.58434	0.0120
At most 2 *	0.655378	21.30617	21.13162	0.0473
At most 3	0.423890	11.02913	14.26460	0.1528
At most 4	0.021261	0.429815	3.841466	0.5121

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Source :Researcher's E-views 9 Computation

The cointegration result for Egypt in table 4.12 of the trace and maximum eigen-value tests shows the existence o five (5) cointegrating vectors (p-value of 0.0000, 0.0006 and 0.0221, for trace test and 0.0211 and 0.0120 for maximum eigenvalue) between EDU, DEFENCE, GDP, HEALTH and INFRACat the 5% level of significance. This thus confirms the existence of long-run equilibrium (cointegrating) effect of EDU, DEFENCE, HEALTH and INFRAC on GDP.

Table 4.13: Cointegration Test Result for Kenya @ 5% level

Date: 08/29/18 Time: 14:06
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments
Trend assumption: Linear deterministic trend
Series: GDP EDU HEALTH DEFENCE INFRAC
Lags interval (in first differences): 1 to 1
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.944111	123.9785	69.81889	0.0000
At most 1 *	0.899152	66.29095	47.85613	0.0004
At most 2	0.474354	20.40814	29.79707	0.3956
At most 3	0.234446	7.545581	15.49471	0.5152
At most 4	0.104276	2.202465	3.841466	0.1378

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.944111	57.68760	33.87687	0.0000
At most 1 *	0.899152	45.88281	27.58434	0.0001
At most 2	0.474354	12.86256	21.13162	0.4649
At most 3	0.234446	5.343115	14.26460	0.6980
At most 4	0.104276	2.202465	3.841466	0.1378

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Source: Computation by researcher using E-view 9.5

The cointegration result for Kenya in table 4.13 of the trace and maximum eigen-value tests shows the existence of four (4) cointegrating vectors (p-value of 0.0000 and 0.0004 for trace test and 0.0000 and 0.0001 for maximum eigenvalue) between EDU, DEFENCE, GDP, HEALTH and INFRACat the 5% level of significance. This thus shows that little existence of long-run equilibrium (cointegrating) effect of EDU, DEFENCE, HEALTH and INFRAC on GDP in Kenya.

Table 4.14: Cointegration Test Result for Nigeria @ 5% level

Date: 08/29/18 Time: 14:10
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments
Trend assumption: Linear deterministic trend
Series: GDP EDU HEALTH DEFENCE INFRAC
Lags interval (in first differences): 1 to 1
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.913183	98.79913	69.81889	0.0001
At most 1 *	0.693181	49.92016	47.85613	0.0316
At most 2	0.520513	26.29023	29.79707	0.1202
At most 3	0.332485	11.58947	15.49471	0.1777
At most 4	0.160778	3.505592	3.841466	0.0612

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.913183	48.87897	33.87687	0.0004
At most 1	0.693181	23.62993	27.58434	0.1482
At most 2	0.520513	14.70075	21.13162	0.3104

At most 3	0.332485	8.083883	14.26460	0.3703
At most 4	0.160778	3.505592	3.841466	0.0612

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Source:Computation by researcher usinng E-view 9.5

The cointegration result for Nigeria in table 4.14 of the trace and maximum eigen-value tests shows the existence of three (3) cointegrating vectors (p-value of 0.0001 and 0.0316 for trace test and 0.0004 for maximum eigenvalue) between EDU, DEFENCE, GDP, HEALTH and INFRACat the 5% level of significance. This thus shows no existence of long-run equilibrium (cointegrating) effect of EDU, DEFENCE, HEALTH and INFRAC on GDP in Nigeria.

Table 4.15: Cointegration Test Result for South Africa @ 5% level

Date: 08/29/18 Time: 14:15
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments
Trend assumption: Linear deterministic trend
Series: GDP EDU HEALTH DEFENCE INFRAC
Lags interval (in first differences): 1 to 1
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.903156	123.3082	69.81889	0.0000
At most 1 *	0.802777	76.61505	47.85613	0.0000
At most 2 *	0.632116	44.14659	29.79707	0.0006
At most 3 *	0.581079	24.14682	15.49471	0.0020
At most 4 *	0.286282	6.745349	3.841466	0.0094

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.903156	46.69313	33.87687	0.0009
At most 1 *	0.802777	32.46845	27.58434	0.0108
At most 2	0.632116	19.99978	21.13162	0.0714
At most 3 *	0.581079	17.40147	14.26460	0.0154
At most 4 *	0.286282	6.745349	3.841466	0.0094

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source:*Computation by researcher using E-view 9.5*

The cointegration result for south Africa in table 4.15 of the trace and maximum eigen-value tests shows the existence of nine (9) cointegrating vectors (p-value of 0.0000,0.0000,0.0006,0.0020and 0.0094 for trace test and 0.0009,0.0108,0.00154 and 0.0094 for maximum eigenvalue) between GDP, EDU,HEALTH,DEFENCE and INFRAC at the 5% level of significance. This shows existence of long – run equilibrium (cointegrating effect of EDU, HEALTH, DEFENCE, and INFRAC on GDP in south Africa.

Table 4.16: RESULT – Johansen Panel Cointegration Test

Johansen
Fisher Panel
Cointegration
Test
Series: GDP EDU HEALTH DEFENCE INFRAC
Date: 08/30/18 Time: 06:31
Sample: 1995 2016
Included observations: 88
Trend assumption: No deterministic trend
Lags interval (in first differences): 1 1

Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)

Hypothesized No. of CE(s)	Fisher Stat.* (from trace test)	Prob.	Fisher Stat.* (from max-eigen test)	Prob.
None	77.69	0.0000	62.44	0.0000
At most 1	28.62	0.0004	21.95	0.0050
At most 2	13.95	0.0832	10.45	0.2345
At most 3	9.231	0.3232	10.27	0.2465
At most 4	4.120	0.8461	4.120	0.8461

Individual cross section results

Cross Section	Trace Test Statistics	Prob.**	Max-Eign Test Statistics	Prob.**
Hypothesis of no cointegration				
Egypt	77.2009	0.0009	32.5359	0.0270
Kenya	96.0358	0.0000	56.7269	0.0000
Nigeria	81.1863	0.0003	47.9538	0.0001
S. Africa	93.0689	0.0000	42.0498	0.0012
Hypothesis of at most 1 cointegration relationship				
Egypt	44.6650	0.0165	26.6243	0.0228
Kenya	39.3089	0.0610	24.3592	0.0470
Nigeria	33.2325	0.2093	18.6859	0.2318
S. Africa	51.0191	0.0029	23.1027	0.0690
Hypothesis of at most 2 cointegration relationship				

Egypt	18.0406	0.2493	12.5408	0.2589
Kenya	14.9497	0.4595	9.4116	0.5487
Nigeria	14.5466	0.4920	8.1286	0.6919
S. Africa	27.9164	0.0166	17.5384	0.0546
Hypothesis of at most 3 cointegration relationship				
Egypt	5.4998	0.4995	4.9651	0.4822
Kenya	5.5381	0.4945	5.1059	0.4625
Nigeria	6.4180	0.3869	6.0586	0.3431
S. Africa	10.3781	0.1036	10.1458	0.0769
Hypothesis of at most 4 cointegration relationship				
Egypt	0.5347	0.5271	0.5347	0.5271
Kenya	0.4321	0.5744	0.4321	0.5744
Nigeria	0.3594	0.6118	0.3594	0.6118
S. Africa	0.2322	0.6880	0.2322	0.6880

Source: Computation by researcher using E-view 9.5

The Panel Cointegration Trace and Maximum Eigenvalue Tests reveal the existence of two (2) cointegrating vectors (with p-values of 0.0000, 0.0050, respectively and also Fisher statistic of 62.44 and 21.95 respectively) between EDU, DEFENCE, HEALTH, INFRAC and GDP. This confirms the cointegration result of the residual cointegration tests of the little or no existence of cointegration between EDU, DEFENCE, HEALTH, INFRAC and GDP.

4.5 Inferential analysis of data

The data for the selected study areas were pooled together to enable the researchers determine the optimum overall result for the studied emerging African economies, using Auto –regressive Distributed Lag (ARDL) model.

4.5.1 Pooled Data ARDL

Table 4.17
Dependent Variable: GDP
Method: ARDL
Date: 09/02/18 Time: 00:49
Sample (adjusted): 2 88
Included observations: 87 after adjustments
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (1 lag, automatic): EDU HEALTH DEFENCE INFRAC
Fixed regressors: C
Number of models evalulated: 16
Selected Model: ARDL(1, 0, 1, 1, 0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP(-1)	0.169019	0.103070	1.639849	0.1050
EDU	-0.188269	0.323321	-0.582298	0.5620
HEALTH	3.587229	1.101658	3.256208	0.0017
HEALTH(-1)	-4.008673	1.052673	-3.808090	0.0003
DEFENCE	-5.619053	1.816858	-3.092731	0.0027
DEFENCE(-1)	5.931586	1.758429	3.373231	0.0012
INFRAC	-0.098847	0.140672	-0.702679	0.4843
C	6.184687	1.723180	3.589112	0.0006

R-squared	0.254872	Mean dependent var	4.341379
Adjusted R-squared	0.188848	S.D. dependent var	3.893093
S.E. of regression	3.506275	Akaike info criterion	5.434433
Sum squared resid	971.2232	Schwarz criterion	5.661183
Log likelihood	-228.3978	Hannan-Quinn criter.	5.525739
F-statistic	3.860290	Durbin-Watson stat	2.250116
Prob(F-statistic)	0.001161		

*Note: p-values and any subsequent tests do not account for model selection.

Source: Researcher's E-view 9.5 computation

Auto regressive distributed lag models was carried out to identify the relation ship between GDP and EDU, HEALTH, DEFENCE and INFRAC using the pooled data. In table 4.17 the R squared and adjusted R squared both showed 25.5% and 18.9% respectively. Hence the goodness of the fit panel regression model implies that the choosen explanatory variables explain variations in the dependent variables . The F- statistic is considerably good, showing that there is a significant positive relationship between the dependent and explanatory variables. The overall probability is 0.001161 , this shows that the government expenditure has a significant relationship with economic growth in the selected African emerging economies. The Durbin- Watson of 2.250116 is considerably good and shows that the outcome of this academic exercise is very reliable.

Based on the analysis of the pooled data the government expenditure on education, health, defence and infrastructure has the t- statistic of -0.582298,3.256208,-3.092731 and –0.702679 respectively and also the probability of 0.5620, 0.0017,0.0027 and 0.4843. Therefore from the analysis we accept the null hypothesis for government expenditure on education and infrastructure which supports that there is no significant relationship with the economic growth. The government expenditure on health and defence has a significant relationship with economic growth, therefore the Null hypothesis is rejected.

4.5.2 Diagnostic Test

4.5.2.1: Test for Serial Correlation (Using Breusch-Godfrey (BG) Tests)

The study test for the presence or absence of serial/autocorrelation using Breusch-Godfrey tests for the model stated in the Null hypothesis format that there is no autocorrelation. This holds if p-value is greater than the chosen level of significance otherwise reject.

Table 4.18
Breusch-Godfrey Serial Correlation LM Test: panel-pooled data

F-statistic	3.491391	Prob. F(2,77)	0.0354
Obs*R-squared	7.233650	Prob. Chi-Square(2)	0.0269
Durbin-Watson stat	1.943123		

Source: Computation by researcher using E-view 9.5

From table 4.18, for the panel data the p-value is less than the chosen level of significance of 5%, indicating the presence of autocorrelation in the model. This is further enhanced with a Durbin-Watson statistics of 1.943123.

4.5.2.2 Test for Heteroskedasticity (Arch)

This is used to test whether the variance of error is constant or not. The assumption of the classical linear regression that the variance of the errors is constant is known as *Homoskedastycity* while, if the variance of the errors is not constant, this would be known as *Heteroskedasticity*. Hence, we test for the presence of heteroskedasticity with the intention of treating same if found. The treatment method adopted here is the Autoregressive conditionally Heteroscedastic test known as ARCH. The Null hypothesis states that there is no Heteroscedasticity if the p-value is greater than the level of significance (Brooks, 2014).

Table 4.19
Heteroskedasticity Test: Breusch-Pagan-Godfrey-Panel

F-statistic	2.160824	Prob. F(7,79)	0.0466
Obs*R-squared	13.98067	Prob. Chi-Square(7)	0.0515
Scaled explained SS	169.3930	Prob. Chi-Square(7)	0.0000

Source: Computation by researcher using E-view 9.5

The null hypothesis states that there is heteroskedasticity if p-value is significant and is less than the chosen level of significance of 5%. Hence, in this case we reject the Null hypothesis that there is no evidence of heteroskedasticity since p-value is greater than 5% significance level.

4.5.2.3: Test for Ramsey Reset Specification

Ramsey (1969) proposed a general functional form misspecification test, Regression Specification Error Test (RESET), which has proven to be useful. The Reset test is a general test for the following type of specification errors:

a) Omitted Variables

b) Incorrect Functional form

c) Correlation between variables which may be caused by measurement error, simultaneous equation combination, combination of lagged values and serially correlated disturbances.

The Reset test is a non-linearity test, or a misspecification of functional form that is a situation where the shape of the regression model estimated is incorrect – for instance, where the model estimated is linear but it should have been non-linear (Brooks, 2014). The Null hypothesis holds that where the p-value of the test statistics is greater than the level of significance, the result is not significant and the regression model is linear, otherwise we reject the Null hypothesis and accept

the Alternative hypothesis that the relationship is significant and the regression model is non-linear.The result for the test is usually presented in the first upper box of the first three rows.

Table 4.20
Ramsey RESET Test—Panel
Equation: UNTITLED
Specification: GDP GDP(-1) EDU HEALTH HEALTH(-1) DEFENCE
DEFENCE(-1) INFRAC C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.780022	78	0.0790
F-statistic	3.168479	(1, 78)	0.0790

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	37.91250	1	37.91250
Restricted SSR	971.2232	79	12.29396
Unrestricted SSR	933.3107	78	11.96552

The p-values in the table 4.20. for t and F-statistics being greater than the 5% significance level, indicates that the test statistics are not significant at the 5% level. Thus, the output from this model testing provides a best fit and can be relied upon.

4.6 Test of hypotheses

The following research hypotheses was raised in line with the objectives and research questions;

Ho_1: Government expenditure on education has no significant relationship with the economic growth of selected emerging economies in Africa.

Ho_2: Government expenditure on health does not exert positive and significant impact on economic growth of selected emerging economies in Africa.

Ho_3: Government expenditure on defence is not significantly related to economic growth of selected emerging economies in Africa.

Ho_4: Economic growth of selected emerging economies is not a significant function of Government expenditure.

Ho_5: There is no causality between government expenditure and economic growth of the selected emerging economies in Africa.

To test the hypotheses , Granger causality test was employed for individual country output and the panel-pooled data of the selected emerging African economies.

Table 4.21 Causality test for Egypt

Pairwise Granger Causality Tests
Date: 09/02/18 Time: 16:44
Sample: 1995 2016
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
EDU does not Granger Cause GDP	21	0.82762	0.3750
GDP does not Granger Cause EDU		0.24212	0.6286
HEALTH does not Granger Cause GDP	21	0.01052	0.9195
GDP does not Granger Cause HEALTH		0.12049	0.7325
DEFENCE does not Granger Cause GDP	21	0.97957	0.3354
GDP does not Granger Cause DEFENCE		0.16070	0.6932
INFRAC does not Granger Cause GDP	21	0.02567	0.8745
GDP does not Granger Cause INFRAC		6.12128	0.0235
HEALTH does not Granger Cause EDU	21	0.01600	0.9007
EDU does not Granger Cause HEALTH		1.45001	0.2441
DEFENCE does not Granger Cause EDU	21	0.39794	0.5361
EDU does not Granger Cause DEFENCE		3.85147	0.0653
INFRAC does not Granger Cause EDU	21	0.06625	0.7998
EDU does not Granger Cause INFRAC		0.96577	0.3388
DEFENCE does not Granger Cause HEALTH	21	0.02715	0.8710
HEALTH does not Granger Cause DEFENCE		3.57245	0.0750
INFRAC does not Granger Cause HEALTH	21	0.10046	0.7549
HEALTH does not Granger Cause INFRAC		4.7E-05	0.9946
INFRAC does not Granger Cause DEFENCE	21	0.38213	0.5442
DEFENCE does not Granger Cause INFRAC		2.31619	0.1454

Source: Researcher's E-view 9.5 Computation.

From the Granger Causality Test result in Table 4.21, for Egypt, the test was carried out with a lag 1period, government expenditure is unbundled into four variants and their causal relationship with economic growth is tested. From the results, there was one unidirectional relationship on GDP does not granger cause INFRAC, for the rest of the variables there was no form of unidirectional or bidirectional causality relationship in the result of table . Hence, no causal

relationships exist between EDU, Health, Defence, and GDP within the period under review for Egypt.

Decision: We accept the null hypothesis for EDU, Defence, Health have no granger effect on GDP in Egypt and reject null hypothesis for INFRAC.

Table 4.22:Causality test for Kenya

Pairwise Granger Causality Tests
Date: 09/02/18 Time: 16:47
Sample: 1995 2016
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
EDU does not Granger Cause GDP	21	0.55892	0.4644
GDP does not Granger Cause EDU		0.34793	0.5626
HEALTH does not Granger Cause GDP	21	0.66850	0.4243
GDP does not Granger Cause HEALTH		1.13178	0.3015
DEFENCE does not Granger Cause GDP	21	3.13974	0.0933
GDP does not Granger Cause DEFENCE		0.51350	0.4828
INFRAC does not Granger Cause GDP	21	1.55058	0.2290
GDP does not Granger Cause INFRAC		1.57473	0.2256
HEALTH does not Granger Cause EDU	21	0.18096	0.6756
EDU does not Granger Cause HEALTH		3.13969	0.0933
DEFENCE does not Granger Cause EDU	21	0.11528	0.7381
EDU does not Granger Cause DEFENCE		0.40087	0.5346
INFRAC does not Granger Cause EDU	21	0.43755	0.5167
EDU does not Granger Cause INFRAC		0.24317	0.6279
DEFENCE does not Granger Cause HEALTH	21	0.00816	0.9290
HEALTH does not Granger Cause DEFENCE		0.66502	0.4255
INFRAC does not Granger Cause HEALTH	21	0.41304	0.5285
HEALTH does not Granger Cause INFRAC		0.21124	0.6513
INFRAC does not Granger Cause DEFENCE	21	0.36321	0.5542
DEFENCE does not Granger Cause INFRAC		0.95810	0.3406

Source: Researcher's E-view 9.5 Computation

From the Granger Causality Test result in Table 4.22, for Kenya, the test was carried out with a lag 1period, government expenditure is unbundled into four variants and their causal relationship with economic growth is tested. From the results, there was no form of unidirectional or bidirectional causality relationship in the result of table 4.22. Hence, no causal relationships exist between EDU, Health, Defence, Infrac and GDP within the period under review for Kenya.

Decision: We accept the null hypothesis for EDU, Defence, Health and Infrac have no granger effect on GDP in Kenya.

Table 4.23.Causality test for Nigeria

Pairwise Granger Causality Tests
Date: 09/02/18 Time: 16:51
Sample: 1995 2016
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
EDU does not Granger Cause GDP	21	1.76442	0.2007
GDP does not Granger Cause EDU		0.11801	0.7352
HEALTH does not Granger Cause GDP	21	0.09650	0.7596
GDP does not Granger Cause HEALTH		0.39214	0.5390
DEFENCE does not Granger Cause GDP	21	1.31172	0.2671
GDP does not Granger Cause DEFENCE		0.08444	0.7747
INFRAC does not Granger Cause GDP	21	0.20244	0.6581
GDP does not Granger Cause INFRAC		1.83415	0.1924
HEALTH does not Granger Cause EDU	21	0.23216	0.6357
EDU does not Granger Cause HEALTH		0.21479	0.6486
DEFENCE does not Granger Cause EDU	21	0.13572	0.7169
EDU does not Granger Cause DEFENCE		3.64568	0.0723
INFRAC does not Granger Cause EDU	21	1.39223	0.2534
EDU does not Granger Cause INFRAC		0.01642	0.8995
DEFENCE does not Granger Cause HEALTH	21	0.62776	0.4385
HEALTH does not Granger Cause DEFENCE		0.00380	0.9515
INFRAC does not Granger Cause HEALTH	21	0.00652	0.9365
HEALTH does not Granger Cause INFRAC		0.29332	0.5947
INFRAC does not Granger Cause DEFENCE	21	1.62978	0.2180
DEFENCE does not Granger Cause INFRAC		0.04565	0.8332

Source: Researcher's E-view 9.5 Computation

From the Granger Causality Test result in Table 4.23 for Nigeria, the test was carried out with a lag 1 period, government expenditure is unbundled into four variants and their causal relationship with economic growth is tested. There was no unidirectional and bidirectional relationship. No causal relationships exist between EDU, Health,defence, Infrac and GDP within the period under review for Nigeria.

Decision: We accept the null hypothesis for EDU, Health, defence and Infrac have no granger effect on GDP in Nigeria.

Table 4.24:Causality test for South Africa

Pairwise Granger Causality Tests
Date: 09/02/18 Time: 16:54
Sample: 1995 2016
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
EDU does not Granger Cause GDP	21	0.52820	0.4767
GDP does not Granger Cause EDU		5.14638	0.0358
HEALTH does not Granger Cause GDP	21	5.01243	0.0380
GDP does not Granger Cause HEALTH		1.18332	0.2910
DEFENCE does not Granger Cause GDP	21	2.22447	0.1532
GDP does not Granger Cause DEFENCE		0.01031	0.9202
INFRAC does not Granger Cause GDP	21	7.45890	0.0137
GDP does not Granger Cause INFRAC		24.1928	0.0001
HEALTH does not Granger Cause EDU	21	15.6058	0.0009
EDU does not Granger Cause HEALTH		1.18457	0.2908
DEFENCE does not Granger Cause EDU	21	1.83318	0.1925
EDU does not Granger Cause DEFENCE		0.38906	0.5406
INFRAC does not Granger Cause EDU	21	6.68801	0.0186
EDU does not Granger Cause INFRAC		0.22702	0.6395
DEFENCE does not Granger Cause HEALTH	21	0.04164	0.8406
HEALTH does not Granger Cause DEFENCE		2.52362	0.1296
INFRAC does not Granger Cause HEALTH	21	6.31391	0.0217
HEALTH does not Granger Cause INFRAC		0.16985	0.6851
INFRAC does not Granger Cause DEFENCE	21	4.52915	0.0474
DEFENCE does not Granger Cause INFRAC		0.36648	0.5525

Source: Computation by researcher using E-view 9.5

From the Granger Causality Test result in Table 4.24., for South Africa, the test was carried out with a lag 1period, government expenditure is unbundled into four variants and their causal relationship with economic growth is tested. From the results, there was bidirectional causality relationships between Infrastructure(INFRAC) and GDP in the result of table 4.24. , there was also unidirectional causal relationships between EDU,HEALTH and GDP, hence there was no causal relationship between GDP and defence within the period under review for South Africa.

Decision: We reject the null hypothesis for Infrac, Edu and Health of not having granger effect on GDP in South Africa, while accepting that defence have no granger effect on GDP in South Africa within the period under review.

Table 4.25:Causality test for Panel Pooled

Pairwise Granger Causality Tests
Date: 09/02/18 Time: 16:37
Sample: 1 88
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
EDU does not Granger Cause GDP	87	3.07700	0.0831
GDP does not Granger Cause EDU		3.34231	0.0711
HEALTH does not Granger Cause GDP	87	5.24211	0.0246
GDP does not Granger Cause HEALTH		1.89137	0.1727
DEFENCE does not Granger Cause GDP	87	0.05058	0.8226
GDP does not Granger Cause DEFENCE		2.45090	0.1212
INFRAC does not Granger Cause GDP	87	3.43666	0.0673
GDP does not Granger Cause INFRAC		1.12125	0.2927
HEALTH does not Granger Cause EDU	87	0.01848	0.8922
EDU does not Granger Cause HEALTH		0.00670	0.9350
DEFENCE does not Granger Cause EDU	87	0.11026	0.7407
EDU does not Granger Cause DEFENCE		0.16665	0.6841
INFRAC does not Granger Cause EDU	87	1.51844	0.2213
EDU does not Granger Cause INFRAC		0.69050	0.4084
DEFENCE does not Granger Cause HEALTH	87	0.25950	0.6118
HEALTH does not Granger Cause DEFENCE		0.87846	0.3513
INFRAC does not Granger Cause HEALTH	87	1.77418	0.1865
HEALTH does not Granger Cause INFRAC		0.03351	0.8552
INFRAC does not Granger Cause DEFENCE	87	0.10731	0.7440
DEFENCE does not Granger Cause INFRAC		0.64721	0.4234

Source: Computation by researcher using E-view 9.5

The result from table 4.25 showing Granger Causality of government expenditure against economic growth carried out at the 5% level of significance using a lag of 1 period reveals that there is unidirectional relationship between Health and GDP with F- statistics of 5.24211 and p-values of 0.0246. EDU, Defence and infrac for the panel pooled data, does not Granger Cause GDP with F-statistics of 3.07700, 0.05058 and 3.43666 with p-values of 0.0831, 0.8226 and

0.0673 respectively above the 5% level of significance and GDP also does not granger cause EDU, Defence and infrastructure. This shows that though the relationship is positive, they are however not statistically significant.

Decision Rule: Based on the overall result of the study on granger causality the null hypothesis is accepted for government expenditure on education, defence and infrastructure . The government expenditure on health null hypothesis, that there is no causal relationship between government expenditure and economic growth of selected emerging African countries.

4.7 Discussion of Findings

This study examined government expenditure on economic growth, evidence from selected emerging African countries from 1995 to 2016 with a view to affirming the stand of government expenditure on economic growth in selected emerging African countries using empirical evidence from Egypt, Kenya, Nigeria and South Africa. Following a detail theoretical review and empirical analyses, findings were made in line with the research questions as well as set and tested hypotheses. The study employed five models and used different statistical test – descriptive statistics, Normality test, Unit root test, cointegration tests , ARDL, diagnostic test which include Ramsey reset, Heteroskedasticity, Breusch Godfrey serial correlation, panel data analysis and causality testing techniques to test and analyze the data represented in appendix 1.1, 1.2, 1.3 and 1.4; and the subsequent tests results in tables 4.1 to table 4.25. The findings are hereby discussed below in line with the objectives of this study

Government expenditure on education and economic growth of the selected emerging economies in Africa.

The result of the panel data regression analysis revealed that EDU has a t-statistic value of -0.582298 and a p-value of 0.5620 was found to have a negative relationship with economic growth and this effect is statistically insignificant at 5% level since its p-value is more than 0.05. The coefficient of the past levels of government expenditure on education (EDU) has a negative sign (-0.188269%) at the chosen level of significance. This implies that a 1% increase in past levels of government expenditure on education (EDU) will result to a 0.188269% decline in economic growth. The result of this study is supported by the findings of Eggoh, Houeninvo and Sossou (2015) and Omojimite (2010) .Musaba,Chiloda and Matchaya (2013) however found no significant relationship in Malawi . This also contradicts the Keynesian theory that an increase in government expenditure will facilitate an increase in economic activities and our apriori expectations of a positive and significant effect.

A plausible direct interpretation of this result is that the government expenditure in the selecting emerging African economies have overtime had ineffective government expenditure direction into the educational sector of the economy and such expenditure has not been progressive rather it has been retrogressive on the economies because of the negative sign.

Government expenditure on health and economic growth of the selected emerging economies in Africa.

The result of the panel data regression analysis revealed that Health has a t-statistic value of 3.256208 and a p-value of 0.0017 was found to have a positive and significant relationship with economic growth and this relationship is statistically significant at 5% level since its p-value is well less than 0.05. The coefficient of the past levels of government expenditure on Health has a positive sign (3.587229%) at the chosen level of significance. This implies that a 1% increase in past levels of government expenditure on Health (Health) will result to a 3.587229% increase in economic growth. The result of this study is supported by the findings of Aboubakar and Xu (2017), Bakare and Olubokun (2011), Odior (2011), Bakare and Sanni (2011), Onisanwa and Kurt (2015) all shows a positive and statistically significant effect of expenditure in health on economic growth. This also supports the Keynesian theory that an increase in government expenditure will facilitate an increase in economic activities and our apriori expectations of a positive and significant effect.

A plausible direct interpretation of this result is that the government expenditure in the selecting emerging African economies has overtime been effective as government expenditure direction into the health sector of the economy and such expenditure has been progressive over the period of time under review.

Government expenditure on Defence and economic growth of the selected emerging economies in Africa.

The result of the panel data regression analysis revealed that Defence on the long run has a negative and significant relationship with a t- statistics of -3.092731 and p-value of 0.0027. In the short run it has a t-statistic value of 3.373231 and a p-value of 0.0012 was found to have a positive effect on economic growth and this effect is statistically significant at 5% level since its p-value is well more than 0.05. The coefficient of the past levels of government expenditure on Defence has a positive sign (5.931586%) at the chosen level of significance. The result of this study which shows negative and statistically significant relationship of government expenditure in Defence and economic growth at the long run and positive and statistically relationship at the short run is supported by the findings of Apanisile and Okunlola(2014)

A plausible direct interpretation of this result is that the government expenditure in the selecting emerging African economies has overtime been ineffective as a more increase in government expenditure on Defence, the less the economic growth improves.

Government expenditure on Infrastructure and economic growth of the selected emerging economies in Africa.

The result of the panel data regression analysis revealed that Infrac has a t-statistic value of -0.7022679 and a p-value of 0.4843 was found to have a negative and statistically insignificant relationship at 5% level since its p-value is well more than 0.05. The coefficient of the past levels of government expenditure on Infrastructure (Infrac) has a negative sign (-0.098847%) at the

chosen level of significance. This implies that a 1% decrease in past levels of government expenditure on Infrastructure will result to a 0.098847% decline in economic growth. A plausible direct interpretation of this result is that the government expenditure in Infrastructure of the selecting emerging African economies has overtime been ineffective as a more increase in government expenditure on Infrac, the less the significance on economic growth improvement.

Direction of causality between government expenditure and economic growth of the selected emerging economies in Africa.

The result of the granger causality of government expenditure considered in EDU, Health, Defence and Infrac against economic growth (GDP) carried out at the 5% level of significance using a lag of 1 period reveals that that EDU, Defence and infrastructure for the panel pooled data, does not Granger Cause GDP with F-statistics of 3.07700, 0.05058 and 3.43660 with p-values of 0.0831, 0.8226 and 0.00673 respectively above the 0.05 level of significance and GDP also does not granger cause EDU, Defence and infrastructure. However government expenditure on health granger causes aGDP with t-statistics of 5.24211 and p- value of 00.0246. This shows that though the relationship is positive with EDU.DEFENCE and INFRAC, they are however not statistically significant.

This result is consistent with the findings of Omojimite (2010), Mehrare and Musai (2011) and Akram (2011) who found non-causal relationship between government expenditure and economic growth. This result however is not consistent with our Keynesian theory that an increase in government expenditure will facilitate an increase in economic activities and our apriori

expectations of a positive and significant relationship between government expenditure and economic growth.

The panel data analysis result on pairwise granger causality does not support the the Keynesian theory that an increase in government expenditure will facilitate an increase in economic activities and our apriori expectations of a positive and significant effect. The implication of this panel result is that the selected emerging African economies are yet to productively use its government expenditure to develop the key sector of the economy for economic growth enhancement. Another implication of this result is that the government expenditure are not efficient to key sectors like education and infrastructure which have depleted capital expenditure over time in Africa.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

The findings from the specific objectives of this study are as follows:

1. There is negative and insignificant relationship between Government expenditure on education and economic growth of the selected emerging African economies.
2. There is positive and significant relationship between Government expenditure on health and economic growth of the selected emerging African economies.
3. There is positive and significant relationship between Government expenditure on defence and economic growth of the selected emerging African economies on the short run.
4. There is negative and insignificant relationship between Government expenditure on infrastructure and economic growth of the selected emerging African economies.
5. Government expenditure on EDU, DEFENCE and INFRAC has no granger causal relationship with economic growth in the selected emerging African economies, however government expenditure on health has a granger causal relationship with economic growth of selected emerging economies in Africa.

5.2 Conclusion

This research work studied the relationship between government expenditure and economic growth in the selected emerging African economies, ensuing the theoretical notion of Keynesian's theory. The theory holds that increase in government expenses leads to increased economic activities which leads to economic growth. Different views in favour of the government expenditure leading to economic growth and contradictions were reviewed from theoretical and empirical literature. The need to find out the relationship between government expenditure and economic growth in the selected emerging African economies, contribute to current literature on subject, validate other scholars view point and use a more dynamic and robust analytical tool that captured the panel and time series nature of the data involved motivated this study. The results derived from this study attest that there is negative and insignificant relationship between government expenditure on education and economic growth, positive and significant relationship between government expenditure on health and economic growth,. positive and significant relationship between government expenditure on defence and economic growth, negative and insignificant relationship between government expenditure on infrastructure and economic growth. In conclusion, based on the outcome of the Study, it affirms that the government expenditure variables except government expenditure on health has no causal relationship with economic growth within the period of study.

5.3 Recommendations

On the basis of the results obtained, the following recommendations are made:

1. In as much as the selected African economies are trying to see that education is better funded to promote economic growth in African countries , the impact of this funding is not felt probably as due to the fact that the money spent on education is not translated to economic gains in the domestic economy. On this note high educational attainment, high literacy levels and high levels of human capital are likely to improve the business environment. Possessing such characteristics facilitates the emergence of a highly skilled labor base that is attractive to business. To ensure effective and productive education, clear expenditure roles for countries and the national government should be developed and appropriate resources mobilized. Education spending should also be linked to resource needs (both human and capital) both at sub-national and facility levels. The governments should increase its expenditure on education as well as develop educational quality which leads to human development.

2. The government of the selected emerging economies should encourage vital health care services by setting targets for providing health services to the citizens. This is through investments in health . Increased expenditure on improving health might be justified simply on the grounds of their impact on labor productivity. This supports the case for investments in health as a form of human capital. To reduce the huge budget outlay for importing medicine and drugs, The government should enact a law that restricts a certain percentage of importation of drugs and medical facilities in order to shore up research and development in this sector locally .

3. Several policy implications can be derived from understanding directions and magnitude of causality between expenditures on defence and economic growth. The trends in defence

expenditures are becoming more varied. Investing on defence is one of the prerequisite for a country to be stable for business and economic activities to take place. In order to achieve the national goals and objectives, provision of security to the country is critical. Availability of secured business environment attracts both local and foreign investors in the market which directly contributes to economic growth . The governments of the selected African economies should monitor the expenditure on defence and it's utilization to build up internal and external security.

4. The Government of the selected African economies should emphasize infrastructural development to reduce the cost of doing business and enhance efficiency in service delivery to accelerate development. Businesses, lawmakers, Countries policy should look into African economies infrastructural needs, African countries have need for infrastructure for enhanced service delivery and equitable access. Higher government expenditure on infrastructure should be continually encouraged to create an enabling environment .

5. Allocation of government spending needs should be based on the level of need and the resourcefulness of individual sectors of economies in African countries. Transparency, judiciousness, equity, accountability, effectiveness, adherence to the economic policy should be the guiding principles in the utilization of public government expenditure . This should be done to achieve the intended objectives and goals of government expenditure in Africa .Most importantly, strengthening the anti-corruption crusade as well as the judicial system is imperative to tackle the high level of corruption found in public offices in Africa. This will enhance the thoughtful use of public funds for further economic growth in the economy.

5.4 Contributions to Knowledge

The study empirically observed that government expenditure variables have no significant effect on economic growth of emerging African economies which is contrary to the apriori expectations of the study.

1. This work contributes to current literature on subject by extending the period under review to 2016).
2. This work further validates the findings of some other researchers such as Iheanacho (2016), Okoro (2013), Agbonkhese (2014) and Omojimite (2010) that government expenditure variables does not significantly affects economic growth in the selected African economies
3. Most researchers reviewed literatures employed single country analysis but this study undertakes a panel study of selected emerging economies within the east, west , north and south African region
4. The study used more prominent government expenditure measurement parameters. The variables used include: government expenditure on education, government expenditure on health, government expenditure on infrastructure and government expenditure on defence.
5. Based on the findings, the work identified government expenditure on education as an indicator for economic development rather than economic growth.

5.5 Recommendations for Further Studies

As this work does not claim to be comprehensive, this study recommends the following for further studies:

1. Given lack of complete dataset to cover all African countries, this study can be improved upon by using a complete dataset for African countries adopting a disaggregated technique. This will enhance the comparability of the findings on county by country basis.
2. The current study worked on total government expenditure on education, health, defence and infrastructure, this work can be enhanced by disaggregating these variables into capital expenditure and recurrent expenditure.
3. The current study has worked on the four major components in the economy which influences the economic growth of a country. However, other sectors, including; Agriculture, transport, communications, general administration and other social and community services play a role in the performance of the nation and therefore should also be examined to evaluate the current contributions and changes they offer to the growth of the economy.
4. Future research would also be done on the factors influencing different sectoral expenditure and their momentous results to the economy, economic growth and livelihoods of the citizens.
5. The researcher as well suggests for a review of the government spending and the effectiveness of the projects invested on, to investigate their relevance towards human capital development as well as economic growth of the country.

6. The research recommends a multiple regression approach of government variables and economic growth of emerging African economies and also the use of other statistical techniques to study Effect of government expenditure variables on economic growth.

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APPENDICES

1.1 Egypt's Government expenditure variables and GDP 1995-2016

year	Gdp	Edu	Health	defence	Infrac
1995	4.6	4.6	1.65	3.2	19.2
1996	5	4.7	1.62	3.1	17.3
1997	5.5	4.7	1.79	2.9	17.9
1998	4	4.7	1.97	2.8	21.3
1999	6.1	4.7	2.12	2.7	20.8
2000	5.4	4.7	2.25	2.7	18.9
2001	3.5	4.7	2.33	3.1	17.7
2002	2.4	4.7	2.4	3.4	17.8
2003	3.2	4.9	2.07	3.3	16.3
2004	4.1	4.7	1.99	3	16.4
2005	4.5	4.8	1.99	2.9	17.9
2006	6.9	4	2.29	2.7	18.7
2007	7.1	3.7	2.05	2.5	20.9
2008	7.2	3.8	2.03	2.3	22.3
2009	4.7	3.8	2.06	2.1	18.9
2010	5.1	3.8	1.87	2.1	19.2
2011	1.8	3.8	1.99	1.9	16.7
2012	2.2	3.8	1.91	1.6	14.7
2013	2.2	3.8	2.06	1.6	13
2014	2.9	3.8	2.16	1.7	12.4
2015	4.4	3.8	2.03	1.7	13.7
2016	4.3	3.8	2.04	1.7	14.5

Source: World Bank data 2017

1.2 Kenya's Government expenditure variables and GDP 1995-2016

Year	Gdp	edu	Health	defence	infrac
1995	4.4	5.9	2	1.6	21.4
1996	4.1	5.7	1.7	1.4	16
1997	0.5	5.5	1.6	1.3	15.4
1998	3.3	5.2	2	1.2	15.7
1999	2.3	5.3	1.7	1.2	15.6
2000	0.6	5.2	2.2	1.3	16.7
2001	3.8	5.2	2.1	1.5	18.2
2002	0.5	6.2	1.9	1.6	17.2
2003	2.9	6.5	1.9	1.7	15.8
2004	5.1	6.8	1.8	1.6	16.3
2005	5.9	7.4	1.8	1.7	18.7
2006	6.5	7	1.6	1.5	19.4
2007	6.9	7.2	1.6	1.5	20
2008	0.2	7	1.4	1.6	18.9
2009	3.3	6.3	1.6	1.6	18.5
2010	8.4	5.5	1.4	1.6	20.3
2011	6.1	5.3	2.6	1.5	20.4
2012	4.6	5.5	3.3	1.7	21.2
2013	5.9	5.4	3.3	1.6	20.6
2014	5.4	5.3	3.5	1.3	22.9
2015	5.7	5.3	3.2	1.3	21.7
2016	5.8	5.4	3.3	1.3	17.3

Source: World Bank data 2017

1.3 Nigeria's Government expenditure variables and GDP 1995-2016

Year	Gdp	edu	Health	defence	infrac
1995	-0.3	0.63	0.66	0.7	7.1
1996	5	0.55	0.6	0.5	7.3
1997	2.8	0.6	0.72	0.6	8.4
1998	2.7	0.91	0.91	0.9	8.6
1999	0.5	0.99	0.98	1.4	7
2000	5.3	1.08	0.95	0.8	7
2001	4.4	1.26	1.02	1.3	7.6
2002	3.8	1.58	0.62	1.5	7
2003	10.4	0.94	0.91	0.9	9.9
2004	33.7	0.75	1.41	0.7	7.4
2005	3.4	0.79	1.2	0.6	5.5
2006	8.2	0.82	1.2	0.5	8.3
2007	6.8	0.96	1.47	0.6	9.2
2008	6.3	0.88	1.47	0.8	8.3
2009	6.9	0.73	1.32	0.9	12.1
2010	7.8	0.71	0.91	0.5	16.6
2011	4.9	0.6	1.15	0.6	15.5
2012	4.3	0.58	1.03	0.5	14.2
2013	5.4	0.62	0.88	0.5	14.2
2014	6.3	0.51	0.92	0.4	15.1
2015	2.7	0.47	1	0.4	14.8
2016	-1.6	0.88	0.96	0.4	14.9

Source: World Bank data 2017

1.4 South African's Government expenditure variables and GDP 1995-2016

year	Gdp	edu	Health	defence	infrac
1995	3.1	5.7	3.4	2.1	17
1996	4.3	5.6	3.8	1.8	17.2
1997	2.6	5.6	3.8	1.6	17.6
1998	0.5	5.7	3.6	1.5	18.1
1999	2.4	5.9	3.4	1.5	16.1
2000	4.2	5.4	3.3	1.4	15.6
2001	2.7	5.2	3.3	1.5	15.5
2002	3.7	5	3.2	1.5	15.2
2003	2.9	4.9	3.3	1.5	16
2004	4.6	5.1	3.2	1.4	16.5
2005	5.3	5.1	3.3	1.4	17.2
2006	5.6	5.1	3.4	1.3	18.9
2007	5.4	5	3.4	1.2	20.6
2008	3.2	4.9	3.6	1.1	23.5
2009	-1.5	5.2	3.9	1.2	21.5
2010	3	5.7	4	1.1	19.3
2011	3.3	6	4.1	1.1	19.1
2012	2.2	6.4	4.3	1.1	19.2
2013	2.5	6	4.2	1.1	20.4
2014	1.7	6	4.2	1.1	20.6
2015	1.3	6	4.2	1.1	20.4
2016	0.3	6	4.2	1.1	19.5

Source: World Bank data 2017

UNIT ROOT STATIONARITY TEST

1.5 Egypt

Level 1st difference

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.593731	0.0019
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares
Date: 08/28/18 Time: 21:24
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-1.077179	0.234489	-4.593731	0.0002
C	-0.035772	0.331617	-0.107871	0.9153

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.115185	0.0052
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EDU,2)
Method: Least Squares
Date: 08/28/18 Time: 21:32
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EDU(-1))	-0.957921	0.232777	-4.115185	0.0006
C	-0.043317	0.047705	-0.908012	0.3759

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		-4.567633	0.0020
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(HEALTH,2)
Method: Least Squares
Date: 08/28/18 Time: 21:34
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(HEALTH(-1))	-1.071150	0.234509	-4.567633	0.0002
C	0.022352	0.036458	0.613079	0.5475

Null Hypothesis: D(DEFENCE) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.193493	0.0364
Test critical values:	1% level	-3.831511	
	5% level	-3.029970	
	10% level	-2.655194	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DEFENCE,2)
Method: Least Squares
Date: 08/28/18 Time: 21:36
Sample (adjusted): 1998 2016
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.588818	0.0159
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INFRAC,2)
Method: Least Squares
Date: 08/28/18 Time: 21:37
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INFRAC(-1))	-0.817955	0.227918	-3.588818	0.0021
C	-0.089938	0.393546	-0.228531	0.8218

R-squared	0.417091	Mean dependent var	0.135000
Adjusted R-squared	0.384707	S.D. dependent var	2.215086
S.E. of regression	1.737526	Akaike info criterion	4.037442
Sum squared resid	54.34196	Schwarz criterion	4.137015
Log likelihood	-38.37442	Hannan-Quinn criter.	4.056879
F-statistic	12.87962	Durbin-Watson stat	1.852221
Prob(F-statistic)	0.002099		

Source: Computation by researcher using E-view 9.5

1.6 Kenya

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.815500	0.0001
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares
Date: 08/28/18 Time: 21:44
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-1.304814	0.224368	-5.815500	0.0000
C	0.104813	0.609832	0.171872	0.8655

R-squared	0.652644	Mean dependent var	0.020000
Adjusted R-squared	0.633347	S.D. dependent var	4.502701
S.E. of regression	2.726472	Akaike info criterion	4.938533
Sum squared resid	133.8057	Schwarz criterion	5.038107
Log likelihood	-47.38533	Hannan-Quinn criter.	4.957971
F-statistic	33.82005	Durbin-Watson stat	2.202424
Prob(F-statistic)	0.000016		

Null Hypothesis: D(EDU,2) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.090665	0.0001
Test critical values:	1% level	-3.831511	
	5% level	-3.029970	
	10% level	-2.655194	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EDU,3)
Method: Least Squares
Date: 08/28/18 Time: 21:48
Sample (adjusted): 1998 2016
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EDU(-1),2)	-1.372367	0.225323	-6.090665	0.0000
C	0.019709	0.105938	0.186043	0.8546

R-squared	0.685745	Mean dependent var	0.005263
Adjusted R-squared	0.667259	S.D. dependent var	0.800329
S.E. of regression	0.461659	Akaike info criterion	1.391321
Sum squared resid	3.623195	Schwarz criterion	1.490735
Log likelihood	-11.21754	Hannan-Quinn criter.	1.408145
F-statistic	37.09620	Durbin-Watson stat	2.247711
Prob(F-statistic)	0.000012		

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		-4.312264	0.0034
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(HEALTH,2)
Method: Least Squares
Date: 08/28/18 Time: 21:50
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(HEALTH(-1))	-0.991453	0.229915	-4.312264	0.0004
C	0.079487	0.087246	0.911064	0.3743

R-squared	0.508138	Mean dependent var	0.020000
Adjusted R-squared	0.480812	S.D. dependent var	0.534691
S.E. of regression	0.385270	Akaike info criterion	1.024895
Sum squared resid	2.671795	Schwarz criterion	1.124469
Log likelihood	-8.248953	Hannan-Quinn criter.	1.044333

F-statistic	18.59562	Durbin-Watson stat	2.040260
Prob(F-statistic)	0.000420		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.128544	0.0051
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DEFENCE,2)
Method: Least Squares
Date: 08/28/18 Time: 21:55
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DEFENCE(-1))	-0.917511	0.222236	-4.128544	0.0006
C	-0.003763	0.029399	-0.127986	0.8996

R-squared	0.486373	Mean dependent var	0.010000
Adjusted R-squared	0.457838	S.D. dependent var	0.177408
S.E. of regression	0.130629	Akaike info criterion	-1.138277
Sum squared resid	0.307149	Schwarz criterion	-1.038704
Log likelihood	13.38277	Hannan-Quinn criter.	-1.118840
F-statistic	17.04487	Durbin-Watson stat	2.073837
Prob(F-statistic)	0.000631		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.126981	0.0051
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INFRAC,2)
Method: Least Squares

Date: 08/28/18 Time: 21:56
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INFRAC(-1))	-0.872741	0.211472	-4.126981	0.0006
C	0.063091	0.351483	0.179500	0.8596

R-squared	0.486184	Mean dependent var	0.050000
Adjusted R-squared	0.457638	S.D. dependent var	2.134306
S.E. of regression	1.571814	Akaike info criterion	3.836978
Sum squared resid	44.47080	Schwarz criterion	3.936551
Log likelihood	-36.36978	Hannan-Quinn criter.	3.856415
F-statistic	17.03197	Durbin-Watson stat	1.483674
Prob(F-statistic)	0.000633		

Source: Computation by researcher using E-view 9.5

1.7 Nigeria

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.829558	0.0091
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP)
Method: Least Squares
Date: 08/28/18 Time: 22:01
Sample (adjusted): 1996 2016
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	-0.881298	0.230131	-3.829558	0.0011
C	5.448308	2.093598	2.602366	0.0175

R-squared	0.435624	Mean dependent var	-0.061905
Adjusted R-squared	0.405920	S.D. dependent var	9.041873
S.E. of regression	6.969166	Akaike info criterion	6.811261
Sum squared resid	922.8162	Schwarz criterion	6.910739
Log likelihood	-69.51824	Hannan-Quinn criter.	6.832850
F-statistic	14.66551	Durbin-Watson stat	1.951750

Prob(F-statistic)	0.001131

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.743599	0.0115
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EDU,2)
Method: Least Squares
Date: 08/28/18 Time: 22:07
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EDU(-1))	-0.967169	0.258353	-3.743599	0.0015
C	0.016763	0.050994	0.328715	0.7462

R-squared	0.437755	Mean dependent var	0.024500
Adjusted R-squared	0.406520	S.D. dependent var	0.295786
S.E. of regression	0.227866	Akaike info criterion	-0.025474
Sum squared resid	0.934616	Schwarz criterion	0.074099
Log likelihood	2.254742	Hannan-Quinn criter.	-0.006036
F-statistic	14.01453	Durbin-Watson stat	1.810271
Prob(F-statistic)	0.001487		

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		-4.913903	0.0009
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation

Dependent Variable: D(HEALTH,2)
Method: Least Squares
Date: 08/28/18 Time: 22:08
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(HEALTH(-1))	-1.144432	0.232897	-4.913903	0.0001
C	0.020455	0.051264	0.399022	0.6946

R-squared	0.572918	Mean dependent var	0.001000
Adjusted R-squared	0.549191	S.D. dependent var	0.340432
S.E. of regression	0.228574	Akaike info criterion	-0.019277
Sum squared resid	0.940427	Schwarz criterion	0.080296
Log likelihood	2.192769	Hannan-Quinn criter.	0.000161
F-statistic	24.14645	Durbin-Watson stat	2.094414
Prob(F-statistic)	0.000112		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.353559	0.0004
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DEFENCE,2)
Method: Least Squares
Date: 08/28/18 Time: 22:10
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DEFENCE(-1))	-1.217825	0.227479	-5.353559	0.0000
C	-0.008267	0.066516	-0.124292	0.9025

R-squared	0.614236	Mean dependent var	0.010000
Adjusted R-squared	0.592804	S.D. dependent var	0.465550
S.E. of regression	0.297076	Akaike info criterion	0.504984
Sum squared resid	1.588578	Schwarz criterion	0.604557
Log likelihood	-3.049842	Hannan-Quinn criter.	0.524422
F-statistic	28.66059	Durbin-Watson stat	2.103212

Prob(F-statistic)	0.000043

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.314099	0.0034
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INFRAC,2)
Method: Least Squares
Date: 08/28/18 Time: 22:11
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INFRAC(-1))	-1.017044	0.235749	-4.314099	0.0004
C	0.386562	0.443527	0.871562	0.3949

R-squared	0.508351	Mean dependent var	-0.005000
Adjusted R-squared	0.481037	S.D. dependent var	2.695117
S.E. of regression	1.941539	Akaike info criterion	4.259478
Sum squared resid	67.85230	Schwarz criterion	4.359051
Log likelihood	-40.59478	Hannan-Quinn criter.	4.278916
F-statistic	18.61145	Durbin-Watson stat	2.002795
Prob(F-statistic)	0.000418		

Source: Computation by researcher using E-view 9.5

1.8 South Africa

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.175429	0.0005
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares
Date: 08/28/18 Time: 22:16
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-1.188648	0.229671	-5.175429	0.0001
C	-0.216978	0.436859	-0.496678	0.6254

R-squared	0.598080	Mean dependent var	-0.110000
Adjusted R-squared	0.575751	S.D. dependent var	2.996120
S.E. of regression	1.951504	Akaike info criterion	4.269717
Sum squared resid	68.55062	Schwarz criterion	4.369290
Log likelihood	-40.69717	Hannan-Quinn criter.	4.289155
F-statistic	26.78507	Durbin-Watson stat	2.052303
Prob(F-statistic)	0.000064		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.327687	0.0272
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.
Dependent Variable: D(EDU,2)
Method: Least Squares
Date: 08/28/18 Time: 22:17
Sample (adjusted): 1997 2016

Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EDU(-1))	-0.756118	0.227220	-3.327687	0.0037
C	0.016342	0.055889	0.292398	0.7733

R-squared	0.380879	Mean dependent var	0.005000
Adjusted R-squared	0.346484	S.D. dependent var	0.308605
S.E. of regression	0.249477	Akaike info criterion	0.155740
Sum squared resid	1.120299	Schwarz criterion	0.255313
Log likelihood	0.442599	Hannan-Quinn criter.	0.175178
F-statistic	11.07350	Durbin-Watson stat	1.994520
Prob(F-statistic)	0.003745		

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		-3.900593	0.0082
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(HEALTH,2)
Method: Least Squares
Date: 08/28/18 Time: 22:18
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(HEALTH(-1))	-0.735043	0.188444	-3.900593	0.0010
C	0.009402	0.029796	0.315540	0.7560

R-squared	0.458070	Mean dependent var	-0.020000
Adjusted R-squared	0.427963	S.D. dependent var	0.170448
S.E. of regression	0.128915	Akaike info criterion	-1.164681
Sum squared resid	0.299145	Schwarz criterion	-1.065108
Log likelihood	13.64681	Hannan-Quinn criter.	-1.145243
F-statistic	15.21463	Durbin-Watson stat	1.645705
Prob(F-statistic)	0.001048		

Null Hypothesis: D(DEFENCE) has a unit root

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.430796	0.0026
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

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

Dependent Variable: D(DEFENCE,2)
Method: Least Squares
Date: 08/28/18 Time: 22:20
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DEFENCE(-1))	-0.794118	0.179227	-4.430796	0.0003
C	-0.024706	0.018797	-1.314320	0.2052

R-squared	0.521683	Mean dependent var	0.015000
Adjusted R-squared	0.495110	S.D. dependent var	0.103999
S.E. of regression	0.073897	Akaike info criterion	-2.277646
Sum squared resid	0.098294	Schwarz criterion	-2.178073
Log likelihood	24.77646	Hannan-Quinn criter.	-2.258209
F-statistic	19.63196	Durbin-Watson stat	2.586070
Prob(F-statistic)	0.000323		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.059437	0.0464
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INFRAC,2)
Method: Least Squares
Date: 08/28/18 Time: 22:21
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INFRAC(-1))	-0.701708	0.229359	-3.059437	0.0068
C	0.064290	0.284534	0.225950	0.8238

R-squared	0.342109	Mean dependent var	-0.055000
Adjusted R-squared	0.305560	S.D. dependent var	1.512570
S.E. of regression	1.260472	Akaike info criterion	3.395488
Sum squared resid	28.59819	Schwarz criterion	3.495062
Log likelihood	-31.95488	Hannan-Quinn criter.	3.414926
F-statistic	9.360156	Durbin-Watson stat	1.835291
Prob(F-statistic)	0.006752		

Source: Computation by researcher using E-view 9.5

1.9 Panel-Pooled

PANEL UNIT ROOT

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.118276	0.0000
Test critical values:	1% level	-3.507394	
	5% level	-2.895109	
	10% level	-2.584738	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP)
Method: Least Squares
Date: 08/28/18 Time: 22:27
Sample (adjusted): 2 88
Included observations: 87 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	-0.753306	0.105827	-7.118276	0.0000
C	3.258195	0.617723	5.274524	0.0000

R-squared	0.373479	Mean dependent var	-0.049425
Adjusted R-squared	0.366108	S.D. dependent var	4.768376
S.E. of regression	3.796453	Akaike info criterion	5.528732
Sum squared resid	1225.110	Schwarz criterion	5.585419
Log likelihood	-238.4998	Hannan-Quinn criter.	5.551558
F-statistic	50.66985	Durbin-Watson stat	2.027537
Prob(F-statistic)	0.000000		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.780076	0.0000
Test critical values:	1% level	-3.508326	
	5% level	-2.895512	
	10% level	-2.584952	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EDU,2)
Method: Least Squares
Date: 08/28/18 Time: 22:31
Sample (adjusted): 3 88
Included observations: 86 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EDU(-1))	-0.957042	0.109002	-8.780076	0.0000
C	0.014417	0.088430	0.163032	0.8709

R-squared	0.478551	Mean dependent var	-0.001163
Adjusted R-squared	0.472344	S.D. dependent var	1.128725
S.E. of regression	0.819905	Akaike info criterion	2.463725
Sum squared resid	56.46854	Schwarz criterion	2.520803
Log likelihood	-103.9402	Hannan-Quinn criter.	2.486696
F-statistic	77.08973	Durbin-Watson stat	1.999065

Prob(F-statistic)	0.000000

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		-8.755912	0.0000
Test critical values:	1% level	-3.508326	
	5% level	-2.895512	
	10% level	-2.584952	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(HEALTH,2)
Method: Least Squares
Date: 08/28/18 Time: 22:33
Sample (adjusted): 3 88
Included observations: 86 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(HEALTH(-1))	-0.954276	0.108987	-8.755912	0.0000
C	0.028644	0.049540	0.578207	0.5647

R-squared	0.477176	Mean dependent var	0.000349
Adjusted R-squared	0.470952	S.D. dependent var	0.630274
S.E. of regression	0.458434	Akaike info criterion	1.300982
Sum squared resid	17.65361	Schwarz criterion	1.358060
Log likelihood	-53.94221	Hannan-Quinn criter.	1.323953
F-statistic	76.66599	Durbin-Watson stat	2.001165
Prob(F-statistic)	0.000000		

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		-8.755912	0.0000
Test critical values:	1% level	-3.508326	
	5% level	-2.895512	
	10% level	-2.584952	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(HEALTH,2)
Method: Least Squares
Date: 08/28/18 Time: 22:34
Sample (adjusted): 3 88
Included observations: 86 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(HEALTH(-1))	-0.954276	0.108987	-8.755912	0.0000
C	0.028644	0.049540	0.578207	0.5647

R-squared	0.477176	Mean dependent var	0.000349
Adjusted R-squared	0.470952	S.D. dependent var	0.630274
S.E. of regression	0.458434	Akaike info criterion	1.300982
Sum squared resid	17.65361	Schwarz criterion	1.358060
Log likelihood	-53.94221	Hannan-Quinn criter.	1.323953
F-statistic	76.66599	Durbin-Watson stat	2.001165
Prob(F-statistic)	0.000000		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.605252	0.0000
Test critical values:	1% level	-3.508326	
	5% level	-2.895512	
	10% level	-2.584952	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DEFENCE,2)
Method: Least Squares
Date: 08/28/18 Time: 22:36
Sample (adjusted): 3 88
Included observations: 86 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DEFENCE(-1))	-1.046446	0.108945	-9.605252	0.0000
C	-0.024390	0.029417	-0.829122	0.4094

R-squared	0.523434	Mean dependent var	0.001163
Adjusted R-squared	0.517760	S.D. dependent var	0.391226
S.E. of regression	0.271681	Akaike info criterion	0.254602
Sum squared resid	6.200073	Schwarz criterion	0.311680
Log likelihood	-8.947905	Hannan-Quinn criter.	0.277574
F-statistic	92.26087	Durbin-Watson stat	2.009883

Prob(F-statistic)	0.000000

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.277538	0.0000
Test critical values:	1% level	-3.508326	
	5% level	-2.895512	
	10% level	-2.584952	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INFRAC,2)
Method: Least Squares
Date: 08/28/18 Time: 22:37
Sample (adjusted): 3 88
Included observations: 86 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INFRAC(-1))	-0.894856	0.108107	-8.277538	0.0000
C	0.024114	0.230958	0.104410	0.9171

R-squared	0.449244	Mean dependent var	0.011628
Adjusted R-squared	0.442687	S.D. dependent var	2.868958
S.E. of regression	2.141774	Akaike info criterion	4.384127
Sum squared resid	385.3245	Schwarz criterion	4.441205
Log likelihood	-186.5175	Hannan-Quinn criter.	4.407098
F-statistic	68.51764	Durbin-Watson stat	1.958043
Prob(F-statistic)	0.000000		

Source: Computation by researcher using E-view 9.5

1.10 Diagnostic Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.491391	Prob. F(2,77)	0.0354
Obs*R-squared	7.233650	Prob. Chi-Square(2)	0.0269

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 09/02/18 Time: 01:49
Sample: 2 88
Included observations: 87
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	0.537210	0.237076	2.265984	0.0263
EDU	0.294292	0.333213	0.883196	0.3799
HEALTH	-0.223160	1.081092	-0.206421	0.8370
HEALTH(-1)	0.309601	1.033323	0.299617	0.7653
DEFENCE	-0.936008	1.820161	-0.514245	0.6086
DEFENCE(-1)	0.724329	1.737073	0.416982	0.6779
INFRAC	-0.037853	0.137778	-0.274741	0.7843
C	-2.831126	2.016004	-1.404326	0.1642
RESID(-1)	-0.678529	0.271337	-2.500691	0.0145
RESID(-2)	-0.029202	0.123428	-0.236592	0.8136

R-squared	0.083145	Mean dependent var	-4.44E-16
Adjusted R-squared	-0.024019	S.D. dependent var	3.360549
S.E. of regression	3.400669	Akaike info criterion	5.393604
Sum squared resid	890.4704	Schwarz criterion	5.677042
Log likelihood	-224.6218	Hannan-Quinn criter.	5.507736
F-statistic	0.775865	Durbin-Watson stat	1.943123
Prob(F-statistic)	0.638967		

Source: Computation by researcher using E-view 9.5

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.160824	Prob. F(7,79)	0.0466
Obs*R-squared	13.98067	Prob. Chi-Square(7)	0.0515
Scaled explained SS	169.3930	Prob. Chi-Square(7)	0.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 09/02/18 Time: 01:37
Sample: 2 88
Included observations: 87

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	57.58179	28.59439	2.013744	0.0474
GDP(-1)	3.134969	1.710335	1.832956	0.0706
EDU	1.772798	5.365172	0.330427	0.7420
HEALTH	43.38466	18.28087	2.373227	0.0201
HEALTH(-1)	-41.03358	17.46801	-2.349070	0.0213
DEFENCE	-55.53856	30.14887	-1.842144	0.0692
DEFENCE(-1)	52.00760	29.17930	1.782346	0.0785
INFRAC	-4.324293	2.334309	-1.852494	0.0677

R-squared	0.160697	Mean dependent var	11.16348
Adjusted R-squared	0.086329	S.D. dependent var	60.86969
S.E. of regression	58.18299	Akaike info criterion	11.05251
Sum squared resid	267435.6	Schwarz criterion	11.27926
Log likelihood	-472.7842	Hannan-Quinn criter.	11.14382
F-statistic	2.160824	Durbin-Watson stat	2.489939
Prob(F-statistic)	0.046630		

Source: Computation by researcher using E-view 9.5

Ramsey RESET Test
Equation: UNTITLED
Specification: GDP GDP(-1) EDU HEALTH HEALTH(-1) DEFENCE DEFENCE(-1) INFRAC C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.780022	78	0.0790
F-statistic	3.168479	(1, 78)	0.0790

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	37.91250	1	37.91250
Restricted SSR	971.2232	79	12.29396
Unrestricted SSR	933.3107	78	11.96552

Unrestricted Test Equation:
Dependent Variable: GDP

Method: ARDL
Date: 09/02/18 Time: 01:38
Sample: 2 88
Included observations: 87
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (1 lag, automatic):
Fixed regressors: C

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP(-1)	-0.106193	0.185052	-0.573855	0.5677
EDU	-0.054336	0.327727	-0.165795	0.8687
HEALTH	-0.723140	2.654244	-0.272447	0.7860
HEALTH(-1)	0.603940	2.791679	0.216336	0.8293
DEFENCE	1.488465	4.376795	0.340081	0.7347
DEFENCE(-1)	-1.440952	4.490453	-0.320892	0.7492
INFRAC	0.111483	0.182270	0.611638	0.5426
C	0.769361	3.485038	0.220761	0.8259
FITTED^2	0.119433	0.067096	1.780022	0.0790

R-squared	0.283959	Mean dependent var	4.341379
Adjusted R-squared	0.210518	S.D. dependent var	3.893093
S.E. of regression	3.459121	Akaike info criterion	5.417604
Sum squared resid	933.3107	Schwarz criterion	5.672698
Log likelihood	-226.6658	Hannan-Quinn criter.	5.520322
F-statistic	3.866530	Durbin-Watson stat	2.362711
Prob(F-statistic)	0.000702		

*Note: p-values and any subsequent tests do not account for model selection.

Source: Computation by researcher using E-view 9.5