EFFECT OF INVESTMENT IN HEALTHCARE ON ECONOMIC DEVELOPMENT IN KENYA

BY

JANE N. MURANGO

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DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no material written or published by other people except where due reference is made and author duly acknowledged.

Name: Murango Jane Njoki Reg. No. 11/01513

Sign: ……. Date: ……..

I do hereby confirm that I have examined the dissertation prepared by

Murango Jane Njoki

And have approved it for examination

Sign: ……. Date: ……

Dr. Brigitte Okong'a

Dissertation supervisor

ABSTRACT

Economic development can generally refer to an increase in a country's ability to produce goods and services identified by factors such as production, income and spending. Investment in health in this way becomes a significant variable for economic growth or development since investments in different components of health can lead to improved human capital. Kenya has low investment in the health sector which may adversely affect economic development. The purpose of this study was to explore the effect of investment in health on the economic development in Kenya. The specific objectives were to investigate the effect of public investment in health, private investment and investment in health by international non-governmental organizations on the development of the economy of Kenya. A descriptive research design was used in this study. Secondary time series data for 32 years (1985-2016) was collected from Kenya National Bureau of Statistics (KNBS), Institute of Economic Affairs (EIA), World Bank, Ministry of Finance and Ministry of Devolution and Planning. Data analysis was conducted using Stata statistical software. VECM time series model was fitted to the data. Augmented Dickey Fuller unit root test and Johansen test of cointegration were conducted to ensure stationarity of the data. The study results suggested that both public investment in health ($\beta = 0.1149$; $p < 0.05$) and private investment in health sector ($\beta = 0.2407$; $p < 0.05$) have significant positive effect on economic development. The study results, however, showed that investment in health sector by INGOs have no significant effect on economic development in Kenya ($\beta = 0.3232$; $p > 0.05$). The study makes the following recommendations. First, the government should channel more funding to the health sector as the current funding of 3.4% of GDP falls below the 7% set by the Abuja Declaration in 2001. Secondly, private entities should be encouraged to increase their investment in the health sector in the country. Lastly, the ministry of health and other government stakeholders should partner with INGOs and come up with a framework to ensure that INGOs increase their funding to financial deficit health sector units or activities. Moreover, the INGOs and government should have a governance framework to ensure that financing by INGOs is effectively utilized.

Key words: Economic development, public investment in health, private investment in health.

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DEDICATION

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DEFINITION OF TERMS

Public health investment: Refers to the annual amount allocated to the health sector by the government from the national budget (Mohr and Fourie, 2005).

Private health investment: The resources put into the health sector in long term projects by private entities and non-governmental organizations (Amiri and Gerdtham, 2013).

Health System: A health system consists of all organizations, people and actions whose primary intent is to promote, restore or maintain health (Kirigia, et al., 2006).

Health: Refers to a relative state in which one is able to function well physically, mentally, socially, and spiritually in order to express the full range of one's unique potentialities within the environment in which one is living. In the words of René Dubos, "health is primarily a measure of each person's ability to do and become what he wants to become (Rajeshkumar, & Nalraj, 2014).

LIST OF ABBREVIATIONS AND ACRONYMS

CBN	Central Bank of Nigeria
CEMAC	Countries in the economic community for central African states
DHS	Demographic and Health Survey
GDP	Gross Domestic Product
GMM	General Method of Moments
GNI	Gross National Income
GNP	Gross National Product
HRM	Human Resource for Health
IEA	Institute of Economic Affairs
KES	Kenya Shillings
KNBS	Kenya National Bureau of Statistics
MOH	Ministry of Health
NGO	Non-Governmental Organizations
OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Least Squares
PMG	Pooled Mean Group
POLS	Pooled Ordinary Least Squares
PPP	Purchasing Power Parity
SEE	South Eastern European
THE	Total Health Expenditure
UK	United Kingdom
US	United States
VAR	Vector Autoregressive
VECM	Vector Error Correction Model
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

This chapter of the study will introduce the topic under investigation by giving the background of the study, explaining the problem of the study, the objectives of the study, the significance of the study and the scope of the study. The background of the study entails a description of the main concepts under review by the study and the relationships that are to be investigated. The concepts to be discussed in the chapter include the concept of economic development, health and the relationship between these two variables.

The thinking behind the need to take up the research will be provided in the statement of the problem with a brief description of the gaps that the study aims to fill. This will involve providing an insight to the observations made by the author on the current situation between health and the economic development of Kenya that have motivated the research on the topic, and previous works done on the same topic while the objectives will be composed from the variables identified. Since the study is based on commonly used and researched concepts that include economic development and investment in health sector, and being an academic research, the study will be found significant to different individuals identified in the section on significance. This will help emphasize on the importance of the study and the need to invest time and the researcher's resources in order to achieve the expected outcomes.

1.1.1 Concept of Economic Development

Economic development is a sustained community effort to improve both the local economy and the quality of life by building the area's capacity to adapt to economic change. Todaro and Smith (2012) view development as that process of improving the quality of lives and

capabilities of people by raising their self-esteem, levels of living and freedom from servitude. In its simplest form, development entails the transformation from one condition to another improved condition. In economic terms, development is the capacity of a nation to generate and sustain an annual increase in either its Gross National Product (GNP)which is the market value of all final goods and services produced by permanent residents of a country or its Gross Domestic Product (GDP)which refers to the market value of all final goods and services produced within a country in a given period of time. Economic development generally refers to an increase in a country's ability to produce goods and services. A country can increase production if it increases the amount of resources used or makes better use of existing factors (Elmi, & Sadeghi, 2012). Economic development is less uniquely a function of market forces but the product of long-term investments in the generation of new ideas, knowledge transfer, and infrastructure, and it depends on functioning social and economic institutions and on cooperation between the public sector and private enterprise. In order to sustain a positive growth or development rate of output per capita in the long run, there must be continual advances in technological knowledge in the form of new goods, new markets, or new processes, therefore economic development requires collective action and large-scale, long-horizon investment(Amiri,& Ventelou, 2016).

Eryigit, Eryigit and Selen (2012) argued that the major flows in the economy which act as the identifying factors for economic growth and development in a country include production, income and spending. Production generates income and part of all this income is then spent to buy the available goods and services. Economic development also involves a process where low income national economies are transformed into modern industrial economies, which involves qualitative and quantitative improvements in a country’s economy. Most of the theoreticians think of the economic development as a process that generates economic and

social, quantitative and, particularly qualitative changes(Çetin & Ecevit, 2015; Heshmati, 2011; Solow, 1956; Swan,1956) which causes the national economy to cumulatively and durably increase its real national product. Health status in this way becomes a significant variable for economic growth or development.

1.1.2 Concept of Investment in Health

Investment in the health sector comprises of the funds applied in the different industries in healthcare sector such as pharmaceuticals and devices, hospitals and health insurers to enable the sector to improve its service offering to the population. The traditional concept of health as described by Wang (2013) was based on the assumption that health and disease were objective and observable phenomena. Developments in the areas of anatomy, bacteriology and physiology contributed to this view. Rather than representing the presence of certain attributes, health was therefore defined solely in terms of the lack of disease, symptoms, signs or problems. According to Lago-Penas, Cantarero-Prieto and Fernandez (2013), the concept and definition of health is differently approached when viewed from a cultural point of view. The health expectations by the Americans may in this way differ from those in Africa or better put, those living in developed countries and regions of the world view health differently from those living in developing countries and regions that have culture and ideology of a population or individual. Moreover, Eryigit et al. (2012) indicate that the concept of health is equated to different indicators depending on factors such as the age, sex and even education of a person. Zon, Adrian and Muysken (2011) also noted that the traditional medical model is one of the most accepted general approaches that are used to describe health and is based upon the perspective of illness, disease and proper functioning.

The concept of health as well relates to the general mental, physical and social well-being of an individual or population. In its entirety health can be assessed based on a large range of factors that may include the incidence of disease, disability and injury, mortality rates and the degree to which people's ability to live a normal life is affected by illness and disability. Amiri and Ventelou(2016) explained that the process of analysis and making comparisons of population health status requires a summary of different measures. It also encompasses several components that sum up to describe the health status of a population and different factors that influence the health status of a population. AK(2012) notes that the word health can be traced back to the eleventh and mid-seventeen centuries when it was used to refer to the process of healing, and making whole. The pursuit of health in its broad definition provided by the World Health Organization (2015) can be so inclusive that all human endeavors are considered within its domain. In as much as the WHO definition captures the key components of health, critics throughout the 20th century regarded the definition as being immeasurable, leading to further study and changes to the definition to date.

1.1.3 Investment in Health and Economic Development

Success in delivery of better health care services from public and private institutions has been seen as a worldwide and global challenge. Health-related goals such as improving the quality of services delivered have been highly regarded globally, nationally and locally for a long time now.Gallup and Sachs (2001) indicate that investments in different components of health can lead to reduced poverty. Kirigia, et al., (2006) point out that poor health delivery affects different components in the socio-economic environment including learning, human capital and the environment for entrepreneurial and productive activities. Economists such as Hsiao and Heller (2007) and Bloom and Canning (2000) have also recognized that there is a relationship between good health across the whole population and achievement of economic

growth. At a societal level, similar investments may lead to demographic changes conducive to economic development. In particular, they may lead to a period in which countries have a higher ratio of workers to dependents leading to increased national savings. Economic theory suggests that increased savings ought to enhance growth by providing funding for investment. On the other hand, in the medium term, population growth due to reduced infant mortality could reduce GDP per capita if population growth out passes growth of available resources and capital (Grossman, 2014).

Good health enables individuals to participate in a range of activities and to engage socially with family and shares in their communities (Bloom and Canning, 2000). Good health also allows individuals to be more productive physically and mentally by enabling them to learn more effectively and retain knowledge. Good health also reduces uncertainty, which allows individuals to plan for the whole life. Health improvements in a country have long been noted to contribute to economic development. The relationship between health and economic development is as discussed by Arora (2001) shows that healthier individuals will often have the ability and incentive to save more, and this accumulation of capital may help fuel growth through investment. Healthy people are considered more vibrant, energetic and have more positive outlook on life. These characteristics not only translate to a positive influence on the social infrastructure, but also affect economic development.

Specific studies such as Gallup and Sachs (2001) find that the treatment of malaria in sub-Saharan Africa could increase that continent's per capita growth rate by as much as 2.6 percent a year, and a recent report by the World Health Organization states that in today's world, poor health has particularly pernicious effects on economic development in sub-Saharan Africa, South Asia, and pockets of high disease and intense poverty elsewhere

(WHO 2015) therefore the delivery of crucial health services in such situations could save millions of lives each year, reduce poverty, spur economic development and promote global security. Health is viewed both as an investment in human capital and as an output of a household production process (Grossman, 2000). Various scholars including Heshmati (2011) agree that the relationship between investment in health and economic status is bi-directional meaning that while the delivery of health to individuals affects the general economic position of the individuals and country, the economic status of the individuals and country will also influence health status.

1.1.4 Citizen Health Care Facilities in Kenya

In Kenya, Health services are provided through a network of over 5,000 health facilities countrywide, with the public sector system accounting for about 52; percent of these facilities (Republic of Kenya, 2011). Health services are integrated as one goes down the hierarchy of health structure from the national level to the newly created county levels as envisaged in the 2010 Constitution. County hospitals in this regard concentrate on the delivery of health care services and generate their own expenditure plans and budget requirements based on guidelines from headquarters through the County governments (Republic of Kenya, 2011).

Kenya's centralized approach to health care systems decision making, had long been blamed for, among others, regional disparities in the distribution of health services, inequities in resource allocations, and unequal access to quality health services, with resultant regional differentials in the indicators of health and economic transformation (Ndavi, Ogola, Kizito & Johnson, 2008). The Kenya Ministry of Health's commitment to address the inherent constraints in the health sector have included deliberate decentralization efforts aimed at strengthening the effective implementation of activities at the local levels, while fostering

closer coordination and collaboration amongst the line ministries, donors, organizations and other stakeholders.

The devolved government, the Kenya Health Policy 2012-2030 provides guidance to the health sector in terms of identifying and outlining the requisite activities in achieving the government's health goals which have been slowly implemented since the constitution's promulgation (KPMG, 2013).Kenya Health Policy 2012-2030 provides that at the national level, health leadership is provided by the Ministry of Health (MOH) with the key mandates being development of national policy, provision of technical support, monitoring quality and standards in health services provision, provision of guidelines on tariffs for health services and conducting studies required for administrative or management purposes. At the County Government Level, the Kenya Health Policy 2012-2030 proposes the formation of county health departments whose role will be to create and provide an enabling institutional and management structure responsible for coordinating and managing the delivery of healthcare mandates and services at the county level.

Out of all the health facilities in the country, the MOH controls and runs about 52% while the private sector, the mission organizations and the Local County Governments run the remaining 48%. The public sector controls about 79% of the health centers, 92% of the sub-health centers, and 60% of the dispensaries. The NGO sector is dominant in health clinics, maternity and nursing homes controlling 94% of the total while also controlling 86% of the medical centers in the country (Luoma, 2010). The under-financing of the health sector has reduced its ability to ensure an adequate level of healthcare for the population. Thus, the provision of health and medical care services in Kenya is partly dependent on donors. In 2002, more than 16% of the total expenditure on healthcare originated from donors. There are

also other factors inhibiting Kenya's ability to provide adequate healthcare for its citizens. These include: inefficient utilization of resources, the increasing burden of diseases and the rapid population growth (Luoma, 2010).According to WHO (2015) the health care system in a given country can also affect health outcomes necessitating that governments to intervene extensively in the health care sector through financing and providing health services to try to address market failures, deal with information asymmetries, capture positive spillovers in health service provision and promote equity. The poor quality health care delivery especially in Kenya has also been attributed to gaps in knowledge and skills compounded by broader system failure and low staff numbers. The need to tackle the gaps in Human Resources for Health (HRH), as an essential part of strengthening health system was emphasized in the 2006 World Health Report (WHO, 2015).

1.2 Statement of the Problem

Good health care contributes to economic performance through higher participation and productivity of the individual employees. This cannot be the case in the face of the various scenes of employee discontentment characterized by strikes and boycotts in the health sector since time immemorial. Their grievances include poor facilities and equipment, poor remuneration, lack of career growth, poor management in the healthcare sector and work overload among other issues (Eneji, Vonke & Onabe, 2013). Moreover, Kenya failed to attain the Millenium Development Goal 5 of improving maternal health (MDG 5) where key indicators showed deterioration such as neonatal mortality (UNDP, 2016). This scenario could be an indicator that there is a mismatch between the investment in the health sector and the expected outcome of improved health indicators.

The problem of investment in the health sector is not a new one. KIPPRA (2004) explains that Ministry of Health has been struggling to maintain public sector health facilities. This has led to adoption of healthcare policy reforms to supplement government budgets and revitalize healthcare delivery systems. The most notable health reforms the Government has adopted include decentralization and cost sharing. Kenya's investment in the healthcare sector over the past five years (2012-2016) has averaged 2.8% of the GDP which compares poorly with that of developed countries such as US (10.1%) and UK (12.5%) (Piabuo and Tieguhong, 2017). This low investment in the health sector could lead to poor health status of workers thus leading to adverse effects on national productivity and economic development. It is not clear how Kenya's level of investment in health care has contributed to the economic development of the country.

The concern of the effect of investment in the health sector may be global. Chwala, et al., (2007) found that for middle-income countries, where progress towards better health is already well advanced, other health-related priorities include controlling the burden of non-communicable diseases, assuring health care for aging population, and providing financial protection. Acemoglu and Johnson (2007) also explains that improving health is an important social objective, which has obvious direct payoffs in terms of longer and better lives for millions as well as having large indirect payoffs through accelerating economic growth. However, it appears there is little improvement as far as Africa is concerned with a long way towards achieving the standards of quality in developed countries.

Frenk (2004) indicates that Africa policymakers need to promote more value for money in their health sector ensuring universal access, equity and raising quality of care. This comes on the backdrop of the notion that investment in health and the design of health financing

policies should be addressed in terms of the interaction between health and the economy. Just as growth, income, investment and employment are a function of the performance and quality of the economic system, so is health conditions (mortality, morbidity, disability).Other comprehensive studies from Africa, India and Latin America have found ill health to be a major contributing factor to decline in the economic welfare of households. Gallup and Sachs (2001) indicate that this is caused by inability to work or reduced productivity; additionally, the burden of health care costs also contributes to economic distress.

The assessment of investment in health in developed countries may not have relevance to low income countries where health investment is low. Studies reviewed use health in its general form and do not base their findings on individual components that ensure a good health status. The study therefore seeks to fill the local literature gap by using the countries health investment and relate it to the overall economic performance of the country in relation to the GDP. There is also lack of information on the Kenyan situation. Using current indicators, the researcher was motivated to establish the extent to which the investment in health care sector in Kenya affects the economic development.

1.3 Research Objectives

The main objective of this research was to evaluate the effect of investment in health care sector on the economic development in Kenya. The following were the specific objectives;

i. To investigate the extent to which government investment in public health care affects economic development in Kenya.
ii. To determine the extent to which private sector investment in health care affects development of Kenya's economy.

iii. To investigate the extent of international non-governmental organization investment in health care affects development of Kenya's economy.

1.4 Research Questions

i. Whateffect does public health investment have on the development of the economy in Kenya?
ii. What is the effect of private health investments on development of Kenya's economy?
iii. What is the effect of international non-governmental organization investment in health care on development of Kenya's economy?

1.5 Significance of the Study

Significance of a study refers to the relevance of the study in terms of academic contributions and practical use that might be made of the findings (Oso & Onen, 2009).

The study will make recommendations on the relationship between investments in health and economic outcomes in Kenya. Undeniably such relations and the recommendations made could inform policy formulations in the various cities and counties in the country in general because they are originated through valid research data.

The study's findings will relate the different aspects of health measurement with economic development providing professionals in the health and finance ministries to understand their individual contributions to the relationship.

Findings of this study will also serve as an academic tool that will instruct and inform readers onthe effect of private investment in health on economic development of Kenya.

The findings in this study should contribute to body of knowledge that could be referred to as relevant material in reference to health provisions requirements of Vision 2030 and the MDGs.

1.6 Scope of the Study

This study was undertaken in Kenya where findings were basedon a desk study that was used to assess the various investments in health on economic development. The study covered the period from 1985 - 2016. The study focused on public investment in health, private investment in health and investment in health by INGOs.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter comprises the review of literature by different authors on the topic of health investment and how it relates to economic development. The chapter also indicates the gaps that were to be filled in relation to the scope of the study. Literature review in this case takes up a systematic process of identification, location and analysis of the previous studies containing information relevant to the problem under investigation.

2.2 Theoretical Review

In many relationships between variables, theories are used in order to explain behavior of units or entities in relation to different conditions and environments. Theories are essentially important when backed up by evidence through research such as the current study into the relationship between investment in health and economic development. The interactions between the different variables in a relationship can be broadly described in a theory which makes various assumptions on the conditions prevailing in that relationship. The current study sought to explain the relationship between the public, private and investment by INGOs and economic development with the aim of understanding the final outcome of increased health investment on national income.

2.2.1 Keynesian Theory

The Keynesian general theory of employment, interest and money was devised by Keynes (1936). In this theory, Keynes posited that public expenditure causesnational income. Keynes rebutted the concept oflaissez faire and argued that government expenditure in the various sectors of the economy such as defense, education, health and social security makes

economic growth possible. Moreover, he advocated that the increased fiscal activities of the state enabled the economy to grow better than in those jurisdictions that fiscal activities of the state were minimal. The Keynesian theory advocates for government intervention in form of spending, taxation and regulation to stimulate growth in the economy in times of recession as well as depression. Government should engage in spending in the welfare sectors such as security, education, health and public infrastructure. These sectors stimulate the productive sectors in the economy this leading to economic development.

Keynesian approach to fiscal activities in the health sector hypothesizes that investment in the health sector by the government would positively affect economic growth. Labour and capital are indicated as the major drivers of economic growth. When government increases its investment in the health sector, it increases the quality and efficiency of labour by making people healthier and less susceptible to disease. This increases their output and productivity thus enhancing economic growth. Moreover, increased investment in the health sector would lead to increased research and development and thus increasing the health outcomes of the population. A healthy population implies more people available for work and thus productivity is improved (Sammut, 2013).

This theory informed this study by indicating that when governments increase expenditure and investments in the health sector, labour is enhanced and productivity is increased in the economy leading to enhance economic growth.The theory posits that government should commit itself to maintain demand at a high level so that full employment is achieved. The government can do this by recycling the tax revenues it collects by investing it in public infrastructure in the health sector. This would improve the health welfare of the workforce and also increase production among the sectors that serve the health sector. The overall effect

would be economic growth in the short term and development in the long term. The study hence hypothesized that increased government expenditure in the health sector would have a positive effect in the economy by increasing employment, productivity of the workforce and production in related sectors.

2.2.2Wagner's Theory

Wagner's theory also referred to as Wagner's law posits that there is a long run relationship between increased state spending and economic growth (Wagner, 1883). The theory indicates that as public expenditure in the different sectors rise, national incomes expands. The law hence provides a prediction that a country can develop its industrial economy increasing its share of public spending in relation to the gross national product. Wagner (1883) noted that there are three sectors which governments mostly spend on: security, infrastructure development and social programs such as education and health. Expenditure in these sectors by government influence economic growth through various multiplier effects. These include the positive impact exerted by the wealth per capital income on government services, the increased rate of population growth due to the increase in expenditure andthe increased level of urbanization and industrialization to support the increased government expenditure.

Wagner's theory was supported by Musgrave (1969) who noted that as progressive states industrialize, they increase the public-sector spending and hence the share of the public sector in the national economy increases. This increase in state expenditure spurs demand in the funded sector which then enables other sectors to increase their production to cater for the created demand (Gupta, & Verhoeven, 2011). Wagner (1883) postulated that when the state increases its expenditure in sectors such as education, security, health and infrastructure development, this growth triggers growth in the economic sectors of the state. Wagner

therefore, fronted the argument that there exists a cause and effect relationship between the growth of a country's public sector and industrialization and growth of the economy.

In the current study, Wagner's law was applied to provide a deeper insight into how public investment in the health sector can spur increased production in other sectors seeking to satisfy the increased demand in the health sector. This spurs productivity increases in different sectors thus leading to increased economic growth. Wagner (1883) postulates that the relative growth of the government sector induces industrialization and production in the economic which leads to economic growth and development. Moreover, government investment in the health sector is expected to influence economic growth in two aspects. The first is when the investment leads to improved health outcomes for the workforce which makes the workforce more productive. Secondly, investment in the health sector by the government is expected to increase demand for products and services in the health sector which in turn is expected to enhance production in other sectors. This study hence hypothesized that public investment in health would positively affect economic growth.

2.2.3The Solow-Swan Exogenous Growth Model

The Solow-Swan exogenous growth model explains long-run economic growth as a function of labour, capital accumulation and population growth, and growths in productivity which is because of technological progress (Solow, 1956). The model recognizes human capital as a significant tool for continued endogenous growth. Human capital is accumulated through new skills, knowledge and improved efficiency and productivity of the workforce. In a study estimating the effect of health investment on economic growth, health of the citizenry is considered as a constituent of human capital in the aggregate production function (Mankiw, Romer, &Weil, 1992).

Diseased labour force have poor performance and high dependence which negatively affects productivity. When proper healthcare and attention is not available in a country, some diseases can affect the population which can lower the productivity of the labour force (Mehrara & Musai, 2011). Moreover, increased of contributing to production in the economy, diseased population have a negative effect on the economy as it spends what has already been produced without adding any value on the aggregate production. Moreover, since diseased population requires more care, they lead to waste of man hours considering the labour force that takes care of such sickly population. It is hence expected that increase in investment in the health sector by the government and non- governmental actors would lead to increase in quality of healthcare services. This would in turn lead to increased health outcomes for the population. A healthy population is a productive population and hence productivity would improve.

In the current study, the model was used to explain how private health investment can lead to improvement in human capital which in turn leads to increased productivity and economic growth. The model posits the health status of the population in a country to be a determinant of the labour force supply. When investments in the health sector are increased, this is expected to lead to an increase in the number of healthy labourers who will enhance the country's productive capacity. Conversely, when the investments in the health sector are low, the population van be ravaged by disease and reduce their productivity, thus adversely affecting economic development. The theory hence supports the alternate hypotheses in the study that investment in health by the government, private sector and by the international NGOs would have a positive effect on economic development.

2.3Empirical Review

Empirical review is theanalysis of the findings of various previous studies and develops knowledge from actual experience rather than from theory or belief. The reviewed studies are the studies which have been conducted in relation to public health investments, private health investments and total health investments and their effect on economic development.

2.3.1 Investment in Public Health and Economic Development

Piabuo and Tieguhong (2017) observed that in 2001, African leaders through the Abuja Declaration indicated that they would invest 15% of their total government expenditure on healthcare sector. However, by 2013 there were only five (5) African countries that had achieved that target. Following this background, Piabuo and Tieguhong conducted a comparative analysis on the relationship between health investment and economic growth of countries in the economic community for central African states(CEMAC) and five other African countries that were party to the Abuja declaration. The study used data from the World Development Indicators (2016) database and applied ordinary least square (OLS) to analyze the data. Study findings established that investment in health had a positive and significant effect on economic growth of the two sets of countries that were incorporated in the study. Specifically, the findings indicated that a unit increase in health investment can lead to 0.38 and 0.3 units increase in GDP of the five other African countries and CEMAC respectively(Piabuo &Tieguhong, 2017).

Kareem, Ademoyewa, Fagbohun and Arije(2017) explored the impact of Nigeria federal government's healthcare investment on economic growth of the countryand concluded that public health investment granger caused economic growth.Time series data for 33 years (1981- 2013)was used. The secondary data was collected from annual reports of the Central

Bank ofNigeria. Analysis of the data was conducted through the pooled ordinary least square method (POLS). The data was tested for unit roots using the Augmented Dickey Fuller test. Results from the study indicated that there existed a significant positive association between government totalinvestment in the health sector and economic growth. Granger causality tests indicated a uni-directional relationship from total public health investment to economic growth.

There is evidence that government health investment has an effect on economic development as shown by Kurt (2015) who explored the effect ofgovernment health investment on economic growth of Turkey. The study used the amount of funds invested in general government medicine, products health expenditures and capital health expenditures in the country between the year 2006 and 2013. The study was conducted through time-series analysis using real monthly data that was seasonally adjusted. The findings from the study revealed that government health investment in Turkey had a significant positive effect on economic growth of the country. In India, Rajeshkumar and Nalraj (2014) conducted a study with the purpose of establishing the effect of public health investment on economic growth in four Indian States. Annual data from 1991 to 2010 on public investment and economic growth for the four states was used. The study applied time-series analysis methodology after conducting the necessary diagnostic tests for unit roots and cointegration. The findings revealed that economic growth and public health investment were co-integrated for all the four Indian states included in the study. The findings, hence implied that there was a unidirectional causality that existed from health expenditure to economic growth.

On the other hand, Nigerian study byAyuba(2014) sought to establish the relationship that existed between public social investment and economic growth. The authors had underscored

the importance of having a vibrant healthcare system to support sustainable and viable economic growth. The healthcare system in Nigeria was fraught by poor funding in the healthcare sector and lack or near absence of quality healthcare in Nigeria. In carrying out the study, the authors used the public spending in the healthcare sector as a proxy for health investment. Data for the period of 1990 to 2009 was used and Vector Error Correction Model(VECM) was applied in analysis. Causality, cointegration and stationarity tests on the variables and data were conducted. Study results revealed that investment in health positively influences economic growth both in the short run and along-run. These findings supported Wagner's law.

Sammut (2013) investigated the relationship that existed between investments in health and economic growth of Malta. The study applied the granger causality test to determine the direction and presence of causality. Annual data utilized in the study was from 2000 to 2012. The study measured economic growth though GDP (seasonally adjusted and not seasonally adjusted). Total investment in healthcare (both public and private) was used as the proxy for health investment. The study results suggested that there was no causality running on either way. This indicated that health investment did not cause GDP growth and GDP growth did not cause health investment. This implied that increased investment in health does not trigger increased economic development.

Wang (2011) conducted a study involving 31 countries that explored the effect of health care investment on economic growth. Data from 1986 to 2007 was used in the study and panel regression model was used in analysis. The study results suggested that total investment growth in the health sector will stimulate economic growth. However, while applying quantile regression, the results suggested that in countries with low level of growth, health

investment did not have a significant effect on economic growth. Countries with high and medium levels of economic growth reported higher positive influence of health investment growth on economic growth.

2.3.2 Investment in Private Health and Economic Development

Aboubacar and Xu (2017) assessed the impact of private health investments on economic growth of Sub-Saharan African countries. The study focused on private investments over a period of 10 years (1995 to 2014). The authors used the General Method of Moments (GMM) method to estimate the results. Findings from the study revealed that there was a positive and statistically significant association private healthcare investment and economic growth of the countries. Specifically, private health expenditure which was used as a proxy of private health investment had a significant effect on the economic growth of the countries in the region.

There exists a strong relationship between private investment in health and economic growth of South Eastern European(SEE) countries (Frasholli & Hysa, 2015). The study by Frasholli and Hysa (2015) explored how better health serves as a predictor of economic growthand also analyzed the degree to which economic growth is caused by private health expenditures. Regression analysis was used to identify the effect of private health expenditure per capita and GDP per capita. The data was collected for 12 years (2000-2011) from World Bank database. Results indicated that private health investments per capita in Albania explained slightlymore of the variation in GDP per capita than in the other countries. The results also revealed that Albania and Macedonia were the two countries where private health expenditure had the highest effect on economic growth.

In a study on 20 Asian countries, Mehmood, Syed, Raza and Mureed(2014) investigated the effect of private health investment on economic growth.The authors observed that when the health sector is functioning properly, the economy is positively stimulated for growth. The authors applied the pooled mean group (PMG) estimation method to assess the long run relationship that existed between economic growth and private healthcare investments over a period of 13 years (1990 – 2012). The total private spending in healthcare was used as a measure of private health investment while income per capita was used as the measure of economic growth. Study findings showed that there was a long run relationship between private health investment and income per capita. However, the findings indicated that there was no causality from private health investment to economic growth but there was a uni-causality from economic growth to private health investment.

Akintunde and Satope(2013)explored the effect of private health investment on economic growth in Nigeria. The study covered a period of 34 years (1977 to 2010) and collected timeseries data on private health expenditure and economic growth. Analysis was conducted using the vector error correction model that assisted in assessing whether there was long run association between private health investment and economic growth. The study findings indicated that private health investment had a significant positive relationship with economic growth. However, results established that in the short run, the effect of health investment on economic growth did not converge to long run growth.

Another study in Nigeria byBakare and Sanmi(2012) investigated the role played by private health care investment in promoting economic growth. The study applied annual data from 1970 to 2008. The data was sourced from the Federal Bureau of statistics. Ordinary least squares regression method was applied in analysis to assess the effect of private healthcare investment on economic growth. Study results revealed that private healthcare investment in

Nigeria had a significant positive effect on economic growth of the country. These results implied that improvement in healthcare investments by the private health sector can have positive multiplier effects on the economic growth of the country.

Spiridoula (2012) investigated the influence of private health care investment on economic growth of 28 OECD countries using data from 1990 to 2008. The study employed panel data analysis model using the dynamic Arellano-Bond estimator. The estimation robustness was checked through sensitivity analysis where seven separate panel regression models were run. Results from the study revealed that increase in health investment led to a slight but significant decrease in economic growth. This indicated that increased private health investment in the health sector of the developed OECD countries hampered economic growth.

The study by Bedir (2016) investigated the causality between healthcare investment and economic growth in selected developing countries of East Asia, Middle East, Europe and South Africa. The study used annual data (1995 – 2013) collected from World Bank database. Data collected included data on per capita health investment and per capita gross domestic product as measured using 2005 as the base year through the purchasing power parity (PPP). The study tested the causality between the timeseries of health investments and per capita GDP using the grander causality test. However, the study failed to test for stationarity of the variables which could have led to spurious regression results. Vector autoregressive (VAR) model was applied. The results indicated that there was a two-way causality for Russian federation and Czech Republic and Russian Federation. Results on Korea Republic, Egypt, South Africa, Hungary and Philippines indicated that health investments affected GDP significantly while results on United Arab Emirates, Greece, China, Poland, and Indonesia

indicated causality of GDP on health investment but no causality of health investments on GDP per capita.

Oni (2014) in a Nigerian study, assessed whether health investment has any economic growth impact.The study applied multiple linear regression on total public health investment data against economic growth. Aggregate real output was used as a measure of economic growth while total health expenditure (THE) was used as a measure for total health investment. Time series data for forty one years was used in the study (1970– 2010). The data was sourced from Statistical Bulletins, Central Bank of Nigeria (CBN) and African Statistical Year Books that are produced annually by the African Development Bank. Study results suggested that health total investment had a significant positive effect on economic growth.

In a study in Algeria, Boussalem, Boussalem and Taiba (2014) evaluated the relationship between total healthcare spending and economic growth. The study also assessed the cointegration and causality relationships between economic growth and between total healthcare spending. The study utilized annual data that spanned 41 years (1974-2014). VECM time series model was utilized in analysis. Using annual data.The study findings revealed that there was a long-run causality from total investment in healthcare sector to economic growth. However, findings did not reveal any short-run causality from total healthcare spending to economic growth.

2.3.3 International Organizations'Investment in Healthcare and Economic Development

In Myanmar, the Global Health Fund(2016) established that assistance for health provided by international organizations had enabled the country to reach grand convergence and pro-poor universal health coverage. This had caused the country to improve its human capital and

productivity. Funding received by International organizations had helped Myanmar to scale up current interventions for maternal, infectious and child health conditions to very high levels, health systems strengthening (HSS) to efficientlydeliver these health tools and interventionsand expanding of research and development for discoveryand delivery of new health technologies. This had enabled the country to take care of its population thus enhancing its economic growth.

A study sponsored by the Mexican Commission on Macroeconomics and Health indicated that financing of healthcare by international organizations had insignificant direct effects on economic development of the country (Lustig, 2014).These findings were however, against other studies conducted in Asia and Sub Saharan Africa which indicated that investments in health by international organizations positively affects growth. However, the study by Lustig (2014) indicated that investments in health by these international organizations led to increase in life expectancy from 52 to 56 years. Moreover, the study quoted other microeconomic studies that found a direct impact of adult health on productivity and income though the correlation was weaker than that found incomparative or historical study findings at nationalor regional levels. Nevertheless, when the indirectimpact of health on income through its positive effecton education is analyzed, a very sizeable relationship isfound. Children from poor households reach adulthoodwith chronic health problems that affect their cognitiveabilities and cause them to miss a considerable numberof school days; both imply that their future ability togenerate income will be hampered. In general, resultsshow that health during early childhood (which many international organizations have invested in) determineshealth conditions and educational performance asadolescents, which in turn affect health conditionsand income as adults.

Eneji, Juliana and Onabe (2013) noted that in Nigeria, the major challenge facing policy makers is how to allocate scarce resources across the variety of preferences that contribute to poverty reduction and economic development, including capital expenditures on health. Eneji et al. (2013) hence conducted a study to establish the association between global health NGOs healthcare expenditure and national productivity in Nigeria. The study focused on expenditures by international NGOs from 1999 to 2012 for objective analysis.Regression analysis was used on the collected secondary data. The study also applied questionnaires to prompt responses. The study established that there was a weak and insignificant causal relationship between health investments by INGOs and economic development.

Martin, Grant and D'Agostino (2012) explored how global health funding by international organizations influenced economic development and revealed that investment by global funds into health positively influenced economic growth. There was clear evidence that by investing in health improvements a significant increase in GDP per capita could be attained in four ways. First, a population that is healthier is more economically productive. Secondly, improved health for the population signifies a material economic and developmental outcome in-and-of itself. Third, positive healthcare leads to decrease in many of the additive healthcare costs associated with lack of care like treating opportunistic infections. The findings from the study agreed with Keynesian theory that healthcare spending capitalizes on the Keynesian 'economic multiplier' effect on GDP growth. Therefore, continued under-investment in health and health systems represent an important threat to the future of any country.

2.4 Knowledge Gap

The review of empirical studies on the effect of investment in health on economic growth had revealed various research gaps that the current study sought to fill. The first gap is on the

dearth of studies on Kenya relating to the effect of investment in health on economic growth. Most of the studies reviewed were in Asian countries (Bedir, 2016; Mehmood et al., 2014; Rajeshkumar & Nalraj, 2014) while the few African studies conducted were mostly concentrated in Nigeria (Kareem et al., 2017; Ayuba, 2014; Akintunde & Satope, 2013; Bakare & Sanmi, 2012). Due to the lack of studies on Kenya, the current study was justified to investigate how investment in health affects economic growth of the country to inform policy and practice.

Secondly, some of the studies reviewed applied analysis techniques that were not robust considering the type of data collected. For instance, the study by Bakare and Sanmi (2012) applied ordinary least squares regression despite having annual time series data (1970 to 2008). Another study by Piabuo and Tieguhong (2017) also applied ordinary least squares regression on paned data of CEMAC and other five African countries. The results from such studies may not be reliable and hence more evidence was required to explore how investments in health affects economic growth.

Lastly, some of the studies reviewed had contradictory findings which called for more study to provide conclusive evidence on how investments in health affects economic growth. For instance, Spiridoula's (2012) study established that increase in health investment led to a slight but significant decrease in economic growth while other studies such as Boussalem et al. (2014) revealed that there was a long-run causality from total investment in healthcare sector to economic growth. More evidence is therefore required to conclusively determine the effect of investment in health on economic growth.

2.5 Conceptual Framework

The conceptual framework that guided the study is presented in Figure 2.1. The conceptual framework depicts that public, private and total investment in health can affect economic development of the country.

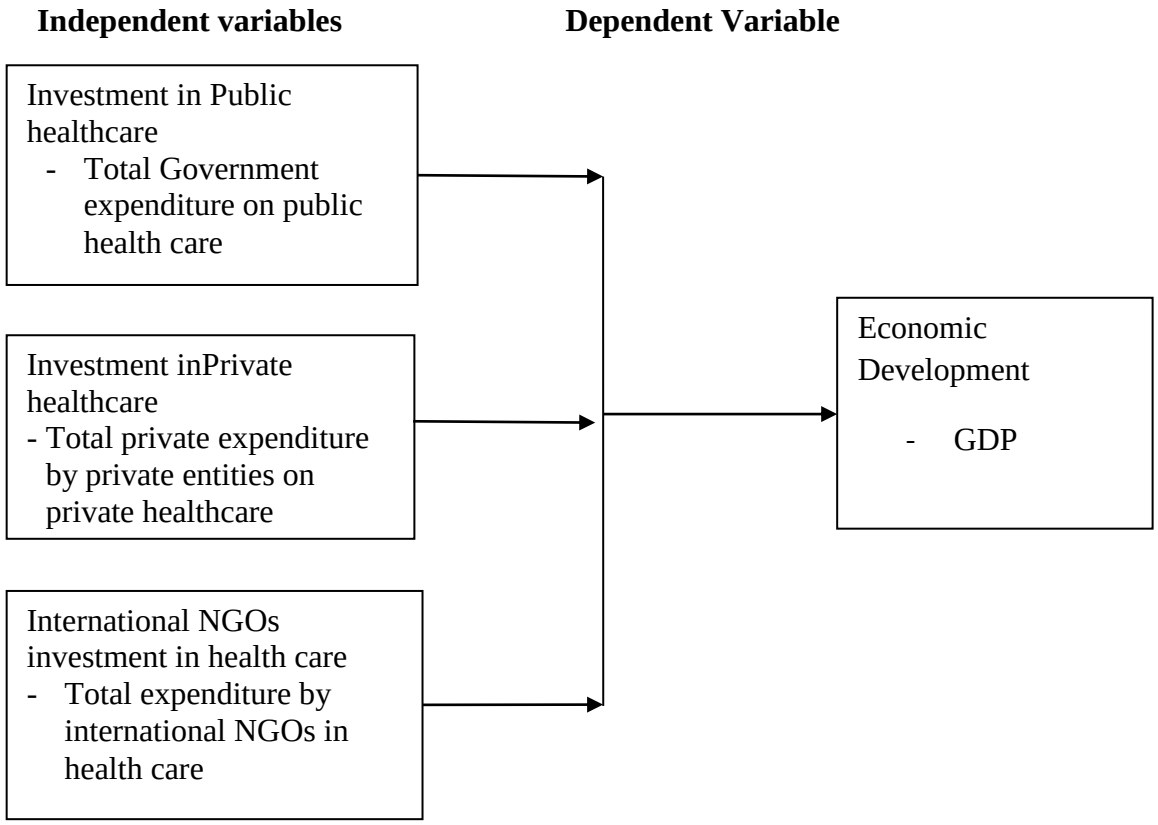

Figure 2.1 Conceptual Framework

2.6 Operationalization of variables

The variables under study and how they were measured is presented in Table 2.1. The Table presents the types of the variables to be included (independent and dependent), the variable names, their indicators, level of measurement and the data collection method that was used.

Table 2.1: Operationalization of Variables

Types of variable	Variables	Indicator	Level of measurement	Data collection method
Dependent	Economic Development	• GDP	Scale	Desk study review guide
Independent	Public investment in health	• Amount of money (KES) invested by government in health sector annually	Scale	Desk study review guide
Independent	Private investment in health	• Amount of money (KES) by private sector and NGOs in health sector annually	Scale	Desk study review guide
Independent	International NGOs investment in health	• Value in KES provided by international NGOs per year to the health sector.	Scale	Desk study review guide

2.7 Research Hypotheses

H_{01}: Public investments in health have no significant effect on the development of the economy in Kenya

H_{02}: Private investments in health has no significant effect on development of Kenya's economy

H_{03}: International NGOs investment in health has no significant effect on the development of the economy in Kenya

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter seeks to elaborate the course of action that was taken in acquiring a valid solution to the problem stated in the introductory chapter. It is divided into the research design adopted, the population of the study, sample and the sampling procedure used and the sources of data for the study as well as the data collection methods that were applied. The chapter also explains the procedures that were applied and how the collected data was analyzed and interpreted to provide meaning to the research.

3.2 Research Design

A good research has to be undertaken using a research design that is applicable to its purpose and needs.According to Babbie (2011), a research design is the scheme, outline or plan that is used to generate answers to research problems. Saunders, Lewis and Thornhill (2012)indicate that selecting a good research design should be guided by an overarching consideration, mainly whether the design achieves the best possible methods of providing trustworthy answers to the research questions.

A descriptiveresearch design was used in this study. It was considered a convenient method because it could be completed relatively quickly and it is cost effective. Creswell (2013) defines descriptive research as a fact-finding approach generating across sectional or longitudinal analysis of the situation. It ascertains and describes these characteristics of the variables of interest in a situation. It is restricted to fact finding and may result in the formation of important principles of knowledge and solutions to significant problems. It goes beyond data collection and involves measures, classification, analysis and interpretation

(Robson, 2012). The descriptive research in the current study assisted in establishing a relationship that exists between health investments and economic growth and hence provide evidence-based findings.

3.3 Target Population

The study was a study on Kenya. Data that was used in the study was longitudinal data for thirty two years (1985-2016). The thirty two years were selected due to the need to use current information on investment in healthcare and also to ensure that the panel is sufficient for inferential analysis. Moreover, Structural adjustment programmes which affected the healthcare sector significantly started in 1985. The effect of investments by the various stakeholders in the health sector from that period therefore needed to be established.

3.4Instrumentation and Data Collection

The study sought to carry out an empirical enquiry on the relationship between investment in health and economic development in Kenya. The study focused on collecting secondary data from available and credible sources on the trends and values of the selected variables of the study. Data was collected from Kenya National Bureau of Statistics (KNBS), Institute of Economic Affairs (EIA), World Bank, Ministry of Finance and Ministry of Devolution and Planning.With the aim of ensuring validity of the information gathered, only authentic sources of data were used which included the government's economic entities, ministries and renowned entities like World Bank. Besides physical access to publications, many online resources entailing array of databases were also utilized for the above-mentioned purpose.Data capture form is presented in Appendix I.

The study made use of government publications including the economic survey, demographic and health survey (DHS) and other related publications. Since the researcher had no control over any variable in the study, the study relied on the present and past conditions of the economic environment including Gross Domestic Product (GDP), public investment in health, private investment in health and international NGOs investment in health over a 32-year period (1985 – 2016). A data collection sheet (Appendix I) was used to collect the required data. Data was only collected from government agencies or other credible institutions to ensure reliability and validity of the data collected data. Table 3.1 indicates the data that will be collected and the source for each.

Table 3.1: Data Collection

Type of data	Source	Period
Public investment in health	Ministry of Health Kenya – Ministry of Finance	1985 - 2016
Private Investments in health	World Bank KNBS	1985 - 2016
International NGOs investment in health	World Bank KNBS Ministry of Health	1985 - 2016
Economic growth	Kenya National Bureau of Statistics – Economic survey Ministry of Health Kenya – Ministry of Finance	1985 - 2016

3.5 Data Analysis

Data analysis was conducted using the Stata statistical software. The data collected was timeseries in nature and hence a timeseries model was applied in analysis. The time series

Vector error correction model (VECM) or the Vector autoregressive (VAR) model were applied depending on the cointegration status of the health investment and economic growth variables. Hacker and Hatemi (2008) posited that VAR model is able to capture the linear interdependencies among the various time series under study. The procedure in VAR enables every variable to take an equation clarifying how it progresses founded on the lags of the other variablesand also on its own lags. Hatemi (2004) indicates that VAR modelling only requires a list of variables which are hypothesized to influence each other inter-temporally. In this study, the variables included will be public health investment, private health investment, total health investment and economic growth. However, VAR is only suitable when there is no cointegration of the variables. When cointegration exists, VECM is more suitable.

The analysis process in the study entailedthree steps. The first step was to load the collected data into the Stata statistical software. The second step was to use the Schwarz's Bayesian information criterion (SBIC)and other lag order selection criteria to establish the appropriate number of lags to use. Lastly, estimation of autoregressive models followed using ordinary least squares method. This estimation enabled fitting of the trend, intercept, and autoregressive integrated moving averages.

3.5.1 Model Specification

The VAR or VECM model that was applied is a multivariate time series function. The independent variables of the study were publicinvestment in health (PIH), private investment in health (PrIH)and investment in health by INGOs(IINGO). The dependent variable was economic development measured using GDP.

The timeseries model was as follows:

$GDP_t = \beta_0 + \beta_1 PIH_t + \beta_2 PrIH_t + \beta_3 IINGO_t + \varepsilon$ …… (i)

Where;

β_0 - Constant showing GDP growth rate in absence of investment in health

PIH– Public investment in health

PrIH– Private investment in health

T – Time period (1985 – 2016)

IINGOs – International NGOs investment in health

ε - Error term

3.5.2Diagnostic Tests

Econometric model was applied in the study to examine the effect of investment in health on economic development. Testing the existence of a dynamic relationship required applying the Johansen test applied to test the presence of cointegration. If cointegration existed, VECM was applied. However, VAR model would be fitted if there was no cointegration.

Granger and Newbold (1974) posited that use of Ordinary Least Squares (OLS) on data that is non-stationary could lead to spurious results which would show statistical significance while in reality there is no relationship between the data used in the model. Spurious regression results in findings that are not reliable and hence having little use as evidence (Cameron, 2005). To avoid spurious regression, test of stationarity was conducted using the augmented Dickey Fuller test (Dickey & Fuller, 1979).Nielson (2005) affirms that fitting a timeseries model requires the data to be non-stationary. Determining stationarity is the primary stage before conducting cointegration.If the data was to be found to have unit roots (non-stationary) first differencing would have been conducted to make the data stationary.

Test of integration was then conducted using the Johansen's cointegration test. This testenabled the researcher to fit the right model to the data based on the test outcome. If the test determined that there was no cointegration, then vector autoregressive (VAR) model would have been fitted. However, if cointegration existed, vector error correction model (VECM) would be fitted (Hendry & Juselius, 2000).

After the diagnostic tests, the appropriate time series model was fitted and the results presented in Tables and figures. Descriptive statistics were also used to inform on the distribution and dispersion of the data.

CHAPTER FOUR

RESEARCH FINDINGS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter presents the data analysis process, findings and the discussion of the findings. Presented in the chapter are the pre-analysis tests, the data processing, and also the post-analysis tests that were conducted. Data analysis entails exploratory analysis of the dependent variable as well as the independent variables. The exploratory analysis includes the descriptive statistics, growth plots and overlain plots.Figures and tables are used to present the findings wherein interpretation is provided. After presentation of the results, a discussion is provided relating the findings to the theoretical and empirical literature.

4.2 Exploratory Analysis of GDP

The trend of GDP was explored over the study period from 1985 to 2016. Study findings as presented in Figure 4.1 established that GDP had an upward trend in the entire study period. Moreover, the trend got steeper from mid 2000s (USD 16 billion) to 2016 (USD 71 billion) indicating that GDP growth increased in that period. The only year on year drop in GDP was observed in 1992 where it shrank from USD 8.2 billion to USD 5.8 billion.

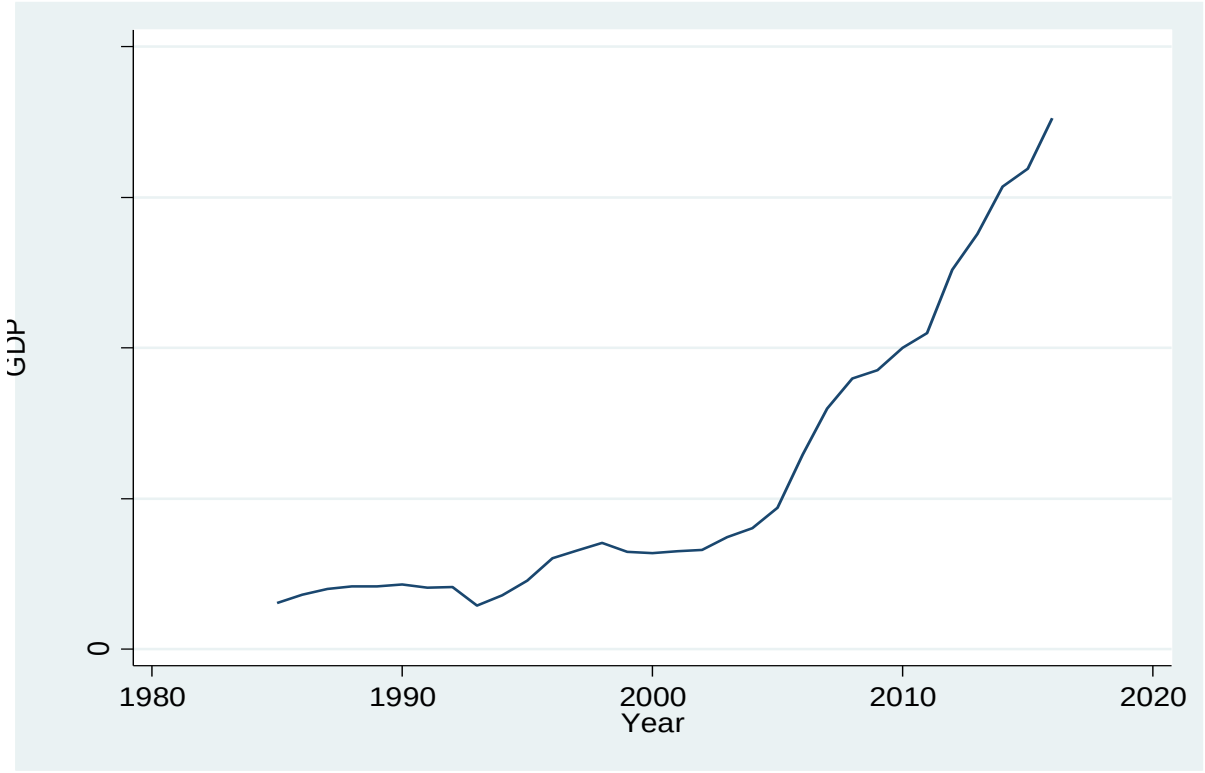

Figure 4.1: Trend of GDP (USD 1985 – 2016)

4.3 Growth Plot for Independent Variables

The study explored how the three independent variables varied over time. The findings of the overlain plots are presented in Figure 4.2. The variables included are public investment in health (PIH),private investment in health (PrIH) and investment in health by INGOs (IINGO). The plots indicate that both private and public investments in health had an upward trend. Investment in health by INGOs was very minimal compared to the investments by private and by public entities. Moreover, the plots indicate that private investment in health surpassed public investment in health from 1985 to 2011. From 2011 to 2016, annual public investment in health was more than annual investment in health by private entities.

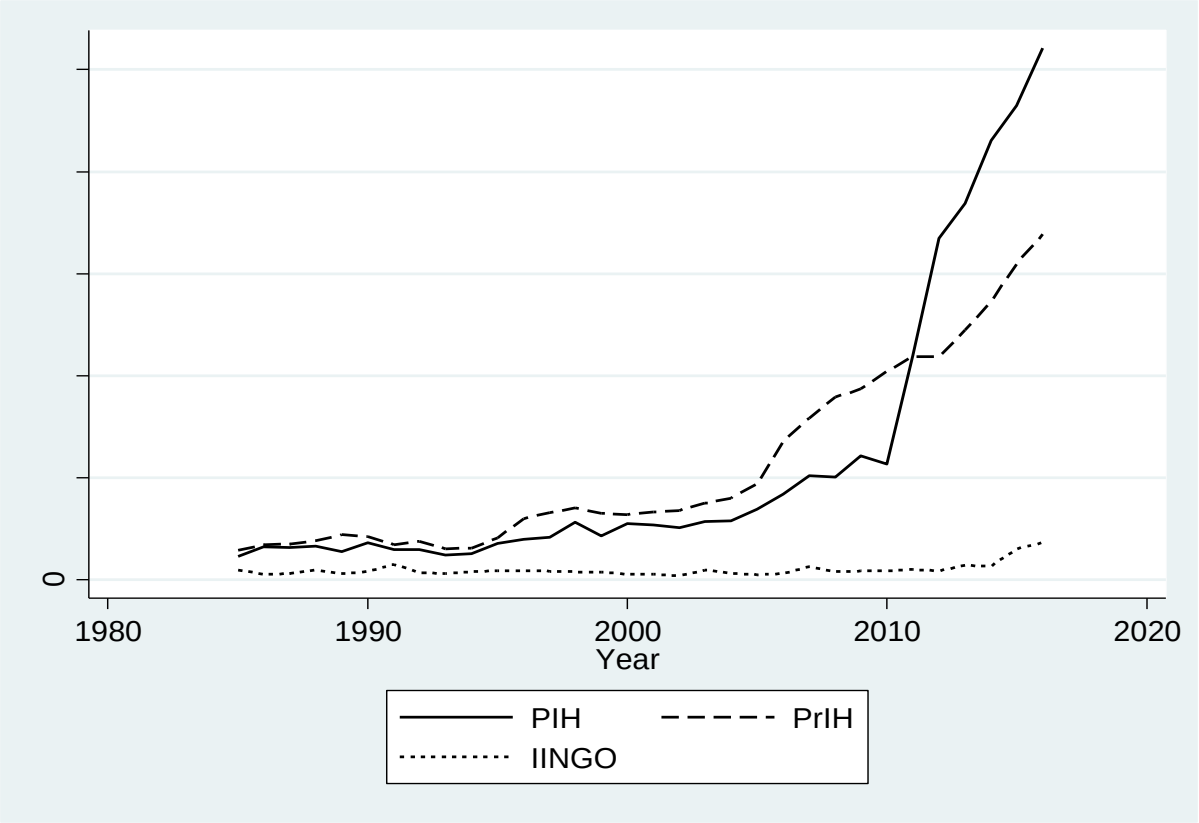

Figure 4.2: Growth Plots for Independent Variables

4.4 Diagnostic Tests

The study conducted post-analysis diagnostics that included testing for heteroscedasticity, serial correlation and normality of residuals. In testing the presence or lack thereof of heteroscedasticity, the Breusch-Pagan Cook Weisberg's was used. The test's null hypothesis is that there is homoscedasticity. The test implies that when p value is more than 0.05, that is evidence of homoscedasticity, but there is evidence of heteroscedasticity when the p value is less than 0.05. Testing for homoscedasticity was performed after running a regression model with GDP as the dependent variable while public investment in health, private investment in health and investment in health by INGOs as the dependent variables. Results presented in Table 4.1 show that the p value of the test was above 0.05 ($p = 0.3928$) and hence the null

hypothesis of homoscedasticity could not be rejected. The conclusion was that there was no heteroscedasticity.

Table 4.1: Test of Heteroscedasticity

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of GDP

         chi2(1)      =     0.73
         Prob > chi2  =   0.3928
```

The Breusch Godfrey Lagrange multiplier test was used to test for serial correlation. This was performed after running the VECM model. The test results applied three lags to establish any serial correlation of higher order. The null hypothesis in this test is that there is no serial correlation. The null hypothesis is accepted when the p value is greater than 0.05, when p value is less than 0.05, this is a sign of serial correlation. The study results are presented in Table 4.2 below. The results indicate that there was no serial correlation for all the three lags used (p values > 0.05).

Table 4.2: Test of Serial Correlation

Breusch-Godfrey LM test for autocorrelation

lags(p)	chi2	df	Prob > chi2
1	0.000	1	0.9850
2	2.695	2	0.2600
3	3.754	3	0.2893

H0: no serial correlation

Lastly, the researcher tested the normality of residuals to establish whether the residuals when the variables are regressed are normally distributed. This test was conducted by overlaying the errors of residuals over a normal distribution. The test was conducted after running the VECM model. The results are presented in Figure 4.1. The study findings show that the residuals did not vary significantly from a normal distribution. A conclusion was therefore made that the residuals are normally distributed.

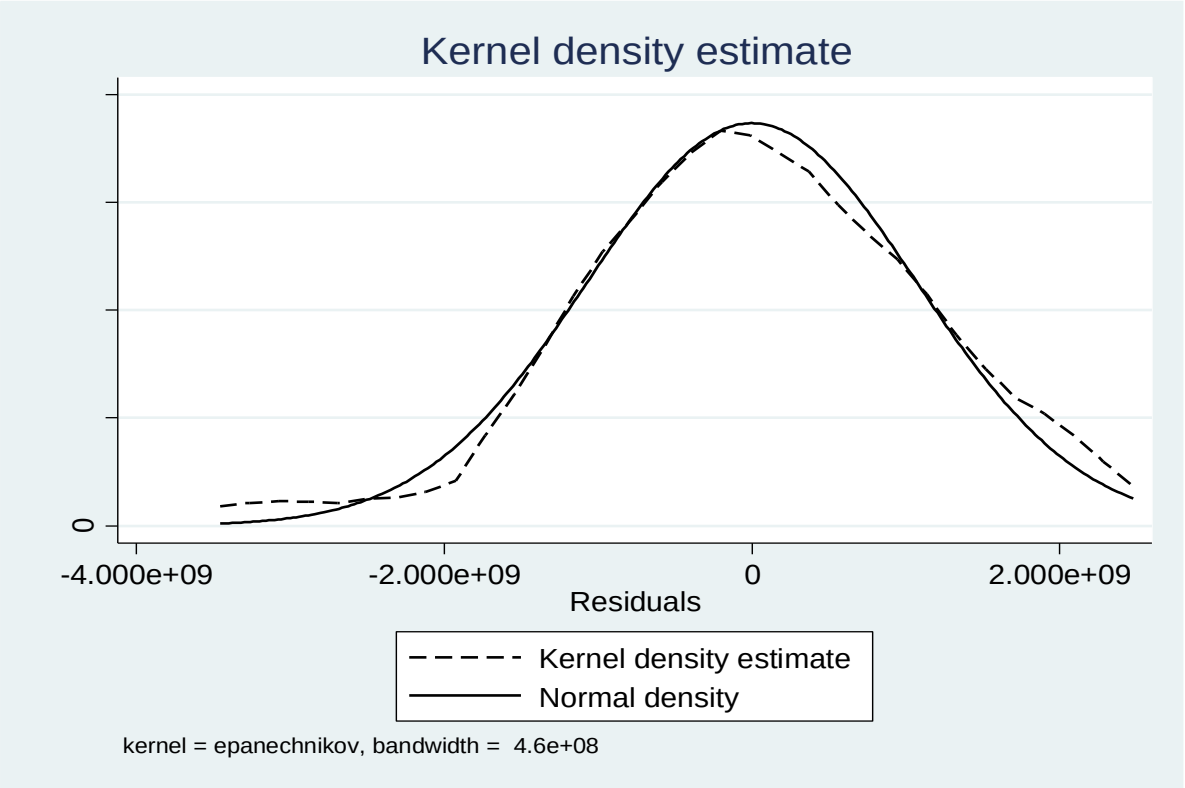

Figure 4.3: Test of Normality of Residuals

4.5 Selecting Number of Lags

The data used in the study was time series data from 1985 to 2016. After the diagnostic tests were conducted, timeseries model fitting was process started. The VECM or VAR timeseries analysis method were to be used. To assess which of the two models was appropriate for the data, the correct number of lags to be used needed to be assessed. This was examinedby

means of the VAR and VECM pre-estimation diagnostics command. The study findings are presented in Table 4.3 where the Hannan and Quinn information criterion (HQIC), Lag length (LL), Akaike's Information Criterion (AIC), the Likelihood Ratio (LR) and the Final Prediction Error (FPE) were used. The study applied two lags as most of the lag selection criteria indicated two lags were appropriate.

Table 4.3: Selecting Number of Lags

Selection-order criteria
Sample: 1987 - 2016 Number of obs = 30

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-2756.48				9.9e+74	184.032	184.092	184.219
1	-2648.65	215.67	16	0.000	2.2e+72	177.91	178.209	178.844*
2	-2628.39	40.519*	16	0.001	1.8e+72*	177.626*	178.164*	179.307

4.6 Unit Root tests

The Augmented Dickey Fuller (ADF) test was used to test whether the variables in the study had unit roots or were stationary. When conducting time series analysis, it is important for the variables to be stationary or have no unit rootsbecause regression using non-stationary variables can produce invalid estimates. The ADF test was applied on all the variables with results as presented in Table 4.4. The study applied the 5% critical value to establish stationarity of the variables. The study results indicated that all the variables were stationary because all the test statistics for all variables were greater than the 5% critical value. This indicated that the regression of the variables would provide reliable estimates.

Table 4.4: Unit Root Test for Study variables

Variable	Test statistic	1% critical value	5% critical value	10% critical value
GDP	4.647	-3.079	-2.983	-2.623
PIH	3.843	-3.079	-2.983	-2.623
PrIH	4.614	-3.079	-2.983	-2.623
IINGO	4.380	-3.079	-2.983	-2.623

4.7 Cointegration Tests

Test of cointegration was applied to assess which of the two models (VECM or VAR) appropriate for the data. Cointegration in time series modelinfers that the variables in the model have a long-term relationship demonstrating that one variable can be applied to describe another variable in the long term. Johansen test for cointegration was used to test cointegration of the variables and findings are presented in Table 4.5. The study findings specify that the hypothesis of no cointegration was not accepted as the trace statistic of zero cointegration (79.5981) was higher that the critical value at 5% (47.21). The study findings showed that there was at least one cointegration equation (indicated by the star on 8.7305 trace statistic). These study results indicated that VECM was the appropriate model to use for the data.

Table 4.5: Johansen Test for Cointegration

Trend: constant — Number of obs = 31
Sample: 1986 - 2016 — Lags = 1

maximum rank	parms	LL	eigenvalue	trace statistic	5% critical value
0	4	-2775.4171	.	79.5981	47.21
1	11	-2752.0344	0.77877	32.8329	29.68
2	16	-2739.9832	0.54045	8.7305*	15.41
3	19	-2735.7302	0.23996	0.2244	3.76
4	20	-2735.618	0.00721		

4.8 Vector Error Correction Model (VECM)

The error correction model was run with GDP being the dependent variable while Public investment in health, private investment in health and investment in health by INGOs as the independent variables. The study applied two lags in the model as per previous results on lag order selection criteria. The VECM model was then developed with results as presented in Table 4.6. Thestudy results indicated that there was one cointegration equation with a negative error correction term (β = -.1647). However, this error correction term was not significant at 5% level (z = -1.57; p > 0.05). These results indicate that when the error term in the cointegration equation is positive, GDP in Kenya falls, but not significantly. Moreover, study results in Table 4.6 belowsuggest that lagged public investment in health had a positive short-term effect on GDP (β = 0.1149; p < 0.05). Moreover, private investment in health had a significant positive effect on GDP (β = 0.2407; p < 0.05). Study results however indicated that investment in health by INGOs did not have a significant effect on GDP (β = 0.3232; p > 0.05).

The resultant time series equation was of the form;

$GDP_t = 1.01e9 + 0.1149PIH_t + 0.2407PrIH_t + 32.32IINGO_t$…….. (ii)

However, investment in healthcare by INGOs could be dropped from the model as it had no significant effect on GDP (See findings in Fig. 4.2 and Table 4.6).

Table 4.6: Vector Error Correction Model

Vector error-correction model

Sample: 1987 - 2016		No. of obs	= 30
		AIC	= 178.0633
Log likelihood = -2643.949		HQIC	= 178.4667
Det(Sigma_ml) = 4.17e+71		SBIC	= 179.3244

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_GDP	6	1.7e+09	0.8018	97.09663	0.0000
D_PIH	6	1.3e+10	0.5620	30.79521	0.0000
D_PrIH	6	4.4e+09	0.7666	78.83304	0.0000
D_IINGO	6	2.0e+07	0.3761	14.46699	0.0248

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
D_GDP						
_ce1						
L1.	-.1646873	.1052026	-1.57	0.117	-.3708806	.0415061
GDP						
LD.	-.053435	.2204652	-0.24	0.808	-.4855388	.3786688
PIH						
LD.	.1149255	.0307702	3.73	0.000	.054617	.175234
PrIH						
LD.	.240697	.0788804	3.05	0.002	.0860943	.3952997
IINGO						
LD.	32.32409	16.83339	1.92	0.055	-.6687508	65.31693
_cons	1.01e+09	4.84e+08	2.08	0.037	5.91e+07	1.96e+09

The VECM model results were used to test the hypotheses of the study. The first hypothesis of the study was;

H_{01}: Public investments in health have no significant effect on the development of the economy in Kenya

Study findings alluded that public investment in health had a positive and significant effect on GDP ($\beta = 0.1149$; $p < 0.05$). This evidence led to the rejection of the first hypothesis and the alternative hypothesis was therefore accepted. The conclusion of the study was therefore that public investments in health have significant positive effect on the development of the economy in Kenya. These results support the findings from a study by Piabuo and Tieguhong (2017) that public investment in health had a positive and significant effect on economic

growth of two sets of African countries that were incorporated in the study. Moreover, the study findings concur with findings by Kareem et al. (2017) that there exists a significant positive association between government total investment in the health sector and economic growth.the findings from this study support The Keynesian general theory of employment, interest and money by Keynes (1936) which posits that government expenditure in the various sectors of the economy such as health makes economic growth possible. Moreover, Keynes (1936) posited that the increased fiscal activities of the state enabled the economy to grow better than in those jurisdictions that fiscal activities of the state were minimal. Similarly, the findings support Wagner's (1883) theory which posits that there is a long run relationship between increased state spending and economic growth.

The second hypothesis of the study was;

H_{02}: Private investments in health has no significant effect on development of Kenya's economy

Study findings suggested that private investment in health had a significant positive effect on GDP ($\beta = 0.2407$; $p < 0.05$). The null hypothesis was hence rejected in favour of the alternative hypothesis. These study results support the Solow-Swan exogenous growth model (1956) which explains long-run economic growth as a function of labour, capital accumulation and population growth, and growths in productivity which is because of technological progress. The model recognizes human capital as a significant tool for continued endogenous growth. Human capital is accumulated through new skills, knowledge and improved efficiency and productivity of the workforce. The findings hence suggest that increased investment in healthcare would result to enhancement of human capital which will accelerate economic growth. The study findings also support the findings from a study by Aboubacar and Xu (2017) that private health investment had a significant effect on the economic growth of the countries in the region. Moreover, the findings concur with findings

from a study of 20 Asian countriesby Mehmood et al. (2014) that there was a long run relationship between private health investment and income per capita.

The last hypothesis of the study was;

H_{03}: International NGOs investment in health has no significant effect on the development of the economy in Kenya

Study results indicated that investment in health by INGOs did not have a significant effect on GDP ($\beta = 0.3232$; $p > 0.05$). The null hypothesis was therefore accepted. These findings contradicted findings from a study conducted in Myanmar by the Global Health Fund (2016) whose findings suggested that assistance for health provided by international organizations had enabled the country to reach grand convergence and pro-poor universal health coverage causing the country to improve its human capital and productivity. The findings also disagree with findings by Martin et al. (2012) that investment by global funds into health positively influenced economic growth. However, the findings concur with findings from a study in Nigeria by Eneji et al. (2013) that there was a weak and insignificant causal relationship between health investments by INGOs and economic development.

Lastly, the study developed the normalized cointegration equation which is presented in Table 4.7. The results from the study suggest that in the long term, the three independent variables included in the study (public investment in healthcare, private investment in healthcare and investment in healthcare by INGOs) had an effect on GDP (chi square = 7285.157; $p < 0.05$). The results also indicate that public investment in health ($\beta = -0.0128$; $p < 0.05$) and private investment in health ($\beta = -0.3685$; $p < 0.05$) had a significant long term causal effect on GDP. However, investment in health by INGOs did not have a significant long term causal effect on GDP($\beta = -15.1680$; $p > 0.05$).

Table 4.7: Normalized Cointegration Model

Equation	Parms	chi2	P>chi2
_ce1	3	7285.157	0.0000

Identification: beta is exactly identified

Johansen normalization restriction imposed

beta	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_ce1						
GDP	1	.	.	.	.	.
PIH	-.0128386	.0047886	-2.68	0.007	-.0222241	-.0034532
PrIH	-.3684913	.0056214	-65.55	0.000	-.3795091	-.3574735
IINGO	-15.16797	11.96497	-1.27	0.205	-38.61888	8.282943
_cons	-3.28e+08	.	.	.	.	.

4.9 Effect of Shocks in Investment in Health on GDP

The study used the impulse response functions (IRF) to assess the effect of structural shocks in investment in health on GDP. Moreover, IRFs were used to assess whether responses to the shocks died out with time. Figure 4.4 Presents the IRFs for impulses of public investments in health, private investment in health and investment in health by IINGOs on GDP.

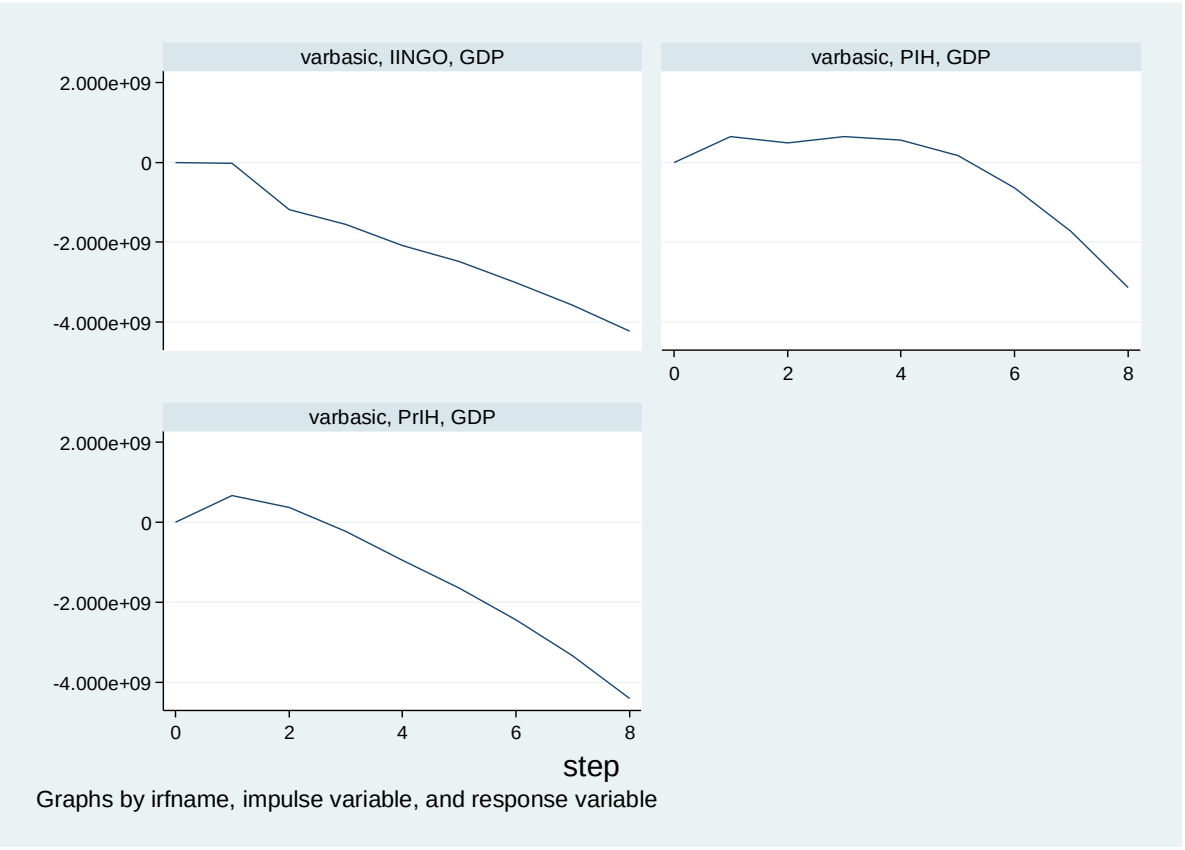

Figure 4.4: Effect of Shocks in Investment in Health on GDP

The results in Figure 4.4 indicate that impulse shocks on investments in health by IINGOs may is likely not to have any effect on GDP in the first year but is likely to cause GDP to decrease after the first year. This effect of the shock may not die out over time and hence it could be considered permanent. Further, shocks on public investment in health are likely to cause GDP to increase in the first five years while they may make GDP to decrease from year five. This might be permanent as it does not seem to die out. Similarly, shocks on private investment in health may cause a rise in GDP in the first two years but the GDP may fall after year three. This effect may also be permanent as it does not revert to its mean over time.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The summary of research findings, conclusion and recommendations are presented in this chapter. The chapter first presents a summary of the research findings which covers the three objectives. Conclusions are also presented in the chapter based on the study findings. Lastly, the chapter provides the recommendations which are made based on the findings arrived at in the study.

5.2 Summary of Findings

Below is a summary of the research findings which are presented in relation to the objectives of the study.

5.2.1 Effect of Public Investment in Health on Economic Development

The study findings suggested that public investment in health have a significant effect on economic development($\beta = 0.1149$; $p < 0.05$). These results supported Wagner's (1883) theory that increased public-sector spending spurs demand in the funded sector which then enables other sectors to increase their production to cater for the created demand. In the current study, Wagner's law applied as the findings suggested that public investment in the health sector can spur increased production in other sectors seeking to satisfy the increased demand in the health sector. This spurs productivity increases in different sectors thus leading to increased economic growth. the study supports the findings by Kareem et al. (2017) that public health investment led to economic growth.

5.2.2 Effect of Private Investment in Health on Economic Development

Study results showed that private investment in health sector has significant positive effect on economic development ($\beta = 0.2407$; $p < 0.05$). The study results support the Solow-Swan exogenous growth model (Solow, 1956). The results indicate that private investment in the health sector can lead to improvement in human capital which in turn leads to increased productivity and economic growth. The Solow-Swan model posits the health status of the population in a country to be a determinant of the labour force supply. When investments in the health sector are increased, this is expected to lead to an increase in the number of healthy labourers who will enhance the country's productive capacity. The findings hence support this theory as investment in the health sector by private entities is positively related to economic development.

5.2.3 Effect of Investment in Health by INGOs on Economic Development

Study findings suggest that investment in health by INGOs have no significant effect on economic development ($\beta = 0.3232$; $p > 0.05$). these results contradicted findings from various studies such as Global Health Fund(2016) and Martin et al. (2012) whose findings had indicated a positive relationship between investment in healthcare by international organizations and economic development. However, the study findings support findings from other studies such as Lustig (2014) and Eneji et al. (2013). Those studies had established no significant causal relationship between health investments by INGOs and economic development.

5.3 Conclusion

The study concludes that public investment in health have a significant positive effect on economic development in Kenya. This may due to the increased productivity of the

population due to improvement in human capital which in turn leads to improved productivity. Increased investment by government in the health sector can enhance economic development by increased productivity in other sectors that provide services and products to the health sector.

Secondly, the study concludes that private investment in the health sector have a positive and significant effect on economic development of Kenya. Avenues through which private investment can significantly improve economic development includes in enhancing human capacity for increased productivity and increased productivity in related sectors.

Lastly, the study concludes that investment in the health sector by international non-governmental organizations does not have a significant effect on economic development of Kenya. The reason behind this can be due to the contribution of INGOs being minimal compared to the contribution made by the government and the private sector in the health care sector.

5.4 Recommendations

The study makes the following recommendations. First, the government has increased its investment in the health sector which is laudable. The investment by government in the health sector surpassed the investment by the private sector in 2011 and it has been increasing since. This indicates focus by the government to enhance health of its citizens. However, at 3.4% of GDP, the investment in health is still below 7% set by the Abuja Declaration in 2001. The government therefore need to channel more funding to the healthcare sector to attain health positive outcomes and increase productivity of the population.

Secondly, the study recommends that the government should encourage private entities to increase their investment in the health sector in the country. From 1985 to 2011, private investment in health sector surpassed government spending. However, as government significantly increased its investment in 2011 onwards, this was not matched by a similar increase by the private sector. Policy framework should be designed that encourage the private sector to increase its investment in the health sector.

Lastly, the ministry of health and other government stakeholders should partner with INGOs and come up with a framework to ensure that INGOs increase their funding to financial deficit health sector units or activities. Moreover, the INGOs and government should have a governance framework to ensure that financing by INGOs is effectively utilized.

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Appendix I: Data Capture Form

Year	**Public investment**	**Private investment**	**International NGOs investment**	**GDP**
1985				
1986				
1987				
1988				
1989				
1990				
1991				
…				
….				
….				
…..				
2016				