ROLE OF PRIVATE INSURANCE ON ECONOMIC GROWTH IN KENYA

BY

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Declaration

The academic paper is my initial piece which hasn't been awarded a degree by any other institution.

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Mutemi Mwende Date

X50/80639/2015

The study report was presented with my authorization as the University Supervisor

Signature …….. Date……

Dr Martine Odhiambo Oleche

Dedication

I’m dedicating this paper to my supervisor for selfless guidance, my family for encouragement and moral support, all enabled me to realize my objective.

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This Research Project might not have been accomplished without the help of a number of individuals who contributed greatly to my crucial objective

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Abstract

The study analysed the role of private insurance sector on Economic growth in Kenya. The main aim was to scrutinize the effects of insurance activities on growth in Kenyan economy. Type of data used was time series for the time frame 1980-2017 and estimated a vector error correction model. To measure insurance market activity, total premium volume from all insurance categories (general and life) was used and real GDP for economic growth. The findings of the study are that, total sum of insurance premiums exhibited a notable positive effect on economic growth. Human and physical capital, savings rate, interest rate and life expectancy affect growth of the Economy in the long-run. Human capital and life expectancy showed notable negative influence tor on growth whereas physical capital and interest rate influence economic growth positively. Savings rate show insignificant adverse effects on economic growth. The research recommendation is that the insurance industry to develop custom made products which are appealing to customers. This would increase policy take up and hence increase premiums collected which in turn will steer economic Also the government should create a favourable operation environment for the insurance sector.

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CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Growth of an economy remains the greatest aspiration for every nation. Economic growth is regarded as the most feasible tool in reducing penury and guaranteeing better living conditions in many emerging economies. This is because economic growth generates not only opportunities through increased job employments but also prosperity in a nation. According to Rodrik (2008), sustainable economic growth enables societies to have better lives and especially those at the heart of poverty. This sustainable economic growth emanates from different actors in an economy. These sources could be sectors or industries whose outputs contribute greatly towards the growth of an economy.

According to the Economic Survey (2019) of Kenya Bureau of Statistics (KNBS), major sectors which greatly contribute to Kenya's gross domestic product (GDP) in Kenya included agriculture, forestry and fishing, manufacturing, electricity supply, building, transportation and storage, information and communication, finance and insurance, and hospitality and food services. As of 2018, agriculture accounted for 34.2 percent while finance and insurance accounted for 6 percent of Kenya's GDP respectively (KNBS, 2019).

Kenya's financial sector greatly contributes to economic growth. For the period 2014-2018, this sector has grown the Kenya economy at the rate of 6.54 percent on an annual basis. This makes this sector key in aiming to make Kenya an industrialized economy through high levels of savings and investments as enshrined in Kenya's vision 2030[1] (Ndung'u et al.,2011). Financial services and products accessibility growth has boosted this sector since 2006. According to the FinAccess Household Survey (2019). Financial services and products access in Kenya were at 82.9 percent, which was an increase from 75.3 percent in 2016. The survey also found that 89 percent

[1]Kenya Vision 2030 is the country's development map that will cover the period 2008-2030 and aims to make Kenya a newly industrialized, "middle-income country providing a high quality life to her citizens by the year 2030". This will be achieved through empowering the economy socially, economically and politically. (http://e-promis.treasury.go.ke/portal/development-strategy/vision-2030/)

rapid growth and uptake of mobile money, increased adoption of innovative and transformative technologies, as well as conducive government policies (CBK, KNBS & FSD-K, 2019).

According to the Kenya's Financial Stability Report (FSR) (2017), the financial sector in Kenya is composed of deposits taking institutions, non-deposit taking institutions and financial markets infrastructure providers. Each component of the financial sector has continued to grow to show contributing to the overall growth of the sector. Notable growths were on banking which grew by 8.1 % Saccos by 9.6 %, pensions by 10.6 %, and capital markets by 12.6 %. In 2017, the financial sector grew by 9.93 % in assets base and in 2018, the sector contributed to 7.55 % of Kenya's GDP. While the other sub-sectors showed an increase in profits, the banking sector experienced a decrease following the interest rates capping and decreased credit flow due to economic uncertainties.

Financial sector in Kenya mainly offer banking, insurance, pension, and Saccos services contributing to 58.3, 7.55, 13.95, and 5.72 % of the GDP respectively in asset terms. Over the last 11 years, the financial industry has greatly contributed towards Kenyan GDP as shown in the table1 below.

Table 1: Financial sector contribution to Kenyan GDP from 2007 to 2018

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Contribution to GDP (%)*	6.5	3.1	4.6	8.8	7.8	6.5	7.2	6.8	6.7	7.1	6.1	6.0	6.7

Sources: Authors own construction from *Economic Surveys 2007-2018*

The consistency in the finance industry's contribution to the GDP growth in Kenya highlights how significant this sector is. Insurance is a paramount sub-sector in finance industry. It is a key player in the transfer of risks and indemnification and more than ever before, a key player in financial mediation (Ward & Zurbrueg, 2007).

According to Kenya's Insurance Industry Report (KIIR) (2018) by AIB Capital Ltd., the insurance industry had grown to have 52 players, 8698 agents 2016 insurance brokers. Although most of the insurance has been concentrated in urban areas and especially in Nairobi, the sector is gradually penetrating all over the country. Most of the insurance companies in Kenya use agents to source for business and generate sales. Therefore, insurance companies in Kenya that

have had the biggest workforce have been competitive and generated better incomes than their competitors.

The insurance industry realized the growth of 6.6 percent in gross premiums increasing from KES 194.74 billion in 2016 to KES 207.68 in 20179(AIB Capital ltd,2018). The growth showed that many people opted for long-term insurance as compared to short-term insurance premiums. This growth was attributed to the growing middle-class in Kenya, changing and growing family structures, increased number of women in wage employment, continued growth in urbanization, increased international trade, financial sector deepening that increased access to financial services and products, and the devolved form of government that saw some health functions devolved to the county level.

Since 2015, the overall insurance penetration has been increasing rising from 2.78 percent to 2.88 percent in 2018 respectively (AIB Capital Ltd, 2018). Furthermore, the insurance industry in Kenya grew by 18.2 percent in asset terms, which was the biggest growth in all economic industry sub-sectors (FSR, 2017). The continued financial sector advancement and the insurance sector has been a big plus for Kenya's quest to attain Vision 2030.

1.2 Statement of the Problem

In Kenya more emphasis has been on banking industry as the key driver of the financial sector, and the Insurance industry seen as a minor secondary contributor to growth of the economy despite the fact that there has been noticeable insurance growth brought about by many factors such as sound regulation and diversification by the financial and non-financial actors now venturing into insurance market with all sorts of insurance policies deepening the penetration(Arena,2006).Insurance penetration as at 2017 stood at 2.8 percent of the population with total gross premiums of Kes 207.68 billion (AIB capital ltd, 2018).

The continued rise of the insurance sector's share in the aggregate finance industry in many countries has attracted a lot of research to unearth how insurance sector growth and development is linked to growth of an economy (Olayungbo & Akinlo, 2016). Africa continues to experience insurance growth and penetration with increased growth in financial inclusion and accessibility of the product. This shows the great potential in the insurance industry. This increased growth has attracted a lot of research to scrutinize the link of insurance development to growth of an economy applying various methods and models like Generalized Method of Moments (GMM)

(Han et al., 2010), and Bayesian TVP-VAR approach (Olayungbo & Akinlo, 2016) on either panel or time series data across many economies to try and get this nexus. The results have been inconclusive.

Here in Kenya, studies have focused mainly on the finance industry growth and the consequent contribution towards growth of the economy. There are few studies carried out in Kenya to scrutinize the insurance market impact on growth of an economy such as by Kanywuiro (2015) and Ndalu (2011). The two studies used GMM and simple regression respectively in the analysis. This study believes insurance premium has a major role in development of Kenya economy, and using most recent data ranging from 1980 to 2017, and vector auto-regressive analysis, then the study endeavours to provide a strong quantitative perspective of the impact that the private insurance sector has had in steering Kenya's growth of the economy

1.3 Research Objectives

The study aims at investigating the contribution of private insurance sector on economic growth in Kenya through a vector autoregressive analysis for the period 1980-2017.

Specifically, the research intends to:

i. Examine the impact of insurance activities on growth in Kenyan economy
ii. Draw policy recommendations on the role of insurance in steering growth of an economy in Kenya.

1.4 Significance of the Study

This study's aim to ring out impact of insurance sector, will provide very important insights of where Kenya stands in her quest to grow insurance and the financial sectors to see that the 6 percent contribution towards the GDP is maintained or made better. These will be lessons that the findings of the study expect the policymakers in the insurance industry could leverage on in their decision-making. The study through perusing various reports and literature will unearth areas that the insurance sector could work in order to boost the current insurance penetration from 2.8 percent to say 4 or 5 percent coverage levels. The study's findings may also present a framework for the investors and those with interest in insurance to make sound and informed decisions.

1.5 The scope of the Study

The focus of the study is to investigate private insurance sector's importance on growth of an economy in Kenya for the period 1980-2017 through a vector autoregressive analysis. Endogenous growth model will be used. The study's goal is to highlight the insurance sector's importance in an economy. To do this, the study will use secondary data to investigate how insurance premium, physical capital, human capital, rate of savings, level of interest rates, and life expectancy respectively affect growth of an economy in Kenya. Secondary data from World Development Indicators (WDI), Insurance regulatory authority (IRA) and the Kenya National Bureau of Statistics (KNBS) will be used.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The section presents a discussion of relevant theories in economic growth and insurance sector. The second part in this section consists of the empirical studies carried out in this area of study and it ends with the third part which gives a summary of the study of what studies carried out.

2.2 Theoretical Literature Review

Various theories that explain economic growth as put forward by various authors in economics are discussed in this section. The theories inform us of the identified factors that cause an economy to grow and the insurance and economic growth relation. Hardwick et al (1999) defined growth of an economy as the expansion of production ability for a country. This growth is reflected in the steady increase of national income over the years. Yearly economic growth rate can be given by average percentage rise in national income for a long duration. The following paragraphs outline various growth models in economics.

The endogenous theory of growth is credited to Barro (1990) and stipulates that budgetary strategy has impact on ratio between per capita output ratios. In this theory, economic growth is explained by the use of Cobb-Douglas function in which economic growth is viewed as the dependent variable. The theory assumes government provides goods and services as a creation factor and consequently, direct taxes are adversely affected. This makes it possible for the interaction between the economic policies with capital and labor to ensure sustainable economic growth. This theory is modelled with technology having a role to play. The returns are constant and thus the inclusion of the services financed by government taxation because of its impact on the output or economic growth (Barro (1990). The argument by Romer (1986) was that private investments create positive externalities in the whole economy and thus capital accumulation causes increasing returns and hence the long run positive growth rate (Masika, 2014).

Solow growth model is attributed to Solow (1956). In this theory, Solow argues that capital accumulation (physical and human) causes growth of an economy with the application of the rule of decreasing returns. The idea behind the theory is growth of output y is determined by labor, capital and technological progress. Therefore, according to Solow as the level of capital and labor increase in an economy, there will be incremental economic growth since the growth is

built on those two main factors. Economic growth is usually studied within the neoclassical exogenous growth model or the more recent endogenous growth theory (Gakunju, 2010).
As per neoclassical model, economic growth is generated via factor accumulation and productivity growth. The factors of the production in this case are labor and capital accumulation in an economy. The idea in this theory is to develop a neoclassical model in explaining growth of an economy. As per this ideology, economic growth depends on the labor, capital and technical progress which is exogenous.

Manual et al (2009) define the insurance penetration as the gross amount of income premium as compared to the GDP which is a proportion of premium quantity to GDP. According to them, the penetration of general insurance in agriculture was the least in all countries. They established this was the case in the US because there are individuals who have been involved in agriculture for quite a while.

Information asymmetry is a key model within insurance attributed to Andreu (1995). The idea is that the party without information negotiates ignorantly and this leads to the problem of adverse selection. Those who are more informed may choose to breach the contract and this causes moral hazards. Governments provide social insurance where families and other groups have access, and this causes industrialization. Although this used to be common in the West, it is now very common in the developing world. Private firms mainly offer insurance in Kenya. It is common that many parties fail to take decisions such as insurance uptake because most of them are not aware of its existence or existence of some form of the premiums. Bala and Verma (2013) established a positive substantial connection between the life assurance and economic growth in India. This studied carried out a simple OLS model for the analysis. The implication that as the insurance sector grows in India, there will be increased growth in the economic performance.

According to Arena (2006), in the growth process, insurance and banking systems play complementary role. While insurance and banking each contribute positively to growth separately, when both are present, their individual inputs are greater. Insurance market development also contributes to securities market health. Insurance market deepening has positive contribution growth of an economy. Life assurance has causal link to growth in

advanced countries only, but general insurance contributes positively in both least developed and developed countries. Some studies indicate life insurances beneficial input to development is mainly via the economic intermediation. The research shows a favourable connection between deepening insurance and economic growth, but it does paint lives.

According to Arena (2006), Insurance and banking systems complement each other on their role to economic growth. Enz (2000) noted that the rate at which the penetration of insurance depends on the income elasticity. The rise in the demand for insurance is accompanied by nation's GDP growth decrease. Since for many people insurance is deemed as a luxury, the increase in their incomes result in increased demand for insurance products. However, if the insurance is treated as a necessity, then its demand increases relative to when it is treated as a luxury. According to Hans el al. (2010) insurance development affects economic development positively. Therefore, the idea was that as the insurance penetration increase, there will be an increased rate of economic growth.

2.3 Empirical Review

According to Arena (2006), insurance and banking system complement each other on their role to economic growth. He argues that despite the fact that each sector affects economic growth positively, the effect is much greater when the two act together. The empirical study showed that insurance positively affects economic growth significantly. Also established life assurance play a insignificant part on growth in least developed countries. Later on, Arena (2008) established that level of incomes affects insurance demand. He further found a positive and significant connection in developed countries. The implication was that Kenya being a low-income nation experienced a low insurance demand and hence insignificant contribution.

The study by Kanywuiro (2015) sought to find out life insurance connection to economic growth in Kenya using the Generalized Linear Model for the period 1999-2013. The study discoveries demonstrated a positive and notable impact of life assurance penetration on growth of the economy. Additional variables incorporated in the study such as population growth and savings were found positively affecting economic growth apart from inflation that was found to have a negative effect. This study limited itself to just one of the products of the insurance.

Ndalu (2011) sought to analyze insurance penetration effect on growth of the economy for the years 2003-2008.Simple regression model was employed. The study, considering data for 45 registered insurance companies in Kenya, established that penetration of insurance had positive effect on growth. The research established in particular that, rise in insurance penetration unit would result in rise of GDP in Kenya by 35.199. The study objectives were achieved by carrying out a simple regression model. The two variables of interest, which were insurance development and financial deepening, were found to have substantial impact on GDP.

Alhassan and Biekpe (2014) studied a causal relation between insurance industry development and economic growth in eight African nations; Algeria, Gabon, Kenya, Madagascar, Mauritius, Morocco, Nigeria and South Africa. The study established a perennial connection between the two in five states out of the eight states. Further, the study results showed a unifacial causality for seven nations only Morocco, results showed bi-directional causality. The analysis used data on time-series for 1990-2010 and VECM model.

Haisss and Sumegi (2008) carried out both empirical and theoretical analysis on insurance market growth and growth of the economy connexion in Europe for 29 European countries. Their study carried out panel data analysis for a period1992-2005 and the study results showed that life insurance has had beneficial contribution to growth of GDP in fifteen countries in European Union, Switzerland, Norway as well as Iceland. The impact was even larger for nations. The study made use of OLS and fixed-effects estimations and a GMM estimation on panel data. The study included "Insurance sector's role in finance-growth-nexus". The study arrived into a conclusion that theoretically insurance sector affects economic growth, but the effect was found to be weak empirical evidence as of yet.

The study by Chen, Lee, Chang and Chi-Feng (2005) sought to establish the link between developments of life-assurance markets and economic growth using a Generalized Method of Moments (GMM), for dynamic models of panel data for sixty nations in which the study covered a period 1976-2005. The study results show a positive and notable connection. In the Sub-Saharan part, which consists mainly of the middle-income economies, Life insurance development was attributed to dependency ratio, stock market turnover ratio, savings, social

security, actual interest rate and savings. Conversely, these factors strengthen life insurance effect on c growth of the economy in Latin America.

In a bid to find out whether insurance promotes economic growth, Din, Abu-Bakar and Regupathi (2017) carried out an empirical study for twenty countries for the time period 2006–2015 This was a comparative study between the underdeveloped and advanced nations. The results of the research stated that growth of the economy and insurance development in third world countries have a favourable and remarkable link. However, the effect of general insurance was found to be immaterial to growth of the economy. The study objectives were achieved by carrying out random and fixed effects models. The study found remarkable link between growth of the economy and general insurance only in developing nations. According to them, impact was more significant in the developing nations. Panel data analysis in which fixed effect model results were obtained for both developed and developing nations. Key variables of interest were life assurance, general insurance, trade openness, banking and stock market development, investment and levels of employment.

Private insurance sector promotes growth of an economy through creation of the investment climate and management of risk. The empirical finding from the study by Rajasthan and Kathmandu (2017) in Nepal established a favourable connection. The study used the measures of insurance such as gross insurance premium (life and general), employment and investment covering the period 2004 -2015. The study arrived at the conclusion that total premium (life and general) influenced country is in GDP growth by 2.03 per cent in 2016 and it is an increasing trend. Further, results show that, Insurance sector covers only 6% of the population density covered pointing out a huge gap of the population who do not have insurance service accessibility.

Blum et al (2002), highlighted insurance and economic growth link, the study postulated that following economic growth can lead to insurance increase and such growth in insurance minimises fluctuations of an economy in the short-run leading to growth of an economy in the long-term. Furthermore, insurance companies' investment growth induces economic growth. Further, study results indicate adverse relationship; the conclusion was that growth of insurance

trigger more reckless behaviour (moral hazard behaviour), leading to inefficient and more volatile economy.

Using multiple regression analysis on longitudinal data from ten countries from 2000 to 2012, Jaba(2014) tried to analyze effect of evolving insurance sector on growth of an economy. The study focused on post transition countries of central and Eastern Europe and the results showed unfavourable and statistically irrelevant correlation. To measure insurance sector's development, penetration of insurance was used.

Using a vector error correction approach for a period 1970-2008 and insurance density to measure of insurance performance, Omoke (2012), established insignificant impact of insurance on Nigeria's growth of the economy .Conclusion drawn was that Nigerians had not fully embraced insurance despite the importance on economic growth. This was indicated by low insurance market activity.

Azman-saini and Peter Smith (2010). On their study using GMM and longitudinal data for 51 countries developed and developing countries for 1981-2005, concluded, insurance market advancement impacts growth by way of improved production capacity in advance economies and accumulation of capital in underdeveloped countries.

2.4 Summary of the Literature

The overview of empirical as well as theoretical literature indicates that economic growth is affected by various factors. The theoretical review indicates that economic growth is based on capital accumulation and labor (Solow, 1956; Barro, 1990). Empirical studies by different authors in different places in the world indicates that industry growth and development affects economic growth positively both in developed and developing world (Ndalu,2011); Hassan & Biekpe (2014).

There are few studies carried out in Kenya to scrutinize the insurance market impact on growth of an economy such as by Kanywuiro (2015) and Ndalu (2011). However, neither of the studies applied Vector Autoregressive Analysis. The two studies used GMM and simple regression respectively in the analysis. From the literature review, clearly none of the studies investigated macroeconomic variables effects on insurance sector growth in Kenya. This gap will be

addressed in this study by carrying out a vector autoregressive analysis with the most recent data for the period 1980 -2017.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This section of study presents the theoretical structure, the empiric model, estimation techniques, description of variables and measurement. The last two sections include Pre-estimation tests: and data, data types and sources.

3.2 Theoretical Framework

To analyse the impact of insurance on economic growth in Kenya, the study adopts the endogenous growth model, and modifies it into a Cobb-Douglass production function which assumes a constant return to scale. This model has been previously used by various writers such as Eller *and others.* (2005), Fink *et al.* (2004, 2005) and Webb *et al* (2002). To begin, the total production model is expressed as follows:

$$Y = AK^{\alpha}H^{\beta}L^{1-\alpha-\beta} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots .1$$

Where, Y is taken as a representation of the (GDP), A represents technological progress, K denotes physical capital, H is the human capital and L is the labor. The equation is converted into per capita terms, hence the following function:

$$\frac{\partial Y}{\partial L} = A(\frac{\partial K}{\partial L})^{\alpha}(\frac{\partial H}{\partial L})^{\beta}(\frac{\partial L}{\partial L})^{1-\alpha-\beta} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots .2$$

Upon further transforming equation 2 into a more intensive form, the resulting equation is given as:

$$Y^{*} = AK^{*\alpha}H^{*\beta} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3$$

Equation 3 can further be decomposed and transformed by taking natural logarithm on both sides and differentiating, to obtain the following:

$$\Delta\, ln\, ln(Y^{*}) = ln\, ln(A) + \alpha(K^{*}) + \beta(H^{*}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4$$

To enable incorporation of insurance in equation 4, ln (K*) is disintegratedto two separate parts as proposed by Haiss and Sumegi (2007). In their view, premium collected by private insurance companies can be considered as flow indicators and they can be a resemblance of input factors which influences the performance of physical capital, hence, accumulated premium can be the converted into assets and added to their respective physical capital. This encourages investments since it influences their capital base. The decomposition of capital gives the following equation:

$$\Delta\, ln\, ln(K^{*}) = \alpha(PREM) + (K_{p}^{*})) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 5$$

Equation 5 is then incorporated into equation 4, and the resulting model is given as follows:

$$\Delta\, ln\, ln(Y^*) = ln\, ln(A) + \alpha_1(PREM) + (K_p^*) + \beta(H^*) \dots\dots\dots\dots\dots\dots\dots\dots 6$$

Where, PREM represents insurance premiums, (K_p^*) represents financial capital, H^*represents human capital, A represents technology and Y^* represents economic growth.

3.3 Empirical model specification

Deriving from the theoretical model above, evidence from studies done previously, show that other factors that are important in determining growth could also affect the insurance market activities. Among the factors includes, saving rate, interest rate and life expectancy. This variable can be included in the model since they affect insurance sector as well as economic growth.

According to Webb and Beck (2003) outline that, personal rate of savings and life assurance cannot be explained directly. According to them, personal rate of savings rise does not guarantee increase in savings in life assurance policies. Anoruo and Ahmad (2002) showed presence of a long-term impact savings rate growth to economic growth.

According to Babbel and Staking (1983), a rise in interest rate have caused an increase in the real costs of insurance policies. Additionally, Outreville (1996) indicated that, real interest rate and life assurance relationship is ambiguous. In the view of economic growth, Shafik and Jalali (1991) attributed that high interest rates is related to low economic growth in developed countries.

Ehrlich and Lui (1991) using an overlapping-generations (OLG) model of endogenous growth showed that; Growth rate of an economy in the long run can be raised by increased life-expectancy. Additionally, Growth rate responsiveness to the youngster's life expectancy is greater compared to advance age life span. Average life span affects growth of an economy positively in countries with low life expectancy. Conversely, life assurance activity and life expectancy relate adversely. This means high death rates leads to higher life assurance activities (Tabata, 2005). However, Beenstock and others (1986), Outreville (19960), and Ward and Zurbruegg (2000) all showed average life span and life insurance premium have a positive relation. From this evidence, the relationship among the variables can be linearized as follows:

$$Y(GDP) = f(A, K_p^*, H, PREM, SavingRate, Interestrate, lifeexpectancy) \dots\dots\dots\dots 7$$

Equation 7 is further transformed into an econometric equation as follows:

$$\Delta\, ln\, ln(Y_t^*) = ln\, ln(A_t) + \alpha_1(PREM_t) + (K_p^*)_t + \alpha_3(H^*_t) + \alpha_4(SR_t) + \alpha_5(IR_t) + \alpha_6(LE_t) + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 8$$

The variables are as described above, and α_1, α_2, α_3, α_4 , α_5 and α_6 are coefficients of premium, Physical capital, human capital, Saving Rate(SR), interest rate(IR) and Life expectancy(LE) respectively, e_t error term, and time subscript. Description of variables used is as indicated in table 2.

Table 2: Variable Measurement and Description

Variable Name	**Notation**	**Measurement**	**Expected Sign**	**Source**
Log of Real GDP		Log of gross domestic output given by the ratio of the gross domestic output to consumer price index. This is expressed base-year prices) in Kenya shillings		WDI
Log of Insurance Premium Volume	PREM	Given by the log of the total gross f premium revenue from all insurance business categories (general and life) for private insurance companies measured in Kenya shillings(Billions)	±VE	CBK
Log of Physical Capital	CF	Measured by log of the gross capital formation expressed in Kenya shillings	±VE	WDI
Log of Human Capital	H	This will be taken as the log of government expenditure on education measured in Kenya shillings	±VE	WDI
Log of Saving Rate	SR	This is the comparison of the log of the gross household saving to the sum of adjusted gross disposable income adjusted for pension fund contributions measured in Kenya Shillings (Billions)	±VE	CBK
Log of Interest Rate	IR	This is Proxied by the log of the treasury bill expressed Kenya shillings	±VE	CBK

Life Expectancy	LE	This is the log of life expectancy at birth, the total for both male and female in Kenya. This is expressed in years.	±VE	WDI

Source: Authors construction

3.4 Estimation Techniques

When carrying out estimation in economics models, it is a common issue to experience certain Models in which some parameters function as the explanatory variables for other predictor variable but are also explained by the predictor variable they describe (Asteriou & Hall , 2007). In this study, the variables seem to outline such a relationship. Carrying out regression estimation while ignoring such issues may result in biased estimates. To address such an issue, Sims (1980) brings a different viewpoint recommending in the case of simultaneousness, the variables in the model to be considered as endogenic. This prompted inception of the vector autoregressive models.

In the view that the variables in this study show such characteristics, this study adopts a VAR model for analysis. The reduced VAR equation, which will be used to estimate equation 8, is specified as follows:

$$X_t = A_0 + \sum_{i=1}^{d} A_i X_{t-i} + u_t \quad (10)$$

Where;

X_t = represents the variables under study.

A_0 = is a column vector of constant terms.

A_i = represents a $m \times m$ coefficients matrix

u_t = represents error term.

In the VAR, every single variable is expressed as a linear function of its past values, past values of all the other variables that are being studied and a serially uncorrelated error term. Before the estimation, the following pre-estimation checks will be executed, to guide on choice of VAR model to be estimated. The pre-estimation tests include:

3.4.1 Stationarity test

An analysis involving time series data usually assume stationarity. This usually implies that the series does not have a trend and exhibit consisted mean over time in addition to serial correlation over time. According to Gujarati (2011), the main importance's of stationarity is that, the behaviour of nonstationary time series, can only be analysed for the duration under scrutiny and cannot be generalized. This is disadvantageous for the reasons of prediction and policy inference. Additionally, regressions for two nonstationary time series may lead to inaccurate statistical analysis. For this reason, an Augmented Dickey-fuller test for non-stationarity will be executed on all the variables. Non-stationary will be differenced.

3.4.2 Cointegration Test

If two or more variables whose linear combination yields stationarity, and have equilibrium relationships, then they are said to be cointegrated (Österholm & Hjalmarsson, 2007). To test for cointegration, the study will carry out a Johansen test for cointegration. The test is carried under the assumption of no cointegration. Cointegration is an important test because it determines the model to be used for estimation. Upon carrying out a cointegration test, if the variables will be found to be integrated at order two and above, the vector error correction model will be estimated, otherwise, Vector Autoregressive model will be estimated.

3.5 Data, Data Types and Sources

Secondary time-series data type for the time frame 1980-2017 was used. Data will be collected from the World Development Indicators database. Additional data will be obtained from the Kenya National Bureau of Statistics (KNBS) database and Insurance regulatory Authority.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This section sets out study's methodological results. Various analysis were executed, and their findings presented. The chapter starts with descriptive statistical analysis preceded by the preliminary tests and finally estimation of the model.

4.2 Descriptive statistics

Mean gives the average value for each parameter for the given duration. Absolute variability and the extend of divergence are measured by the standard deviation. The minima and maxima show lowest and highest figures for different variables during the time covered by the observations under scrutiny. Skewness is the measure of data if it is symmetrical or asymmetrical. Negative values of indicate that the data skewed to the left while positive values is an indication of rightward skewness. Kurtosis measures peakedness. Table 3 shows the results of the descriptive statistics preceded by a summary of the same. Real GDP the ratio of the gross domestic output to consumer price index. Premium insurance is the sum of premium income from all insurance business categories (life and non-life) for private insurance companies, capital is gross capital formation, Human Capital is the government expenditure on education, saving rate is the comparison gross household saving to the sum of adjusted gross disposable income adjusted for pension fund contributions. Interest rate is proxied by treasury bill while Life-expectancy is the living-expectancy at birth, total for both male and female in Kenya.

Table 3: Descriptive Statistics

Variable	N	Mean	Std. Deviation	Minimum	Maximum	Kurtosis	Skewness
Log of RealGDP	38	9.0684	0.3777	8.0483	9.6542	0.786	-0.437
Log of Premium	38	5.3236	2.0601	3.0003	8.3201	-1.680	0.478
Log of Physical Capital	38	5.1452	0.6372	4.0952	6.1647	-0.974	-0.131
Log of Human Capital	38	4.5542	0.6369	3.4379	5.5345	-1.174	-0.156
Log of Interest Rate	38	1.0383	0.2638	0.1492	1.5948	3.309	-1.154
Log of Savings Rate	38	1.2023	0.1495	0.9351	1.5981	0.518	0.458
Log of Life Expectancy	38	1.7579	0.03234	1.7069	1.8189	-0.820	0.077

Author's Computation (2020)

Log Real GDP had the highest mean value with 9.0684 with the standard deviation of 0.3777 which showed the variation from the mean values of the study variables. The Log physical capital and Log human capital which is measured as government expenditure on education had the mean of 5.1452 and 4.5542 respectively. Similarly, they had a standard deviation of 0.6372 and 0.6369 respectively.

The maximum values show the highest attainable observation value in the variables while the minimum values show the least achievable values of the observations of the variables. Log of Real GDP had the highest maximum value of 9.6542 and the minimum value of 8. 0483.Log of Interest rate had the least low and least maximum values as 0.1492and 1.5948 in that respect. Log of saving rate was second with lowest values of the minimum of 0.9351 and maximum of 1.598.

Skewness values show the distribution of the variable either to the left or to the right in relation to the normal distribution. The positive values show the skewness of the variables to the right while negative values show the distribution to the left. Log real Real GDP, Log of Physical capital, Log of human capital and log of interest rate skewness values were found to be negative While log of premium, log of saving rate and log life expectancy skewnes value were found to be positive and hence the implication that the distribution to the right-hand side. Since normal distribution is 1.0 and any of the values near this indicate normal distribution. In this study all the variables can be said to be following normal distribution with slight skewness to either left or right of the normal distribution. The variables skewed to the left include Log Real GDP, log of Physical Capital, log of human capital and log of interest Rate. the values of, -0.437, -0.131, -0.156 and 1.154 respectively. The other three variables; Log of premium volume, Log of Savings rate and log of Life Expectancy were slightly skewed to the right with 0.478,0. 0.458 and 0.077.

Kurtosis on the other hand shows the peakedness of the distribution of the variable observations. The high positive values indicate the high extreme values of the variable observations. High kurtosis value shows tail data in excess of normal distribution tail such as five standard deviations from the mean or more while low values indicate tail data which less extreme than normal distribution tail. Log of interest rate had the steeper peak with 3.309 followed by Log of Real GDP 0.786, and Log of savings rate with 0.518. Negative kurtosis value indicate that the distribution has lighter tails than the normal and a flatter peak. Log of premium, log physical capital, log human capital and log life expectancy had negative kurtosis values. The closest to the normal distribution has the least value and in this case is log of savings Rate with 0.518

4.3 Diagnostic Tests

4.3.1 Normality Test

Normalcy test was carried out using the Shapiro-Wilk test in which the decision rules is that values less than 0.05 indicates non-normality in distribution and values greater than 0.05 implies normal distribution. Table 4 provides normality test results for variables included in the study.

Table 4: Shapiro-Wilk Normality Test

Variable Name	Obs	W	V	z	Prob>z
Log of Real GDP	38	0.79652	7.732	4.291	0.00001
Log of Insurance Premium Volume	38	0.67109	12.499	5.299	0.00000
Log of Physical Capital	38	0.73778	9.965	4.823	0.00000
Log of Human Capital	38	0.79036	7.967	4.354	0.00001
Log of Saving Rate	38	0.85750	5.415	3.544	0.00020
Log of Interest Rate	38	0.88735	4.281	3.051	0.00114
Log of Life Expectancy	38	0.95377	1.757	1.182	0.11858

Author's Computation from the data

Shapiro-Wilk test was used to find out the normality of the variables used in this study and the results are indicated in Table 4. From the results, all the variables were found demonstrated normal distribution because their p values happen to be below 0.05. Only log of life expectancy is not normal since the p value is greater than 0.05.

4.3.2 Multicollinearity Test

Multicollinearity is the situation in which the independent variables are related to each other. This leads to results which are spurious and inconsistent. variance inflation factor (VIF) test was used. Mean VIF of values greater than 8.0 indicates the presence of multicollinearity. The values less than 8.0 show the absence of multicollinearity (Gujarati, 2003). The presence of multicollinearity implies dropping some specific variables to try solving the issue

Table 5: Multicollinearity Test

Variable Name	VIF	1/VIF
Physical Capital	1.72	0.581647
Human Capital	1.54	0.650127
Interest Rate	1.35	0.738242
Saving Rate	1.20	0.833623
Insurance Premium Volume	1.09	0.920088
Life Expectancy	1.05	0.950447
Mean VIF	1.33	

Author's Computation (2020)

The results on the above results show the mean VIF of 1.33 which is less than 8.0 and hence there is no multicollinearity.

4.3.3 Heteroskedasticity Test

We proceeded to test for the presence of the heteroscedasticity in the following section on assumption of constant variance against the alternative hypothesis and results were presented the following table. The p-value above 0.05 indicates absence of heteroscedasticity while p value less than 0.05 indicates the presence of heteroscedasticity Breusch.T. S. & Pagan A. R. (1979).

TABLE 6: HETEROSCEDASTICITY TEST

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4.732783	6	0.788797	44.93563	0.053
	Residual	0.544172	31	0.017554		
	Total	5.276956	37			

Author's Computation (2020)

The p values of 0.053 shows that we can accept the null hypothesis, hence the absence of heteroscedasticity.

4.3.4 Serial Correlation Test

This used Durbin-Watson statistic to test for serial correlation, which is the relationship of the current variable observations with the previous period observations.

Table 7: Serial correlation test

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.947a	0.897	0.877	0.3050724	1.97

Author's Computation (2020)

The Durbin-Watson value of 1.97 which is close to 2 indicates that there is no serial correlations. Hence the observations in the previous period does not affect current period.

4.4 Stationarity Test Analysis

This study employed Augmented Dickey-Fuller test to test for Stationarity of the variables. All the parameters demonstrated non-stationarity at a point except interest rate.

Table 5: Dickey Fuller Unit Root Test

Variable	Levels			Order of differencing	Difference		
	Statistics	P-Value	Comment		Statistic	P-Value	Comment
Log RealGDP	1.156	0.9957	Non-Stationary	1	-5.352	0.0000	Stationary
Log Insurance Premium Volume	6.167	1.0000	Non-Stationary	2	-9.752	0.0000	Stationary
Log Physical Capital	3.401	1.0000	Non-Stationary	1	-4.418	0.0003	Stationary
Log Human Capital	7.817	1.0000	Non-Stationary	2	-9.513	0.0000	Stationary
Log Saving Rate	-2.507	0.1139	Non-Stationary	1	-6.807	0.0000	Stationary
Log Interest Rate	-3.647	0.0049	Stationary	0	-3.647	0.0049	Stationary
Log Life Expectancy	1.548	0.9977	Non-Stationary	5	-5.361	0.0000	Stationary

Author's own Computation from the dataset

In order to make them stationary, they were differenced with respective order of cointegration as shown in table 5 above. Life expectance was differenced five times to male stationary while insurance premium and human capital were differenced twice to make them stationary. The rest of variables which included the real output, physical capital and saving rate became stationary after first difference.

4.4 Lag-Selection Criterion

The dependence of the dependent variable on other independent variables is not always instantaneous. This is because dependent variables respond to independent variables with time lapse. This time lapse is called the lag. Therefore, determining maximum number of lags prior estimation of the model in economics is crucial. Various criterion such as Schwartz and Alkaike Information Criterions (AIC), Final Prediction Error (FPE), Hannan-Quinn information criterion (HQIC), and Schwarz's Bayesian Information Criterion (SBIC) can be used for the determination of the optimal lag-length. Using the four criteria the values of most of these lag length criteria are minimised, indicated by asterisks in the output.

Table 6: Lag Selection Criterion

Selection -Order Criterion **Sample: 1984-2017**					**Number of observations = 34**			
Lag	Log Likehood	Likelihood Ratio	df	P	FPE	AIC	HQIC	SBIC
0	-2202.44			0.000	6.600E+47	129.967	130.074	130.282
1	-1976.48	451.93	49	0.000	2.100E+43	119.558	120.415	122.072
2	-1826.63	299.7	49	0.000	8.300E+40	113.625	115.233	118.339
3	-1615.65	421.94	49	0.000	2.100E+37	104.097	106.455	111.011
4	-222.476	2786.4*	49	0.000	57387.2*	25.028*	28.1359*	34.1413*

Author's Computation from the dataset

Prior to carrying out cointegration test, the study carried out the lag selection criterion to establish the maximum lags. Schwartz and Alkaike Information Criterions was used to determine the optimal number of lags required. From table 6, maximum lag length was determined to be 4.

4.5 Cointegration Analysis

To test for cointegration, the study carried out a Johansen test under the assumption of no cointegration. Cointegration is an important test because it determines the model to be used for estimation. Upon carrying out a cointegration test, if the variables are discovered to be integrated at order two and above, the vector error correction model was estimated.

Table 7: Johansen Cointegration Test

Johansen Test for Cointegration					
Trend: Constant Sample: 1987-2017				Number of Obs = 31 Lags = 2	
Maximun				Trace	5% Critical
Rank	Parms	Log Likelihood	Eigenvalue	Statistic	Value
0	56	-1777.4334	.	277.1589	124.24
1	69	-1720.7201	0.97424	163.7322	94.15
2	80	-1686.72	0.88848	95.7321	68.52
3	89	-1662.2036	0.79438	46.6993*	47.21
4	96	-1648.8861	0.57650	20.0642	29.68
5	101	-1643.0793	0.31246	8.4506	15.41
6	104	-1639.8447	0.18835	1.9814	3.76
7	105	-1638.854	0.06192		

Author's own Computation from the dataset

This study employed Johansen test for cointegration and the rule in this test is that if the trace statistic is greater than the critical value then the null hypothesis is not rejected which implies dependent and explanatory long run connection Johansen (1995). The results indicated in table 7 confirm the variables are cointegrated at order 3. This means there are three cointegrated equations in the model.At rank 3, critical value is greater than trace statistics, to be specific, 46.6993 is less than 47.21. As it was found that there were three cointegrated equations, the study went on to estimating the Vector Error Correction Model (VECM) as explained previously.

4.6 Vector Error Correction Model Results

Upon carrying out a cointegration test, if the variables are found to be integrated at order two and above, the vector error correction model was determined as the appropriate model to be estimated. The results for the vector error correction model were presented in Table 8.

Table 8: Vector Error Correction Model Estimates

Variable	Coefficient	z value	Prob(z)	[95% Conf.	Interval]
Differenced log of Real GDP	-.3034 (0.0274)	-11.09	0.000	-.3571	-.2498
Log of real GDP lagged	.1465 (0.1561)	2.84	0.005	.04533	.2476
Log of Insurance Premium lagged	.03377 (0.00170)	19.84	0.000	.03711	.03043
Log of Physical Capital lagged	.001668 (.2008)	0.01	0.993	.3918	.3952
Log of Human Capital lagged	-8.201(1.1201)	-7.32	0.000	-10.397	-6.0053
Log of Savings Rate lagged	-2175.82 (2259.265)	-0.96	0.336	-6603.899	2252.26
Log of interest Rate lagged.	601.9827 (2456.721)	0.25	0.806	-4213.102	5417.07
Log of life Expectancy lagged	-1998592 (496220.5)	-4.03	0.000	-2971	-10260
Constant	-611.698	-0.05	0.963	-26555.19	25331.79

F	44.94
P	0.000
R-squared	0.8969
Chi2	112.28

Author's own Computation from the dataset

The results indicate R-squared is 0.8969 meaning the depended variables explain 89.69% of the variation of the dependent variable explains how adequately the model is appropriate for the data. F Value is 44.94 and p-value 0.000 meaning the regression model fits the data significantly Ronald A. Fisher (1925). Chi2 explains short-term effects.

The error correction term shows adjustment rate of the model towards equilibrium real GDP. Specifically, it measures the rate of the adjustments of the variables in the model towards the real GDP. In this case, it can be interpreted that the adjustment rate towards equilibrium from the independent variables to log real GDP is 30.34 percent. The indication is the long-run relationship between the independent and dependent variables. Other coefficients of the variables in the study show the independent variables effects on economic growth in the short-run. P-value confirms significance of the variables on independent variable. The p-value below 0.05 indicate significant effect significant effect while p values above 0.05 indicate effect of the variable of concern is insignificant. The standard errors show the variation from the mean which determine the accuracy and hence determines the level of significance. The z-score is the number of standard deviations a given data point lies from the mean. For data point that lies below the mean, Z-score is negative and positive for data points above the mean.

The log of real GDP in the first lag significantly and positively affect economic growth at 5 percent level of significance. A unit change in the real GDP in the first lag increases economic growth by 0. 1464898.The implication is that the economic performance is affected by economic performance in the previous year. The p-value which is 0.000 indicate a remarkable effect at 5% significant level. Research by Saymeh & Orabi(2013) arrived at same conclusion.

Insurance industry is key in an economy and plays a crucial role. From the study findings, insurance premium significantly and positively affects economic growth. A unit increase in

insurance premium in the first lag give rise to economic growth by 0.0337703 at 5 % level of significance. This could be attributed to the fact that insurance supplements capital formation in the economy and therefore it implies increased economic activities. These findings were similar to the previous studies by Arena (2006), Kanywuiro (2015) and Ndalu (2011) who had arrived at a conclusion that insurance affect economic growth positively.

Physical capital which is the gross capital formation indicated to impact economic growth although insignificantly. A unit change in the physical capital accumulation leads to the economic growth by 0.0016677 at 5 percent level of significance. The findings are similar to findings by Ali G (2015) although in his finding's capital formation significantly affect economic growth.

Human capital which measures government expenditures on education was found to have a significant negative effect on economic growth at 5 percent significance level. Increase by one unit of human capital, reduces real GDP by 8. 201098. This implies that as government increases expenditures on education there is going to low levels of economic performance. This is associated by the fact increased expenses reduce revenues allocated to other developmental activities hence low economic performance. Similarly, Solow (1956) argued that capital accumulation (physical and human) causes growth of an economy with the application of the law of diminishing returns.

Saving rate which is the comparison gross household saving to the sum of adjusted gross disposable income adjusted for pension fund contributions affect the real GDP negatively and insignificantly. Increase in the saving rate by one unit reduces the real GDP by 2175.82 although this effect is not significant. This implies that saving rate is not a key variable in the economic performance of any nation. The p value for the saving rate was 0.336 greater than 0.05 and hence insignificant. This is contrary study by Uddi *et a*l (2016) who concluded savings rate had affected economic growth positively.

Similarly, interest rate at first lag does not play any key role on growth of the economy. There is positive insignificant effect on the real GDP with a p value of 0.806. A unit change in the investment rate increases real GDP BY 601.9827 although this effect was found to be

insignificant. This is similar to the previous study by Kanywuiro (2015) which had established that interest rate leads to economic growth.

Lastly, life expectancy is negatively related to real GDP hence reduction in economic growth. Increase in life expectancy by one year significantly reduces real GDP by 1998592 at 5 percent level of significance. This perhaps because was people grow old their productivity reduces and thus this negatively affect economic performance. The p value of 0.000 showed that the effect notable at 5 percent of significance level. This is contrary to findings by Ehrlich and Lui (1991) who concluded that increased life expectancy raises economic growth rate.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND AREAS OF FURTHER RESEARCH

5.1 Introduction

This section provides the summary of the research results and the inference on how objectives were achieved. Second part of this section provides the policy recommendation on the basis of the research results. The section ends by proposing further areas of research.

5.2 Summary and Conclusion

The first objective of this study was to find the impact of insurance activities on growth in Kenyan economy for the period 1980-2017. Using the VECM, the study established that the independent variables which include the insurance premium volume, physical capital, human capital, savings rate, interest rate and life expectancy affects economic growth in the long-term. Particularly, insurance premium which is given by the total sum of premium income from all insurance business categories for private insurance was discovered to have positive significant effect on economic growth in Kenya. This was similar to the previous findings which had established a positive connection.

Secondly, the study sought to establish impact of other elements in economic growth and it was established that economic performance in the preceding year have a positive influence on future economic growth positively. Additionally, physical capital and interest rate have a positive effect on economic growth while human capital and life expectancy lead to reduction in economic growth.

5.3 Policy Recommendation

First, this study establishes that premium cause an increase in economic growth and this could be attributed to the fact that money from insurance premium is used for investment leading to capital accumulation. Therefore, this study proposes that insurance sector should invest in ensuring more favourable policy terms and developing more appealing products which will attract more customers hence increase premiums.

Secondly the government of Kenya should also concentrate on other factors that affect economic growth such increasing levels of savings and investments in the country because this increases economic growth. Particularly, the government should take appropriate fiscal and monetary

policies that results to increased savings and investments. This will in turn translate to increase in economic activity and thus economic growth.

5.4 Further Areas of Research

This study has provided similar results on the role of insurance on economic growth showing that premium insurance affect economic growth positively. This confirms results from previous studies concluding on the role of premium insurance on economic growth. The research proposes a further research on the overall contribution of insurance sector in the finance industry.

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