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**The relationship between life insurance and economic  
growth: Evidence from Kenya (1999 to 2013)**

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**DECLARATION**

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the Research Proposal contains no material previously published or written by another person except where due reference is made in the Research Proposal itself.

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This Research Proposal has been submitted for examination with my approval as the Supervisor.

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## **Abstract**

The study assesses the development of the life insurance sector in Kenya, in relation to economic growth. The direction of causality is first established and a comprehensive data analysis is carried out on the relationship between life insurance penetration and GDP growth rate, in the presence of other influencing factors, using a panel of three countries (Kenya, Uganda and Tanzania) within a Generalized Linear Model (GLM) framework. The study comprises a time frame starting from 1999 to 2013. From the model, results indicate no significant relationship between life insurance penetration and economic growth in the presence of other stronger variables. The life expectancy variable in particular shows a significant positive relationship to economic growth; an observation that would prompt further analysis under future research.

## Chapter 1: Introduction

### 1.1 Background

The growth of an economy, locally and globally, serves as a point of interest for several states in the world. The growth of an economy can be measured as the output per head of population, in form of goods and services (Lewis, 2013). Goods and services may be differentiated from one another in terms of industry origin, hence leading to the evolvement of contributory state sectors.

Within the Kenyan context, six sectors have been assigned the mandate to deliver on the desired sustained ten percent (10%) economic growth rate, as outlined in the country's Vision for the year 2030 (The Ministry of Devolution, Planning and Vision, 2007). They include; i) *tourism*, ii) *agriculture*, iii) *business processing output*, iv) *manufacturing*, v) *wholesale and retail trade* and vi) *financial services*. Specific growth rates achieved under each of these serves to strengthen the Vision's economic pillar, that overall addresses the country's efforts towards achieving its Millennium Development Goals (MDGs).

The financial services sector has been outlined as a major economic driver, being in line with Kenya's Vision to establish a vibrant and globally competitive state that addresses *high level of savings* and *financing for investment*. This is with the aim of poverty reduction and enabling more low - income earners access affordable financial services (Kenya Financial Sector Deepening (FSD), n.d.).

The financial sector in Kenya comprises services as offered mainly by banks, insurance companies, capital markets and pension funds. As of the year 2014, the overall industry contributed an estimated nine point one percent (9.1%) to the country's GDP, a rise from the previous seven point two percent (7.2%) registered in the year 2013 (The Ministry of Devolution, Planning and Vision, 2015) Past eight - year statistics are depicted in the table below;

Year	2007	2008	2009	2010	2011	2012	2013	2014
Financial Sector Contribution*	6.5%	3.1%	4.6%	8.8%	7.8%	6.5%	7.2%	9.1%

Table 1

\*To economic growth (measured in GDP) in Kenya

The rising proportion of the financial services contribution serves to highlight its significance in projecting economic growth.

Among component financial service industries is the insurance sector, which has been termed as a critical player in *risk transfer and indemnification* as well as *financial intermediation* (Ward & Zurbruegg, 2000) *Financial Intermediation* would refer to the intervention of an institution, in this case, acting as a middle agent between the depositor of funds and the borrower of the same.

According to Curack *et al* (2009), economic growth is realized through the function of financial intermediaries. Further explained is that insurance companies play their part in issuing policies and thus collecting funds and transferring them to deficit economic units for financing real investment.

An effort by the Government of Kenya is clearly observed, under the scope of Vision 2030, towards enhancing its financial sector strategy through strengthening the insurance industry. This includes measures such as

“...creating public awareness of insurance benefits, attracting capital infusion to increase premium growth and profitability, enhancing affordability and accessibility of insurance services and increasing retention capacity to minimise outflows arising from low local underwriting capacity”

This objective strengthens the contributory significance of insurance to economic growth.

Insurance is broadly classified as either general or life; the former referring to risk mitigating measures of non – life items while the latter covers the life aspect of the policyholder or their dependents. The life assurance uptake in Kenya generally follows a “second –place” lead due to the more dominant non – life insurance demand in the country. Below is a table depicting the trend of gross written premiums of each type as from the year 2006 to 2013, as sourced from the Association of Kenya Insurers (AKI) (2013);

<i>Year</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>
Non - Life Insurance *	29.2	32.95	36.89	43.11	52.35	60.67	71.46	86.64
Life Insurance*	12.48	15.14	18.3	21.36	26.71	30.93	37.08	44.01

Table 2

\*Figures are in Billion Kenya Shillings

The larger general insurance industry is favoured by its obligatory nature, with most persons required to take up insurance covers especially for items such as motor vehicles and commercial property. This sector, though a proxy for establishing the trend of insurance uptake in Kenya, would therefore not provide a suitable means of establishing what persons *freely* do with their funds and how this translates to economic growth, because of an element of compulsion. Conversely, each cover offered under life insurance is optional to the individual and institutional consumer in Kenya.

The seemingly lower demand for life insurance in most developing countries, such as Kenya, is because of its supposed irrelevance, its observation as being inappropriate for ideological, cultural, or religious reasons, or because economic security is already guaranteed through the family (Outreville, *Life Insurance Markets in Developing Countries*, 1996). Additionally, the Kenyan context was discovered to host a majority of persons with low disposable income, contain low public awareness on exact benefits from life insurance, a poor savings culture and unfavourable general public image of insurers within society.

This is despite the potential for life insurers mainly acting as major investors in long term funding, strengthening its financial intermediation objective. Not only does this serve the insurer well as per asset - liability matching of their “long – term” products, but also serves the economy by availing more investment opportunities for financiers. With more people embracing the industry, the motivation for purchase of life insurance grows and, hopefully, generates positive economic returns. The desire is to therefore alleviate current local ideology on, and consequently enhance the demand for life insurance in “a supply – led” economy (Outreville, *The Relationship between Insurance and Economic Development: 85 Empirical Papers for a Review of the Literature*, 2013).

## **1.2 Problem Statement**

In order to realize the desired economic growth of at least 10% GDP per year, as outlined under Vision 2030, a number of financial strategies have been mentioned as to specify the role of the financial services sector (among others) in achieving this goal. The sector should address the current level of savings and financing for investment. Of particular concern in this research is the life insurance industry, as part of the financial services, which has the potential to serve as a strong financial intermediary. However, this objective has failed to materialize to some extent due to the low penetration and demand for the service to begin with, hence demeaning its

contributory role. The result is that a conclusive observation cannot be given on the exact level of life insurance growth towards overall improvement of Kenya's GDP. It is therefore important to confirm the relationship between the two variables, so as to make better - informed decisions on how to develop this seemingly minor sector in line with the overall economic development of the country, and hopefully conclude on a positively correlated causal dependence.

### **1.3 Research Objective**

This particular research addresses what kind of relationship exists between life insurance growth and economic growth in Kenya.

### **1.4 Justification of the study**

The study establishes the relationship between life insurance and economic growth, so as to provide the avenue for industry development in a low penetration state, and consequently align its progress in significantly realizing Kenya's positive economic prospects. Should life insurance then have the potential to substantially affect the economy, then the research shall suggest or give ground for efforts towards the sector's growth.

Moreover, the in – depth study of the life insurance sector in Kenya contributes significant consumer trait information as to enable relevant insurers better address the needs of their target market, through their products.

## **Chapter 2: Literature Review**

The causality between economic growth and insurance as a financial institution has been highlighted through major speculation. Patrick (1966) mentions that economic growth can be “*supply - led*” through growth in financial institutions (life insurance being a part of the sector) or, inversely, financial institutions can be “*demand - led*” through the growth of an economy.

It thus lies in the interest of the research to confirm the former proposition in the author’s argument, and apply it to the Kenyan context.

### **2.1 Life Insurance**

The significant role of life insurance as a financial intermediary has been ascertained through its various core functions. According to Investopedia, financial intermediation refers to the middle point position that an acting agent takes while taking in funds from a depositor then lending them out to a borrower.

Skipper (1997) outlines contributory factors of the overall insurance industry to economic development as follows; i) *promotion of financial stability and reduction of anxiety*, ii) *may act as a substitute for some government security programs*, iii) *facilitation of trade and commerce*, iv) *mobilization of savings*, v) *efficient risk management*, vi) *loss mitigation* and vii) *efficient capital market allocation*.

Life insurance more specifically can additionally increase productivity by reducing the demand for liquidity and leading to the shift from unproductive use of resources (Webb *et al*, 2002). This is true as life insurance creates the incentive to save (usually over a long term) in order to hedge against the risk of unpredictable death that consequently leads to financial implications for the policyholder’s dependents.

However, Ward & Zurbruegg (2000) argue out that life insurance, as a stronger player than general insurance concerning the financial intermediary role, has the advantage of enhancing liquidity because of limiting wastage of economic resources through ensuring early monetary realization of asset holdings.

Moreover, the same authors mention insurance companies, as institutional investors, enhance their investments through monitoring, in order to realise sufficient return for risk tolerated. The preferred projects that they fund to realize return goals are able to improve productivity.

Despite these positive findings however, life insurance uptake in Kenya is not at an optimum level. Noted as an issue affecting the general market, the 2013 AKI report considers that, ironically, the low penetration of insurance favours the sector's growth by bridging the gap. Moreover, strong economic growth, increasing disposable incomes, favourable demographics, increasing awareness and the introduction of micro – insurance platforms would boost demand for the service.

Arena (2008), however, zones in on one element driving the demand for insurance; the level of income of a country. He mentions that in the case of life insurance, the impact on economic growth is driven by high - income countries only, as observed from a sample of countries studied over a term of twenty eight years. Kenya, as a developing country with an averaged low disposable income, is implied to bear the brunt on insignificant life insurance growth towards economic development.

Beck and Webb (2003) add to this notion by mentioning the robust predictors of life insurance as income, banking sector development and inflation in a country, as per a study conducted on sixty eight economies for thirty nine years. With reference to the latter, well – functioning banks are able to encourage investor confidence in other financial institutions such as life insurers, and provide such companies themselves with an efficient payment system.

*Banc assurance* offered by banking institutions also avails the opportunity for increased uptake of life insurance products. An illustration closer to home pertains to the launch of Barclays Life Assurance Kenya institute as of April 2015, made possible by Barclays Bank's acquisition of a banc assurance license as awarded by the Insurance Regulatory Authority (IRA). The institute is said to have initially targeted half a million customers registered with the bank at the time, through Barclays Bank Kenya's 122 branches. (Capital FM, 2015)

The state of Kenya's average income however does not justify lessening efforts towards life insurance growth to enhance the economy's GDP. On the contrary, and as mentioned earlier, the current climate provides a viable opportunity, as the former Governor for the Central Bank of Kenya mentioned in his key note address, highlighting the financial sector's contribution towards Vision 2030, at a 2014 AON Kenya Insurance Brokers' seminar;

“... (The life insurers’) importance is in raising long-term funds to support economic development. This is particularly important in the capital markets that provide suitable long-term investment vehicles for insurance products. Kenya's insurance sector has played a pivotal role in development of the domestic bonds market. It is therefore important that we upscale the insurance penetration to mobilise additional long-term funds... (There is) a huge market in Kenya waiting to be discovered by insurance players. The challenge is to design suitable, affordable and accessible products to tap this nascent market.” (Ndung'u, 2014)

## 2.2 Economic Growth

The increase in National Output and Income, which consequently comprises economic growth, could be attributed to financial liberalization and deepening in Kenya, as advocated by Odhiambo (2009). Liberalization, as further elaborated, could be manifested in far - reaching financial reforms as taken up by many developing countries. These include; i) *deregulating interest rates*, ii) *eliminating or reducing credit controls*, iii) *allowing free entry into the banking sector*, iv) *giving autonomy to commercial banks*, iv) *allowing for private ownership of banks* and v) *liberalization of international capital flows*.

Financial deepening is often understood to mean that; i) *sectors and agents are able to use a range of financial markets for savings and investment decisions, including those with long term maturities*, (ii) *financial intermediaries and markets are able to deploy larger volumes of capital and handle larger turnover, without necessitating large corresponding movements in asset prices* (enhancing market liquidity) and (iii) *the financial sector can create a broad menu of assets for risk-sharing purposes* (hedging or diversification). (Goyal et al, 2011)

As implied by the liberalization techniques by developing countries, widening the dominant banking sector scope is an important but not adequate step, should financial depth in an economy be achieved. A *range of avenues* for savings and investment decisions has been highlighted as ensuring liquidity of cash-flows (an indicator of financial depth) which then promotes further economic development.

Thus, it may be argued if the state in question comprises a certain level of average income per person and if each should be able to afford the “luxury” of savings and investment, especially in a developing country like Kenya.

According to Enz (2000), the rate of insurance penetration could be greatly determined by income elasticity, which studies the relationship between one's income and their demand for a certain quantity of a product. The author draws that income elasticity of demand for the particular product, insurance, declines as GDP of a country grows. Further elaborated, as the income of an individual increases, their demand for insurance as a *luxury* product increases whereas if it were treated as a *necessity*, the demand for the same would decrease.

Applying this paradox to the Kenyan context, where about forty three percent (43%) (2012 estimate) of the population live below the poverty line (Central Intelligence Agency (CIA)), many might not afford life insurance, let alone investing through other means.

### **2.3 Life Insurance and Economic Growth; Meeting in the Middle**

The role of life insurance as a savings and investment vehicle may prompt economic growth through better utility of monetary resources. Life insurers' industrial operations further enhance the financial sector through asset acquisition and management and through the position as financial intermediary.

However, Ward & Zurbruegg (2000) highlight the potential of insurance being a disincentive to save because the major determinants of the precautionary motive to save, such as death and retirement in the case of life insurance, can all be transferred as risks to insurance companies, depleting the individual's autonomy. Moreover, the morale hazard risk where persons intentionally subject themselves to an insurable risk, especially in the case of general insurance, leads to an overall decrease in the perpetrator's productivity level. This in turn weakens their significant labour role towards achieving economic growth.

Outreville (1996), from his analysis of developing countries, also goes ahead to point out that the structural, financial and technical constraints, which include 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.

These counter arguments then beg the question as to whether life insurance has a significant mark in a developing economy as to actually progress growth.

Some authors still seem optimistic. Han *et al.* (2010) drew the conclusion that insurance development is positively correlated with economic growth. Moreover, they mention that life and non – life insurance play a more important role for developing countries as compared to

developed ones. From their study on insurance density impact on both types of economies, they conclude that there is about 2.495 per cent increase in economic growth given 1 per cent increase in life insurance density for the developing economies.

On the other hand, Enz (2000) observes the higher life insurance penetration and its premium growth exceeding growth in GDP, in countries such as Kenya, which may just as well ironically benefit from its worsening age structure and probable inability to sustain social security systems.

The need for life insurance is indeed justified, but translating it to a greater impact on the economy and hence qualify the strengthening of the sector, remains as the riddle of this study. From Enz's (2000) last statement, efforts would then have to be targeted towards channelling greater growth in the life insurance sector to reflect in the economy, in such a way as to make the two variables meet and progress in the same direction.

A study conducted on the Malaysian setting by Ching *et al.* (2010) enabled them realize that a long – run relationship between the country's life insurance sector and real GDP is significant, as per the insurance sector's allocation of pooled funds collected and thereby invested in certain assets, such as financial and real property investments. This would widen the country's savings - investments nexus, which then increases output and ultimately spurs economic growth.

Kugler and Ofoghi (2005) use evidence from the UK to confirm the long run relationship between growth in insurance and the economy by considering disaggregated data under each of the life and general insurance realms. Long term insurance in the UK was analysed to have contributed about 90 billion pounds in premiums, thereby confirming the potential of such a sector contributing significantly to economic growth of a country.

This could clearly outline what impact life insurance could have on GDP in Kenya, in the long run.

## **2.4 The Next Step**

It thus rests on both players in the Kenyan market (life insurers and economy policy – makers) to converge on how exactly growth in each variable may benefit the other. For instance, the independence of life insurance growth as compared to a dwindling economy would not be sensible, should Kenya want to achieve a middle income status with time; a status dependent on the financial sector input as a major economic driver.

However, simply selling life insurance policies for the sake of economic dominance should not be the only aim. The benefits of life insurance as a savings and protection vehicle for the individual have been clearly stipulated. The well – being of the individual may translate into more productivity, enhancing his financial position and consequently the economy at large.

### Chapter 3: Methodology

This section focuses on the tools and appropriate model that shall be used to analyse the relationship between life insurance and economic growth in Kenya. Data analysed was taken to be *quantitative*, given that the study concerns numerically - measurable variables.

The section shall involve noting the intricacies of data distribution, average and volatility measures as well as the dependence direction and magnitude of the life insurance – economy relationship.

#### 3.1 Analysing Insurance Level Indicators

The level of insurance imminent in an economy takes up two main indicators. An explanation of each of these shall be relayed and, further on, the preferred choice with reasons.

*Insurance penetration* refers to the ratio of premiums underwritten in a given year to GDP of a country.

$$= \frac{\text{Premium}}{\text{GDP}} \quad \text{Equation a)}$$

Penetration gives a better understanding of the insurance sector revenue as a proportion of the GDP, representing the industry's relative importance in the domestic economy. (Gupta, 2011)

From specialised studies conducted, an increase in insurance penetration in the Indian context would be attributed to large scale practices as to affect the economy such as entry of new players into the insurance sector, introduction of new products and channels of distribution and access of private insurers into uncovered markets.

*Insurance density*, as clearly outlined by Chen et al. who conducted an international cross country analysis between insurance and economic growth, is the ratio of premiums to capita (i.e. premiums per unit of a population).

$$= \frac{\text{Premium}}{\text{Capita/Population}} \quad \text{Equation b)}$$

As explained in the statistical overview of life and non-life insurance density in selected emerging countries and regions worldwide in 2013 (Statista, n.d.), insurance density links the size of the insurance markets to the level of a country's financial development.

The preferred indicator of insurance under this study would be the penetration of insurance in the country, as by its very calculation, it considers the level of economic development (GDP) of a country and captures readily accessible data pertaining to Kenyan insurance market statistics.

### **3.2 Data Collection and Analysis**

Data was sourced from secondary means that were readily available and accessible. Online statistics on international websites, such as the World Bank, depicts annual GDP growth rates over a particular time frame while the annual life insurance premiums written could be found in insurance regulator reports such as those of the Insurance Regulatory Authority (IRA).

The period of observation of progression of the two variables was fifteen years, as of the year 1999 to 2013. The period under study encompassed data that was available for historical and current relationship trend analysis.

The data would be best interpreted using inferential statistics, in order to properly come up with a conclusion from appropriate statistical tests carried out. Data distribution patterns, average and volatility would give a good understanding as to how each variable would evolve and be projected into the future.

The *model* of selection was determined to take into account the inferential nature of data as well as to solve the research objective of the study; to obtain the relationship between life insurance penetration and economic development within Kenya.

### **3.3 Data Tests and Model**

Prior to modelling the data, a statistical test was applied to analyse the *direction* of causal dependence between life insurance penetration and economic growth (GDP). This employed Granger's Causality test, which can be used to find the causal variable amongst panel time series sets of data. The result of this test would affirm the stronger causal variable between GDP and life insurance penetration.

An impulse response test under a Vector Auto Regression (VAR) shall follow thereafter, to trace out the responsiveness of the dependent variable to shocks to each of the explanatory factors. (Brooks, 2008)

The causality test was considered crucial as to justify or channel efforts towards increasing life insurance penetration so as to prompt further economic growth.

The most appropriate data model that was found to be relevant to this study was the *Generalised Linear Model (GLM)*, applicable to a time – series cross section data set under a panel comparison.

The model was thus selected because of its flexibility in accommodating both linear and non – linear relationships as well as ease of interpretation. The GLM model proves useful in determining important predictors of the response (dependent) variable and quantifying the relationship observed.

The conventional GLM equation takes the form of the response variable dependent on the linear predictor and error term.

$$y_i = \mu_i + \varepsilon_i, \quad \text{Equation c)}$$

Where i)  $y$  is the *response variable*, ii)  $\mu$  is the set of *explanatory variables* and *respective coefficients* and iii)  $\varepsilon$  is the error term, normally distributed with zero mean and constant variance.

The panel regression equation takes into consideration explanatory variables determining lagged GDP over time. The traditional equation for a panel of countries, as depicted by Beck & Levine (2004), is as follows;

$$y_{i,t} - y_{i,t-1} = \alpha y_{i,t-1} + \beta \sum X_{i,t} + \gamma_i + \varepsilon_{i,t-1} \quad \text{Equation d)}$$

Where i)  $y$  is the *logarithm of real per capita GDP*, ii)  $X$  is the set of *explanatory variables*, iii)  $\gamma$  is an *unobserved country – specific effect*, iv)  $\varepsilon$  is the *error term*, v) the subscript  $i$  represents a particular *country* out of a panel and vi) the subscript  $t$  represents the *time period*. The parameters  $\alpha$  and  $\beta$  are the coefficients of projection of  $y_{i,t}$  onto past and constant values of  $y_{i,t}$  and  $X_{i,t}$  respectively (Holtz – Eakin *et al*, 1988).

For the purpose of this study, the equation was slightly altered to incorporate the nature of specific variables under observation. It breaks down the linear predictor under GLM into its constituent explanatory variables, retaining the response variable and error term as follows:

$$y_i = \mu_i + \varepsilon_i,$$

$$y_{i,t} = \alpha y_{i,t-1} + \delta Z_{i,t-1} + \beta_m \sum X_{m,i,t} + c + \varepsilon_{i,t-1} \quad \text{Equation e)}$$

Where i)  $y$  is *real per capita GDP*, ii)  $Z$  is the main explanatory variable, *life insurance penetration*, iii)  $X$  is the set of other explanatory variables, iv)  $c$  is the constant and iv)  $\varepsilon$  is the *error term*. The subscript  $i$  represents a particular *country* out of a panel, the subscript  $t$  represents the *time period* and the subscript  $m$  represents the *explanatory variable* in question (each  $m^{\text{th}}$  variable has a different coefficient). The parameters  $\alpha$ ,  $\delta$  and  $\beta$  are the coefficients of lagged  $y$ , lagged  $Z$  and  $X$  respectively.

To justify the selection of a panel equation, the model considered Kenya as well as the remaining East Africa region (Uganda and Tanzania), so as to comprise a more accurate investigation. This inclusion would confirm a clearer direction as to the evolution of the relationship between life insurance penetration and economic growth on a regional level. Readily available data pertaining to the life insurance industry's annual premium trends in each of the two countries additionally justified their selection.

The additional explanatory variables (control variables) apart from life insurance penetration would confirm the effect of other factors on GDP and remain relevant as to affect life insurance itself.

The explanatory variables considered significant in this model as to affect both GDP and life insurance penetration included; i) *life expectancy growth*, ii) *savings rate*, iii) *population growth* and iv) *prevalent inflation rate* per year.

From their study on factors affecting the demand of life insurance, Browne & Kim (1993) incorporated a log linear equation and estimated the regression coefficients of *life expectancy* (a proxy for the probability of death), and *inflation* to take up *negative* signs, thus implying they had a negative correlation to life insurance penetration.

Rising inflation would result into lower purchasing power, leading to the purchase of life insurance becoming a less attractive venture, whereas increased life expectancy (lower probability of death) would lessen the need for life insurance as a financial protection product upon death. There exists, however, the opposite effect of life expectancy on GDP, where productivity is hinged on the probability of survival of an individual. This assumes that with a greater number of persons surviving over a long period of time, the potential of contributing towards a higher GDP increases. The overall regression equation shall have to consider this effect of life expectancy on GDP.

Increasing *population growth* and an improved *savings rate* were mentioned to be positively correlated to life insurance penetration (Kartheeswari & Rajeswari, 2012), hence implying taking up positive signs. Population growth confirms greater potential for demand and purchase of life insurance while increased savings by households avails the financial capacity to consume life insurance.

This research employed *EViews (Version 9)* as the computer program applicable to the testing and modelling of data.

### **3.4 Limitations of Data**

The additional control variables were considered too few as to give an accurate description of the life insurance – economic growth dependence tendency. However, the observation of such key variables over a long period of time and over a range of countries presented a realistic conclusion on the relationship under study.

GLM restricts application to data sampled from a one parameter exponential family of distributions (Haberman & Renshaw, 1996). Furthermore, it does not prescribe methods of estimating the distribution type of the data in question.

## Chapter 4: Methodology Results and Analysis

### 4.1 Granger Causality Test and Impulse Response

The results of the Granger Causality Test are depicted below. The first run assumed common coefficients with lagged values of GDP and life insurance penetration. The second run assumed individual or independent coefficients with one lagged values of the same variables.

#### Pairwise Granger Causality Tests

Date: 11/10/15 Time: 12:36

Sample: 1999 2013

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LIFEP does not Granger Cause GDP	39	1.52963	0.2312
GDP does not Granger Cause LIFEP		4.86156	0.0139

Table 3: *Stacked Granger Causality Test* (common coefficients)

#### Pairwise Dumitrescu Hurlin Panel Causality Tests

Date: 11/10/15 Time: 12:43

Sample: 1999 2013

Lags: 2

Null Hypothesis:	W-Stat.	Zbar-Stat.	Prob.
LIFEP does not homogeneously cause GDP	2.51299	-0.07058	0.9437
GDP does not homogeneously cause LIFEP	4.91043	1.03052	0.3028

Table 4: *Dumitrescu Hurlin Granger Causality Test* (individual coefficients)

The null hypotheses being tested are the following:

#### *Stacked Test*

1.  $H_0$  – Life insurance penetration (LIFEP) does not granger cause economic growth
2.  $H_0$  – Economic Growth (GDP) does not granger cause life insurance penetration

#### *Dumitrescu Hurlin Test*

1.  $H_0$  – Life insurance penetration does not homogeneously cause economic growth
2.  $H_0$  – Economic growth does not homogeneously cause life insurance penetration

Granger Causality Test	Hypothesis being tested	Probability	Conclusion
<i>Stacked</i>	1. $H_0$	0.2312	Reject
	2. $H_0$	0.0319	Do not Reject
<i>Dumitrescu Hurlin</i>	1. $H_0$	0.9437	Reject
	2. $H_0$	0.3028	Reject

Table 5: Analysis of Granger Causality Test

The stacked test reveals that the second null hypothesis (2.  $H_0$ ) is true; economic growth does not necessarily prompt life insurance penetration. This implies that depth in the insurance market may be autonomous or is attributed to factors other than growing GDP.

The *Dumitrescu Hurlin* test implies bidirectional homogeneous causality as from both of the null hypotheses tested, no causal variable is depicted to be significantly stronger as to preempt the other.

To obtain the *impulse responses* of economic growth to shocks in life insurance penetration and vice versa, a VAR equation is first run, with the endogenous variables comprising GDP and life insurance penetration and the exogenous variable being the constant ( $c$ ) from the regression model.

The following tabled graphs in the next page illustrate the response trend of each variable to impulses generated. The trend was estimated over a period of ten years. Note that the title of each graph signifies the response given a certain impulse.

For instance, the title “Response of GDP TO GDP” represents the graphical trend of GDP response when the lagged version changes, assuming that economic growth depends on its previous statistic.

Response to Cholesky One S.D. Innovations  $\pm 2$  S.E.

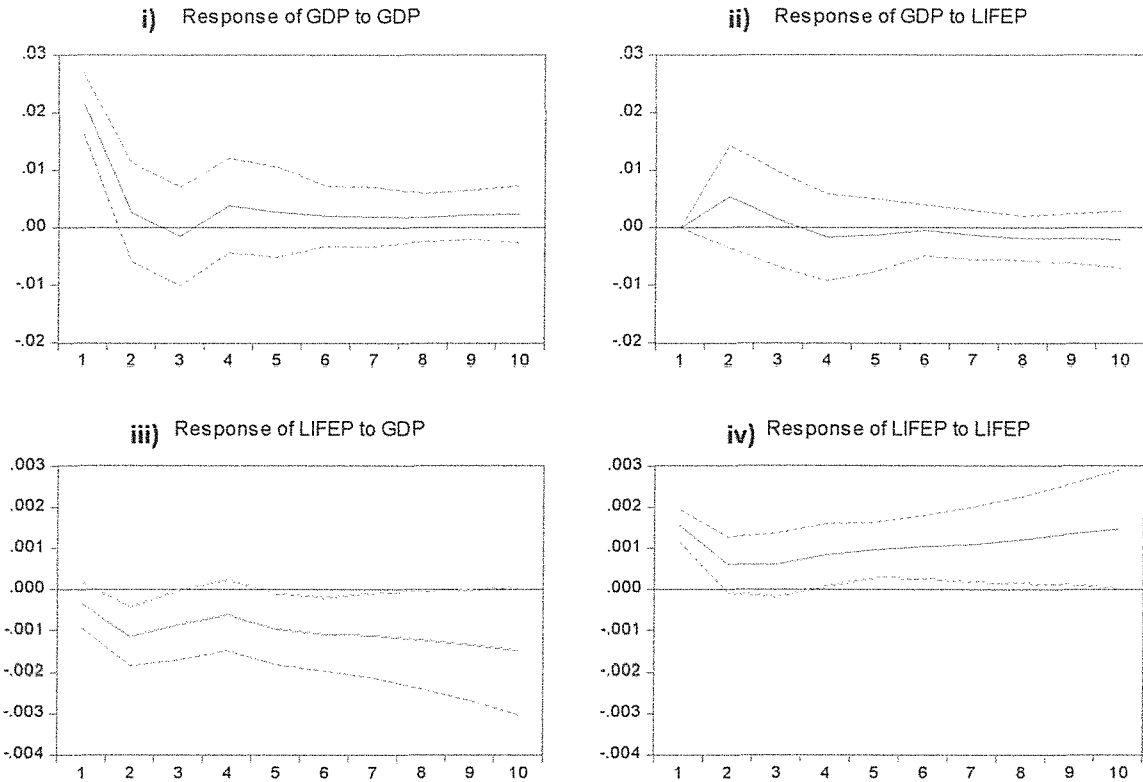


Table 6: *Impulse Response Graphs from VAR*

Focus is on the trend on the **blue line** depicted in each of the graphs above. In graph **ii)**, shocks to life insurance penetration have a positive impact on GDP for three and a half years but then afterwards, the effect of the shock is short lived.

In graph **iii)**, innovations (impulses) of GDP constantly have a negative impact on life insurance penetration, without the effect of the shock dying down even after the tenth year. This may magnify the demand leading trend of life insurance, as majorly stemming from GDP movements.

Under this test, GDP fluctuations are shown to have a higher impact on life insurance penetration over time, thereby strengthening its causality capacity.

#### 4.2 Generalized Linear Model

The regression was run as to incorporate the significance, magnitude and direction of the relationship between economic growth and life insurance penetration but with other essential economic factors coming into play.

Thus a regression was carried out under a GLM framework, with the extra set of explanatory variables. Data was entered in abbreviated form to simplify analysis. The following list comprises the abbreviations and respective representations;

*GDP* – Economic Growth in the current year (Dependent variable  $-y_{i,t}$ )

*LAGGDP* – Economic Growth in the previous year ( $y_{i,t-1}$ )

*LAGLIFEP* – Life insurance penetration in the previous year ( $Z$ )

*INF* – Inflation Rate

*LIFEEX* – Life expectancy growth

*POP* – Population growth

*SAV* – Savings rate

*C* – Constant

The results of the model are depicted below;

Dependent Variable: GDP  
 Method: Generalized Linear Model (Newton-Raphson / Marquardt steps)  
 Date: 11/18/15 Time: 16:50  
 Sample: 1999 2013  
 Included observations: 45  
 Family: Normal  
 Link: Identity  
 Dispersion computed using Pearson Chi-Square  
 Convergence achieved after 0 iterations  
 Coefficient covariance computed using observed Hessian

Variable	Coefficient	Std. Error	z-Statistic	Prob.
LAGGDP	0.070207	0.163281	0.429976	0.6672
LAGLIFEP	0.830568	1.101762	0.753855	0.4509
INF	-0.096396	0.065171	-1.479110	0.1391
LIFEEX	1.498162	0.580067	2.582739	0.0098
POP	1.332831	1.155502	1.153465	0.2487
SAV	0.058912	0.079626	0.739854	0.4594
C	-0.006010	0.033563	-0.179062	0.8579

Mean dependent var	0.058170	S.D. dependent var	0.023658
Sum squared resid	0.015287	Log likelihood	115.5606
Akaike info criterion	-4.824918	Schwarz criterion	-4.543881
Hannan-Quinn criter.	-4.720150	Deviance	0.015287
Deviance statistic	0.000402	Restr. deviance	0.024627
LR statistic	23.21731	Prob(LR statistic)	0.000727
Pearson SSR	0.015287	Pearson statistic	0.000402
Dispersion	0.000402		

Table 7: GLM Results

Independent Variable	Coefficient	Probability (Level of Significance)
<i>Lagged GDP</i>	$\alpha = 0.070207$	0.6672
<i>Lagged Life insurance penetration</i>	$\delta = 0.830568$	0.4509
<b><i>m (explanatory variable)</i></b>	<b><math>\beta_m</math></b>	
<i>Inflation</i>	- 0.096396	0.1391
<i>Life expectancy</i>	1.498162	0.0098
<i>Population growth</i>	1.332831	0.2487
<i>Savings</i>	0.058912	0.4594

Table 8: Coefficients and Level of Significance of Independent Variables

As depicted in Table 8, lagged life insurance penetration, as predicted, has a positive relationship with economic growth (GDP), with a magnitude of 0.83 (rounded off) as a coefficient value. However, this is registered at lower than 90% confidence level ( $p = 45.09\%$ ), which draws the variable's insignificance in being a strong predictor for GDP.

This implies that life insurance in East Africa region, let alone Kenya, is not yet as large an industry as to make a huge impact towards economic growth. Considering the benefits of the service however, both to the consumer and to the provider, the challenge lies in reversing this trend, with evidence of bidirectional causality confirmed through the *Dumitrescu Hurlin* causality test conducted.

The most significant variable observed as to affect economic growth however is life expectancy, given a confidence level of above 95% ( $p = 0.98\%$ ). It could therefore be interpreted, given the depicted positive relationship with GDP, that the longer people live, the greater their contribution towards improving an economy's growth prospects. Ironically however, this could dim an individual's propensity to take out life insurance to hedge against unexpected death, should the same individual be aware that such a risk is highly unlikely (estimated high life expectancy).

Longer life expectancy however works in favour of hedging against longevity risk, in the event of an individual (usually retired) dependent on a source of income when they are no longer able to work or remain in employment. A life insurance product such as a *whole life annuity* can be purchased to provide a means of financial sustainability for as long as a person is alive.

Table 8 confirms the relationship directions that inflation and population growth negatively and positively impact GDP growth respectively. The continued hike in consumer good prices diminishes purchasing power, thereby reducing an individual's ability towards making monetary transactions as to boost the economy of a country, let alone purchasing life insurance. On the other hand, an increase in population avails a greater number of individuals that have the potential to contribute towards the economy through their spending, saving and production (work) patterns. As per Kartheeswari & Rajeswari's (2012) proposition, population growth additionally creates demand for goods and services, including life insurance products, thereby enhancing their uptake and consequently penetration into the market.

Evidenced from a positive coefficient highlighted in Table 7 historical values of GDP promote future economic growth. The growth of an economy in past years would prompt higher incomes in future awarded to persons and therefore enable them afford some goods and services that were otherwise considered as luxuries, such as life insurance. In addition, the need for life insurance increases with income as it protects dependents against the loss of expected future income due to premature death of the wage earner (Browne & Kim, 1993).

The positive relationship between savings and economic growth could be attributed to the greater propensity to make future purchases and engage money transactions with one's current funds, especially given a low rate of inflation. If one's current savings increase, the higher their spending capacity. Savings rate is also positively correlated with life insurance penetration. Life insurance implies saving to ensure family financial welfare in the event of unexpected death as the breadwinner of the home. In this case, you entrust the life insurer with your savings. Moreover, current savings promote future spending, especially at a rate close to inflation.

## Chapter 5: Recommendations

From the methodology conducted and analysis of results, life insurance penetration has been proven to bear a positive relationship to economic growth. However, the study confirmed that GDP growth more likely causes the uptake of life insurance as compared to the reverse, hence confirming a “demand - led” system where economic growth prompts uptake of life insurance. This observation contrasts against Outreville’s (Life Insurance Markets in Developing Countries, 1996), where he refers to developing countries depicting a “supply - leading” trend.

To further enhance the directional relationship under study, with life insurance at the core, the significance of the service must first be realised without considering pricing as a factor. That is, an individual must become aware of the valuable benefit of life insurance as a risk management tool in order to automatically channel a proportion of his available income for purchase, without necessarily waiting for improved economic conditions.

The availability of *micro – life insurance* products has made the purchase of life insurance a more affordable reality, thereby reducing the burden of paying expensive premiums. Such products must be designed in such a way as to meet the consumer’s needs and be thoroughly elaborated by respective insurers’ (or their intermediaries) in order to enhance the consumers’ understanding of how the product works.

When individuals are comfortable with how they shall benefit from a certain product, they are usually more than willing to pay the price dictated to them. Thus increased awareness of current and reliable products enhances uptake, thereby increasing penetration and, consequently, economic growth.

In consideration of the high significance of life expectancy towards achieving economic growth, this factor should be used to prompt life insurance penetration as well. As mentioned previously, longer life expectancy would imply the risk of “outliving” one’s financial assets accumulated during their working period. The annuity market serves as a perfect hedge to this longevity risk.

In Kenya, it has been observed that very few retirees purchase annuity products with their retirement benefit lump sum amounts. Private schemes and the National Social Security Fund (NSSF) instead comprise a much greater chunk of the pensions industry, with an estimated five hundred and forty eight billion Kenya shillings in assets (Ksh. 548 billion) reported as at end of 2012 (Retirement Benefits Authority, 2013). This is despite the fact that annuities, if fairly priced, allow maximization of income over the pensioner’s lifetime compared with other ways

of releasing assets, since alternatives would always require excess assets at death (Mitchell, 2002).

Awareness should be created concerning such single benefit conversion options, especially in pension schemes, and more innovative and relevant products be introduced to the market such as index linked annuities.

Another major booster to penetration would be the enhancement of the overall financial sector as to instil investor confidence in the whole industry and its services. The decline in a representative financial institution, such as the collapse or insolvency of banks as observed during the last quarter of the year 2015, may lower credibility in other operating companies such as insurers.

Proper systems of integrity and accountability must be maintained with respective regulators constantly auditing companies, in order to prevent large scale calamities from occurring and negatively affecting customers' investments. Confidence in a particular institution greatly influences the investment in another. For instance, should a seasoned investor be satisfied with banking services offered, they would be more inclined to extend their risk aversion and try alternative investment options such as insurance.

## **Chapter 6: Conclusion**

The financial sector in Kenya benefits from both short and long term businesses, with the latter being an efficient vehicle for savings and investments.

Life insurance acts as a financial intermediary within the long term business scope, providing life products to policyholders and investing premiums received in various asset types. Despite a recognised positive relationship with economic growth however, the sector still reports no significant impact due to low market penetration.

This observation contrasts with the more dominant pension industry (a component of long term business), which has registered over five hundred billion Kenya shillings (Ksh. 500 billion) in assets since 2012, as compared to the thirty seven billion Kenya shillings (Ksh. 37) under life insurance, registered in the same year. The pensions industry would thus serve as a stronger contributor to Kenya's GDP.

Integrating the retirement sector with the life insurance business (mainly through the provision of affordable annuities consistent with inflationary effects over time) could see the enhancement of penetration in the life insurance sector.

Methodology results indicate life expectancy as the single variable deemed to be a significant contributor to economic growth in the Kenyan, Tanzanian and Ugandan economies. The development of annuities in the life insurance sector may take advantage of this trend, providing a means of income to "longer living" individuals who are retired.

The results of the Impulse Variation test imply that short term shocks in life insurance penetration bear the capacity to affect economic growth (over an estimated three and a half year period). The impact therefore of life insurance penetration on GDP cannot be entirely denied to exist.

Economic growth would more likely cause uptake of more life insurance products, especially due to an increased savings capacity per individual. The concept of life insurance as a luxury fades, with more insurers providing cheaper and useful alternatives to lower income earners (micro - life insurance). Penetration can therefore be increased should the majority of the potential market appreciate the benefits under products offered and forego risk aversion by investing in the industry.

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