UNIVERSITY OF EDUCATION, WINNEBA

INSURANCE AND ECONOMIC GROWTH IN GHANA.

ANDREWS OSEI-BONSU

MASTER OF PHILOSOPHY

2019

UNIVERSITY OF EDUCATION, WINNEBA

INSURANCE DEMAND AND ECONOMIC GROWTH IN GHANA.

ANDREWS OSEI-BONSU

8170180001

A thesis presented to the Department of Economics Education, Faculty of Social Sciences, submitted to the School of Graduate Studies in partial fulfilment

of the requirements for the award of the degree of
Master of Philosophy
(Economics)
In the University of Education, Winneba

JULY, 2019

DECLARATION

I, ANDREWS OSEI-BONSU, declare that this thesis, with the exception of quotations and references contained in published works which have been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

SIGNATURE: ....

DATE: ………………………………

SUPERVISOR'S DECLARATION

I/ We declare that, the preparation and presentation of this thesis work was supervised in accordance with the guidelines for supervision of thesis/dissertation/project as laid down by the University of Education, Winneba.

Dr. Anselm Komla Abotsi (Principal Supervisor)

Signature: ………………………

Date: ……………………………

Dr. Emmanuel Carsamer (Co- Supervisor)

Signature: ....

Date: …………………………....

DEDICATION

I dedicate this work to my family especially my wife, children, brothers and sisters. To my beloved late Parents, may their souls rest in perfect peace.

ACKNOWLEDGEMENTS

I owe profound gratitude to my principal supervisor Dr. Anselm K. Abotsi and Co- Supervisor Dr. Emmanuel Carsamer for their invaluable input, support, constructive comments, suggestions and encouragement that made the completion of this research work possible. I am grateful and may God bless you all.

I also wish to express my sincere gratitude to all my teachers/ lecturers who in various ways have equipped me with knowledge and skills to be able to produce this thesis.

I really appreciate each and every one who has contributed to the success of this research especially Mr. Emmanuel Asare Bediako for his enormous support. Finally, May the almighty God bless all friends and loved ones who prayed, encouraged and motivated me.

TABLE OF CONTENT

Content **Page**

LIST OF TABLES

LIST OF FIGURES

FIGURES **PAGE**

ABBREVIATIONS

AIC	Akaike Information Criterion
ARCH	Autoregressive Conditional Heteroskedasticity
ARDL	Autoregressive Distributed Lag
CAGR	Compound Annual Growth Rate
CUSUM	Cumulative Sum
CUSUMSQ	Cumulative Sum of Square
DFID	Department for International Development
DOLS	Dynamic Ordinary Least Square
FPE	Final Prediction Error
GDP	Gross Domestic Product
GFDD	Global Financial Development Database
GMM	Generalized Method of Moments
GSS	Ghana Statistical Service
HQ	Hannan- Quinn Information Criterion
IAIS	International Associations of Insurance Supervisors
IRF	Impulse Response Function
LM	Lagrange Multiplier
LR	Log-Likelihood Ratio
NIC	National Insurance Commission
OBG	Oxford Business Group
OECD	Organization for Economic Co-operation and Development
PNDC	Provisional National Defense Council
R&D	Research and Development

SIC	Schwarz Information Criterion
SSA	Sub-Saharan Africa
TFP	Total Factor production
UNCTAD	United Nations Conference on Trade and Development
VDC	Variance Decompositions
VECM	Vector Error Correction Model
WDI	World Development Indicators

ABSTRACT

The study was necessitated by the fact that insurance has been recognized by many researchers as having effect on economic growth but little has been done in that regard in Ghana. The main objective of the study is to examine the effect of insurance on economic growth in Ghana using quarterly data from the first quarter of 2006 to the second quarter of 2018. The study employed Johansen and Juselius cointegration approach and Vector Error Correction Model (VECM). Findings revealed that there is a significant and positive both short and long run relationship between insurance and economic growth in Ghana. There is also a bidirectional causality between insurance and economic growth. The study recommends that in order to promote economic growth, attention must be given to the development and implementations of policies that promote an increase in coverage and access of insurance products in order to increase premium. The regulatory body, National Insurance Commission (NIC) should reinforce existing policies such as compulsory motor insurance, compulsory fire insurance for private/ public buildings, etc. in order to increase premium income.

CHAPTER ONE

INTRODUCTION

1.0 Background to the study

The theory of economic growth and the factors affecting it are one of the most important concerns of many economists and macroeconomic research. This assertion is confirmed by many reasons including the number of theories developed, the empirical analysis conducted as well as the discussions and working papers written on the topic for the past three decades. Economic growth is the continuous improvement in the capacity to satisfy the demand for goods and services resulting from increased production scale and improved productivity (Department for International Development (DFID) annual report 2010). In other words, economic growth is an increase in the goods and services produced by an economy in a given year. Again, economic growth can be explained as the increase of per capita gross domestic product (GDP) or aggregate income, Dynan (2018). It is often measured in the rate of change in real GDP.

Economists in trying to understand what goes into the economy in order to achieve growth came out with various models of growth. The classical economic school of thought with the proponent being Adams Smith (1776) came out with capital accumulation and division of labour as ingredients of the growth process. According to him, "income per capita must in every nation be regulated by two different circumstances; first by the skill, dexterity and judgement with which its labour is generally applied. Secondly, by the proportion between the number of those who are employed in useful labour and that of those who are not so employed", Smith (1776).

Determining factors and patterns of economic growth has attracted the attention of researchers for a long time (Njegomir and Stojić, 2010). As there was always the unexplained percentage of growth, three economic growth theories emerged, classical, neo-classical and endogenous growth theory, which is usually referred to as new growth theory. Endogenous models have been expanded to incorporate financial sector spillovers and the quality of financial institutions.

According to Levine (1997), the financial services sector has been a major economic driver in every economy across the world. Levine (1997) found a strong literature supporting a significantly positive correlation between banking, financial development and a country"s economic growth. Merton (2004) notes that "….in absence of a financial system that can provide the means for transforming technical innovation into broad implantation, technological progress will not have a significant and substantial impact on the economic development and growth…" Financial sector intermediary development stimulates economic growth by creating economic conditions that enhance efficiency in resource allocation (Levine, 2004). From the above, a strong financial sector is very key in the economic growth of a country.

Levine (1997) posited that market frictions such as information and transaction costs motivate the emergence of financial markets and intermediaries, which serve multiple functions: facilitating the trading, hedging, diversifying, and pooling of risk; allocating resources; monitoring managers and exerting corporate control; mobilizing savings; and facilitating the exchange of goods and services. These financial functions, in turn affect economic growth through the channels of capital accumulation and technological innovation.

Economists such as Schumpeter (1934) had long recognized the importance of financial markets in the development process. Schumpeter (1934) contends that the services provided by financial intermediaries are important for stimulating technological innovation and economic growth. According to him, a well-developed financial system can channel financial resources to their most productive use, leading to the growth of the economy. Obviously, a strong financial sector has a significant positive impact on total factor productivity, which translates into high long-run economic growth (Haiss and Sumegi, 2008). The financial sector consists of institutions that mobilize funds from idle surplus agents for onward transmission to productive agents for utilization (investment). These institutions are banks, capital markets, insurance companies, etc.

Most of the literature for economic growth and financial development nexus is concentrated on specific problems related to the banking industry or capital markets and possible solutions to overcome the challenges they pose. Levine, Loayza, and Beck (2000) established a significantly positive correlation between banking/financial industry development and a country‟s economic growth.

The banking sector played a function known as financial intermediary, these functions include mobilization of savings, enhancing economic activities in the private sector, facilitating technological progress, etc. Financial intermediaries can generate growth if the growth is dependent on how efficient the financial industry mobilizes and allocates savings in the economy. By attracting deposits from various economic units in the economy and financing investment projects in the private sector, financial intermediaries generate higher levels of economic growth, support firms that depend on external finance and reduce the financing constraints of small and medium-sized enterprises (Beck, Maimbo, Faye and Triki, 2011).

Financial innovations help to reduce transaction and information costs, efficient financial markets help economic agents to hedge, trade and pool risk, which leads to raising investment and economic growth. To Ang (2008), the role of other intermediaries such as insurance institutions in the growth nexus has been largely ignored in terms of research as compared to banks and stock markets.

UNCTAD (1964) acknowledged that “a sound national insurance and reinsurance market is an essential characteristic of economic growth”. The rapidly globalizing world has changed the life of the individuals in the last century, and increased earnings which have led to an increase in the motives of the individuals and their property protection. This has increased the share of insurance in the financial sector (Lee, Lee, and Chiu, 2013).

The insurance sector is not an economic unit that only offers insurance against the risk of people and organizations, but it also helps macro-economy by bringing employment and foreign exchange to a country (Outreville, 1996). Dickinson (2000) posited that a sector of insurance more developed and in particular life insurance funds provides long and stable maturity funds for the development of public infrastructure and at the same time, reinforce the country's financing capacity. Insurance is a very important sub-sector of the financial sector, which accounts for a significant portion of the economy in a developed market. When insurance companies collect relative premium from many economic agents in the economy, they are able to mobilize like none other institution, a large pool of funds that could be invested in both short and long- term periods. Insurance is very key to the ability of emerging and lower-middle-income economies to grow, develop and provide a reliable cover for risk to the citizens (Akanro, 2008). Insurance provides stability by allowing large and small businesses to operate with a lesser risk of volatility or failure (Akanro, 2008).

Insurance plays a number of valuable economic functions that are largely different from other types of financial intermediaries. In order to highlight specifically the uniqueness of insurance, it is worthy to focus on those services provided, excluding for instance, the contractual savings features of whole or universal products. The indemnification and risk pooling properties of insurance facilitate commercial transactions and the provision of credit by mitigating losses as well as the measurement and management of non-diversifiable risk more generally (Akinlo and Apanisile, 2014). Typically, insurance contracts involve small periodic payments in return for protection against uncertain, but potentially severe losses. Among other things, this effect of income smoothing helps to avoid excessive and costly bankruptcies, and facilitate lending to businesses. Most fundamentally, the availability of insurance enables risk-averse individual and entrepreneur to undertake higher risk, higher returns activities than what they would do in the absence of insurance, promoting higher productivity and growth (Brainard and Schwartz, 2008).

The Ghanaian insurance industry has been transformed significantly. For instance, the transformation of the industry from state-led to a market-driven one due to the privatization of state-owned insurance firms; the insurance Act 724 (2006) ensured the legal separation of insurance companies into life and non-life entities; and the massive influx of foreign insurers onto the market. All these changes led to a keener competition in the insurance industry. According to the 2017 edition of the Oxford Business Group (OBG) Report, the value of Ghana‟s insurance market will reach US$600 million in 2018, from US$400million in 2014, based on a projected annual growth rate of 8.5percent. The report cited an Ernst & Young (EY) Global Limited 2016 survey, which posits that Ghana had the highest potential for growth in insurance premiums, and the least in terms of risk in sub-Saharan Africa (Oxford Business Group (OBG), 2017). UK-based research firm, Timetric, reported that as of February 2016, Ghana‟s middle class was growing along with the economy and as a result, the demand for insurance is expected to increase. (OBG, 2017).

In view of the important role of insurance in the growth process, some empirical studies have been undertaken on its impact on economic growth. Even where such studies exist, a significant number of those studies have concentrated mainly on Europe, North America, Asia, Latin

America, and some selected sub-Saharan African countries. Phutkaradze (2014) employing multiple regression analysis, found a negative and statistically non-significant correlation between insurance and GDP growth in post-transition economies. Azman-saini and Smith (2010) using dynamic panel data analysis results, demonstrated that insurance sector development affects growth predominantly through productivity improvement in developed countries, while in developing countries it promotes capital accumulation. Ouedraogo, Guerineau, and Sawadogo (2016) using panel data of developing Sub-Saharan Africa (SSA) countries, realized that life insurance effect on growth is less for SSA and British legal system countries, compared to non-SSA and non-British legal system countries.

Majority of the finance-growth nexus studies on Ghana have focused mainly on the causality between bank-based financial development and economic growth, rather than on the effect of insurance on economic growth. Agyei"s (2015) results support a positive long-run relationship between financial development and economic growth. The findings of Samanhyia, Donbesuur, and Owusu-Ansah (2014) suggest that one will judge financial sector development as having a negative or positive effect on growth depending on the choice of indicator as a proxy for financial sector development. The current study seeks to examine the effect of insurance on economic growth in Ghana

1.1 Problem Statement

There is a plethora of literature on financial development and economic growth in Ghana. Agyei (2015) found a positive long-run relationship between financial development and economic growth. Samanhyia et al. (2014) found a mixed effect on growth depending on the choice of indicator as a proxy for financial sector development. Others also focused on the banking sector, the capital market and its impact on economic growth. For example, Agyapong, Asante and

Anokye (2011) using Autoregressive Distributed Lag (ARDL)/ Dynamic Ordinary Least Square (DOLS), found that bank competition and stock market development granger cause economic growth in Ghana.

Adu-Asare‟s (2014) results showed that there is unidirectional Granger causality from bank competition to economic growth but bidirectional Granger causality between financial innovation and economic growth. Armah (2015) who employed the Johansen multivariate cointegration technique and vector error correction model realized that in the long run, the share of foreign banks is positively related to economic growth whilst bank competition is negatively related to economic growth. Armah (2015) also found that the share of foreign banks and bank competition are not significantly associated with economic growth, in the short run. Manu‟s (2017) results from the VECM regression analysis revealed that the Stock Market contributes positively to economic growth only in the short-run and a unidirectional causal link between market capitalization ratio and GDP, running from development in the size of the Stock Market to economic growth.

An attempt was made by Alhassan and Fiador (2014) in the insurance growth nexus which observed a long-run positive relationship between insurance penetration and economic growth, a unidirectional causality was found to run from aggregate insurance penetration, life and non-life insurance penetration to economic growth to support the „supply-leading‟ hypothesis. They used a yearly data spurning from 1990 to 2010 and ARDL as their methodology. The current study intends to use gross insurance premium as a proxy for insurance instead of the insurance penetration which is premium as a ratio of GDP.

According to International Association of Insurance Supervisors (IAIS) 2017 report, the penetration rate provides a good numerical basis for international comparison across jurisdictions and regions. But it does not reveal detailed information about the actual dynamics of the local insurance market. It does not indicate how many people actually have insurance coverage, nor does it signify the quality of coverage and whether it provides value to clients. Again, the current study believes that, as a policy variable it should be free from possible serial correlation. For the reasons above this study side with authors such as Tong (2008), Akinlo (2012), Akinlo and Apanisile (2014), Okonkwo (2019) etc. that gross written premium is the best proxy to capture insurance. This study also increased the control variables from three to five, and used Johansen and Juselius cointegration procedure which has the ability to estimate multiple long run relationship and different order of integration. Again, Han *et al*. (2010) also explored the relationship between insurance and economic growth for 77 countries over the period of 1995–2004 using generalized methods of moments (GMM). Their results proved that aggregate (non-life and life) insurance have a much significant effect on economic growth for developing countries as compared to developed countries. Since Ghana is a developing country, the study used aggregate insurance written premium as a proxy for insurance.

Given the growing importance of the insurance sector and economic growth, there is the need to explore the effect of insurance on economic growth in Ghana, since very little has been done in that regard. This study intends to use a more rigorous methodology and expand the coverage to empirically examine the effect of insurance on economic growth in Ghana.

1.2 Research Objectives

The main objective of the study is to assess the effect of insurance on economic growth in Ghana.

The specific objectives to be achieved are to:

1. Examine the effect of insurance on economic growth in Ghana.
2. Analyze the dynamic interactions between insurance and economic growth in Ghana.
3. Examine the effect of innovations (shocks) of insurance on economic growth.

1.3 Research Questions

To achieve the above research objectives, the researcher seeks to answer the following research questions.

1. What is the effect of insurance on economic growth in Ghana?
2. What are the dynamic interactions between insurance and economic growth in Ghana?
3. What is the effect of innovations (shocks) of insurance on economic growth?

1.4 Significance of the study

Economic growth and the factors affecting it are one of the most important concerns of many economists and governments as a whole. In view of this, the research results will contribute to knowledge and also add to the existing literature. The research results are relevant to policy makers, finance experts, players of the insurance industry and researchers in the sense that few or little is known about the domain. Investigating the insurance and economic growth can be of principal interest to government and its agencies in the regulation of the insurance industry. It will help stakeholders formulate policies such as compulsory life and property insurance which will increase premium collection capable of enhancing the development and effectiveness of the insurance industry and its corresponding effects on economic growth in Ghana.

Again, the results of the study can serve as an appropriate guide to the insurance sector reforms and also help evaluate the effectiveness of the reforms. This will help achieve a more competitive, healthier, efficient and deeper insurance sector. This study will also address the inherence in the methodology as appears in the literature.

1.5 Scope

The study will focus precisely on the insurance and its linkage with economic growth in Ghana. In line with the research objectives, empirical investigations will be carried out on the impact of insurance on the economic growth prospects of the Ghanaian economy using quarterly data of Gross Insurance Premium from National Insurance Commission (NIC), Global Financial Development Database (GFDD) from the World Bank and Gross Domestic Product (GDP) from Ghana Statistical Service (GSS), World Development Indicators (WDI) Database.

The study will also use financial development, government expenditure, trade openness and inflation as control variables to test the multivariate causality between insurance and economic growth in Ghana. The data set is from the first quarter of 2006 to the second quarter of 2018. The duration was chosen due to the availability of data.

1.5 Structure and Organization of the study

The study is organized as follows, the chapter one of the study introduces the subject and covers areas such as background to the study, statement of the problem, research objectives, research questions, significance of the study, scope of the study, and limitation of the study. The second chapter reviews relevant literature on insurance and economic growth, with subheadings such as conceptual review, theoretical review and empirical review. The third chapter discusses the theoretical framework of the research, methodology employed, and data analysis techniques. The fourth chapter covers; data presentation, analysis, and discussions of the findings. The last chapter which is chapter five is organized into introduction, summary of findings; summary of test of hypotheses, recommendations, and conclusion which is followed by references and appendices.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents theoretical and empirical literature on insurance and economic growth in Ghana. The first section will be theoretical literature on insurance and economic growth in Ghana. The sub-headings to be reviewed under the theoretical literature are economic growth, the state of Ghana"s economy, finance-growth nexus, insurance, the history of insurance in Ghana, and the state of the insurance industry in Ghana. The empirical findings of previous studies on insurance- growth nexus starting from the other parts of the world (Europe, America, Asia) narrowing it down to Africa, further to West Africa and finally to Ghana. Lastly, the third section summarizes the chapter.

2.1 Conceptual Review

2.1.0 *Economic Growth*

Economic growth is the continuous improvement in the capacity to satisfy the demand for goods and services resulting from increased production scale and improved productivity. According to Amadeo (2019), economic growth is an increase in the production of goods and services over a specific period. To be most accurate, the measurement must remove the effects of inflation. He further explained that economic growth creates more profit for businesses. As a result, stock prices rise which gives companies capital to invest and hire more employees. As more jobs are created, incomes rise, making consumers have more money to buy additional products and services driving higher economic growth. For this reason, all countries want positive economic growth. This makes economic growth the most-watched macroeconomic indicator. Simply put, we can achieve economic growth by increasing the quantity or quality of the working age population, the tools that they have to work with, and the recipes that they have available to combine labor, capital, and raw materials, a second method of producing economic growth is technological improvement which will lead to increased economic output.

Investopedea.com posits that Gross Domestic Product (GDP) is the best way to measure economic growth since it takes into account the country's entire economic output. The GDP includes all goods and services that firms in the country produce for sale, it measures final production. It doesn't matter whether they are sold domestically or overseas. It doesn't include the parts that are manufactured to make a product. It includes export because they are produced in the country and imports are subtracted from economic growth. Most countries measure economic growth each quarter. According to the World Bank, the most accurate measurement of economic growth is real GDP. It removes the effects of inflation. The GDP growth rate uses real GDP.

Ivic (2015) postulates that economic growth is the continuing increase in the volume of production in one country, i.e. GDP growth. It is associated with the accumulation of capital, i.e. with investments. According to him, the capital means permanent production of goods that serve as a work tool in the production of other goods which can be done through investment. Ivic (2015) classified investment as investing in fixed and revolving funds, that is, the part of the social product that is not spent, but it is used for replacement and construction of new capacity. Investments are divided in different ways according to purpose, according to their technical structure and according to the criteria of funding sources. From the above, the financial sector which is the wheel of all classification of investment comes into the scene. This study seeks to find out the effect of insurance, which is one of the sub-sectors of the financial, sector on economic growth in Ghana.

2.1.1 Ghana's Economy

Ghana‟s economic growth pattern has varied significantly, and this is reflected in the sectoral distribution of national output shifting from agriculture in favour of industry and services sectors. Estimates from World Development Indicators (1984-2012) indicate an annual average growth rate of agriculture of about 3.3% between 1984 and 2012 compared with 7.8% for industry and 6.7% for services. A rebase of the national accounts in 2006 further pushed the contribution of the sector to GDP to an average of 50%. The strong show of services in terms of growth and sectoral contribution has emanated largely from improved growth performance of trade, hospitality, telecommunication, and financial subsectors, aided by the liberalisation of activities that have seen increased private sector participation in the sub-sector, (Alagidede et al 2013).

The shift from agricultural dominance to services in real GDP may be perceived as structural transformation of the economy. According to (Alagidede et al., 2013), structural transformation of economic arrangement represents an increasing ability of the economy and society to respond efficiently and effectively to changing and growing pressures for enhanced welfare among people. This entails a process by which proportionate increase in employment and output of an economy are accounted for by other sectors other than agriculture. According to Darko (2015), the Ghanaian economy has consistently performed better than Sub-Saharan Africa, countries in terms of economic performance. The total economic performance of Ghana has expanded at an average annual rate of 9.7% from 1980 to 2013 compared to other Sub-Saharan African (SSA) countries which have recorded an average expansion rate of 7.02%. From the GSS GDP estimates for 2018 showed a growth rate of 6.3 percent compared to 8.1 percent in 2017. Services sector remains the largest sector. Its share of GDP increased from 46.0 percent in 2017 to 46.3 percent in 2018. However, the sector's GDP growth rate decreased from 3.3 percent in

2017 to 2.7 percent in 2018. The study would like to find out if insurance has a role to play in the growth of the Ghanaian economy by empirically examining the effect of insurance on economic growth in Ghana.

2.1.2 Insurance

Insurance has been defined by various writers and experts in different contexts over the years. The term insurance may be defined as a co-operative mechanism to spread the loss caused by a particular risk over a number of persons who are exposed to it and who agree to insure themselves against that risk (Pal *et al*., 2007). Emmanuel (2001) defines insurance as a contract whereby one party, called the insurer, agrees in consideration of the money paid to him called, the premium, by another person or party known as the insured, to indemnify him (the insured) against any loss resulting to him on the happening of certain events, or to pay a certain specified sum of money on the happening of the specified event or events.

According to Craig and Monique (2003) insurance is defined as a method of protecting people from financial loss. To them, protection is accomplished by the transfer of the chance of loss from the individual to the group to which he or she belongs. A small amount of money called premium is collected from each member of the group and is then used to pay those members who suffer financial loss. Holyoake *et al*. (2005) opine that insurance acts as a stimulus for the activity of businesses that are already in existence. This is done through the release of funds for investment in the productive side of the business, which would otherwise have to be held in easily accessible reserves to cover any future loss.

From the researcher‟s point of view, insurance is a risk transfer policy that ensures that full or partial financial reimbursement for the loss or damage caused by some unforeseen circumstances of which the policyholder has no control of. Insurance institutions perform similar functions, just as banks and capital markets, such as mobilizing funds through premium payments and making it available for investors or investing directly. Thus, they serve as financial intermediators to individuals, business units and governments. By accepting premiums, insurance institutions create funds that are invested in the capital market and thus contribute to economic growth. Again, as a provider of risk transfer and institutional investor, insurance institutions contribute to economic growth by mobilizing domestic savings, managing risks and losses more efficiently (Skipper, 1997). It is a form of risk management primarily used to hedge against the risk of a contingent, uncertain loss.

An entity which provides insurance is known as an insurer, insurance company, insurance carrier or underwriter. A person or entity who buys insurance is known as an insured or policyholder. Recently, insurance growth has been more prevalent as a result of changing regulation and increased risk aversion. Insurance companies are classified into two main groups: specialist companies and composite companies. Specialist companies are the ones that underwrite only one class of business. Thus, an insurance company could be a Life Assurance one, authorized to underwrite only life insurance, or a non-life insurer (General insurance company) authorized to underwrite general businesses. Composite insurance companies are those authorized to underwrite both Life and Non-life insurance policies.

2.1.3 History of Insurance in Ghana

Ghana Insurance Industry traces its root to the colonial era when the insurance business was transacted through foreign trading companies who acted as chief agents of insurance companies in the United Kingdom and elsewhere. Insurance was introduced in Ghana in the late 19th Century by the British merchants who were bound by the "British merchant shipping laws". The law basically states that all goods being shipped into the British colonies should be carried by ships owned by British citizens (Appietu-Ankrah, 2008). Implying, the goods being carried by ships owned by its citizens were insured by insurance companies in the United Kingdom. As a result, these insurance companies in the United Kingdom saw the need to have agents in Ghana where the goods were sent.

In 1924, Royal Exchange Assurance Corporation which was then represented by its Chief Agent, Barclays Bank, opened its branch in the Gold Coast. It then became the first insurance company to operate in Ghana. It is now known as Enterprise Insurance Company after going through a series of changes. After that, many other foreign companies opened offices in the Gold Coast, NIC (2016). The Gold Coast Insurance Company was the first local insurance company to be established in the Gold Coast in 1955. It was renamed Ghana Insurance Company when Ghana gained its independence. It traded mainly life assurance policies targeted at Gold Coasters and other Africans in the Gold Coast. Prior to that, life policies were sold to only Europeans.

In 1958, a second local company, Ghana General Insurance Company was established with Ghanaian and American shareholders to underwrite fire and motor insurance business. The State Insurance Corporation was incorporated in 1962 by an Executive Instrument, EI 17 when three existing insurance companies (Gold Coast Insurance Company, Ghana General Insurance Company, and Co-Operatives Insurance Company) were merged by the Government to form the State Insurance Corporation.

The year 1972 was a significant year for the development of insurance in Ghana. A number of insurance-related legislations were passed, the most significant being NRCD 95 which established the Ghana Reinsurance Organization in October 1972, with statutory requirements to reduce the outflow of premiums from the country in the form of reinsurance premiums. The Decree also made it compulsory for all insurance companies operating in the country to be incorporated in Ghana with their head offices also located in Ghana, with 40% of the shares owned by Ghanaians. In 1976, there were 18 insurance companies with one (1) reinsurance industry, and insurance brokerage firms were established (Bank of Ghana achieves)

The 1989 insurance law, PNDC Law 229 led to the establishment of the National Insurance Commission (NIC) which was amended and improved in 2006 with the insurance Act 724. The commission's mandate is to ensure effective administration, supervision, regulation, monitoring, and control the business of insurance by protecting policyholders and the insurance industry, NIC (2016). The Insurance Act 724 of 2006, however, outlaw‟s composite insurance companies in Ghana. An insurance company can either register as a life assurer or a general insurer but not both. The regulator advocated this change so that companies could specialize in one area, gaining the expertise necessary for the industry to expand.

NIC is mandated to perform a wide spectrum of functions including licensing of entities, setting of standards and facilitating the setting of codes for practitioners. The Commission has the mandate to approve rates of insurance premiums and commissions, provide a bureau for the resolution of complaints and arbitrate insurance claims when disputes arise. They are also responsible for the provision of recommendation to the sector Minister for policy formulation, supervision of practitioners, enforcement of compliance and public education.

Another key mandate of the Commission is to ensure the development of strong relationships with regulators from other countries and international bodies such as the International Associations of Insurance Supervisors (IAIS), and ensuring the conformity of practitioners to internationally accepted standards. The enactment of Act 724 was a major milestone towards a robust insurance regulatory environment as it empowers and grants adequate powers to the commission. Currently, 55 insurance companies have been registered by the national insurance commission comprising 26 non-life companies, 24 life companies, and 5 re-insurance companies, NIC report 2016.

The value of the country‟s insurance market will reach US$600 million in 2018, from US$400million in 2014, based on a projected annual growth rate of 8.5percent, the 2017 edition of the Oxford Business Group Report has shown. The report cited an EY January 2016 survey as saying Ghana had the highest potential for growth in insurance premiums, and the least in terms of risk in sub-Saharan Africa. Measured as a percentage of GDP, insurance penetration remains below two percent of the population, which underpins the vast but yet to be exploited potential. The sector accounted for about 5 percent of asset ownership in the financial sector, as at the first quarter of 2016. As Ghana‟s middle class grows along with the economy, the Oxford Report says the demand for insurance is expected to also increase. Additionally, it says the country‟s population is growing steadily, which could help boost the industry. For example, New research by UK-based Information Solutions and Technologies Company called Timetric, estimates that the size of the country‟s life insurance industry alone will more than double by 2020, from $150.8 million in 2014 to approximately $413 million in 2019 (Business and Financial Times Aug. 2014).

Timetric‟s report cited in Business and Financial Times (Aug. 2014) reveals that the Ghanaian insurance industry is one of the fastest-growing insurance industries in Africa, in terms of gross written premium. The report covers an exhaustive list of parameters, including written premium, incurred loss, loss ratio, commissions and expenses, combined ratio, total assets, total investment income, and retentions. In addition, it provides historical values for the Ghanaian insurance industry for the report‟s 2009-2013 review period and forecast figures for the 2013-2018 forecast period. It also offers a detailed analysis of the key segments and categories in the Ghanaian insurance industry, along with forecasts until 2018. According to the Business and Financial Times (Aug. 2014), Timetric reported that the industry grew at a compound annual growth rate (CAGR) of 30.4 percent in 2013. This was supported by growth in the life and non-life insurance segments, with the former having posted a CAGR of 37.1 percent and the latter having registered a CAGR of 27.7 percent.

The insurance industry is dominated by the non-life segment, which constituted 48.8 percent of the total gross written premium in 2013; this was followed by life insurance with a share of 43.6 percent, and personal accident and health insurance with a share of 7.6 percent. The report said the industry grew at a CAGR of 30.4 percent during the review period (2009-2013), as compared to other African countries, such as Chad with 2.3 percent, Cote d‟Ivoire with 3.9 percent, Cameroon with 9.4 percent and Uganda with 18.8 percent. The industry, according to the survey, is expected to grow at a forecast-period CAGR of 23.0 percent in 2018, supported by an increase in oil and gas production, the implementation of compulsory fire insurance for commercial buildings, and an increase in gold production (Oxford Business Group Report cited in Business and Financial Times Aug. 2014). According to the National Insurance Commission‟s report 2017, Industry gross premium amounted to GHS 2.4 billion up by 26% from GHC 1,929 million at the end of 2016 which stood at 24% from GHC 1,560 million over the same period in 2015. The total premium for life insurance stood at GHC 859 million while non-life business amounted to GHC 1,070 million. This represented a contribution of 45% and 55% respectively in 2016 and compares with a similar contribution of 45% and 55% in 2015 as displayed on tables 1.1, 1.2 and 1.3.

Table 1.1: Life insurance Assets

	LIFE		
	2016 (GHS M)	2015 (GHS M)	GROWTH RATE
TOTAL ASSETS	2241	1744	28%
TOTAL INVESTMENT	1939	1465	32%
ACTUARIAL LIABILITIES	1434	1165	23%
TOTAL CAPITALIZATION	649	463	40%

Source: NIC report, 2016

Table 1.2: Non-Life Insurance Assets

	NON LIFE		
	2016 (GHS M)	2015 (GHS M)	GROWTH RATE
TOTAL ASSETS	1506	1320	14%
TOTAL INVESTMENT	886	620	43%
TECHNICAL PROVISIONS	547	566	34%
TOTAL CAPITALIZATION	704	545	29%

Source: NIC report, 2017

Table 1.3: Gross Insurance Premium

YEAR	PREMIUM INCOME (GHS M)	PREMIUM GROWTH RATE
2009	342,973,719	
2010	458,117,746	33.5%
2011	628,528,775	37.2%
2012	850,657,054	35.3%
2013	1,052,090,981	23.6%
2014	1,239,853,442	17.8%
2015	1,560,679,185	26%
2016	1,928,838,573	24%
2017	2,439,189,432	26%

Source: NIC report, 2017

According to the NIC 2017 report, the investment mix of the insurance industry is displayed in Table 1.4 and 1.5. It has been disaggregated in life and non-life insurance industries.

Table 1.4: Investment Mix of Life Insurance Industry for 2017

Investment Mix	In Percentages (%)
Government Securities	21
Deposit at License Banks	33
Other Deposits	10
Equities (Listed and Unlisted)	7
Mutual Funds	3
Property Investment (PPE)	23
Related Party Investment	2
Other Investment	1

Source: NIC report, 2017

Table 1.5: Investment Mix of Non-Life Insurance Industry for 2017

Investment Mix	In Percentages (%)
Government Securities	21
Deposit at License Banks	42
Other Deposits	11
Equities (Listed and Unlisted)	14
Mutual Funds	3
Property Investment (PPE)	8
Related Party Investment	-
Other Investment	1

Source: NIC report, 2017

From the regulators and industry players" point of view which is backed by strong facts and figures, the insurance industry is growing and it is expected to grow further. This therefore justified the importance of examining the effect of insurance demand on economic growth in Ghana.

2.2. Theoretical Review

2.2.0 Economic Growth Models

Determining factors and patterns of economic growth has attracted the attention of researchers for a long time (Njegomir and Stojić, 2010). As there was always the unexplained percentage of growth, three economic growth theories emerged: classical, neo-classical and endogenous growth theory which is usually referred to as new growth theory. It all started with Harrod (1939) and Domar (1946), they were touted as the pioneers of modern economic growth model.

Roy F. Harrod introduced the concepts of warranted growth, natural growth, and actual growth in his paper "An Essay in Dynamic Theory," Harrod (1939). The warranted growth rate is the growth rate at which all savings are absorbed into investment. This is the growth rate at which the ratio of capital to output would stay constant. The natural growth rate is the rate required to maintain full employment. Harrod‟s model identified two kinds of problems that could arise with growth rates. The first was that actual growth which was determined by the rate of saving and that natural growth was determined by the growth of the labor force. There was no necessary reason for actual growth to equal natural growth, and therefore the economy had no inherent tendency to reach full employment. This problem resulted from Harrod‟s assumptions that the wage rate is fixed and that the economy must use labor and capital in the same proportions.

The second problem implied by Harrod‟s model was unstable growth. If companies adjusted investment according to what they expected about future demand, and the anticipated demand was forthcoming, warranted growth would equal actual growth. But if actual demand exceeded anticipated demand, they would have underinvested and would respond by investing further. This investment, however, would itself cause growth to rise, requiring even further investment. The same story can be told in reverse if actual demand should fall short of anticipated demand. The result then would be a deceleration of growth. This property of Harrod‟s growth model became known as Harrod‟s knife-edge. Here again, this uncomfortable conclusion was the result of two unrealistic assumptions made by Harrod:

(1) Companies naïvely base their investment plans only on anticipated output, and

(2) Investment is instantaneous.

In spite of these limitations, Harrod did get economists to start thinking about the causes of growth as carefully as they had thought about other issues, and that is his greatest contribution to the field.

Harrod‟s equilibrium analysis was based on three assumptions:

(i) Saving is proportional to national income, St = sYt; (2.0)

(ii) Investment, the demand for saving, is proportional to the growth of national income,

$I_t = g(Y_{t+1} - Y_t)$; and (2.1)

(iii) Saving equals investment, the demand for saving equals the supply of saving, $S_t = I_t$.

From this, one derives the „fundamental equation‟, $Y_{t+1} - \frac{Y_t}{Y_t} \equiv Pw = \frac{s}{g}$ 2.2

Where Y_{t+1} is the current growth, Y_t is previous growth, s is savings, I_t is investment, g is economic growth and Pw is the „warranted‟ rate of growth. Put differently, national income follows the first-order difference equation $Y_t = \frac{[\frac{g}{(g-s)}]}{Y_{t-1}}$ with 1 > g > s > 0, Domar (1946) using different model attained the same result.

Evsey Domar propounded neoclassical mathematical proposition on the process of economic growth in his 1946 paper on "*Capital Expansion, Rate of Growth and Employment*". The axiom put forward by Domar was that an economy will be in equilibrium when its productive capacity is equal to its national income by considering the relationship between capital accumulation and full employment. Domar (1946) adopted a classical doctrine where the labour force and its productivity were key to the economic growth paradigm which was based on the assumption that the growth rate of national income was a combined effect of the growth of labour and its productivity. The approach adopted by Domar (1946) was based on the general equilibrium theory, where demand meets supply which was developed in a closed economic setting, disregarding the possibility of having external economies or diseconomies. From the supply side, the rate of growth of the production function was a function of the productive capacity-capital ratio of the following order with respect to time (Domar 1946):

$$\frac{dP}{d\square} = I\sigma \qquad (2.3a)$$

Where:

I = Investment per year

ζ = Productive capacity

From the demand side, Domar defines the rate of growth of national income as a function of the rate of growth of investment over time through the multiplier driven by the marginal propensity to save, s. The demand function, therefore, is represented as (Domar 1946,):

$$\frac{dY}{d\square} = \frac{dI}{d\square} \times \frac{I}{s} \qquad (2.3b)$$

Where:

Y = National Income

s = Marginal propensity to save

Domar's general equilibrium position was, therefore, where supply meets demand (Domar 1946):

$$\frac{dY}{d\square} = \frac{dP}{d\square} \qquad (2.4a) \quad \frac{dI}{d\square} \times$$

$$\frac{I}{s} = I\sigma \qquad (2.4b)$$

By directly integrating both sides of equation (2.4b) with respect to time, Domar obtained the following equilibrium growth path for a closed economy:

$$I(t) = I_0 e^{\zeta s t} \qquad (2.5)$$

In Domar‟s world, for the economy to remain in equilibrium, this required the actual rate of investment, denoted *r,* to grow at the same rate as the required equilibrium rate of *s*ζ. From equation (2.5), differentiating with respect to time, we get:

$$\frac{dI}{d?} = s\zeta I_0 e^{s\zeta t} \quad (2.6a)$$

From equation (2.1), it follows that:

$$\frac{dY}{d?} = \zeta I_0 e^{s\zeta t} \quad (2.6b)$$

Domar then equates the actual investment rate to the productive capacity, $r = \zeta$. (Domar 1946):

$$\frac{dY}{d?} = rI_0 e^{s\zeta t} \quad (2.6c)$$

For Domar‟s equilibrium to hold:

$$\frac{\frac{dY}{d?}}{\frac{dP}{d?}} = \frac{rIoe^{s\sigma ?}}{s\sigma Ioe^{s\sigma ?}} \quad (2.7a)$$

The fundamental Domar growth model equation is, therefore:

$$\frac{\frac{dY}{d?}}{\frac{dP}{d?}} = \frac{r}{s\sigma} \quad (2.7b)$$

In restating Domar‟s proposition, for an economy to remain in a state of full employment, the actual rate of growth of investment should equal the productive multiplier, $r = s\zeta$. However, Domar‟s approach provided solutions that were paradoxical. Situations where $r > s\zeta$ implied a demand-creating effect that implied a shortage of capacity. For the equilibrium to hold, this meant that the rate of investment should fall towards the productive multiplier. Overall, Domar‟s (1946) economic growth path leads to a failure to attain full employment if the solution deviates from the equilibrium path given in (2.7b).

Harrod (1939) and Domar (1946) developed their models independently but have the same substance hence the name Harrod-Domar growth model. Their model simply suggests that economic growth depends on two things, the level of savings and capital-output ratio. According to Harrod-Domar, if a country is able to mobilize savings which will lead to investment and capital accumulation which depends on the quantity of capital-labour ratio, then that country will achieve economic growth. The same equation has recently reemerged as Piketty"s Second Fundamental Law of Capitalism (Piketty, 2014). Many development economists used it to help countries to achieve economic growth but were met with some challenges warranting an army of criticisms.

The main criticism of the model is the level of assumption, one being that there is no reason for growth to be sufficient to maintain full employment; this is based on the belief that the relative price of labour and capital is fixed, and that they are used in equal proportions. Brown (1988) argues that the Harrod-Domar model doubts whether annual investment growth would automatically be sufficient to maintain full employment. The criticisms of the Harrod-Domar model lead to the development of another economic growth model known as the most comprehensive growth model in the academic literature.

The Solow (1956) growth model shows how savings, population growth, and technological progress affect the level of an economy"s output and growth over time. The model assumes that GDP (economic growth) is produced according to an aggregate production function of technology. The production function takes the Cobb-Douglas form

$$Y_t = A_t K_t^{\alpha} L_t^{1-\alpha}, \; 0 < \alpha < 1 \qquad (2.8)$$

Where Y_t is the Output (GDP)

A_t is the technological progress or sometimes known as Total Factor production (TFP)

K_t is the capital input and

L_t is the labour input.

It is worthy to note that an increase in A_t or TFP increases the productiveness of other factors.

In addition to the production function, the Solow growth model had four other equations namely, capital accumulation, $K_t = (Y_t - C_t) - \delta K_t$ (2.9)

Which simply means that capital stock at each period depends on savings (in a closed economy where savings equals investment) and it is negatively related to depreciation ($-\delta K_t$).

The Solow model did very well in explaining all the stylized facts of growth in industrialized countries. According to the model, the savings rate affects the level of the steady state, but it does not affect the steady-state growth rate because different savings rate in different industrialized countries does not translate into long-term differences in the growth rate (Solow 1956). Even though Solow‟s growth model did well at matching the facts of economic growth and the basis of many more advanced models in macroeconomics, it is not devoid of criticisms. The Solow neoclassical growth models are criticised for lacking policy implications. In these models, growth is purely a function of inputs and technology is exogenous. Savings/investment, the crucial variable explaining what level of steady state income different countries reach, is also exogenous (Aghion and Hovitt, 2006). This brought the development of other growth models which took care of other variables that affect economic growth such as research and development (R&D), innovations as well as the financial sector.

Romer (1986) relaunched the growth model with a paper on increasing returns in which there was a stable positive equilibrium growth rate that resulted from endogenous accumulation of knowledge. This was an important breakthrough with the existing literature in which technological progress had largely been treated as completely exogenous. Romer further developed his model to include the effect of innovations, research and development (R&D) which stresses the importance of profit-seeking research in growth process, (Romer 1990). The model allows for spillovers in investments (investment in broad sense either intangible goods or in human capital and R&D) which cause social returns to deviate from private or individual returns. Romer"s idea can be captured by the equation $Y_i = A(K, L) * K_i^{\tau} L_i^{(1-\tau)}$ (2.10)

Where

Yi is growth

K is capital

L is labour

i is the firm

η is private return to capital [η+(η-1)] =1 (2.11)

A is technology or efficiency.

If an individual firm makes an investment, it increases the capital stock thereby increasing the capital stock and the efficiency (A) of the economy at the macro level (Schettkat 2004). The innovation, research and development component in the Romer"s theory is an important factor in a long-term economic growth of a country. It is very broad which includes among other things financial development (financial sector). According to the model, the channels through which financial development influences economic growth are the following; marginal productivity of capital, the savings rate and technological innovations (Bednarcyk, 2013).

Endogenous growth models show that economic growth performance is related to financial development, technology, and income distribution. Greenwood and Jovanowic (1990) argued that income per capita helps determine membership in an information processing intermediary that in turn improves investment decisions and economic growth. Researches within the financial literature focused on the explanation of externalities that may promote economic growth in addition to labour, capital, and technology factors that were typically used by representatives of classical and neo-classical economic growth theories (Njegomir and Stojić, 2010). However, most of the researches in the financial sector is focused on the impact of banking while several studies examined the impact of capital markets development, but the current study seeks to find out the effect of insurance on economic growth in Ghana.

2.2.1. The Theory of Demand for Insurance

The primary motive for people to demand for insurance is in order to avoid risk (uncertainty). According to Hirshliefer and Riley (1992), in the analysis of choice under uncertainty, it is common to denote an outcome of an uncertain event which is assumed to be exogenous and is chosen by nature. To be modest, one may consider only two possible states of the world, a loss of a wealth versus non loss, or a loss of person's life (dead) versus non loss (alive). Frech III (1994) posits that people use insurance to transfer wealth/income/consumption from one state of the world to the other to be able to face uncertainty about what state of the world may occur. Bernoulli (1738) formulated two assumptions about demand for insurance which is motivated by human behaviour, namely: (i) Individual's endeavour to maximize the expected utility of his income (wealth), and

(ii) The principle of diminishing marginal utility of income (wealth).

The Bernoulli (1738) assumptions can be applied, thanks to the von Neumann-Morgenstern's (1953) axioms on rational behaviour that ensure coherent decisions by an expected utility maximizing individual. Arrow (1996) based on these premises and formulated the theory of the demand for insurance using a contingent claims approach/ the mutuality principle, assuming an economy where risk is given by nature, public information, expected utility maximizing economic agents, and no transaction costs. Arrow (1996) showed that it is advantageous for economic agents to share losses or insure each other either directly trading insurance or simply may agree to help each other in case of a loss. In the real world, insurance is sold by insurance intermediaries probably due to the presence of transaction costs.

According to him, this is a better option in the sense that instead of accumulating funds to meet contingencies by themselves, agents pay premiums (purchase insurance coverage) and let insurance carriers accumulate and manage the reserves. This study is linked to this theory since as more and more individuals demand for insurance to cover their risk, premium increases. This may lead to a pool of funds which can increase investment and for that matter economic growth, "all other things being equal". This assertion has been empirically proven by some researchers and this study would like to assess same in Ghana.

2.2.2. Finance – Growth Nexus

The finance-growth nexus dates back to Schumpeter (1912) who posited that a well-developed financial system catalyzes technological innovation and economic growth through the provision of financial services and resources to those entrepreneurs who have the highest probability of successfully implementing innovative products and processes. Most of the empirical findings on finance-growth nexus discovered that a more developed financial sector serves as a fertile ground for the allocation of resources, better monitoring, fewer information asymmetries and economic growth (Shen and Lee, 2006). Levine (1997) came out with a sound theoretical approach to the study of the relationship between finance and growth. He posits that the emergence of financial markets and intermediaries, which serve multiple functions such as facilitating the trading, hedging, diversifying, and pooling of risk; allocating resources;

monitoring managers and exerting corporate control; mobilizing savings; and facilitating the exchange of goods and services is as a result of market frictions such as information and transaction costs. That notwithstanding, it is important to point out that some researchers have maintained that finance may not be a significant determinant of economic growth and development (Robinson, 1952; Lucas, 1988; Stern, 1989).

The theoretical literature has proposed three schools of thought on the transmission mechanism between finance and growth, Alhassan and Fiador (2014).

„Demand-following" hypothesis which is the first school of thought, argues that an expanding economy creates the demand for financial services and again, the growth in the real economy stimulates the demand for financial services (Robinson,1952; Romer, 1990). As real income rises, economic agents" (households and firms) demand for financial services increases, which leads to the development of the financial sector through the creation of financial assets and liabilities.

Another school of thought known as the „Supply-leading" hypothesis posits that efficient utilization of funds from surplus spending units to deficit spending units to propel growth is as a result of well-developed financial markets (Patrick, 1966). From the above, financial system ensures that the cost of acquiring information is reduced for effective allocation of resources. The performance of investment portfolios, funds transfer between deficit and surplus spending units and risk diversification will be facilitated due to easy access to information. These functions of financial systems will lead to maximum usage of resources, which propel increase in investments and growth. Greenwood and Jovanowic (1990) argued that income per capita helps determine membership in an information-processing intermediary that in turn improves investment decisions and economic growth. The reduction in transaction costs, as the main function of financial intermediaries, was first introduced by Gurley and Shaw (1956). In their early studies, they underlined the fact that financial intermediaries had an advantage over direct financing in economies of scale that resulted from shared costs. Intermediaries collect funds and more efficiently transform them into investments than individual economic units do. Quartey and Prah (2008) did a study in Ghana and reported that whereas there is some evidence in support of demand-following hypothesis when growth in broad money to GDP ratio is used as a measure of financial development, there is no significant evidence to support either the supply-leading hypothesis or demand-following hypothesis when growth in domestic credit to GDP ratio, private credit to GDP ratio and private credit to domestic credit ratio are used as proxies for financial development.

The third school of thought, known as the "Feedback" hypothesis posits that there is bi-causality between finance and growth. It is argued that well-developed financial systems stimulate economic growth through technological changes, product, and services innovation (Schumpeter, 1912) which promotes demand for financial services (Levine, 1997). Patrick (1966) posited that the direction of causality changes over the course of development. According to him, the supply-leading hypothesis is dominant during the initial stages of economic growth, and subsequently shifts its leading role to the demand-following one. He asserted that as the process of real growth occurs, the supply-leading impetus gradually loses its grounds and the demand-following hypothesis and cultural change become dominant. This therefore means that initially, causality run from finance to growth, a scenario that should be expected in developing countries. The demand-following pattern should then be expected to establish causality that runs from growth to finance at a later stage. More advanced economies may accordingly be expected to exhibit this direction of causality (Agu and Chukwu, 2008). In responding to the demand for financial services, growth is also enhanced leading to feedback causality (Luintel and Khan, 1999). The insurance industry, as a financial intermediary, provides risk management services to economic agents (businesses and household). Funds mobilized from premium generation are made available to other agents of the financial system for investments purposes which can lead to economic growth, "all other things being equal."

Again, the risk management mandate of insurance firms ensures business continuity which is necessary to stimulate enterprise and business growth. But growth in real economy could also have a direct impact on insurance. Higher incomes and profits by businesses will tend to stimulate their demand for insurance products. As individuals earn higher income through economic growth, their ability to buy insurance products is enhanced. As the growth in the real economy leads to greater expansion in business operations, so does their risk levels increase. Hence, the need for risk transfers in the form of insurance. The theories above are related to the study because it is the demand for insurance which leads to accumulated premiums that the insurance companies can invest through a financial intermediary to boost economic growth, an objective which this study seeks to achieve.

Romer (1986) points out that the differences between banks and other non-bank financial intermediaries are clearly stated. While banks are required to hold a fraction of deposits as reserves, non-banks have no such requirements. As financial intermediaries are competitive and intermediation is costless, this makes non-bank institutions such as insurance companies mobilize more funds for investment which will lead to economic growth. The study therefore wants to investigate if the above assertion is true in Ghana.

2.3. Empirical review

Empirical studies on the causal relationship between insurance and economic growth have been mixed, as some show evidence of a positive relationship, others assume otherwise. For instance, Outreville (1990) found that nonlife insurance is positively associated with GDP per capita for 55 developing counties. He also goes ahead to point out that the structural, financial and technical constraints, which included the small size of the life insurance market, under-capitalization of firms and lack of skilled personnel, prompt the over-reliance of such countries on international services and may negatively impact the supply of local insurance. This situation may affect the results if not checked by policymakers of developing countries, but the current study will use aggregate written premium to proxy insurance which the researcher believes will deal with such a problem.

Soo (1996) developed a dynamic optimization model that includes the availability of life insurance as a tax-loaded premium for individuals to maximize their lifetime utility. This analytical framework allows us both to examine life insurance effects on individual and aggregate consumption and saving rates and to evaluate whether taxing a life insurance premium would promote discouraging aggregate savings, consumption and wealth. In this model, policies in favor of the growth of the life insurance sector increase aggregate savings and consumption and have a positive effect on economic growth, but the current study believes that the activities of non-life insurance must also be looked at, hence the use of aggregate written premium to measure insurance.

Ward and Zurbruegg (2000) examined the dynamic relationship in the short and long term between economic growth and the development of the insurance sector. This study was conducted on a sample of nine Organization for Economic Co-operation and Development

(OECD) countries by performing a cointegration analysis for the period 1961-1996 by taking real GDP as a measure of economic activity and total premiums as a measure of the insurance business. The results show that insurance has an impact on economic growth in some countries (Canada and Japan), and in other countries, the opposite is true. Results like that depend on a number of circumstances such as the cultural, legal and regulatory environment and the impact of moral hazard in insurance. Excellent results but the current study focuses on insurance and economic growth in Ghana which we believe a little has been done in that area.

With particular emphasis on insurance activity, Webb, Grace, and Skipper (2002) model the impact of financial intermediaries (banks, life, and nonlife insurers) on economic growth in the context of a neoclassical Solow-Swan model predicting that the drivers of the level of output and investment will be insurance, banking, and capital stock productivity. The current study uses the endogenous growth model of Romer which inculcated finance into the growth model. Haiss and Sumegi, (2008) investigate in their work whether and how insurance influences economic growth. They analyze the various channels of influence of the insurance sector vis-à-vis economic growth: risk transfer, substitute savings, investment, and possible sources of contagion and repercussions to the economy. They find out that the transfer of risk to the insurer stabilizes income streams of business entities, dampens volatility and improves economic activity. Both increasing the value, and also expanding the area of financial investment and also deepening capital markets have a positive effect on economic growth. The current study focuses on only the insurance sector and its effect on economic growth since the other financial sub sectors may influence the results one way or the other.

Arena (2008) using the generalized method of moments (GMM) for dynamic models of panel data for 55 countries between 1976 and 2004, testing whether there is a causal relationship between insurance market activity (life and nonlife insurance) and economic growth. The study finds robust evidence for both life and nonlife insurance having a positive and significant causal effect on economic growth. For life insurance, high-income countries drive the results, and for nonlife insurance, both high-income and developing countries drive the results. The current study uses VECM because of its ability to capture both short run and long run at a go.

Han, Li, Moshirian, and Tian (2010) examined the relationship between insurance development and economic growth by employing GMM models on a dynamic panel data set of 77 economies. Using insurance density as a measure for the development of insurance controlled by a simple conditioning information set and a policy information set, they concluded that insurance development is positively correlated with economic growth which had significant different forms between developing countries and developed countries. Using insurance density to proxy insurance for a developing country like Ghana as it is likely to be influenced by a higher population vis a vis low written premium hence the use of gross written premium.

Lihan and Taha (2011) investigated the role of insurance in economic growth using 29 countries between 1999 and 2008 and found out that there is a positive relationship between insurance and economic growth in the sample countries. The sample, which was divided into developed and developing countries, indicated that the overall insurance development, grouped into life and non-life insurance development was very instrumental in the economies of developing countries than they are in developed countries. As their results confirmed that overall insurance development is instrumental in the economic growth of developing countries, the current study also uses aggregate written premium but focused on a single country.

Chien-Chiang (2011) disaggregated real insurance premiums into life and non-life insurance premiums to examine the interrelationship between insurance market activities and economic growth for ten selected OECD countries from 1979 to 2006. Panel unit-root tests, heterogeneous panel cointegration tests, and panel causality techniques are all employed, and they concluded that there is evidence favoring the hypothesis of a long-run equilibrium relationship between real GDP and insurance market activities. The non-life insurance market has a greater impact on real GDP than the activities of the life insurance market. The causality test of the dynamic panel-based error correction model shows a long-run and short-run bidirectional causality. The current study uses Johansen and Juseleus as well as VECM because of its ability to capture both short run and long run at a go

Chen, Lee and Lee (2011) studied the effect of life insurance (using penetration and density measure) on economic growth and what conditions affect the insurance-growth nexus including economic, financial, demographic, income level and regional conditions. The authors employ the two-step system GMM of dynamic model for 60 countries. The result shows that the development of the life insurance market has a positive effect on economic growth. The conditional variables such as savings, the real interest rate, social security, the stock market turnover ratio, and the young dependency ratio of middle-income countries, sub-Saharan Africa, alleviated the positive impacts of the development of the life insurance market on growth. On the contrary, the conditional variables of low-income countries and Latin America strengthen the positive impact of the life insurance market on growth. The current study uses gross written premium and a host of control variables that may also influence economic growth.

Azman-Saini and Smith (2011) also employed a panel data on 51 developed and developing countries from 1981 to 2005 to examine the impact of insurance market development on economic growth. The authors found that a positive relationship between insurance development and economic growth which they explained is transmitted through improvements in productivity for developed countries but the channel for developing countries was through capital accumulation for investments. Horng, Chang, and Wu (2012) employed the Vector Autoregressive on Taiwanese data from 1961 to 2006 to examine the insurance-growth nexus by testing the demand-following hypothesis versus supply-leading hypothesis. The authors found short-run causality running from economic growth to insurance to support the „demand-following" hypothesis. The current study will capture the causality using granger causality.

Zhou, Wu, Li, and Chen (2012) employing the returns on insurers stock to proxy for insurance market activity, examined the linkage between insurance penetration and economic growth as well as how the quality of environment and governance law moderates the insurance-growth nexus. Through a dynamic panel estimation, the authors found that well-defined environment and governance law improve the impact of insurance penetration in promoting economic growth with the effect more dominating in developed markets than developing markets and also support the supply leading hypothesis. Bednarczyk (2013) in his discussion of the link between insurance development and economic growth and review of empirical studies on the insurance-growth nexus, he found out that insurance development, as a part of financial development, provides a positive effect on long-term economic growth.

Ul Din, Abu-Bakar and Regupath (2017), investigated the relationship between insurance and economic growth in 20 countries for the period 2006–2015. Using fixed effect model for the data-set which was confirmed by the Hausman statistics, the study found a positive and a significant relationship between life insurance, measured through net written premiums and density, and economic growth for developed countries while the same is true for developing countries when insurance is measured through penetration proxy. Their results also reveal that non-life insurance has statistically significant, for all three proxies, relationship with economic growth for developing countries whereas, in case of developed countries, the results are only significant when insurance density is used as a proxy for insurance. The study revealed that the role of non-life insurance is more significant for developing countries as compared to developed countries.

Dash, Pradhan, Maradana, Gaurav, Zaki and Jayakumar (2018), also studied insurance market penetration and economic growth in eurozone countries. Their findings revealed that there was both unidirectional and bidirectional causality between insurance market penetration and per capita economic growth. The issue of disaggregation and penetration has given a mixed result, hence the current study focusing on Ghana, uses gross written premium.

Africa has also had its fair share of the insurance-growth nexus from Southern Africa through Eastern Africa to West Africa. Olayungbo (2015) examines the dynamic interactions among insurance, financial development and economic growth in South Africa for the period of 1970 to 2012 using Vector Error Correction Model (VECM) and Toda-Yamamoto (T-Y) causality test to analyze the short run and long run relationship after establishing a multivariate cointegration relation among the variables of interest. According to him, VECM shows in the short run, financial development promotes insurance and the Toda-Yamamoto causality test supports the insurance-led and finance-led growth hypothesis with unidirectional causalities running from insurance activities and financial development to economic growth. His results therefore, support the theory of supply leading and demand-following hypothesis for South Africa. In his conclusion, financial interdependence of insurance and financial development are crucial for growth in South Africa. The current study seeks to achieve similar objectives in Ghana but uses granger causality instead of Toda- Yamamoto since the former has proven in literature to be more appropriate for cointegrated data set.

Kanywuiro (2015) assesses the development of the life insurance sector in Kenya in relation to economic growth. The results indicate no significant relationship between life insurance and penetration and economic growth in the presence of other stronger variables such as life expectancy. Akinlo (2013) examines the effects of insurance on economic growth in Nigeria using the period 1986–2010. The structure, growth of insurance sub-sectors and the direction of causality between insurance and economic growth in Nigeria were examined. An error-correction model analysis and cointegration technique were adopted in the analysis. The cointegration technique shows that all the variables apart from premium are highly significant. The coefficient of premium was significant at 10 percent. The results indicate that insurance measured as premium has a positive significant influence on economic growth and that there is a long-run relationship between insurance and economic growth in Nigeria. The current study uses VECM since the ECM used by Akinlo is appropriate for a single cointegrating equation.

Olayungbo (2015) examines the asymmetric non-linear relationship between insurance and economic growth in Nigeria between 1976 and 2010 and after the cointegration, the asymmetry causality and the asymmetric impulse responses show a robust significant relationship between high gross domestic product (GDP) and low insurance in the long run. Mojekwo and Agwuegbo (2011) investigate the impact of insurance contributions on economic growth in Nigeria between 1981 and 2008 using a dynamic factor model. Their results indicate a positive relationship between insurance contribution, measured by the volume of premium and economic growth in

Nigeria. Umoren and Emem (2016) adopted a multiple linear regression method in their study. They discovered that insurance sector growth has contributed significantly to the economic growth in Nigeria within the period of the study. According to them, premium income of insurance industry has a positive influence on GDP but behaves insignificantly in explaining the changes in the contribution of the insurance industry to the economic growth in Nigeria within the period under study.

Olayungbo (2015) investigated separately the effects of life and non-life insurance on economic growth in Nigeria from 1976 to 2013. The Autoregressive Distributed Lags (ARDL) was adopted given the different order of integration of the variables of interest. The bound test was used to estimate the growth model which shows a long run relationship between economic life, non-life insurance and economic growth in Nigeria over the period of study. His study further confirms a positive and significant contribution of life and non-life insurance on economic growth in Nigeria as a result of the long run and the short run dynamics. The author concluded that life and non-life insurance act as complements to economic growth in Nigeria rather than substitutes. The current study uses Johansen and Juseleus since ARDL is not appropriate for multiple cointegrating equations.

Ubom (2014) examined the link between investment portfolio of insurance firms and economic development in Nigeria. The findings revealed that insurance firms were not making any significant influence on economic development in Nigeria. Also, Philip (2010) empirically assessed insurance market activities in Nigeria with the view to determining its impact on economic growth from 1970 to 2008. The finding revealed that the insurance sector did not reveal any positive and significant effect on economic growth in Nigeria within the period.

Alhassan and Fiador (2014) employed an autoregressive distributed lag (ARDL) bounds approach to examine the long-run causal relationship between insurance and economic growth in Ghana from 1990 to 2010 and found there were a long run positive relationship and unidirectional causality from aggregate insurance penetration, life and non-life insurance penetration to economic growth. Various studies have shown the inconsistency in disaggregated insurance measure hence the use of aggregate written premium. Again, using penetration (premium as a ratio of GDP) as a measure of insurance on economic growth is likely to cause serial correlation and as a result, the current study uses gross written premium. Lastly the current study also expanded the coverage and uses Johansen and Juseleus as well as VECM instead of ARDL.

2.3 Theoretical Framework

Following Romer of 1986, a "new growth theory" came into being. This theory enabled the integration of finance into economic growth models. Endogenous growth models show that economic growth performance is related to financial development, technology, and income distribution. According to Steger (2013), Romer"s analysis rests on three premises namely;

(1) Economic growth is driven by technological progress as well as capital accumulation;

(2) Technological progress results from deliberate actions taken by private agents who respond to market incentives;

(3) Technological knowledge is a non-rivalrous input.

The endogenous growth theory reinvigorated the determinants of long-term growth. In addition, endogenous growth theory is clearly of the discussion for current researchers (Pack, 1994). Pagano (1993), asserted that the techniques of endogenous growth models have demonstrated that, "there can be self-sustaining growth without exogenous technical progress and that the growth rate can be related to preferences, technology, income distribution, and institutional arrangements." According to him, it is possible to show both level and growth effects of financial intermediation. Romer (1986) points out that the differences between banks and other non-bank financial intermediaries are clearly stated. While banks are required to hold a fraction of deposits as reserves, non-banks have no such requirements. As financial intermediaries are competitive, and intermediation is costless, non-bank institutions such as insurance companies mobilize more funds for investment which will lead to economic growth. The structure of the endogenous growth is of the AK type (Romer, 1989; cited in Olayungbo, 2015) in the sense that there are constant returns to a sufficiently broad concept of capital.

The AK model is of the form:

$$Y_t = AK_t \qquad (2.12)$$

Where Y signifies output, A is technology and K in its broad sense includes both human capital and stock of capital. This model assumes absence of diminishing returns, constant return to scale competitive economy and increasing function of capital. Capital stock evolves as follows:

$$\acute{K}_t = sY_t - \delta K_t \qquad (2.13)$$

where *A* is an exogenous and constant productivity parameter and *s* is an exogenous, constant investment rate. In this set-up, *K* is interpreted as physical capital, but in Romer (1986) *K* was interpreted as knowledge and -δ is a parameter for depreciation. But the growth rate of output per capital is given as;

$$\frac{\dot{Y}_t}{Y} = \frac{\acute{K}_t}{K_t} \qquad (2.14)$$

Putting equations 2.12 and 2.13 together, we have

$$gy \equiv \frac{\dot{Y}_t}{Y_t} = sA - \delta \qquad (2.15)$$

From equation (2.14), the fundamental parameters of the economic environment endogenously determine growth rate (gy) of the economy. In this example, a permanent increase in the investment rate *s* will permanently raise the growth rate of the economy.

Romer (1990) put the nonrivalry of ideas on center stage, Romer makes a more basic distinction: between ideas, on the one hand, and everything else (call them "objects") on the other. Objects are the traditional goods that appear in economics. An idea is a design, a blueprint, or a set of instructions for starting with existing objects, and transforming or using them in some way that generates either more output or more utility example, the financial sector. What is the distinction between ideas and objects? Objects are *rival*: one person‟s use of an object precludes the simultaneous use of the object by others. In contrast, ideas are *nonrival*: an idea can be used simultaneously by any number of people. According to Jones (2019), Romer‟s nonrivalry of ideas means that production is characterized by increasing returns to scale. Let A denote an index of the level of technology (e.g., the stock of knowledge or the number of ideas or financial sector) and let the vector X denote all the other – rival – inputs into production. Finally, let Y denote output. Then the basic production function is:

$$Y = F(A, X). \qquad (2.16)$$

Given a certain quantity of objects X and the set of knowledge A, the function $F(\cdot)$ tells us how many output produced. Now consider the properties of $F(\cdot)$. In particular, suppose we wish to double the production. The *standard replication argument* tells us that one way to do this is by doubling the objects (X), In other words, for some $\lambda > 1$,

$$F(A, \lambda X) = \lambda Y. \qquad (2.17)$$

That is, there is constant returns to scale to the objects in production. But equation (2.16) makes clear that we have implicitly used the nonrivalry of ideas in the replication argument: This means that, as long as more knowledge is useful, if we double the objects and double the knowledge as well, we will more than double the output:

$$F(\lambda A, \lambda X) > F(A, \lambda X) = \lambda Y. \quad (2.18)$$

That is, production is characterized by *increasing returns to scale*. Because of the nonrivalry of ideas, there is constant returns to objects and therefore increasing returns to objects and ideas taken together (Jones, 2019).

From the above equation, insurance enters the growth model as investment (nonrivalry ideas) which has been empirically proven; Rao (2006), in his study titled, "Investment styles and performance of equity mutual funds in India" observed that in India 86.14per cent of the investment of Life Insurance Companies is made in stock exchange securities. Nagaraju and Roopa (2017) researched the "Investment Portfolio of Life Insurance Companies in India: A Study on Selected Life Insurance Companies of India". Their findings show that the Life insurance companies mainly concentrate toward share investment where usually they do the investment through private placement and also, they invest in government securities which they usually do as a part of statutory requirement and safety purpose. According to them, the insurance companies in India from their inception are investing in different financial assets.

The equation (2.16) is transformed into a linear econometric model adopted from Han *et al*. (2010), Horng *et al*. (2012), Ghosh (2013) and Alhassan and Fiador (2014) and it‟s specified as

$$growth_t = \alpha_0 IP_t + \alpha_i X_t + \varepsilon_t \quad (2.19)$$

where $growth_t$ is economic growth in year t, IP_t is gross insurance premium in year t, X is a vector of controls and ε_t is a disturbance term.

2.5 Conclusion

This chapter reviewed some theoretical and empirical literature as far as insurance and economic growth in Ghana is concerned. It is therefore important to recognize that there is a large gap existing in the literature regarding insurance which is proxied by gross insurance premium and economic growth. For this reason, it is imperative to empirically investigate the effect of insurance and economic growth.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents the research methodology. This chapter describes the sources of the data used for the study, the model specification and definition of variables. The chapter also deals with the estimation techniques and measurement of the data. The chapter also explains the expected signs of the variables.

3.1 Model Specification

In estimating the empirical relationship between insurance and economic growth in Ghana, the linear time-series model specified by Han *et al*. (2010), Horng *et al*. (2012), Ghosh (2013) and Alhassan and Fiador (2014) was used. They regressed economic growth against insurance penetration (which was further decomposed into life and non-life) with control variables. The model regressed economic growth on insurance which is proxy by gross written premium as used by Tong (2008) who measured insurance activity using total insurance premiums.

The control variables for this study are financial development, government expenditure, trade openness, and inflation. Financial development has been suggested to facilitate economic growth (Beck and Webb, 2003). Government expenditure is usually used as a control variable when depicting economic growth in finance-related literature (King and Levine, 1993; Levine, 1998; Levin, Loayza and Beck, 2000) and insurance-related literature (Ward and Zurbruegg, 2000; Webb, Grace and Skipper, 2002; Arena, 2008). Trade openness as used by Ul Din *et al*. (2017) can also affect the economic growth of a country and Han *et al*. (2010) found inflation as a significant determinant of economic growth. These variables were used as a control since their omission could lead to omissions of relevant variable (Gujarati, 1995). All the data were transformed into log except the inflation which is already in rates, the log transformation gives the most similar variances, the most valid test of significance and also gives a reasonable approximation to a normal distribution (Bland and Altman, 1996). Below is the functional form of the model as specified in the theoretical framework in the previous chapter.

$$growth_t = \alpha IP_t + \alpha_i X_t + \varepsilon_t \quad (2.19)$$

Where $growth_t$ is economic growth in year *t*, IP_t is the insurance premium in year *t*, *X* is a vector of controls (financial development, government expenditure, trade openness and inflation), ε_t is a disturbance term and α_i are the parameters. The variables in Eq. (2.19) are transformed by their logarithm to make for easy interpretation of regression coefficients in a standardized form of a percentage to form Eq. (2.19).

$$lngrowth_t = \alpha_0 + \alpha_1 lnip_t + \alpha_2 lnfd_t + \alpha_3 lngexp + \alpha_4 lnopenness + \alpha_5 inf_t + \varepsilon_t \quad (2.20)$$

3.2 Definition of Variables

3.2.0 Economic Growth

Economic growth is an increase in the production of economic goods and services, compared from one period of time to another. According to the endogenous growth model, it is an increase in the amount of physical capital goods which is powered by investment from the financial sector (ideas and innovations) in the economy. Economic growth is measured in the growth of real gross domestic product (GDP), that is GDP adjusted for inflation. Economic growth is the dependent variable in this study.

3.3.1 *Insurance*

Outreville (1996) defines insurance as a contract whereby one party, the insurer, undertakes, for a premium or an assessment, to make a payment to another party, the policyholder or a third party, if an event that is the object of a risk occurs. It is often defined as a contract of indemnity. Insurance is an important intermediary in the financial market and also plays a very vibrant role in the economy by mobilizing savings and supplying long term capital for economic growth and as an asset allocator. Insurance underpins the risk-taking behaviour in society that is a prerequisite for all economic activities (Olayungbo and Akinlo, 2016).

3.2.2 *Financial Development*

Financial development (ratio of broad money (M2) to GDP, Darrat, 1999) is defined as the improvement in quantity, quality and efficiency of financial intermediary services (Choong and Chan, 2011). Financial development means improvements in producing information about possible investments and allocating capital, monitoring firms and exerting corporate governance, trading, diversification, and management of risk, mobilization, and pooling of savings, easing the exchange of goods and services.

3.2.3 *Government expenditure*

Government expenditure refers to money spent by the public on the acquisition of goods and the provision of services. This includes public consumption and public investment as well as transfer payments consisting of income transfer. The relationship between government expenditure and economic growth has attracted considerable interest among economists and policy makers hence its inclusion in the study as a control variable. Government expenditure also impacts economic growth as used by Azman-Saini and Smith (2010).

3.2.4 *Trade Openness*

Trade openness can potentially enhance economic growth by providing access to goods and services, achieving efficiency in the allocation of resources and improving total factor productivity through technology diffusion and knowledge dissemination (Barro & Sala-i-Martin, 1997; Rivera-Batiz and Romer, 1991).

3.2.5 *Inflation*

Inflation rate in an economy is defined as the percentage change in the price level over time. Inflation rate is regarded as a control variable because high inflation has the tendency of distorting economic activity; thus, an increase in the rate of inflation will reduce the level of economic growth (Oyedotun and Adesina, 2015).

3.3 Data and Source

The study employed quarterly data of gross insurance premium as a proxy for insurance, Gross Domestic Product growth, Financial development, Government expenditure, Trade openness, and Inflation. The gross written premium was used as a proxy for insurance as was applied by Browne *et al*. (2000) and Li and Yao (2007), Tong (2008). The use of Growth of Gross Domestic Product (GDP growth) as a proxy for economic growth was adopted from Alhassan and Fiador (2014). The use of financial development (ratio of broad money to GDP) and Inflation was adopted from Darrat (1999). Government expenditure also impacts economic growth as used by Azman-Saini and Smith (2010). Ul Din *et al*. (2017) also used Trade openness as a control variable in their study.

Table 3.0. DATA SOURCE

S/N	Data	Source
1.	Economic growth proxied by real GDP growth and Inflation	Ghana Statistical Service (GSS)
2.	Insurance proxied by gross written premium	National Insurance Commission (NIC) of Ghana
3.	Financial development proxied by ratio of broad money to GDP	Bank of Ghana
4.	Government expenditure	World Development Indicators (WDI) Database of World Bank
5.	Trade openness proxied by export and import as a ratio of GDP	Global Financial Development Database (GFDD) of World Bank

Source: Arthur, 2019.

The data spanned from the first quarter of 2006 to the second quarter of 2018. The duration was chosen due to data availability.

The data set that was in yearly range was transformed into quarterly range using the quadratic match average of the E- views software. The quadratic match average performs a local quadratic interpolation of the low frequency data into high observations. The method fits a high polynomial by taking sets of three adjacent points from the low frequency data (yearly/ annual) and fitting a quadratic match so that the average of the high frequency data matches the low frequency data actually observed.

3.4 Research Design

Research design refers to the overall strategy that a researcher chooses to integrate the different components of the study in a coherent and logical way, thereby ensuring the effective addressing of the research problem, (Laberee, 2009). Research designs can be classified into two namely;

i. Positivist design and

ii. Interpretive design

This study uses the positivist research design which according to Hughes (2010) refers to a paradigm in research which sees the world as being based on unchanging, universal laws and the views that everything that occurs around us can be explained by the knowledge of the universal laws. The positivist research design seeks generalized patterns based on an objective view of reality. In short it is a research design meant for theory testing by using scientific and systematic approach which leads to the use of quantitative methodology.

Swanson (2016) explains that secondary data analysis is one of the popular examples of positivist research design. To him, secondary data analysis is an analysis of data that has been previously collected and tabulated by recognized sources.

3.4.0 Descriptive statistics

The study will conduct descriptive statistics of the relevant variables involved in order to visualize what the data is showing. Descriptive analysis of data is necessary as it helps to determine the normality of the distribution of the data set. It was done in terms of central tendency which includes, mean, median, etc. and a measure of variability such as standard error, skewness, kurtosis, etc.

3.5 Estimation Techniques

Unit Root Test

In this study, two stationary tests on individual stochastic trend will be conducted, that is Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) tests which are very popular in literature as far as time series data is concerned. According to Arltova and Fedorova (2016), the most suitable test for unit root in terms of short time series data is ADF and PP. As the ADF uses a parametric autoregression to approximate the structure of errors, the PP uses non-parametrically adjusted test statistics which increase the power of the test and improve test results. The value of ADF t-statistic and PP z-statistic will be compared to the critical values. The basic formula of the ADF procedure is specified in the equation below;

$$\Delta Y_t = \alpha + \delta_t + \rho Y_{t-1} + \sum_{i=1}^{p} \propto i \, \Delta Y_{t-1} + \varepsilon_t \qquad (3.0)$$

Where Y_t denotes the series at time t, Δ is the difference operator, α, δ, ρ and ∝ are parameters to be estimated, ε is the stochastic random disturbance term and p is the lag length included in the estimation process. The lag length is chosen based on information criteria such as Akaike Information Criterion (AIC) or the Schwarz Information Criterion (SIC).

A unit root test is vital in observing the stationarity of time series data. Its main objective is to estimate and check whether the variables observed have a tendency to return to the long-term trend, follow a shock or the variables follow a random walk. If the variables follow a random walk after a temporary or permanent shock, the regression between variables is spurious (Omoniyi and Olawale, 2015). According to the Gauss-Markov‟s theorem, in such cases, the series does not have a finite variance. Hence the OLS will not produce consistent parameter estimates.

A stationary series is one whose basic properties, for example, its mean and its variance, do not change over time. Stationarity test can be done at level, at first differences and second differences (changes). If a series is stationary at level, then the series is integrated of order zero, I(0) and if stationary at first differences and second differences, the series are integrated of order one and two, I(1) and I(2) respectively. Therefore, in order to test for the stationarity of the variables, the study will employ the Augmented Dickey-Fuller (ADF) (1979) and Phillips-Perron (1988).

The Augmented Dickey-Fuller test statistic and Phillips- Perron test statistic estimates the stationarity of the variables base on the following Hypothesis:

Ho: No stationary

Ha: Stationary

Reject H_o if the p-value is smaller than 0.05 which shows that the data is stationary. The time series under consideration should be integrated in the same order before we can proceed to cointegration analysis and causality test. The unit root test is basically required to ascertain the number of times a variable/series has to be differenced to achieve stationarity.

Cointegration Test

Granger (1981) and, Engle and Granger (1987) were the first to formalize the idea of cointegration, providing tests and estimation procedure to evaluate the existence of a long-run relationship between a set of variables within a dynamic specification framework. Testing for cointegration is a necessary step to establish if a model empirically exhibits meaningful long-run relationships. Thus, cointegration establishes a stronger statistical and economic basis for empirical error correction model, which brings together short and long-run information in modeling.

If a linear combination of two stochastic processes is integrated of order zero, then the time series are cointegrated. For the sake of clarity, cointegration means that a linear combination of two non-stationary processes is stationary, hence has a constant mean and variance (Wooldridge, 2013). As for a less technical description, two cointegrating processes have an inner long-run relationship. For instance, cointegrated variables x_t and y_t will move over time in a similar way.

What is more, the movement is to some extent predictable. In other words, the linear combination of x_t and y_t will not deviate far from its long-run equilibrium (Wooldridge, 2013).

Autoregressive Distributed Lag (ARDL) Cointegration Test

Modeling time series in order to keep their long-run information intact can be done through cointegration. Granger (1981) and, Engle and Granger (1987) were the first to formalize the idea of cointegration, providing tests and estimation procedure to evaluate the existence of a long-run relationship between a set of variables within a dynamic specification framework. Testing for cointegration is a necessary step to establish if a model empirically exhibits meaningful long-run relationships. Thus, cointegration establishes a stronger statistical and economic basis for empirical error correction model, which brings together short and long-run information in modeling variables.

The Autoregressive Distributed Lag (ARDL) model also known as bounds test proposed by Pesaran, and Shin (1998); Pesaran, Yongcheol, and Richard (2001) was employed because it is good when sample size is relatively small which makes it impossible to use other cointegration procedures such as Granger (1981) and Johansen (1988). Autoregressive Distributed Lag (ARDL) approach to cointegration or bound procedure for a long-run relationship can be used irrespective of whether the underlying variables are I(0), I(1) or a combination of both. In such a situation, the application of ARDL approach to cointegration will give realistic and efficient estimates. The use of the bounds technique is based on three validations. First, Pesaran *et al*. (2001) advocated the use of the ARDL model for the estimation of level relationships because the model suggests that once the order of the ARDL has been recognized, the relationship can be estimated by OLS. Second, the bounds test allows a mixture of I(1) and I(0) variables as regressors, that is, the order of integration of appropriate variables may not necessarily be the same. Therefore, the ARDL technique has the advantage of not requiring specific identification of the order of the underlying data. Third, this technique is suitable for small or finite sample size (Pesaran *et al*., 2001).

The employment of the ARDL technique is well grounded on several empirical studies that have applied the bounds approach to cointegration to relatively small sample sizes (Karim et al 2015, Oteng-Abayie et al 2006, Alhassan and Fiador, 2014). The presence of I(2) in a data set makes the ARDL unsuitable. Therefore, in order to test for the stationarity of the variables to ensure that the series is clear of I(2) variables, the study will employ the Augmented Dickey-Fuller (DF) (1979). With respect to Eq. (1), the ARDL frame-work for examining the relationship between insurance and economic growth is specified as

$$\Delta lngrowth_t = \alpha o + \sum_{i=1}^{p} \theta i \Delta lngrowth_{t-1} + \sum_{i=0}^{p} \mu i \Delta lnip_{t-1} + \sum_{i=0}^{p} \Delta lnfd_{t-1} + \sum_{i=0}^{p} \phi i \Delta lngexp_{t-1} + \sum_{i=0}^{p} \varphi \Delta lntop_{t-1} \sum_{i=0}^{p} \delta i \Delta inf_{t-1} + \gamma 0 lngrowth_{t-1} + \gamma 1 lnip_{t-1} + \gamma 2 lnfd_{t-1} + \gamma 3 lngexp_{t-1} + \gamma 4 lntop_{t-1} + \gamma 5 inf_{t-1} + \varepsilon_t \quad 3.1$$

Where Δ is the difference operator while ε_t is white noise error term. $lngrowth_t$ is GDP growth in log form in time t, $lnip_t$ is Insurance Premium in log form in time t, $lnfd_t$ is Financial Development in log form in time t and inf is inflation in time t. If one cointegrating vector (the underlying equation) is identified, the ARDL model of the cointegrating vector is reparameterized into Error Correction Model (ECM) (Nkoro and Uko, 2016). The reparameterized result gives short-run dynamics (i.e. traditional ARDL) and long-run relationship of the variables of a single model. The re-parameterization is possible because the ARDL is a dynamic single model equation and of the same form with the ECM. Distributed lag Model simply means the inclusion of unrestricted lag of the regressors in a regression function. ARDL cointegration approach (Pesaran and Shin, 1998 and Pesaran *et al*, 2001) is not suitable for multiple long-run relations and the presence of 1(2) variables. That is, if all the variables in the model are made the dependent variable, there should be only a single cointegrating equation with the rest not being cointegrated.

Johansen and Juselius (1990) Cointegration Procedure

Johansen and Juselius (1990) framework which was an improvement on Johansen (1988) model which was likelihood-based theory presented for a model without constant term and seasonal dummies. But for statistical and probabilistic analysis, the constant plays a crucial role in the interpretation of a model (Johansen 1991). When there are more than two I(d) variables in the estimated model which seems to have a feedback effect, then the residual-based cointegration tests (suitable for bivariate analysis) are inefficient and can lead to contradictory results. Engle and Granger (1987) approach to cointegration do not distinguish between the existence of one or two cointegrating vectors but rather relies on super-convergence result. Practically, its estimates differ with the arbitrary normalization implicit in the selection of the left-hand-side variable for the regression equation if Ordinary Least Square (OLS) is applied. These different arbitrary normalizations can negatively alter Engle and Granger (1987) test (Nkoro and Uko, 2016). Again, Engle and Granger (1987) approach does not allow for hypothesis testing on the cointegrating relationship itself, but the Johansen and Juselius (1990) approach does (Brooks 2002)

Nkoro and Uko (2016) outlined the conditions for the application of Johansen and Juselius, (1990) cointegration technique as follows:

• When there are different I(d) variables in the system: The Johansen and Juselius (1990) procedure can handle variables of the same and different orders of integration, there could be cases where there is a mix of I(0), I(1) and I(2) variables present in the model, cointegrating relationships might well exist. According to (Nkoro and Uko, 2016), caution should be applied in a situation where there are I(2) variables because different orders may produce complicated results, which is quite common in econometric analysis. Nevertheless, the most desirable case is when all the variables are integrated of the same order. However, this is not always the case as most macroeconomic variables are not stable or stationary. This approach is based on a VAR model to examine the long run relationships that may exist among the variables in question when the variables are integrated of the same order or of a different order.

• When there are more than one (multiple) cointegrating vectors: The Johansen- Juselius (1990) cointegration approach is relied upon when there are more than one (multiple) cointegrating vectors (relations) among the underlying variables, n>1, of which the Engle and Granger (1987) or ARDL approach fall shot to address. From the requirements above, the Johansen- Juselius (1990) provides a multivariate maximum likelihood technique that leads to the determination of the number of cointegration vectors in an equation. It is an extension of the single equation error correction model to a multivariate one. Suppose we have n variables and assume all are endogenous (using matrix notation for $Z_t = [Y_{1t}, Y_{2t}, Y_{3t}]$

$$Z_t = \delta_0 + \delta_{1t} + \Pi_1 Y_{t-1} + \Pi_2 Y_{t-1} + \ldots\ldots\ldots + \Pi_p Y_{p-1} + u_t \quad (3.2)$$

Where Zt is a vector containing n variables, I(d). The subscript t denotes the time period. δ is an (n×1) vector of constants, δ1 is the trend, Π1 through Πp is an (n×n) matrix of coefficients where p is the maximum lag length included in the model, and μt is an (n×1) vector of error terms (i. e.

vector of impulses or innovation or shock in the language of VAR, which represents the unanticipated movements in (Y_t) (μ_t ~iid N (0, δ_2)) (Nkoro and Uko, 2016).

Which in the final broad form gives;

$$\Delta Z_t = \delta_0 + \delta_{1t} + \Gamma_1 \Delta Z_{t-1} + \Gamma_2 \Delta Z_{t-2} + \cdots + \Gamma_{p-1} \Delta Z_{t-p} + \Pi_p Z_{t-p} + \varepsilon_t \qquad (3.3)$$

Where $\Gamma i = (I - \Pi_1 - \Pi_2 - \Pi_3 - ... - \Pi p)$ (I = 1, 2, ..., P-1) and $\Pi = -(I - \Pi_1 - \Pi_2 - \Pi_3 - ... - \Pi p)$.

Γi is the first row of Γ, and Πp is the first row of Π. ΔZ are stationary, i=1, 2…P-1 is all I(d). Πp Z_t- must be stationary, I(d). The only difference between a standard first difference version of a VAR model and equation 3.5 is the term $\Pi_p Z_{p-t}$. Γj represents the dynamics of the model in the short run, that is, the estimable parameters while Π rank represents the long run relationship among the variables included in the vector Zt, and I is the identity vector.

The short-run dynamics of the model is represented by Γ_j, that is, the estimable parameters while the long run relationship among the variables is the rank of Π which is included in the vector Z_t and I is the identity vector. The Π is called the impact matrix since it determines the extent to which the system is cointegrated (the number of independent cointegrating vectors). Thus, it determines how many error correction terms are in the model. Conventionally, the number of eigenvalues of Π that are significantly different from zero determines the rank of the matrix Π as well as the cointegrating relationship. The Johansen-Juselius (1990) approach distinguishes three possibilities depending on the values of $\Pi(r)$ where r is the rank of Π, that is the number of linearly independent cointegrating vectors namely;

i. When the rank equals n (r=n), where n is the number of variables in the system, meaning that all variables in Zt are I(0) (stationary) and there is no stochastic trend in the underlying series.

ii. When the rank is 0, r=0. That is, n is nxn matrix of zeros, implies that the variables included in the model are not cointegrated. This shows that there are no linear combinations of the variables in the vector Zt.

iii. When the rank(r) is lower than n implies that there exists a maximum of n-1 cointegrating relationships the form β'Zt-l~1(0). However, the issue is to find r greater than zero but less than (0<r<p) or r ≤ (n-1), which implies that a stationary number of linear combinations exist among the vector process Zt (Enders, 2004, and Quang, 2007).

The Steps of the Johansen and Juselius (1990) Cointegration Approach

Step 1: Testing for Stationarity of the Variables and Order of Integration. In order to avoid the problem of spurious regressions, unit roots test is conducted as a pre-condition in the study of a time series and cointegration. If the variables are integrated of the same order or of a different order, then we apply Johansen- Juselius (1990) cointegration test.

Step 2: Optimum Lag Length Selection: Before the cointegration tests are carried out, it is essential to determine the dynamic specification of the VAR model. Information criteria such as LR (Log-Likelihood Ratio Criterion), AIC (Akaike Information Criterion), SIC (Schwarz Information Criterion), FPE (Final Prediction Error), HQ (Hannan- Quinn Information Criterion) are used to select appropriate lag length (k). Appropriate lag length (p) selection starts by estimating a VAR model with p arbitrary set equal n-1 lags, (i.e. the number of variables under consideration minus one). After the appropriate lag length, the next is the determination of the order of integration. The VAR model is specified when appropriate lag length and order of integration have been established. That is, the lag-length is being determined after testing for unit roots.

Step 3: Choosing the appropriate model regarding the deterministic components in the multivariate system: It is necessary to examine whether an intercept and or a trend should enter either the short-run or the long-run model, or both before carrying out the cointegration test. Johansen (1995) distinguishes between five models as Nkoro and Uko, (2016) describes; no intercepts and no deterministic trends, restricted intercepts and no deterministic trends (no trend), unrestricted intercepts and no deterministic trends or intercept, unrestricted intercepts and restricted deterministic trends or intercept and linear trend and unrestricted intercepts and deterministic trends or intercept and quadratic trend. The challenge in an empirical study is, which of the three models (1, 2 and 4) is appropriate in testing for cointegration since model one and five are unlikely to happen. Johansen-Juselius, (1990) opted for a VAR model that does not contain deterministic trends but contains unrestricted intercepts. Nevertheless, Johansen (1992) suggested Pantula principle which is a joint test hypothesis of both the rank order and the deterministic components.

Step 4: Determining the Number of Cointegrating Vectors: The number of Cointegrating Vectors is determined based on two likelihood ratio test statistics and both involve estimation of the matrix Π which is a k x k matrix with rank r. The two likelihood ratio test statistics are the trace and maximum eigenvalues tests which procedures are based on the propositions of eigenvalues.

The Trace Test

The trace test examines the null hypothesis of cointegrating vectors is less than or equal to r against the alternative hypothesis that Π(r) is of the full rank, r = n cointegrating vectors.

The Maximum Eigenvalue Test

On the other hand, the maximum eigenvalue test examines the null hypothesis of r = 1 cointegrating vectors against the alternative hypothesis of r +1 or r > 1 cointegrating vectors.

H0 (r0): rk (Π)= r0 with the alternative H1 (r1): rk (Π)= r_1+1. The exact number of cointegrating equations is determined by comparing the computed log-likelihood values and eigenvalues to the critical values. The resulted long-run equation is analyzed base on the cointegration relations that have been established.

Step 6: Vector Error Correction Model (VECM)

After establishing the number of cointegrating vectors, the next is to estimate the Error Correction Model.

Vector Error Correction Model (VECM)

A vector error correction (VEC) model is a restricted VAR designed for use with non-stationary series that are known to be cointegrated. The VEC specification restricts the long run behavior of the endogenous variables to converge to their cointegrating relationships while allowing a wide range of short-run dynamics. The VEC has cointegration relations built into the specification so that it restricts the long run behaviour of the endogenous variables to converge to their cointegrating relationships while allowing for short-run adjustment dynamics (Sibindi, 2014). The ECM test for the speed of adjustment and how the variables in the data-set converge to equilibrium in the long run. The advantage of VECM is that it has a robust interpretation with long term and short- term equations. Vector Error Correction Model (VECM) will therefore be used to check the short run and the long run dynamics between the variables using the specification below.

$$\Delta lngrowth_t =$$

$$\alpha_0 lngrowth_t + \sum_{i=1}^{\rho} \alpha_1 lngrowth_i \Delta lngrowth_{t-1} + \sum_{j=1}^{\rho} \alpha_2 lngrowth_j \Delta lnip_{t-1} +$$

$$\sum_{k=1}^{\rho} \alpha_3 lngrowth_k \Delta fd_{t-k} + \sum_{l=1}^{p} \alpha_4 \, lngrowth_l \Delta lngexp_{t-l} +$$

$\sum_{m=i}^{p} \alpha_5 lngrowth_m \, lntop_{t-m} + \sum_{l=1}^{\rho} \alpha_6 lngrowth_n \Delta inf_{t-n} + \phi ECT lngrowth_{t-1} + \varepsilon_t$

(3.4)

$\Delta lnidt =$

$\alpha_0 lnip_t + \sum_{i=1}^{\rho} \alpha_1 lnip_i \Delta lngrowth_{t-i} + \sum_{j=1}^{\rho} \alpha_2 lnip_j \Delta lnip_{t-j} + \sum_{k=1}^{\rho} \alpha_3 lnip_k \Delta fd_{t-k} +$

$\sum_{l=1}^{p} \alpha_4 \, lnip_l \Delta lngexp_{t-l} + \sum_{m=i}^{p} \alpha_5 lnip_m \, lntop_{t-m} + \sum_{l=1}^{\rho} \alpha_6 lnip_n \Delta inf_{t-n} + \phi ECT lnip_{t-1} +$

$lnip_{t-1} + \varepsilon_t$.

(3.5)

$\Delta lnfd_t =$

$\alpha_0 lnfd_t + \sum_{i=1}^{\rho} \alpha_1 lnfd_i \Delta lngrowth_{t-i} + \sum_{j=1}^{\rho} \alpha_2 lnfd_j \Delta lnip_{t-1} + \sum_{k=1}^{\rho} \alpha_3 lnfd_k \Delta fd_{t-k} +$

$\sum_{l=1}^{p} \alpha_4 \, lnfd_l \Delta lngexp_{t-l} + \sum_{m=i}^{p} \alpha_5 lnfd_m \, lntop_{t-m} + \sum_{l=1}^{\rho} \alpha_6 lnfd_n \Delta inf_{t-n} +$

$\phi ECT lnfd_{t-1} + \varepsilon_t$ . .

(3.6)

$\Delta lngexp_t = \alpha_0 lngexp_t + \sum_{i=1}^{\rho} \alpha_1 lngexp_i \Delta lngrowth_{t-i} + \sum_{j=1}^{\rho} \alpha_2 lngexp_j \Delta lnip_{t-1} +$

$\sum_{k=1}^{\rho} \alpha_3 lngexp_k \Delta fd_{t-k} + \sum_{l=1}^{p} \alpha_4 \, lngexp_l \Delta lngexp_{t-l} + \sum_{m=i}^{p} \alpha_5 lngexp_m \, lntop_{t-m} +$

$\sum_{l=1}^{\rho} \alpha_6 lngexp_n \Delta inf_{t-n} + \phi ECT lnfd_{t-1} + \varepsilon_t.$ (3.7)

$\Delta lntop_t =$

$\alpha_0 lntop_t + \sum_{i=1}^{\rho} \alpha_1 lntop_i \Delta lngrowth_{t-i} + \sum_{j=1}^{\rho} \alpha_2 lntop_j \Delta lnip_{t-1} + \sum_{k=1}^{\rho} \alpha_3 lntop_k \Delta fd_{t-k} +$

$\sum_{l=1}^{p} \alpha_4 \, lntop_l \Delta lngexp_{t-l} + \sum_{m=i}^{p} \alpha_5 lntop_m \, lntop_{t-m} + \sum_{l=1}^{\rho} \alpha_6 lntop_n \Delta inf_{t-n} +$

$\phi ECT lnfd_{t-1} + \varepsilon_t.$ (3.8)

$$\Delta inf_t = \alpha_0 inf_t + \sum_{i=1}^{\rho} \alpha_1 inf_i \Delta lngrowth_{t-i} + \sum_{j=1}^{\rho} \alpha_2 inf_j \Delta lnip_{t-1} + \sum_{k=1}^{\rho} \alpha_3 inf_k \Delta fd_{t-k} + \sum_{l=1}^{p} \alpha_4\, inf_l \Delta lngexp_{t-l} + \sum_{l=1}^{p} \alpha_5\, inf_m \Delta lntop_{t-m} + \sum_{l=1}^{\rho} \alpha_6 inf_n \Delta inf_{t-n} + \phi ECTinf_{t-1} + \varepsilon_t$$

. . .

(3.9)

Where ɸ denote the speed of adjustment and ε_t is white noise error terms. The ECT is a cointegrating term, measuring the speed of adjustment that lngrowth, lnip, lnfd, lngexp, lntop and inf bring to their long-run relationship. The VECM will be used to test the first hypothesis.

The Granger Causality Test

Granger causality (or "G-causality") was developed in the 1960s and has been widely used in economics studies (Seth, 2007). Granger causality is a “bottom-up” procedure, with the assumption that the data-generating processes in any time series are independent, then the data sets are analyzed to see if they are correlated. The opposite is a “top-down” method which assumes the processes are *not* independent; the data sets are then analyzed to see if they are generated independently.

Granger causality test is used to determine the direction of effect of a variable on another.

According to Granger causality, if a signal X_1 "Granger-causes" (or "G-causes") a signal X_2, then past values of X_1 should contain information that helps predict X_2 above and beyond the information contained in past values of X_2 alone. Its mathematical formulation is based on linear regression modeling of stochastic processes (Granger, 1969). More complex extensions to nonlinear cases exist, however these extensions are often more difficult to apply in practice.

The basic idea of the Granger causality test is to established correlation direction. For instance, assume two stochastic processes x_t and y_t. It is said that variable x_t Granger-causes variable y_t if and only if the lagged value of x_t has better forecasting capability on y_t than just lagged values of y_t on itself. Bivariate VAR(n) models in differences are widely used for the purpose of Granger causality testing (Green, 1997; Iqbal & Uddin, 2013). Nonetheless, Green (1997) argues that the underlying statistical inference is falsely concluded if both variables are cointegrated.

Granger-causality has several components. The first component is based on the principle that only past values of X can Granger-cause Y because the future cannot cause the past or the present. If X occurs after Y, then we know that X cannot cause Y. Similarly, if X occurred before Y then that does not necessarily imply that X caused Y. The second component of Granger-causality is exogeneity; Sims (1972) stated that for variable X to be exogenous of variable Y, X must fail to Granger-cause Y; this component was confirmed by Engle, Hendry, and Richard (1983). Independence is the third component of Granger-causality because variables X and Y are only independent of each other if both fail to Granger-cause the other. The final component of Granger-causality is that of asymmetry; if X Granger-causes Y, then changes in Y has no effect on the future values of X.

The Granger causality test was used to check the causality of the variables (Engle and Granger, 1987; Hayashi, 2000). Causality test was performed within the vector error correction model (VECM) framework to examine the causal relationship between insurance and economic growth as well as the control variables. The Granger causality based on error correction model helps not only to know the direction of causation but also to identify the variables that are exogenous and endogenous. Aside the lagged, ECM will inform us on what it takes to revert to equilibrium when there is a shock to the variable. The Granger causality will be used to test the second hypothesis.

Impulse Response Functions and Variance Decomposition

Sims (1980) pioneered the use of impulse response functions and variance decompositions to capture the underlying shocks and its effects on other variables in the model.

The VAR approach proposed by Sims (1980) has the desirable property that treats all variables as symmetric. For simplicity, we look at two-variable case, the time path of lngrowth affected by current and past realizations of the sequence and the time path of lnip can also be affected by current and past realizations of the sequence. Consider the simple bivariate equation as follows:

$$lngrowth_t = \beta_{10} - \beta_{12}ip_t + \gamma_{11}lngrowth_{t-1} + \gamma_{12}\, ip_{t-1} + \varepsilon lngrowth_t \quad (3.10)$$

$$ip_t = \beta_{20} - \beta_{21}\, lngrowth_t + \gamma_{21}lngrowth_{t-1} + \gamma_{22}ip_{tt-1} + \varepsilon ip_t \quad (3.11)$$

Where it is assumed that

i. both $lngrowth_t$ and ip_t are stationary

ii. ε_t and ε_t are white-noise disturbances with standard deviations of $\zeta lngrowth$ and ζip, respectively, $\{\varepsilon lngrowth_t\}$ and $\{\varepsilon ip_t\}$ are uncorrelated white-noise disturbances.

Equations (3.10) and (3.11) constitute a first-order vector autoregression (VAR) which simply means that each variable depends on the first lag of itself and the other variable. The simple two-variable first-order VAR is useful for illustrating the multivariate higher order systems. The structure of the system incorporates feedback because $lngrowth_t$ and ip_t are allowed to affect each other. For example, -β12 is the contemporaneous effect of a unit change of ip_t on $lngrowth_t$ and γ_{12} is the effect of a unit change in ip_t on $lngrowth_t$. Note that the terms of $\varepsilon lngrowth_t$ and εip_t are pure innovations (shocks) in $lngrowth_t$ and ip_t respectively. Hence, if $-\beta_{21}$ is not equal to zero

($-\beta_{21} \neq 0$), ε $lngrowth_t$ has an indirect contemporaneous effect on ip_t, and if $-\beta_{12}$ is not equal to zero ($-\beta_{12} \neq 0$), εip_t has an indirect contemporaneous effect on $lngrowth_t$ (Samsi, 2017).

Variance Decompositions (VDC)

The variance decomposition measures the importance of each shock in the independent variable in explaining the variance in the dependent variable. In other words, variance decomposition measures the percentage of the forecast error of the variable that is explained by another variable (Samsi, 2017). The most essential aspect of the variance decomposition is that; it provides information on how a variable of interest responds to shocks or innovations in other variables. In the context of this study, variance decomposition allows the researcher to explore the relative importance of each independent variable in the dependent variable. The Sim's (1980) innovation accounting procedure is employed to interpret economic implications of insurance in accounting for variations in economic growth. This procedure involves the decomposition of forecast error variance of each variable into components attributable to its own innovations and to shocks of other variables in the system.

It is worthy to note that the variance decomposition contains the same problem imbedded in impulse response analysis. In order to identify the $\{\varepsilon lngrowth_t\}$ and $\{\varepsilon ip_t\}$ sequences, it is necessary to restrict the β matrix. Moreover, it is customary to obtain the variance decompositions under various orderings if the correlation coefficient is significantly different from zero. To conclude, impulse response functions and variance decompositions which is also known as "innovation accounting", can be a useful tool to examine shocks and its effects amongst variables (Samsi, 2017). The impulse response functions and variance decompositions which is also known as "innovation accounting will be used to test the third hypothesis.

The dynamic specification of all models based on various diagnostic tests will be conducted. These include the Jarque-Bera test for normality, the LM test for serial correlation, the ARCH test for autoregressive conditional heteroskedasticity, CUSUM and CUSUMSQ plots (95% bounds) for testing parameter and variance stability, and coefficient value of the normalized cointegrating equation to see whether the long run relation is significant as an error correction mechanism for short-run disequilibrium.

3.6. Expected Results

3.6.1. *Insurance*

The effect of insurance on economic growth is expected to be positive. An increase in insurance premium collection is expected to increase funds for investment which will propel real growth in the economy. This assertion is well grounded in literature as reported by (Outreville, 1996; Soo, 1996; Ward and Zurbruegg, 2000; Webb, Grace and Skipper, 2002; Haiss and Sumegi, 2008; Han *et al*., 2010; Horng *et al.* 2012; Kanywuiro, 2015; Akinlo, 2013; Umoren *et al*, 2016; Alhassan and Fiador, 2014). Base on this scholarship, insurance has a positive sign.

3.6.2. Financial Development

The expected sign of financial development in the model is positive since financial development is positively related to economic growth (King and Levine, 1993a; Ram, 1999; Schich and Pelgrin, 2002; Levine *et al*., 2000; Habibullah and Eng, 2006 and Olayungbo, 2015).

3.6.3. Government Expenditure

The expected sign of government expenditure on economic growth is still under debate. Whiles some research works such as Jiranyakul and Brahmasrene (2007), Leshoro (2017) found a positive relationship between government spending and economic growth, others such as Nurudeen and Usman (2010), Diyoke, Yusuf and Demirbas (2018) also found a negative sign of government expenditure against economic growth. Therefore, in this study the sign is indeterminate.

3.6.4. Trade Openness

According to Barro and Sala-i-Martin (1997); Rivera-Batiz and Romer (1991), trade openness is positively signed because it can potentially enhance economic growth by providing access to goods and services. On the contrary, another strand of research posits that increase in trade openness may be detrimental to economic growth by increasing inflation and lowering exchange rates (Cooke, 2010; Jafari, Samimi, Ghaderi, Hosseinzadeh, and Nademi, 2012). Trade openness may impact economic growth negatively for countries which specialize in production of mostly primary products (Haussmann, Hwang, and Rodrik, 2007).

3.6.5. Inflation

Inflation rate regarded as a control variable is expected to be negatively correlated with economic growth (Oyedotun and Adesina, 2015). High inflation has the tendency of distorting economic activity; thus, an increase in the rate of inflation will reduce the level of economic growth.

3.7 Conclusion

The chapter described the data, sources and the variables used in the study. Furthermore, the study formulated the econometric model to be estimated by the study and specified the technique to be used in estimation.

The Johansen and Juselius approach to cointegration and VECM as well as the Granger causality are used to examine the effect and the dynamic interactions of insurance and economic growth. Finally, Impulse Response Function and Variance Decomposition are used to measure the effect of innovations (shock) of insurance on economic growth.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

This chapter presents the results of the study and its corresponding discussions. The presentation started with descriptive statistics of the relevant variables involved in order to visualize what the data is showing. This was then followed by unit root test and then Johansen and Juselius, (1990) Cointegration Procedure. The VECM and Granger causality were also conducted which were presented and discussed accordingly. Impulse response analysis and variance decompositions which is also known as "innovation accounting", were used to examine the shocks and their effects amongst the variables. The discussion ended with the diagnostic test of the model.

4.1 Descriptive statistics

This section reports descriptive statistics of the data which is presented in Table 4.1. The descriptive statistics results show that economic growth averaged 6.91 with a standard deviation of 3.06 and a maximum value of 14.47 and a minimum value of 2.88 over the period under study. Insurance average 25.87 with a standard deviation of 16.63 and maximum and minimum value of 77.09 and 7.09 respectively. The financial development had a mean value of 1.52 with a maximum value of 9.99, a minimum value of 0.71 and a standard deviation of 0.57. Over the study period, government expenditure averaged 3.73 with a standard deviation of 0.33 and fell within the ranges of 4.23 and 3.04 as maximum and minimum respectively. Trade openness also obtained a mean value of 23.19, a standard deviation of 0.46 and a maximum and minimum value of 23.68 and 22.30 respectively. Inflation averaged 13.54 with a standard deviation of 3.37 and maximum and minimum values of 19.70 and 8.70 respectively.

A careful observation of the mean and the median of the series are close to each other for all variable set which indicates that there is minor symmetry of these variables. The result shown in Table 4.1 indicates that all the variables have positive average values (means). There is a minimal deviation of the variables from their means as shown by the standard deviations. In addition, the result in Table 4.1 again reveals that almost all the variables show signs of positive skewness with the exception of government expenditure and trade openness. With the exception of the log of economic growth and log of insurance which have a mesokurtic kurtosis (normally distributed), the rest are platykurtic kurtosis (a flatter curve). The Jarque-Bera statistic also shows that the null hypothesis that the series is normally distributed cannot be rejected for all the variables except trade openness which is significant at 5%.

Table 4.1: Descriptive statistics of the study

	LNGROWTH	LNIP_	LNFD	LNGEXP	LNTOP	INF
Mean	6.907718	25.87763	1.517662	3.732957	23.18772	13.54093
Median	6.329033	21.38561	1.502032	3.854661	23.45979	12.98167
Maximum	14.47367	77.08707	2.998017	4.229860	23.67526	19.69667
Minimum	2.881585	7.097407	0.714308	3.045831	22.29661	8.700000
Std. Dev.	3.055179	16.63408	0.574085	0.338880	0.462563	3.374016
Skewness	0.896008	1.159872	0.610152	-0.418608	-0.589270	0.274221
Kurtosis	3.116563	3.892046	2.773353	1.864315	1.714565	1.774768
Jarque-Bera	6.718559	12.86867	3.209398	4.147312	6.336047	3.754128
Probability	0.094760	0.071605	0.200950	0.125725	0.042087	0.153039
Sum	345.3859	1293.881	75.88308	186.6479	1159.386	677.0467
Sum Sq. Dev.	457.3717	13557.94	16.14909	5.627147	10.48425	557.8154
Observations	50	50	50	50	50	50

Source: Computed by the author, 2019

4.2 Unit Root Test Results

The ADF and the PP test for unit root were conducted with intercept and trend in the model for all the variables used in the study as presented in Tables 4.2.1 and 4.2.2. The ADF test has the null hypothesis that „there is a unit root" rejected if the test statistic absolute value is greater than the critical value. Better still if the probability value (p-value) of the test statistic is less than the significance level of interest, it shows the series is stationary.

Table 4.2.1: Results of Unit Root Test with Intercept and Trend (ADF and PP) at level

	ADF					**PP**		
Variables	t- Statistics	Lag	Prob.	I(d)	t- Statistics	BW	Prob.	I(d)
LNGROWTH	-2.653626	1	0.2597	I (0)	-2.179120	2	0.4901	I (0)
lnIP	-3.245536	3	0.0891	I (0)	-22.14807	11	0.0000	I (0)
lnFD	-2.211861	0	0.4726	I (0)	2.186617	1	0.4681	I (0)
lnGEXP	-2.470770	1	0.3406	I (0)	-3.508932	3	0.0495	I (0)
lnTOP	-1.551009	1	0.7974	I (0)	-1.100427	5	0.9185	I (0)
INF	-3.089408	1	0.1204	I (0)	-2.031923	5	0.5696	I (0)

Note: D denotes the first difference, I(d) is the order of integration and BW is the bandwidth

Source: Computed by the author, 2019

At levels, insurance premium was stationary at 10% in ADF and 1% in PP significance level as illustrated in Table 4.2.1. However, at first difference, all the variables were stationary at 1% significance level except trade openness and inflation which were stationary at 10% significance level as indicated in Table 4.2.2. Therefore, the variables are I (1).

Table 4.2.2: Results of Unit Root Test with Intercept and Trend (ADF and PP) at first difference

	ADF				PP			
Variables	t- Statistics	Lag	Prob.	I(d)	t- Statistics	BW	Prob.	I(d)
D(LNGROWTH)	-5.056559	3	0.0009	I (1)	-4.561172	1	0.0033	I (1)
D(LNIP)	-44.80045	2	0.0000	I (1)	-26.75272	11	0.0000	I (1)
D(LNFD)	-7.529165	0	0.0000	I (1)	-7.515841	3	0.0000	I (1)
D(LNGEXP)	-12.19313	0	0.0000	I (1)	-14.03255	4	0.0000	I (1)
D(LNTOP)	-2.856627	0	0.0853	I (1)	-2.930496	3	0.0625	I (1)
D(INF)	-2.719254	0	0.0339	I (1)	-2.848117	3	0.0881	I (1)

Note: D denotes the first difference, I(d) is the order of integration and BW is the bandwidth

Source: Computed by the author, 2019

4.3 Cointegration Testing

4.3.1. *Autoregressive Distributed Lag (ARDL) Cointegration Test*

The results of the ARDL cointegration test is presented in Table 4.3.1. The null hypothesis of no levels relationship was rejected for all the variables when they are the dependent variable. This indicates that there exists a multiple long-run relationship between the variables.

Table 4.3.1: Bounds Test for the existence of Cointegration

F Bounds Test		F- Statistic			T- Bounds Test	T- Statistic		
	Critical Value	Significance	I(0)	I(1)	Critical Value	Significance	I(0)	I(1)
Lngrowth	4.261292	10%	2.26	3.35	-4.486783	10%	-2.57	-3.86
K	5	5%	2.62	3.79		5%	-2.86	-4.19
		2.5%	2.96	4.18		2.5%	-3.13	-4.46
		1%	3.41	4.68		1%	-3.43	-4.79
Actual Sample	46	Finite Sample n= 50						
lnip	9.438187	10%	2.26	3.35	-6.941973	10%	-2.57	-3.86
K	5	5%	2.62	3.79		5%	-2.86	-4.19
		2.5%	2.96	4.18		2.5%	-3.13	-4.46
		1%	3.41	4.68		1%	-3.43	-4.79
Actual Sample	46	Finite Sample n= 50						
lnfd	2.784680	10%	2.26	3.35	-1.190410	10%	-2.57	-3.86

K	5	5%	2.62	3.79		5%	-2.86	-4.19
		2.5%	2.96	4.18		2.5%	-3.13	-4.46
		1%	3.41	4.68		1%	-3.43	-4.79
Actual Sample	44	Finite Sample n= 45						
lngexp	3.893249	10%	2.26	3.35	-4.385015	10%	-2.57	-3.86
K	5	5%	2.62	3.79		5%	-2.86	-4.19
		2.5%	2.96	4.18		2.5%	-3.13	-4.46
		1%	3.41	4.68		1%	-3.43	-4.79
ActualSample		Finite Sample n= 50						
lntop	5.557223	10%	2.26	3.35	-0.349266	10%	-2.57	-3.86
K	5	5%	2.62	3.79		5%	-2.86	-4.19
		2.5%	2.96	4.18		2.5%	-3.13	-4.46
		1%	3.41	4.68		1%	-3.43	-4.79
Actual Sample	46	Finite Sample n= 50						
inf	5.766156	10%	2.26	3.35	-6.941973	10%	-2.57	-3.86
K	5	5%	2.62	3.79		5%	-2.86	-4.19
		2.5%	2.96	4.18		2.5%	-3.13	-4.46
		1%	3.41	4.68		1%	-3.43	-4.79
Actual Sample	46	Finite Sample n= 50						

Note: k is the number of regressors used in the model.
Source: Computed by the author, 2019

As indicated in chapter three, the ARDL approach to cointegration is not suitable when there are multiple long-run relationships. The result above shows that there are multiple long-run relationships between the variables in the model. Therefore, a more satisfactory approach in the literature has been Johansen- Juselius (1990) cointegration procedures. Not only does this approach yield maximum likelihood estimator of unconstrained cointegrating vectors, but it also allows one to explicitly test for the number of cointegrating vectors (Nkoro and Uko (2016).

4.3.2. *Lag Length Selection Test*

Using the information criteria, the lag length selected for the study is 4 based on (AIC). According to Liew (2004), Akaike"s information criterion (AIC) and final prediction error (FPE) are superior to the other criteria when dealing with small sample size, in the sense that they minimize the chance of underestimation. From Table 4.3.2, the AIC criteria selected a lag length of 4 whilst FPE gave a lag length of 3. The AIC lag length was used over the FPE since the AIC was an improvement to overcome the inconsistency in the FPE (Liew, 2004). In general, the major drawback of the FPE information criteria lies with the problem of underestimation and overestimation of lag length which are regarded as undesirable, (Cheung and Lai 1993).

Table 4.3.2: Optimal Lag Length Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-448.0050	NA	36.94292	20.63659	20.87989	20.72682
1	-193.9293	427.3090	0.001861	10.72406	12.42715	11.35565
2	-129.4736	90.82401	0.000560	9.430618	12.59350	10.60357
3	-34.56494	107.8507*	4.96e-05*	6.752952	11.37563*	8.467262
4	13.41563	41.43777	5.02e-05	6.208380*	12.29085	8.464051*

Source: Computed by the author, 2019

4.3.3. *Johansen- Juselius (1990) Cointegration Test*

To established empirically meaningful relationships, cointegration analysis test was conducted for the existence of cointegrating vectors using the Johansen- Juselius (1990) approach. The Tables 4.3.3a and 4.3.3b display the cointegration results of the two likelihood ratio test statistics namely the trace and maximum eigenvalues tests respectively. Based on the results, Table 4.3.3a shows the Trace test which indicates that the null hypothesis of no cointegration was rejected at five (5%) percent significant level.

Table 4.3.3a: Trace Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.955735	321.8973	95.75366	0.0000
At most 1 *	0.790914	187.8418	69.81889	0.0000
At most 2 *	0.757649	120.5464	47.85613	0.0000
At most 3 *	0.573005	59.59958	29.79707	0.0000
At most 4 *	0.385253	23.00729	15.49471	0.0031
At most 5	0.047351	2.085861	3.841466	0.1487

Unrestricted Cointegration Rank Test (Trace)
Source: Computed by the author, 2019

Table 4.3.3b also displays the Maximum Eigenvalue test which indicates that the null hypothesis of no cointegration was rejected at five (5) percent significant level. The two tests indicate that at most, there are four (4) cointegrating equations in the model.

Table 4.3.3b: Maximum Eigenvalue

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.955735	134.0555	40.07757	0.0000
At most 1 *	0.790914	67.29544	33.87687	0.0000
At most 2 *	0.757649	60.94681	27.58434	0.0000
At most 3 *	0.573005	36.59229	21.13162	0.0002
At most 4 *	0.385253	20.92143	14.26460	0.0038
At most 5	0.047351	2.085861	3.841466	0.1487

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)
Source: Computed by the author, 2019

4.4 Results of the Vector Error Correction Model (VECM)

The estimation of the VECM model is to enhance the quality, flexibility, and versatility of the econometric model of dynamic systems and the integration of short-run dynamics with the long-run equilibrium.

4.4.1 *Results of the Long-Run Relationship*

The results of the Johansen and Juselius, (1990) cointegration test and confirmed by the VECM are presented in Table 4.4.1. Consistent with expectations, insurance has a positive relationship with economic growth in the long run. With the coefficient of 7.26 which is significant at one percentage (1%) and means a change in insurance in the long run, will result in approximately 7.26 percentage points increase in economic growth in the long run. Based on the result above, the study rejects the null hypothesis (H_0) which is „there is no significant positive effect of insurance on economic growth in Ghana.‟

The result is consistent with the findings of Han *et al*. (2010), Azman-Saini and Smith (2011), Bednarczyk (2013), Umoren *et al*. (2016), and Alhassan and Fiador (2014). For instance, Han *et al*. (2010), concluded that insurance development is positively correlated with economic growth in a panel of 77 countries. Azman-Saini and Smith (2010) also found a positive relationship between insurance development and economic growth of a panel of 55 countries. Bednarczyk (2013) found out that insurance development, as a part of financial development, provides a positive effect on long-term economic growth in his review of empirical studies on the insurance-growth nexus. Alhassan and Fiador (2014) found there was a long run positive relationship between aggregate insurance penetration, life and non-life insurance penetration to economic growth in Ghana. According to Umoren et al. (2016), premium income of the insurance industry has a positive influence on the economic growth of Nigeria.

Financial development has a negative relationship with economic growth in the long run. The coefficient was -0.67 but not significant. Even though the sign does not follow theory or a prior, it is consistent with the findings of Adu, Marbuah and Tei Mensah, (2013) who used the ratio of broad money supply to GDP as the proxy for financial development in Ghana; the effect was negative and marginally significant. The researcher posits that any expansionary fiscal and monetary policies resulting in excess money supply could be inimical to growth. Ghana is found of monetary expansion through public sector emoluments, authorities must ensure that it is accompanied by an improvement in productivity to generate the needed growth-enhancing effects on the economy. Government expenditure is negatively related to economic growth in contrast with the expected sign of a positive but it‟s well grounded in literature. A coefficient of -5.11 and statistically significant indicates that 1% percent increase (decrease) in government expenditure will lead to approximately 5.11 percentage decrease (increase) in economic growth.

There is a plethora of literature on a negative relationship between government expenditure and economic growth Abu-Bader and Abu-Qarn, (2003) study on the causal relationship between government expenditure and economic growth for Syria, Israel and Egypt, using the multivariate cointegration and VAR techniques established negative long-term relationship between the two variables. Amponsah-Nketiah, (2009) also found a similar result using OLS, Sakyi (2011), Sakyi and Adams (2012), all found a negative coefficient for government expenditure of their studies done on the Ghanaian economy which proved that government expenditure in Ghana is detrimental to economic growth. Nketiah-Amponsah (2009), posited that such a relationship stems from the need to raise taxes by the government to finance government spending which hurt economic growth.

In contrast with expectations, trade openness also has a negative relationship with economic growth with a coefficient of -6.59 which is significant 1% level. It means that a 1% percentage increase (decrease) in trade openness will lead to a decrease (increase) in approximately 6.59 percent in economic growth. Even though the result is contrary to expectation, it is consistent with some empirical findings. For instance, Haussmann, Hwang, and Rodrik, (2007) reported that trade openness impact negatively on economic growth for countries which specialize in the production of low-quality products. According to them, countries exporting primary products are vulnerable to terms of trade shocks.

Another strand of research by Cooke, (2010); and Samimi, Ghaderi, Hosseinzadeh, and Nademi, (2012), argue that increase in trade openness may be detrimental to economic growth by increasing inflation and lowering exchange rates. Huchet-Bourdon, Le Mouël, Vijil, (2012) results suggest that trade may have a negative impact on growth when countries have specialized in low-quality products; trade clearly enhances growth once countries have specialized in high-quality products and their export basket exhibits a maximum required level of quality.

The priori expectation of a negative relationship between economic growth and inflation was confirmed by the results. The long-run coefficient of -0.26 which is weakly significant, the result indicates that a percentage (1%) increase (decrease) in inflation will lead to a decrease (increase) of approximately 0.26 percent in economic growth. The result is consistent with findings of Akinlo (2013), Adu *et al*., (2013), Akinsola and Odhiambo, (2017), etc.

Table 4.4.1 Long-Run Relationship

	Coefficient	Std. Error	t-Statistic
D(LNIP(-1))	7.261412	0.43744	16.5998
D(LNFD(-1))	-0.672821	1.46556	-0.45909
D(LNGEXP(-1))	-5.110608	2.34331	-2.18094
D(LNTOP(-1))	-6.591035	1.54471	-4.26684
D(INF(-1))	-0.255014	0.14672	-1.73811
C	167.2394		

Source: Computed by the author, 2019

4.4.2 *Short Run Analysis*

The dynamic interaction between the dependent variable and the regressors has also been explored which is displayed in table 4.4.2. The ECM has a coefficient of -0.214822 at 10% significance level which is very good for the model because it implies that the process is converging in the long run, that‟s the speed of adjustment. This means that any deviation in economic growth in the long run is likely to be corrected quarterly from the short run towards the long run. In other words, about 22% of disequilibrium in the previous quarter is corrected in the current quarter. From Table 4.4.2, the lag of economic growth is positively related with the current economic growth. The coefficient of 0.179 at 10% significant level indicates that a 1 percent increase in the previous quarter‟s growth will lead to approximately 0.18 percentage increase in the current quarter‟s growth. Based on the lag length criteria, 4 lags were used for the model. There is a positive relationship between the 4th lag of insurance and economic growth with a coefficient of 0.074 at 5% significance level. The results indicate that; a 1 percentage change in the previous year‟s insurance will increase (decrease) economic growth by approximately 0.074 in the short run which is consistent with the long run results.

Financial development (lag 2) also has a positive relationship with economic growth having a coefficient of 0.48 at 1% significant level. This is very consistent with the long run dynamics. This means that a 1 percentage increase in financial development in the previous two quarters will lead to approximately 0.48 increase in economic growth in the short run. Government expenditure in lag 3 and economic growth are negatively related in the short run at 1% significance. The coefficient of -3.65 indicates that a 1% percentage increase (decrease) in government expenditure in the previous 3 quarters will result in approximately -3.65 decrease in the current economic growth in the short run. This is premised on the assumption that the government expenditure in previous quarters has an influence on the current economic growth, the result can be likened to that of Sheehey (1993) who posited that government expenditure is negatively related to economic growth when government size is large. Trade openness in its 4th lag has a negative relationship with the current economic growth which is very consistent with the long run results. As expected, the previous year‟s inflation is negatively related to the current year‟s economic growth.

Table 4.4.2: Short-Run Dynamics

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.701113	0.20922	3.35101	0.0018
D(LNGROWTH(-1))	0.179341	0.14842	1.20836	0.0985
D(LNIP(-4))	0.073656	0.04919	1.49724	0.0179
D(FD(-2))	0.482500	0.49836	0.96817	0.0037
D(GEXP(-3))	-3.646121	0.93655	-3.89316	0.0018
D(LNTOP(-4))	-25.92572	6.12398	-4.23348	0.0082
D(INF(-4))	-0.015704	0.22395	-0.07012	0.0580
CointEq(-1)*	-0.214822	0.02862	- 2.51791	0.0639

R-squared	0.917785
Adj. R-squared	0.796880
Sum sq. resids	6.657023
S.E. equation	0.625771
F-statistic	7.590968
Log likelihood	-20.90551
Akaike AIC	2.181652
Schwarz SC	3.246563
Mean dependent	0.173302
S.D. dependent	1.388478

Source: Computed by the author, 2019

From Table 4.4.2, the R-squared coefficient of 0.92 indicates that the exogenous variables explain the variations in the endogenous variable by 92% in the model. The adjusted (R2) which minimizes the influence of the number of explanatory variables is included in the model. The adjusted R2 of approximately 80% indicates that after removing the influence of the explanatory variables, the dependent variable is still explained by the equation. The F-statistic is relatively high at 7.6 and it explains how the independent variables jointly influence the dependent variable in the model, thus provides a good fit for the estimated model. Based on these probability statistics from the regression, the model is good for analysis and policy interpretation.

4.5 Results of the Granger Causality Test

The Granger causality test results show that there is bidirectional causality between insurance and economic growth at 5% significant level as displayed in Table 4.5.

Table 4.5: Granger Causality Test

Excluded	Chi-sq	df	Prob.
D(LNIP)	10.74429	4	0.0296
D(LNFD)	6.682695	4	0.1536
D(LNGEXP)	9.720625	4	0.0454
D(LNTOP)	8.342211	4	0.0798
D(INF)	1.728887	4	0.7855
All	67.19680	20	0.0000

Dependent variable: D(LNIP)

Excluded	Chi-sq	df	Prob.
D(LNGROWTH)	11.66811	4	0.0200
D(LNFD)	12.64718	4	0.0131
D(LNGEXP)	8.174244	4	0.0854
D(LNTOP)	6.062883	4	0.1945
D(INF)	6.355179	4	0.1741
All	28.79251	20	0.0919

Dependent variable: D(LNGROWTH)
Source: Computed by the author, 2019

The results follow the "Feedback" hypothesis which posits that there is bi-causality between finance and growth. It is argued that well-developed financial systems stimulate economic growth through technological changes, product, and services innovation (Schumpeter, 1912) which promotes demand for financial services (Levine, 1997). The result is consistent with the findings of Ying, Linsen and Wenjie (2017) who investigated insurance development and economic growth in China; Dash, et al. (2018) also studied insurance market penetration and economic growth in eurozone countries and found a bidirectional causality between insurance and economic growth. The result above confirms the rejection of the null hypothesis (H_0) that there is no causal effect between insurance and economic growth in Ghana.

4.6 The Results of Impulse Response Functions and Variance Decomposition

Table 4.6.1 and Figure 4.6.1 displays the impulse response function of innovation in insurance and its effect on economic growth. From Table 4.6.1 and Figure 4.6.1, eight quarters were used for the analysis.

Table 4.6.1: Impulse Response Function

Period	
1	-0.035231
2	-0.013483
3	0.205939
4	0.354177
5	0.457964
6	0.503130
7	0.484067
8	0.396925

Source: Computed by the author, 2019

A one Standard error shock (innovation) to insurance results in a decrease in economic growth in the first two quarters because initial money taken from the economy to insurance is leakage. Economic growth picks off positively from the third quarter to the sixth quarter, after which it started falling, though still positive. Base on the results, we can conclude that shock to insurance has a positive effect on economic growth in both short and long run. The result is consistent with Olayungbo (2015), and Kanywuiro (2015).

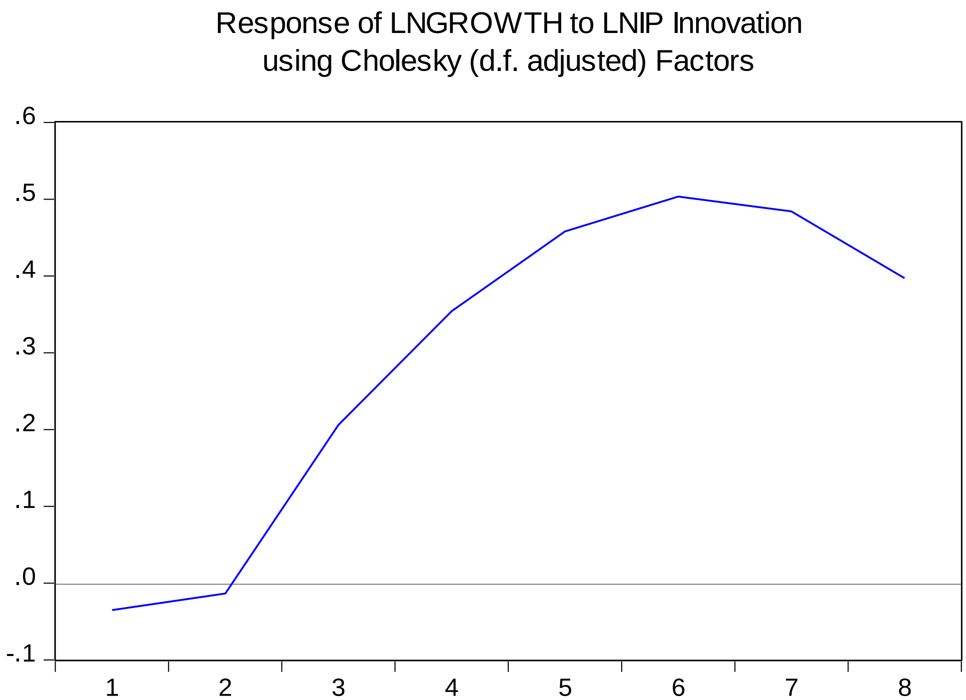

Figure 4.6.1: Response of LNGROWTH to LNIP Innovation using Cholesky Factors

Source: Computed by the author, 2019

The estimated variance decomposition of economic growth over the two-year horizon is presented in Table 4.6.2 a and b. From Table 4.6.2 a, in the short run (2nd quarter), past economic growth innovations explain about 72% fluctuations of the current economic growth and about 10% being accounted for by insurance which is significant. But in the long run (8th quarter), innovations (shocks) in the lag of economic growth cause about 33% in the fluctuations of economic growth whilst innovations (shocks) in insurance account for about 17% in the fluctuations of economic growth, for instance, the mobile network companies getting involved in the insurance industry. It can be observed that there is a long run effect of innovations (shocks) in insurance on economic growth as the coefficients increase in the long run.

Table 4.6.2a: Variance Decomposition of LNGROWTH

Period	S.E.	LNGROWTH	LNIP	LNFD	LNGEXP	LNTOP	INF
1	0.625771	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	1.253030	71.96127	9.560683	9.816742	0.018085	1.302493	7.340728
3	2.168376	52.82065	12.19127	18.86364	4.854792	2.569158	8.700492
4	3.344082	45.28446	12.87364	22.20277	3.093674	4.396105	12.14935
5	4.288453	38.31394	14.75031	26.38936	1.881648	3.710027	14.95471
6	5.018534	36.20713	14.95204	28.04655	1.649811	2.886453	16.25802
7	5.713843	34.56120	15.75346	26.51307	3.964466	2.227131	16.98068
8	6.229276	33.21335	16.61373	24.38511	7.268920	2.035727	16.48316

Source: Computed by the author, 2019

Table 4.6.2b: Variance Decomposition of LNIP

Period	S.E.	LNGROWTH	LNIP	LNFD	LNGEXP	LNTOP	INF
1	3.992362	3.572886	96.42711	0.000000	0.000000	0.000000	0.000000
2	5.042810	4.532023	74.53686	2.732094	3.115262	13.29644	1.787321
3	5.517317	3.911328	74.24069	2.286250	3.396109	12.00207	4.163554
4	5.987629	11.12354	68.09764	1.992228	3.836938	10.77150	4.178159
5	7.999467	8.470997	77.54183	2.282781	2.737029	6.128644	2.838718
6	8.676866	8.872160	68.12496	2.496626	2.749218	14.01891	3.738125
7	9.328997	8.914094	64.33158	2.206760	2.756017	17.94361	3.847936
8	10.00041	11.45617	61.56077	2.825475	2.779265	15.91098	5.467339

Source: Computed by the author, 2019

Table 4.6.2b also displays analyses of the decomposition of insurance. In the short run (2nd quarter), innovations in the lag of insurance can cause about 75% of fluctuations in insurance and economic growth also accounts for about 5% in the fluctuations in insurance. But in the long run (8th quarter), innovations (shocks) in the lag of insurance cause about 62% in the fluctuations of insurance whilst innovations (shocks) in economic growth account for about 12% in the fluctuations of insurance. Almost the same picture is painted from Table 4.6.2a. The result confirms the bi-causality of insurance and economic growth within the period under study. The reason being that it's only after growth has been sustained before economic agents think about insurance. Due to this, growth has a strong effect in the long run than the short run. The study rejects the null hypothesis that „innovations (shocks) in insurance have no effect on economic growth in Ghana." based on the results above.

4.7. Diagnostics

The serial correlation was performed to ensure that the model is not serially correlated and not heteroskedastic. The test statistics indicate that the data set is not serially correlated and heteroskedastic since the probability values are greater than the rule of thumb (5%). From Table 4.7.1, probability of 0.5521 for the 4th lag indicates that the null hypothesis of no serial correlation cannot be rejected.

Table 4.7.1: VEC Residual Serial Correlation LM Tests

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	40.01076	36	0.2966	1.117081	(36, 29.1)	0.3827
2	29.89387	36	0.7533	0.737706	(36, 29.1)	0.8083
3	42.21578	36	0.2201	1.211408	(36, 29.1)	0.2997
4	36.05583	36	0.4660	0.958795	(36, 29.1)	0.5521

Source: Computed by the author, 2019

The rule of thumb for heteroskedasticity is that the model is not heteroskedastic when the probability value is above 5% significance level. The probability value of 0.4288 confirms that the model is not heteroskedastic.

Table 4.7.2: VEC Residual Heteroskedasticity Tests (Levels and Squares)

Chi-sq	df	Prob
804.5237	798	0.4288

Source: Computed by the author, 2019

The model is also normally distributed according to the Jarque-Bera results. The skewness has a value of -0.036 which is less than -1 and closer to zero. The kurtosis also has a value of 3.21 which is a mesokurtic kurtosis indicating that the model is normally distributed.

And lastly, the Jarque-Bera test shows that the data is normally distributed (coefficient of 0.09, $p < 0.05$). The result is displayed in Figure 4.7.1.

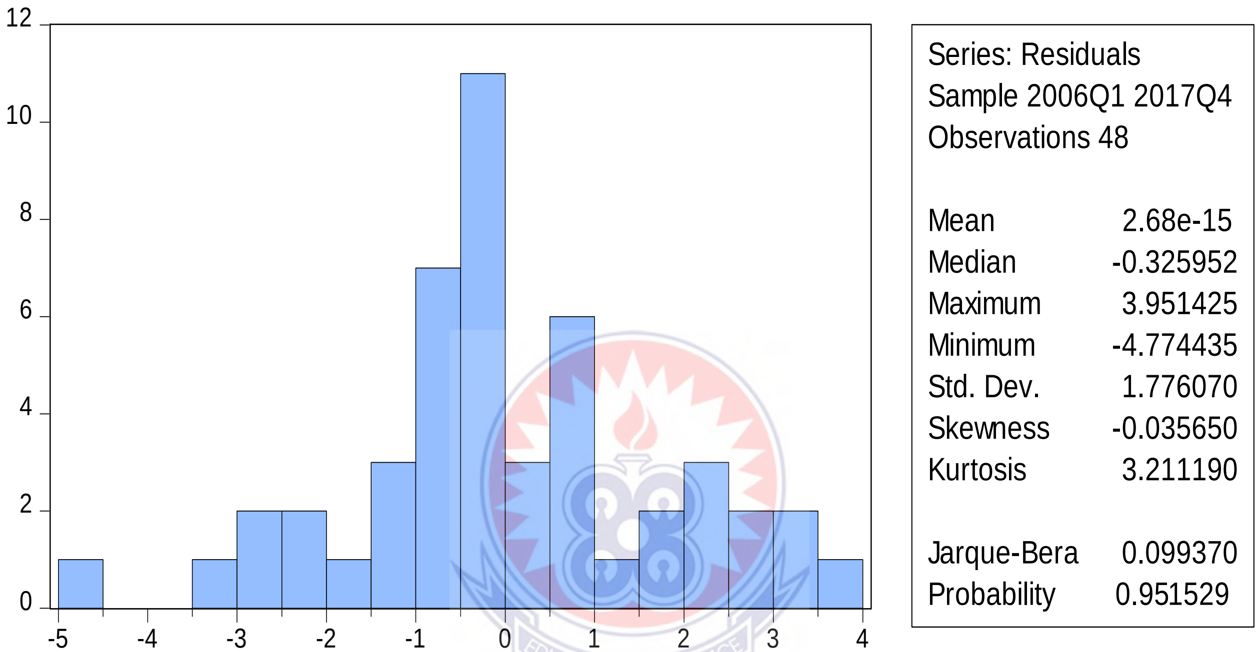

Figure 4.7.1: Normality Test
Source: Computed by the author, 2019

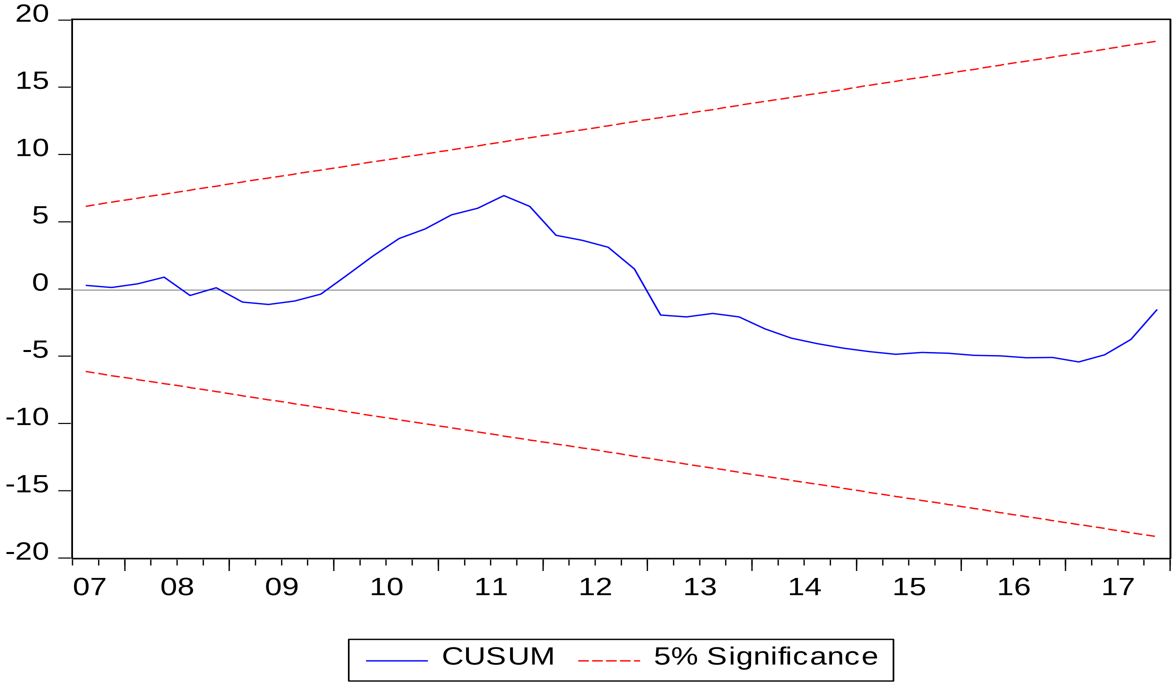

Figure 4.7.2: Cumulative Sum (CUSUM)
Source: Computed by the author, 2019

Finally, the cumulative sum (CUSUM) of recursive residuals and the cumulative sum of squares (CUSUM SQ) of recursive residuals show that the model is stable as displayed on figure 4.7.2 and 4.7.3.

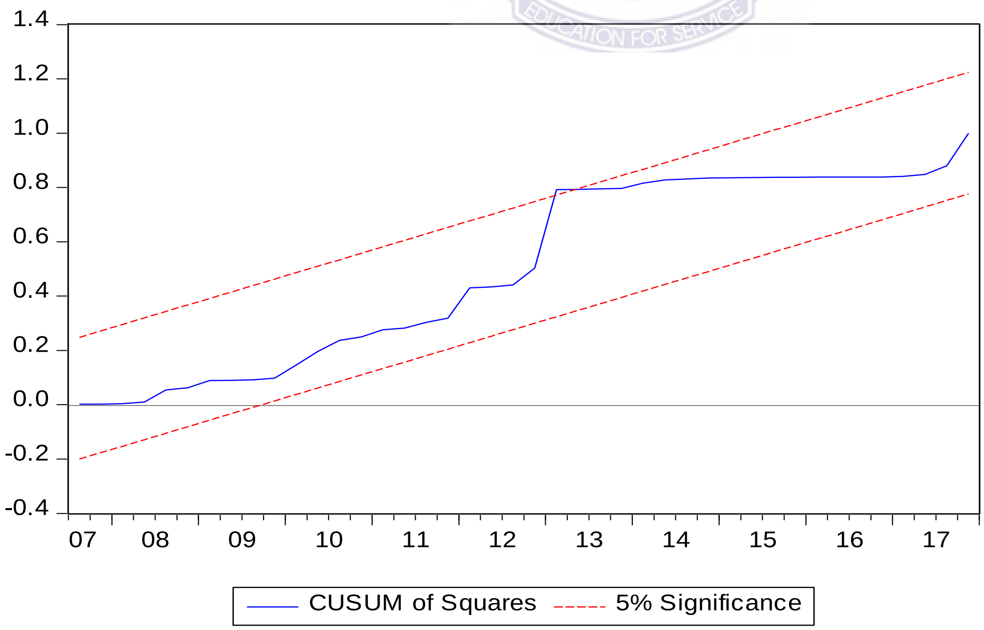

Figure 4.7.3: Cumulative Sum of Squares (CUSUM SQ)
Source: Computed by the author, 2019

Conclusion

The empirical results of insurance and economic growth was presented in this chapter. It started with the descriptive statistics of the data set which proved that the data set was normally distributed and good for analysis. The time series properties of the data set were also examined using ADF and PP technique of which all the series were stationary at first difference except insurance premium. The study further conducted the cointegration test using the Johansen and Juselius technique which indicated that, there was a long run relationship among the variables. Both long run and shot run estimates using the VECM revealed a significant positive relationship between insurance and economic growth with the speed of adjustment of approximately 22%, meaning that any disequilibrium in the short run will be corrected in the long run. There was bi-causality running from insurance to economic growth and economic growth to insurance. Finally, innovations (shock) in insurance have a significant positive effect on economic growth.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.0 Introduction

The entire study is summarized in this chapter. This chapter presents summary, conclusions as well as recommendations for policy formulation. Again, suggestions for further research was also presented in this chapter.

5.1 Summary of the Study

The theory of economic growth and the factors affecting it are one of the most important concerns of many economists and macroeconomic research. Economists in trying to understand what goes into the economy in order to achieve the desired growth came out with various models of growth. Endogenous growth models originally developed by Romer (1986) have been expanded to incorporate financial sector spillovers and the quality of financial institutions.

The objectives set for the study were: to examine the effect of insurance on economic growth in Ghana; to examine the dynamic interactions between insurance and economic growth in Ghana; and to examine the effect of asymmetric of insurance on economic growth in Ghana. In order to check for stationarity and ascertain the order of integration of the quarterly data set used, the ADF and the PP test were employed. The ADF and the PP test revealed that all the variables were integrated of order one with the exception of insurance which was stationary at levels or order zero.

To examine the effect of insurance on economic growth as well as the dynamic interactions between insurance and economic growth, the Johansen and Juselius (1990) cointegration approach, as well as VECM, was employed. Again, Granger causality in VECM was also used to examine the causal effect of insurance and economic growth. And finally, impulse response function, as well as variance decomposition, was employed to examine the effect of innovations (shocks) of insurance on economic growth. The study estimated the Long run relationship and Short-run dynamics between insurance and economic growth. The key findings are as follows: The cointegration analysis revealed that there was at most four (4) cointegrating equations in the model. The VECM long run revealed that Insurance has a positive and strong significant relationship with economic growth. This result re-emphasizes the crucial role insurance plays in the economy. Financial development was negatively related to economic growth but not significant, which was contrary to expectations even though similar findings were found in the literature.

Government expenditure in the long run is negatively related to economic growth and highly significant. This is an indication that, either the government spends on unproductive projects which do not affect growth or the government‟s spending crowds out investors. Trade openness was also found to be significantly negative with economic growth. By inference, Ghana‟s exports are made up of mostly primary products, the nature of our imports made up of mostly consumables which is detrimental to economic growth. Lastly, inflation was also found to be negative and significant with economic growth as expected theoretically. The result simply means that, if the government is able to keep inflation down, it will exert a positive impact on economic growth.

The error correction term coefficient of approximately 22 percent indicates the speed of adjustment of any disequilibrium in the previous quarter back to the long run equilibrium in the current quarter. There is a positive relationship between the 4th lag of insurance and economic growth which was significant. Financial development (lag 2) also has a significant positive relationship with economic growth.

Government expenditure in lag 3 and economic growth are negatively related in the short run, and significant. Trade openness in its 4^{th} lag has a negative relationship with economic growth which is very consistent with the long run results. As expected, the previous year‟s inflation is negatively related to the current year‟s economic growth.

The Granger causality in the VECM also revealed that there is a bidirectional causality running from insurance to economic growth and vice- verse. The result was consistent with the feedback hypothesis. And finally, the impulse response functions and the variance decompositions confirmed that an innovation (shock) in insurance positively impact economic growth.

5.2 Conclusions

The study drew the following conclusions as a result of the findings made:

The estimation results rejected the null hypothesis (H_0) and accepted the alternative (H_1) that there is a significant positive relationship between insurance and economic growth in Ghana. The study also revealed that financial development was negatively related to economic growth in the long run but positive in the short run. Government expenditure, trade openness and inflation were negatively related to economic growth.

The study also rejected the null hypothesis (H_0) and accepted the alternative (H_1) that there is a bidirectional causality running from insurance to economic growth which is consistent with the feedback hypothesis in Ghana. Lastly, impulse response functions and the variance decompositions confirmed the rejection of null hypothesis (H_0) and accepted the alternative (H_1) that an innovation (shock) in insurance has a positive effect on economic growth.

5.3 Policy Recommendations

The study seeks to highlight the effect of insurance on economic growth as its main objective but added some control variables such as; financial development, government expenditure, trade openness, and inflation to find out how their presence will also impact economic growth in Ghana.

The insurance companies play a very important role among the financial intermediaries in the economy which include; the main risk management tool for individuals, companies, and government. Through issuing insurance policies, they collect funds and transfer them to deficit economic units for financing real investment. The importance of insurance is growing due to the increasing share of the insurance sector in the aggregate financial sector in almost every developing country with Ghana inclusive.

Based on the findings of the study, the following policy recommendations were made:

As insurance promotes economic growth, policies should be developed to support the insurance industry. The study suggests that attention must be given to the development and implementations of policies that promote an increase in coverage and access of insurance products in order to increase premium. Existing policies such as compulsory motor insurance, fire insurance for private-public buildings, etc. should be reinforced in order to increase premium income. Government through the regulatory body, the National Insurance Commission (NIC) should provide an appropriate environment for the insurance business to grow. Also, the insurance business leaders must identify, formulate, and implement appropriate strategies including service quality and operational efficiency to meet customer expectation for growth and sustainability of the industry. If insurers do not understand their customers" needs, finances and cultures, then the design of effective products is seriously impeded which may lead to a decrease in insurance as well as economic growth.

The NIC which is the regulatory body of the insurance industry in Ghana should consider expanding their policy and regulatory framework to include non-traditional delivery channels such as cell phones (mobile money) sales, E-zwich, etc. This may help reduce transaction cost, increase participation as well as convenience. This may increase insurance premium and for that matter economic growth, "all other things being equal".

The study found a negative but not significant long-run relationship between financial development and economic growth which is an indication that one of the indicators that propel economic growth is financial development. As a result, the government through the Bank of Ghana and other stakeholders in the financial sector should develop and continue implementation of policies as well as a regulatory framework that will ensure financial sector reforms. This will ensure a growing and formidable financial sector which will promote economic growth in Ghana. Again, the government should ensure financial discipline in order not to increase money supply which may not correspond with productivity. Based on the findings, the researcher would like to encourage the central bank to continue with their reforms to regulate and sanitize the financial sector to ensure Ghana has a robust and stable financial sector that the citizens can have confidence in. The study also recommends to the Government to ensure the passage of the Fiscal Responsibility Act to ensure fiscal discipline by government agencies to control money supply. By so doing, financial development can affect economic growth positively, "all other things being equal".

Following the results of the estimation in the previous chapter which reports a significant and negative relationship between government expenditure and economic growth, this study therefore recommends that the government should encourage and support the private sector initiative rather than trying to lead, in order to accelerate economic growth. The government should increase its spending on infrastructure, social and economic activities as well as investment in transport and communication sectors since it would reduce the cost of doing business as well as raise the profitability of firms which will eventually lead to an increase in economic growth.

The investigation revealed that trade openness has a significant negative relationship with economic growth. Based on the results, the study recommends that the country should modify the composition of a trade by switching from exports of raw materials and semi-manufactured goods to high valued-added goods which will boost the economy. Trade clearly enhances growth once countries have specialized in high-quality products and their export basket exhibits a valued added product. In view of this, the government should embark on policies that ensure the processing of goods before exporting.

Finally, as expected, the estimation results indicate that inflation has a negative and significant effect on economic growth in Ghana. These findings provide some important policy implications. The central bank should concentrate on policies which keep the inflation rate down because it may be helpful for the achievement of robust economic growth. Monetary policy must be designed to stabilize the general prices and curb inflation. Appreciable minimum inflation is also essential for reducing the uncertainties and fluctuations in the financial market which in turn boosts investment in the country. Better coordination between monetary and fiscal policies is required to achieve an appreciable minimum rate of inflation which can propel economic growth in Ghana.

5.4 Limitations of the Study

This study is not spared of setbacks just as any other work. The usefulness of the research findings is limited to Ghanaian economic dynamics thus, they cannot be generalized. Only in a developing economy with financial system dynamics similar to those in Ghana could these results apply. Another limitation of the study was limited availability of data. For instance, the researcher wanted to extend the data backward to include more observations but was constrained by unavailability of data.

5.5 Further Research

The research of interrelationship between insurance and nonfinancial sectors of the economy such as democracy, institutional growth and customer satisfaction in the promotion of economic growth in Ghana should be of interest for further research. Again, effects of the insurance industry on the development of banking and stock market sector; which will identify the effects of the transmission channels of insurance on economic growth in Ghana should be of interest for further research.

References

Abaidoo, G. G. (2015). *Customer Satisfaction Factors in Life Insurance Growth in Ghana*. Walden University.

Abu-Bader, S., & Abu-Qarn, A. S. (2003). *Government Expenditures, Military Spending and Economic Growth*: Causality Evidence from Egypt, Israel, and Syria. *Journal of Policy Modeling*, 25(6), 567-583.

Adu G., Marbuah G., Tei-Mensah J. (2013). *Financial development and Economic Growth in Ghana:* Does the measure of financial development matter?

Adu-Asare, I., A., and Aboagye, A. Q. Q. (2014). *Bank Competition, Financial Innovations and Economic Growth in Ghana*. *African Journal of Economic and Management Studies*, 5, 30–51.

Agbelenko, A. (2015). *Financial development and economic growth in Togo*. 11BE16155246, 7(18), 633 – 640. https://doi.org/10.5897/AJBM2015.7874.

Aghion P., and Howitt P. (2006). *Appropriate Growth Policy: A Unifying Framework*. Journal of the European Economic Association 4(2-3): 269-314.

Agu, C. C. and Chukwu, J. O. (2008). *Toda and Yamamoto Causality Tests between "Bank Based" Financial Deepening and Economic Growth in Nigeria*. *European Journal of Social Sciences*, 7(2).

Agyampo, J. and Akanlagm, A. K. (2011). *Promoting Customer Satisfaction in the Insurance Industry in Ghana: A Case Study of Selected Insurance Companies in the Tamale Metropolis.*

Agyei, C. K. (2015). *Financial Development and Economic Growth*: The Causal Relationship in Ghana. Kwame Nkrumah University of Science and Technology.

Akanro, B. (2008). *The Insurance Industry Vs Nigeria Economy, Light Does not Shine in Light*. www.scirp.org/(S(351jmbntvnsjt1aadkposzje))/reference/ReferencesPapers.

Akinboade, O. (1998). *Financial Development and Economic Growth in Botswana*: A Test for Causality. Savings and Development. 22. 331-348.

Akinlo, T. (2013). *The Causal Relationship Between Insurance and Economic Growth in Nigeria (1986-2010)*. Department of Economics Obafemi Awolowo University, Ile-Ife, Nigeria.

Akinlo, T. and Apanisile, O. (2014*). Relationship between Insurance and Economic Growth in Sub-Saharan African:* A Panel Data Analysis. *Modern Economy*, 05(02), 120-127.

Akinsola, F. A., And Odhiambo, N. M. (2017). *Inflation and Economic Growth: A Review of The International Literature*. *Comparative Economic Research*, 20(3), 201710.1515/cer-2017-0019.

Alagidede, P., Baah-Boateng, W. and Nketiah-Amponsah, E. (2013). *The Ghanaian economy: An overview*. *Ghanaian Journal of Economics*, Vol. 1, Journal compilation, African Finance and Economics Consult.

Alhassan, A. L., & Fiador, V. (2014). *Insurance-Growth Nexus in Ghana: An Autoregressive Distributed Lag Bounds Co-Integration Approach*. Review of Development Finance.4 (2014) 83–96.

Amadeo K., (2019). *Economic Growth, Its Measurements, Causes, and Effects. www.thebalance.com/what-is-economic-growt.*

Ang, J. B. (2008). *A Survey of Recent Developments in the Literature of Finance and Growth*. https://doi.org/10.1111/j.1467-6419.2007.00542.x.

Apergis N., Filippidis I, and Economidou, C. (2007). *Financial Deepening and Economic Growth Linkages*: A Panel Data Analysis. *Review of World Economics* 143(1), 10.1007/s10290-007-0102-3.

Appietu-Ankrah, K. (2008). *The Insurance Industry and Ghana's Economy*. The insurance industry-and-ghana%E2%80%99s-economy. http://www.ghanabusinessnews.com/2008/12/19/.

Arena, M. (2008). "*Does Insurance Market Activity Promote Economic Growth? A Cross Country Study for Industrialized and Developing Countries*", *The Journal of Risk and Insurance*, 75(4), 921-946. www.researchgate.net.

Arestis, P., Demetriades, P. O. and Luintel, K. B. (2009*). Financial Development and Economic Growth*: The Role of Stock Markets.

Arltova, M. and Fedorova, D. (2016). *Selection of Unit Root Test on the Basis of Length of the Time Series and Value of AR (1) Parameter*. Statistika 96(3).

Arrow K. J., (1963). *Uncertainty and the welfare economics of medical care,* American Economic Review, vol. 53, no. 5, pp. 941–973, 1963.

Arrow, K. J. (1962). *The Economic Implications of Learning by Doing*, *Review of Economic Studies 29*, 153–173.

Arrow, K. J. (1962b). *Economic Welfare and the Allocation of Resources for Invention*, in R. R. Nelson (ed.), *The Rate and Direction of Inventive Activity*, Princeton University Press, Princeton, NJ.

Azman-saini, W.N.W. and Smith, P. (2010). *Finance and growth: New Evidence on The Role of Insurance. Published in: South African Journal of Economics*, 79(2), 111-127.

Barro, R. J. and Sala-i-Martin X. (1995). *Technological Diffusion, Convergence, and Growth*. *NBER* Working Paper No. 5151, Issued in June 1995.

Beck, T. and Levine, R. (2002). *Industry Growth and Capital Allocation: Does Having a Market- or Bank-Based System Matter*? *NBER* Working Paper No. 8982.

Beck, T. and Webb, I. (2002). *Economic, demographic and institutional determinants of life insurance consumption across countries*. World Bank Econ. Rev. 17(1), 51–88.

Beck, T., Maimbo, S.M., Faye, I., Triki, T. (2011). *Financing Africa: Through the Crisis and Beyond*; The World Bank: Washington, DC, USA, 2011.

Bednarczyk, T. H. (2013). *Insurance Development as a Factor in Long-Term Economic Growth*. *Insurance Review* 4/2013 / Wiadomości Ubezpieczeniowe 4/2013.

Bencivenga, V. R. and Smith, B. D. (1991). *Financial Intermediation and Endogenous Growth*. *The Review of Economic Studies*, 58(2), 195-209. Oxford University Press.

Bernouilli D. (1738), Exposition of a New Theory on the Measurement of Risk. Econometrica, vol.22, (1954), pp. 23-36.

Bildirici, M. and Türkmen, C. (2015). *The Chaotic Relationship Between Oil Return, Gold, Silver and Copper Returns in TURKEY: Non-Linear ARDL and Augmented Non-linear Granger Causality*. Procedia - Social and Behavioral Sciences 210 (2015) 397 – 407

Bland, J. M. and Altman, D. G. (1996). *The Use of Transformation When Comparing Two Means*. *BMJ: British Medical Journal*, 312(7039), 1153 Published by: BMJ Publishing Group.

Brainard, L., and Schwartz, B. L. (2008). *What is the Role of Insurance in Economic Development?* Zurich, Zurich Financial Services.

Brooks, C. (2002). *Introductory Econometrics for Finance*, Cambridge University Press.

Browne, M. J. and Kim, K. (1993). *An international analysis of life insurance demand*, *Journal of Risk and Insurance*, 60, 616-634. https://doi.org/10.2307/253382

Browne, M. J., Chung J., Frees, E. W. (2000). *International Property-Liability Insurance Consumption. The Journal of Risk and Insurance* 67(1), 73–90

Chen, P. F., Lee, C. C. and Lee, C. F. (2012). *How does the Development of the Life Insurance Market Affect Economic Growth? Some international evidence*. *Journal of International Development*, 24, 865-893

Cheung, Y. W., Lai, K. S. (1993). *Finite Sample Sizes of Johansen's Likelihood Ratio Test for Cointegration*. *Oxford Bulletin of Economics and Statistics*, 55, 313–328

Chien-Chiang, L. (2011). *Does Insurance Matter for Growth: Empirical Evidence from OECD Countries*. *The B E Journal of Macroeconomics* 11(1),18-18, 10.2202/1935-1690.2080.

Choong, C. K. and Chan, S. G. (2011). *Financial Development and Economic Growth: A Review. African Journal of Business Management* 5(6):2017-2027. Cointegration - With Application to the Demand for Money. *Oxford Bulletin of Economics and Statistics*, 52, 169-210.

Cooke, D. (2010). *Openness and inflation*. *Journal of Money, Credit and Banking*, 42, 267–287. https://doi.org/10.1111/jmcb.2010.42.issue-2-3

Craig, C. and Monique, C. (2003). *Protecting the Poor, A Microinsurance Compendium. ILO Cataloguing in Publication Data*: microinsurance, life insurance, health insurance, low income, developing countries. 11.02.3. International Labour Office, CH-1211 Geneva, Switzerland www.ilo.org

Darko, C. K., *(2015). Determinants of Economic Growth in Ghana.* *http://hdl.handle.net/10419/123098*

Darrat, A. (1999). *Are Financial Deepening and Economic Growth Causally Related*? Another Look at the Evidence. *International Economic Journal*, 13(3), 19-35

Dash, S., Pradhan, R. P., Maradana, R. P., Gaurav, K., Zaki, D. B., Jayakumar M. (2017). *Insurance Market Penetration and Economic Growth in Eurozone Countries*: Time Series Evidence on Causality Indian Institute of Technology Kharagpur, Kharagpur721302, India.

Demirhan, E., Aydemir, O., and İnkaya, A. (2011). *The Direction of Causality between Financial Development and Economic Growth: Evidence from Turkey*.

Department for International Development (DFID) department for Business, Innovation & Skills (BIS) *Annual Report* 2010

Dickey, D.A., Fuller, W.A. (1979). *Distributions of the estimators for autoregressive time-series with a unit root*. *J. Am. Stat. Assoc*. 75, 427–831

Dickinson, G. (2000). *Encouraging a Dynamic Life Insurance Industry: Economic Benefits and Policy Issues*, London: Center for Insurance and Investment Studies. www.researchgate.net.

Diyoke, K., Yusuf, A. and Demirbas, E. (2018). *Government Expenditure and Economic Growth in Lower Middle Income Countries in Sub-Saharan Africa*: *An Empirical Investigation*. 10.9734/AJEBA/2017/38552

Domar, E. D. (1946). *The Shift to Services: A Review of the Literature. Econometrica, Vol. 14, No. 2* (Apr., 1946), pp. 137-147. https://www.jstor.org/stable/1905364

Dynan K., (2018). *GDP as a Measure of Economic Well-being*. Hutchins Center Working Paper #43. https://www.brookings.edu/research/gdp-as-ameasure-of-economic-well-being.

Emmanuel, C. O. (2001). Law of contract and insurance: Your New Millennium Questions with global case citations answered. Lagos: Eco Standard Services.

Enders, W. (2004). *Applied econometrics time series. 2nd Edition*. Birmingham, AL: University of Alabama

Engle, R.F. and Granger, C.W.J. (1987). Cointegration and Error Correction Representation, Estimation and Testing. Econometrica, 55, 251-276. http://dx.doi.org/10.2307/1913236.

Engle, R.F., Hendry, D.F. and Richard, J.F. (1983). *Exogeneity. Econometrica*, 51, 277-304. http://dx.doi.org/10.2307/1911990

Eschenbach, F. (2004). *Finance and Growth: A Survey of the Theoretical and Empirical Literature. Tinbergen Institute Discussion Paper* No. TI 2004-039/2.

Fortune, P. (1973). *A Theory of Optimal Life Insurance: Development and Tests. The Journal of Finance*, 27(3), 587 – 600

Frech T., (2000). *Managed Health Care Effects: Medical Care Costs and Access to Health Insurance*. University of California, Santa Barbara

Fuertes T. (2018). *Cointegration in Economy: A Long-Term Relationship*. www.quantdare.com

Ghosh, A. (2013). *Does life insurance activity promote economic development in India*: *Development Finance*, 4, 83-96. doi:10.1016/j.rdf.2014.05.003

Goldsmith, R.W. (1969). *Financial Structure and Development*. Yale University Press, New Haven.

Granger, C. W. J. (1969). *Investigating Causal Relations by Econometric Models and Cross spectral Methods*. *Econometrica*, 37(3).

Greene, W.H. (1997). *Econometric Analysis. 3rd ed*, NJ: Prentice Hall.

Greenwood J., and Jovanovic B. (1990). *Financial Development, Growth, and the Distribution of Income. The Journal of Political Economy*, 98(5), 1076-1107. Published by: The University of Chicago Press.

Gujarati, D. (1995). *Basic Econometrics*. Mcgraw-Hill, New York.

Gurley, J. G. and Shaw, E. S. (1956). *Financial Intermediaries and the Saving-Investment Process*' https://doi.org/10.1111/j.1540-6261.1956.tb00707.x.

Habibullah, M. S. and Eng, Y. S. (2007). *Does Financial Development Cause Economic Growth? A Panel Data Dynamic Analysis for the Asian Developing Countries*. Pages 377-393 | Published online: 27 Jun 2007.

Haiss, P. R. and Sümegi, K. (2008). *The Relationship of Insurance and Economic Growth – A*

Theoretical and Empirical Analysis. *Emprica, Journal of Applied Economics and Economic Policy*, 35(4), 405-431.

Han, L., Li, D., Moshirian, F. and Tian, Y. (2010). *Insurance Development and Economic Growth, The Geneva Papers on Risk and Insurance*. Issues and Practice, 35(2), 183–199.

Harrington, S. E., and Niehaus, G. (2000). *Volatility and underwriting cycle*. In G. Dionne (Ed.), The handbook of insurance. Boston: Kluwer Acadamic.

Harris, H. and Sollis, R. (2003). *Applied Time Series Modelling and Forecasting*. *Wiley*, West Sussex.

Harrod, R. F. (1939). *An Essay in Dynamic Theory*. *The Economic Journal*, 49(193), 14-33. Blackwell Publishing for the Royal Economic Society.

Haussmann, R., Hwang J. and Rodrik, D. (2007). *What You Export Matters*. *Journal of Economic Growth*, 12, 1–25.https://doi.org/10.1007/s10887-006-9009-4.

Hayashi, F. (2000). *Econometrics*. Princeton University Press and copyrighted, © 2000.

Hirshleifer, J. and Riley, J.G. (1992). *The Analytics of Uncertainty and Information*, Cambridge University Press, Cambridge.

Holyoake, J. and Weipers, B. (2005). *Insurance*, 4th Ed. UK: CIB Publishing.

Horng, M.-S., Chang, Y.-W. and Wu T.-Y. (2012). *Does Insurance Demand Or Financial Development Promote Economic Growth? Evidence from Taiwan*. *Appl. Econ. Lett*., 19 (2), 105-111.

Huchet-Bourdon M., Le Mouël C. and Vijil M. (2012). *The Relationship Between Trade Openness and Economic Growth: Some New Insights on The Openness Measurement Issue. Agrocampus-Ouest*, UMR 1302 SMART, Rennes, France.

Hughes, P. (2010). *Paradigms, methods and knowledge. International Perspectives on Theory and Practice, 2nd edition*. Maidenhead: Open University Press.

Insurance Act, (2006, Act 274). Accra: Ghana Publishing Corporation, Assembly Press.

Ivic M. M. (2015). *Economic Growth and Development*. *Journal of Process Management – New Technologies, International. Vol. 3, No.1, 2015*

Jiranyakul, K. and Brahmasrene, T. (2007). *The Relationship Between Government Expenditure and Economic Growth in Thailand*. www.questia.com.

Johansen, S. (1988). *Statistical Analysis of Cointegration Vectors*. *Journal of Economic Dynamics and Control*, 12, 231-254. http://dx.doi.org/10.1016/0165-1889(88)90041-3.

Johansen, S. (1991). *Testing Weak Erogeneity and the Order of Cointegration in UK Money*.

Johansen, S. (1995). *Likelihood-Based Inference in Cointegrated Vector Autoregressive Models* (New York: Oxford University Press).

Johansen, S. and Juselius, K. (1990). *Maximum Likelihood Estimation and Inference on Cointegration - With Application to the Demand for Money*. *Oxford Bulletin of Economics and **Statistics***, 52**,** 169-210.

Johansen, S. (1992)., *Determination of co-integration rank in the presence of a linear trend. Oxford Bulletin of Economics and Statistics* 54, 383–397.

Jones C. I., (2019). *Paul Romer: Ideas, Nonrivalry, and Endogenous Growth*. Stanford University, Stanford CA 94305-5015, USA chad.jones@stanford.edu

Kahneman, D. and Tversky, A. (1979). *Prospect Theory: An Analysis of Decision under Risk*. *Econometrica*, 47(2), 263-91.

Kanywuiro, C. W. (2015). *The Relationship Between Life Insurance and Economic Growth: Evidence from Kenya* (1999 to 2013). https://suplus.strathmore.edu/handle/11071/5049/restricted resource?bitstreamId=2481211.

King, R. G. and Levine, R. (1993). *Finance and Growth: Schumpeter Might Be Right*", Quarterly. *Journal of Economics*, CVIII, 717-737.

Lee, C.C., Lee, C.C. & Chiu, Y.B. (2013). "*The Link between Life Insurance Activities and Economic Growth: Some New Evidence*". *Journal of International Money and Finance*, 32, 405–427.

Leechor C. (1994). *Ghana: Frontrunner in Adjustment*. Washington, D.C.: World Bank.

Leshoro, T. L. A. (2017). *An Empirical Analysis of Disaggregated Government Expenditure and Economic Growth in South Africa.* Working paper 22644, University of South Africa.

Levine R. (2005). *Finance and Growth: Theory and Evidence*. *NBER* Working Paper No. 10766. www.nber.org.

Levine, R. (1997). *Financial Development and Economic Growth*: Views and Agenda. *Journal of Economic Literature*, XXXV, 688–726.

Levine, R. (2004). *Finance and Growth: Theory and Evidence*. *NBER* Working Paper No. 10766 JEL No. G0, O0

Levine, R., Loayza, N., Beck, T. (2000). *Financial Intermediation and Growth: Causality and Causes*. *Journal of Monetary Economics*, 46 (2000) 31}77.

Li, D., Moshirian, F., Nguyen, P., and Wee, T. (2007). *The Demand for Life Insurance in OECD Countries*. *Journal of Risk and Insurance*, 74 (3), 637–652.

Li, K. and Yao, S. (2007). Specialization and Trade*: A Game Theoretical Approach*. https://doi.org/10.1111/j.1468-0106.2006.00327.x.

Liew, V. K. (2004). *Which Lag Selection Criteria Should We Employ*? *Economics Bulletin*. 3. 1-9.

Lihan, E. and Taha B. S. (2011). *The Relationship between Insurance Sector and Economic Growth: An Econometric Analysis. International Journal of Economic Research*, 2(2), 1 – 9.

Lucas, R. E. (1988). *On the Mechanics of Economic Development*. University of Chicago, Chicago, 1l 60637, USA.

Luintel, K. and Khan, M. (1999). A Quantitative Reassessment of The Finance-Growth Nexus: Evidence from A Multivariate VAR. *Journal of Development Economics,* 60(2), 381-405.

Manu, F. (2017). Performance of the Ghana Stock Exchange and economic growth. http://hdl.handle.net/20.500.11988/322.

Mantaye A., (2011). *Essays on Insurance Economics*. University of Leicester, UK
Laberee, R. V., (2009). Organizing your Social Science Research Paper. www.libguides.usc.edu

McKinnon, R. (1973). *Money and Capital in Economic Development.* The Brooking Institute, Washington DC.

McMillan, D. G. (2003). *Non-Linear Predictability of UK Stock Market Returns*. *Oxford Bulletin of Economics and Statistics*, 65 (5), 557–573.

Merton, R.C. and Bodie, Z. (2004). „*The Design of Financial Systems: Towards a synthesis of function and structure*", National Bureau of Economic Research Working Paper Number 10620.

Mojekwu, J. and Agwuegbo, S. O. N. (2011). *The Impact of Insurance Contribution to Economic Growth in Nigeria*. www.researchgate.net.

Nagaraju, B. and Roopa, M. B. (2017). *Investment Portfolio of Life Insurance Companies in India: A Study on Selected Life Insurance Companies of India*. IRACST – *International Journal of Commerce, Business and Management* (IJCBM), ISSN: 2319–2828, 6(1).

Ngongang, E. (2015)., *Financial Development and Economic Growth in Sub- Saharan Africa: A Dynamic Panel Data Analysis*. 10.14207/ejsd.2015.v4n2p369.

NIC, (2016). National Insurance Commission Annual Report. www.nic.org.gh.

Njegomir, V. and Stojić D. (2010). *Does Insurance Promote Economic Growth: The Evidence from Ex-Yugoslavia Region. EKON. MISAO I PRAKSA DBK. GOD XIX*. (2010) BR. 1. (31-48)

Nketia-Amponsah, E. (2009). *Public Spending and Economic Growth: Evidence from Ghana (1970–2004).* Development Southern Africa, 26 (3), 333-340.

Nkoro, E. and Uko, A. K. (2016). *Autoregressive Distributed Lag (ARDL) Cointegration Technique: Application and Interpretation*. *Journal of Statistical and Econometric Methods*, 5 (4), 3.

Nurudeen, A. and Usman, A. (2010). *Government Expenditure and Economic Growth in Nigeria, 1970-2008*: *A Disaggregated Analysis*. *Business and Economics Journal*, 4. 1 11.

Olayungbo, D. O. (2015*). Insurance Demand, Financial Development and Economic Growth in South Africa: Evidence from Toda-Yamamoto Causality Test*, *Journal of Applied Economics and Business*, 35-55.

Olayungbo, D. O. (2015). Effects of Life and Non-Life Insurance on Economic Growth in Nigeria: An Autoregressive Distributed Lag (ARDL) Approach. *Global Journal of Management and Business*, *Global Journals Inc*. (USA) Online ISSN: 2249-4588 & Print ISSN: 0975-5853.

Olayungbo, D. O. (2015). *Insurance and Economic Growth Nexus in Nigeria: Asymmetric Non Linear Relationship under Heterogeneous Agents*. https://doi.org/10.1111/1467-8268.12144.

Olayungbo, D. O. Akinlo, A. E., and McMillan, D., (2016). *Insurance Penetration and Economic Growth in Africa: Dynamic Effects Analysis Using Bayesian TVP-VAR approach*. 10.1080/23322039.2016.1150390.

Omoniyi, L.G. and Olawale, A.N. (2015). *An Application of ARDL Bounds Testing Procedure to the Estimation of Level Relationship between Exchange Rate, Crude Oil Price and Inflation Rate in Nigeria. International Journal of Statistics and Applications*, 5, 81-90.

Okonkwo I. V., (2019). *Insurance Penetration Rate and Economic Growth in Nigeria: 1981-2017*. https://www.researchgate.net/publication/330619648

Oteng-Abayie, E. F. and Frimpong J. M. (2006). *Modelling and Forecasting Volatility of Returns on the Ghana Stock Exchange Using GARCH Models*. *American Journal of Applied Sciences*, 593(10), 10.3844/ajassp.2006.2042.2048.

Ouedraogo, I. M., Guerineau, S. and Sawadogo, R. (2016). *Life Insurance Development and Economic Growth: Evidence from Developing Countries*. https://ideas.repec.org/a/jed/journl/v43y2018i2p1-28.html.

Outreville, J. F. (1990). *The Economic Significance of Insurance Markets in Developing Countries. The Journal of Risk and Insurance*, 57(3), 487-498.

Outreville, J. F. (1996). *Life Insurance Markets in Developing Countries*. *The Journal of Risk and Insurance*, 63(2), 263-278.

Oxford Business Group || The Report: Ghana (2017)

Oyedotun, T. M. and Adesina, B. D. (2015). *Nexus between Economic Growth and Insurance Business in Nigeria*. *Research Journal of Finance and Accounting*. www.iiste.org ISSN 2222-1697 (Paper) ISSN 2222-2847 (Online), 6(9).

Pack H. (1994). *Endogenous Growth Theory: Intellectual Appeal and Empirical Shortcomings*. *Journal of Economic Perspectives*, 8(1), 55-72.

Pagano, M. (1993). *Financial markets and growth, An overview*. Umuersltci Bocconr, Mhn. Italy and CEPR, London, UK. *European Economic Review,* 37, 613-622. North-Holland.

Pal, K. Bolda, B.S., and Garg, M.C., (2007). *Insurance Management: Principles and Practices*. Deep & Deep Publication PVT Ltd.

Patrick, H. (1966), *Financial Development and Economic Growth in Underdeveloped Countries*. *Economic Development and Cultural Change*, 14, 174-189.

Pesaran, M.H. and Shin, Y. (1998). *An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis. In: Strom, S., Ed*., Chapter 11 in Econometrics and Economic Theory in the 20th Century the Ragnar Frisch Centennial Symposium, Cambridge University Press, Cambridge, 371-413.

Pesaran, M.H., Yongcheol, S. and Richard, J.S. (2001). *Bounds Testing Approaches to the Analysis of Level Relationships*. *Journal of Applied Economics*, 16, 289-326. http://dx.doi.org/10.1002/jae.616.

Philip, B. (2010). *Real Costs of Nominal Grade Inflation? New Evidence from Student Course Evaluations*. https://doi.org/10.1111/j.1465-7295.2009.00245.x.

Phillips, P.C.B. and Perron P. (1988). "*Testing for Unit Roots in Time Series Regression*," *Biometrika*, 75, 335-346.

Phutkaradze, J. (2014). *Impact of Insurance Market on Economic Growth in Post-Transition Countries*. *International Journal of Management and Economics*, 44(1), 10.1515/ijme-0011. www.researchgate.net.

Quartey, P. and Prah, F. (2008). *Financial development and economic growth in Ghana: is There a Causal Link*? *The African Finance Journal*, 10(1), 28-54.

Ram, R. (1999). *Financial Development and Economic Growth: Additional Evidence, Journal of Development Studies,* 35(4), 164-174.

Rao, D. N. (2006). *Investment styles and performance of equity mutual funds in India*. DOI: http://dx.doi.org/10.2139/ssrn.922595

Rivera-Batiz, L. and Romer, P. (1991). *Economic Integration and Endogenous Growth*. *The Quarterly Journal of Economics*, 106(2), 531-555.

Robinson, J. (1952). *"The Generalisation of the General 'theory"*. In her The Rufeo~ln/eres/a~]d Other Essays, (London: Macmillan).

Romer, P. M. (1986). *Increasing Returns and Long-Run Growth*. *The Journal of Political Economy*, 94(5), 1002-1037.

Romer, P. M. (1990). *Endogenous Technological Change*. *The Journal of Political Economy*, 98(5).Rousseau, P. L. and Wachtel P., (2000). Inflation, Financial Development and Growth. New York University - Stern School of Business

Saci, K., Giorgioni, G. and Holden, K. (2009). *Does Financial Development Affect Growth*? *Applied Economics*, 41(13), 1701-1707.

Sakyi, D. (2011), *Trade Openness, Foreign Aid and Economic Growth in Post-liberalization Ghana: An Application of ARDL Bounds Test*. *Journal of Economics and International Finance*, 3(3), 146-156

Sakyi, D. and Adams, S. (2012). *Democracy, Government Spending and Economic Growth: The Case of Ghana, 1960-2008*. *The Journal of Applied Economic Research*, 6, 361-383.

Samanhyia, S., Donbesuur, F. and Owusu-Ansah, I. (2014). *Financial Development and Economic Growth in A Post Financial Liberalization Era in Ghana: Does the Measure of Financial Development Matter*? *Journal of Economics and Sustainable Development*, 5(25), 51-59.

Samimi, J. A., Ghaderi, S., Hosseinzadeh, R., and Nademi, Y. (2012). *Openness and Inflation: New Empirical Panel Data Evidence*. *Economics Letters*, 117, 573–577. https://doi.org/10.1016/j.econlet.2012.07.028.

Samsi S. M. (2017). *Stock Market and Economic Growth in Asean-5*. Faculty of Economics and Administration University of Malaya Kuala Lumpur.

Schettkat, R. (2004), *Micromechanics of Composite Materials*. University of Wuppertal – Department of Economics. *IZA Discussion* Paper No. 964.

Schich, S. and Pelgrin F. (2002), *Financial development and investment: Panel Data Evidence for OECD Countries from 1970 to 1997*. *Applied Economics Letters*, 9(1), 1-7, 10.1080/13504850110048505

Schumpeter, J. A. (1912). *The Theory of Economic Development*, tenth printing 2004, Transaction Publishers, New Brunswick, New Jersey.

Schumpeter, J.A. (2008). *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle*, translated from the German by Redvers Opie, New Brunswick (U.S.A) and London (U.K.): Transaction Publishers.

Seth, A. (2007). *Granger causality*. *Scholarpedia*, 2(7), 1667.

Shaw, E. S. (1973). *Financial Deepening in Economic Development*. Oxford University Press, New York.

Sheehey E. (1993). *The Effect of Government Size on Economic Growth*. *Eastern Economic Journal*, 19(3), 321-328.

Shen, C. H. and Lee, C. C. (2006). *Same Financial Development Yet Different Economic Growth: Why*? *Journal of Money, Credit and Banking*, 38(7), 1907-1944.

Shiller, R. J. (1993). *Macro Markets: Creating Institutions for Managing Society's Largest. Economic Risks*. Clarendon Press, Oxford.

Shiller, R. J. (2005). *Irrational Exuberance. 2nd Edition*. Princeton University Press, Princeton (NJ)

Shin, Y., Yu, B. and Greenwood-Nimmo, M. (2014). *Modeling Asymmetric Cointegration and Dynamic Multipliers in a Nonlinear ARDL Framework*. In: Horrace, Springer Science & Business Media, New York, 281-314. https://doi.org/10.1007/978-1-4899-8008-3_9

Sibindi, A. B. (2014). *Remittances, Financial Development and Economic Growth: Empirical Evidence from Lesotho*. *Journal of Governance and Regulation*, 3(4).

Skipper, H. D. (1997). *Foreign Insurers in Emerging Markets*: Issues and Concerns, Occasional Paper 97-2, Center for Risk Management and Insurance.

Smith, A. (1776). *An Inquiry into the Nature and Causes of the Wealth of Nations* geolib.com/smith.adam/wonintro.html.

Sodokeh, W. A. (2015). *Factors Influencing the Growth of the Life Insurance Industry in Ghana*. *The Quarterly Journal of Economics*, 70(1), 65-94 Published by: The MIT Press

Solow, R. M. (1956). *A Contribution to the Theory of Economic Growth*: *The Quarterly Journal of Economics*, 70(1), 65-94 Published by: The MIT Press.

Soo, H. H. (1996). *Life Insurance and Economic Growth: Theoretical and Empirical Investigation*, Doctoral Dissertation, University of Nebraska. www.researchgate.net.

Steger, M. (2013). Globalization: *A Very Short Introduction*, OUP Oxford, 4 Apr 2013 – Business & Economics.

Stern, N. (1989). *The Economics of Development: A Survey*. *The Economic Journal*, 99(397), 597-685. Wiley on behalf of the Royal Economic Society.

Tong, H. (2008). *An Investigation of the Insurance Sector's Contribution to Economic Growth*: Proquest. LLC, University of Nebraska, Nebraska.

Ubom, U. B. (2014). *Investment Portfolio of Insurance Firms and Economic Development in Nigeria*. *International Journal of Finance and Accounting*, 3(5), 286-294.

Ul Din, S. M., Abu-Bakar, A. and Regupathi, A. (2017). *Does insurance promote economic growth: A comparative study of developed and emerging/ developing economies*. *Cogent Economics & Finance* (2017), 5: 1390029. https://doi.org/10.1080/23322039.2017.1390029.

Umoren, N. J. and Emem, M. J. (2016). *Relative Contributions of the Insurance Industry to the Growth of the Nigerian Economy*. *International Journal of Emerging Research in Management &Technology*, 5(6), 2278-9359.

United Nations Conference on Trade and Development in Geneva (1964). Conference report.

Von Neumann, J., Morgenstern, O. (1953). *Theory of Games and Economic Behavior*. Princeton: Princeton University Press von Neumann, John and Oskar

Wachtel, P. (2003). *Growth and Finance: What Do We Know and How Do We Know It?* https://doi.org/10.1111/1468-2362.00077

Ward, D. and Zurbruegg, R. (2000). *Does Insurance Promote Economic Growth? Evidence from OECD Countries*. *The Journal of Risk and Insurance*, 67(4), 489-506.

Webb, I. P., Grace, M. F. and Skipper, H. D. (2002). *The Effect of Banking and Insurance on the Growth of Capital and Output*. Centre for Risk Management and Insurance Working Paper No. 02-1, Robinson College of Business, Georgia State University, Atlanta, 2002.

Wood, A. (1993). *Financial development and economic growth in Barbados: Causal evidence*. *Savings and Development*, 17(4), 379-390.

Wooldridge, J.M. (2013). *Introductory econometrics: A modern approach (5th ed.)*. Mason, OH: South-Western, Cengage Learning.www.bog.gov.ghwww.nicgh.org

Yao, S. (2006). *On Economic Growth, FDI and Exports in China*. Applied Economics, **38,** 339-51**.**

Ying, W., Linsen, Y., Wenjie, P. (2017). *Life Insurance Contribution, Insurance Development Growth in China and Economic*. University of International Business and Economics, Shanghai, China.

Zhou, C., Wu, C., Li, D. and Chen, Z. (2012). *Insurance Stock Returns and Economic Growth*. *Geneva Papers on Risk and Insurance* - Issues and Practice 37(3).