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Is Insurance The Panacea To The Economic Growth Challenges In Ghana? An Empirically Examination

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Abstract:*The purpose of the study is to examine the effects of insurance on the growth of the economy of Ghana with annual data from 1990 to 2016. In this regard, Autoregressive Distributed Lag (ARDL) estimation technique is adopted based on the stationarity properties of the variables, established using the Augmented Dickey Fuller and Philip Perron tests. The findings of the study in the long-run revealed a positive effect of life and non-life assurance penetration on growth of the economy in the long run. However, among the two insurance variables life insurance penetration was the significant determinant of economic growth. In the short term, it is established that the previous year's penetration of life assurance does have a significant impact on growth of the economy. It was also evidence that macroeconomic variables such as trade openness, interest rate and inflation are key determinants of growth of the Ghanaian economy. Based on these findings, the study recommends the National Insurance Commission in partnership with insurance providers should create an insurance market knowledge and awareness network to improve consumer demand in the insurance industry. Also, the study recommends that premium rates be reduced in order to increase demand for insurance policies in Ghana.*

Keywords:*Insurance; Economic Growth; Life Assurance; Non-Life Insurance Penetration; Autoregressive Dynamic Lag Model; Ghana*

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I. Introduction

There is a growing phenomenon in the portion of the insurance industry, and the total it serves in the financial market in virtually every emerging and industrialized world (Outreville, 2011). The link amid the industry and growth of the economy has gained growing attention from analysts recently. Development in the industry has given an unsatisfying description of the interrelationships among these factors. Scholars have addressed the existence of the causality, whether the production of insurance induces growth of the economy or growth of the economy follows the insurance market, or whether the two factors influence each other (Peleckien*et al.,* 2019).

According to Afriyie (2006), attempts have been made by several persons and organizations to define insurance in various categories. Insurance is categorized under life, marine and various parts. Some list it below subtitles like personal and home insurance, interest insurance and liability insurance. Insurance may be more generally defined as life and non-life assurance.

Over the last decade, insurance companies have seen global growth rise to 175% between 2000 and 2008, far above global growth of an economy (Outreville, 2011). In 2009, the worldwide insurance first-rate amounted to US$4.06 trillion in value, comparable to 7% of the worldwide Gross Domestic Product (GDP). World insurance payments improved by 6% from $4.3 billion in 2010 to $4.57 billion in 2011. Agreeing with Olayungbo and Akinlo (2016), world insurance grew from $4.57 trillion in 2011 to $4.61 trillion in 2012 and $4.64 trillion in 2013. Insurance penetration reveals broad differences among the selected African nations. Data obtained from some selected African countries revealed the following increases. In 1990, Algeria accounted for 1.02%, Egypt for 0.77%, Kenya 2.63%, Mauritius for 3.20%, Nigeria for 0.55%, South Africa for 9.89%, Tunisia for 1.41% and Zimbabwe for 3.84%. By 2013, the African countries had some fascinating differences. The penetration of insurance in Algeria fell in 2013 at 0.68%, Egypt at 3.41%, Mauritius at 5.84%, Nigeria at 0.36%, South Africa at 15.40%, Tunisia at 1.76%, and Zimbabwe at 15% (Olayungbo and Akinlo, 2016).

Since the upsurge in insurance, there is an argument that insurance business does not add much to the growth of a country, primarily because of its non-financial activities and the intangible products and services being offered by the insurance sector (Peleckien*et al.,* 2019). The exact problem in this regard has to do with the fact that there is scanty data on the progress of insurance industry and the impact it has had on growth of the economy. Though, a number of developed countries have established the existence of these facts (Kjosevski, 2011; Lee *et al.,* 2018), there is some gap particularly in developing countries such as Ghana in terms of

tracking and identifying the effect that these insurance businesses have on the economic growth of the country. This problem has created all manner of perceptions among consumers of insurance products as to the exact benefits these insurance products and services bring or add to the economic growth of the country in any form (Han *et al.,* 2010).

Olayungbo and Akinlo (2016) use the Bayesian Time Varying Parameter Vector Auto regression (TVP-VAR) model and stochastic variance technique to investigate the active relationships between insurance and development of an economy in 8 African countries from 1970-2013. A positive association is established for Egypt whereas a short term negative and long-term positive results were achieved for Kenya, Mauritius and South Africa. In addition, a negative impact was identified for Algeria, Nigeria, Tunisia and Zimbabwe. Also, Chien-Chiang (2011) investigated how insurance market activities affect development of an economy, particularly, GDP for 10 selected OECD countries between 1979 and 2006. Using various estimation techniques, the study established that non-life assurance market has more influence on GDP than life assurance market. Again, Mojekwu*et al.* (2011) studied the effect of insurance contributions on development of the economy of Nigeria over 27 years, using a dynamic factor model between 1981 and 2008. The result reflects a positive correlation between insurance premiums, prime volume measures and economic growth, in particular with the rise in Nigeria's GDP rate. Furthermore, Lee *et al.* (2018) examine the connection between insurance activities and development of an economy using time series data from 1967 to 2014. Using the static panel model and the active panel model for 123 countries, the study showed that the link between insurance and development of an economy varies from country to country due to income, investment success and insurers. The study suggested that policy makers should consider interconnections between the finance and insurance industries.

Based on the empirical literature, it is an indisputable fact that insurance is of considerable benefit to contemporary society by offering large economic activities that are feasible in addition to their benefits to economies in terms of size, wages, controlled properties, and others. It is important to remember that growth of an economy is characterized by rich and thriving nationwide insurance industry. Emphasis has been placed to the effect that it is important to recognize the property-liability insurance and life assurance in emerging markets and development (Han *et al.,* 2010). Some scholars have also established that the insurance contributions to economic growth of a country are traced from various dimensions such as risk transfer and indemnification and monetary intermediate services.

Further research suggests that economic contributions come in different ways. Some contributions include improving competitiveness and promoting creativity in insurance services and improving manufacturing quality, improved expenditure opportunities, decreasing waste of early monetary deployment and operational control benefits for insurance (Ward and Zurbruegg, 2011).

The insurance industry in Ghana is relatively stable and provides considerable prospects and opportunities for the analysis mentioned here. Accessible data shows that about 30% of Ghanaians are insured. The insurance sector announced an annual profit and total cooperate tax of GH202 million and GH36 million respectively by the end of 2018. Concerning total premium, the insurance industry contributed a whopping amount of GH2,937,534,716 in 2018. The insurance industry in Ghana is still growing. The insurance industry in Ghana presently consists of 29 non-life insurance firms, 24 life insurance, 3 reinsurance 82 brokerage companies and 3 insurance loss adjusters. As a percentage of GDP, insurance penetration in Ghana was below 1.85 per cent at the end of the first quarter of 2016 and 1.2 per cent in the last quarter of 2017. There is a general opinion that the industry is underperforming and that the domination of the country's workers in the informal sector can be attributed to this. According to NIC (2018) high premiums and complicated underwriting accounts for this poor patronage of insurance products.

Currently, available evidence in Ghana shows that the penetration of both life and non-life assurance has risen recently. For instance, life insurance penetration increased from 0.512 percent in 2014 to 0.515 percent in 2015. Likewise, the penetration of non-life insurance rose from 0.58 percent in 2014 to 0.62 percent in 2015. NIC (2018) statistics have showed that life and non-life assurance added greatly to the combined premiums of the sector. Such figures offer a strong indicator that life and non-life assurance is increasing and still, provides substantial contributions to total premiums. The question is does this growth trend in life and non-life assurance contributions result in or have an effect on economic growth? This hidden phenomenon, it seems, cannot be unraveled by mere observation, but by the need to empirically assess the influence of life and non-life assurance on the development of the economy of Ghana. Hence study seek to study and test the hypotheses that; Life insurance Non-life insurance do not have a significant impact on economic growth.

II. Materials And Methods

This section explains the methodology and materials applied in the study.

2.1 Model Specification

The study follows the model (Din *et al.*, 2017; Arena, 2008) proposed to model the association between life and non-life insurance and growth of an economy. However, in relation to the current study, some modifications were done to the aforementioned authors models, thus the new model specified to suit the current study is as follows;

$Y_t = f(LIP_t, NIP_{t,} V_t)$ …… (1)

Where, economic development (Y_t) is a function of life insurance penetration (LIP_t) and non-life assurance penetration (NIP_t). Also, V_t represents the control variables that can have an effect on economic growth overtime.

Equation (1) then becomes estimable in a log linear form as;

$lnY_t = \beta_0 + \beta_1 LIP_t + \beta_2 \ln NIP_t + \beta_3 \ln INT_t + \beta_4 \ln TO_t + \beta_5 \ln INF_t + \varepsilon_t$ …… (2)

In equation 2, $lnY_t =$ natural log of Economic growth is the dependent variable, whiles the explanatory variables are;LIP_t = natural log of Life insurance penetration, $\ln NIP_t$= natural log of Non-life Insurance,$\ln TO_t$ = natural log Trade openness, $\ln INT_t$= natural log of Interest rate, and $\ln INF_t$= natural log of Inflation. The error term, $\varepsilon_t$is presumed to be independent and identically distributed and t=time subscript. The variables employed in the model are estimated in their natural logarithm form. This is because, it helps to explain the coefficients of the co-integrating vector as long-term elasticities.

2.2 Definition of Variables, Measurement and a Priori Expectation

This section defines the variables used in the study, measurement and a priori anticipated sign based on the theoretical and empirical reviews as summarized in Table 1.

Table 1: Variables, description and a priori expectation

Variable	Description	A Priori
Dependent variable = Economic Growth (Y)		
Life Insurance Penetration (LIP)	LIP measured as the ratio of life insurance premium volume to GDP	Positive
Non-Life Insurance Penetration (NLIP)	NLIP measured as the ratio of non-life insurance premium volume to GDP	Positive
Interest Rate	Real interest rate (%) measured as lending interest rate adjusted for inflation as measured by the GDP deflator.	Negative
Trade Openness	Economic Openness measured as (exports + imports) to GDP ratio	Positive
Inflation	Measured as percentage change on consumer price index (CPI)	Negative

Source: Author's construct based on Empirical findings

2.3 Sources of Data

The data employed in the empirical analysis was mainly secondary data gathered from 1990 to 2016, a 26-year period. The data for economic growth, interest rates, inflation and trade openness was sourced from the World Bank's WDI. Life and non-life assurance penetration information, however, is obtained from the Global Financial Data Base (2019). The choice of the sample period is primarily based on availability of data.

2.4 Estimation Strategy

The methods employed for this study were graphical and descriptive statistics. This is to help in gaining insight into the data set, extract relevant variables and their distributions as well as identify other anomalies. Also, Auto Regressive Lag (ARDL) model Co-integration test was applied to test for the impact of Life and Non-Life insurance on economic growth. The E-views statistical software is used to carry out the time series methods.

2.4.1 Estimation Technique

The time series modeling strategies adopted to estimate the parameters in the model specified in equation 3 above in order to achieve the set objectives is discussed in this section. Modern econometric analysis outlines three sequential steps to achieve any meaningful results from a time series data. The steps are as follows: The first step establishes the integration order through the unit root test. The next step is to investigate the existence of a long run equilibrium link between economic growth and its covariates using a standard co-integration testing procedure. The first two steps aforementioned provide a guide on the appropriate data

transformation and choice of estimator that ensures efficient and consistent identification of model parameter. The final step includes the approximation of the long and short run relationships.

2.4.1.1 Unit Root Tests

If one regresses a time-series of variable, **Y,** which is not stationary and therefore has unit root, on regressors that are also non-stationary (have unit roots), the estimated regressions gives a statistically significant relationship/coefficients, even if that is not the case. When such happens, it is termed as spurious regression.

The study employs the ADF and PP unit root tests to help prevent spurious regression results. Zhu and Peng (2012) posit that the ADF test investigates stationarity of time series observations, in which a high-order autoregressive model with an intercept term is established.

The ADF test specifies a null hypothesis of 'the series having unit root' as contrary to the alternate hypothesis of 'the series not having unit root, and it is consequently stationary. The study first tests the series at the levels, if the computed ADF statistic is less than its 5% critical value, the decision is that we fail to reject the null hypothesis. On the other hand, if the ADF statistic exceeds its respective 5% critical value, the null hypothesis of the presence of unit root is rejected and the alternative hypothesis is accepted.

2.4.1.2 The ARDL Co-integration Framework

The study found vast models and estimation techniques that can be employed to analyze the connection between development an economy and insurance. The study chanced upon important works that applied either OLS based multiple linear regression or the residual based Engle-Granger test methods, combination with Johansen (1991) maximum likelihood tests. However, for emerging markets with non-availability of longer period data, the study found the ARDL method more appropriate (Chen, 2013; Pesaran and Smith (1998).

The ARDL technique is less stiff, and can be used on variables with diverse orders of integration. Additionally, the ARDL method of modelling takes sufficient lags in taking the link among the time series data (Pesaran and Shin, 2003). Moreover, Pesaran and Shin (2003) mention that one can derive an error correction term (ECT) via simple linear transformation. The ARDL modelling aids in capturing both short and long-run interactions, and aids in evading stationarity difficulties with time series data. Based on this premises the study employed the ARDL estimation technique specified by Pesaran*et al.* (2001).

2.5 Diagnostics Tests

In order for the model estimated to be used for analysis and policy recommendations it is essential to perform model diagnostic tests. Some of the diagnostics tests are Breusch-Pagan-Godfrey test for heteroscedasticity, Breusch-Godfery Serial Correlation LM test for serial correlation, Jacque-Berra test for normality and Ramsey RESET test for structural constancy of the model. The stability of the coefficients of regression is assessed using Ramsey RESET Test suggested by (Pesaran and Pesaran, 2001). This test tells whether the regression equation is stable over time. When the estimated model satisfies the entire stability tests mentioned above, then the model estimated is considered good and fit for analysis as well as policy recommendations.

III. Results And Discussions

(Should not exceed 10 pages)

The results section should provide details of all of the experiments that are required to support the conclusions of the paper. The section may be divided into subsections, each with a concise subheading.

3.1 Trends in Economic Growth

Trends in life, non-life assurance and development of an economy are discussed in this section of the analysis. The trend in economic growth as depicted in Fig 1 generally has been on the increase with series of fluctuations over the period under review.

Figure 1 indicates that the rate of economic growth has continued to increase after 1990. This growth rate was the outcome of the various recovery programs adopted by the nation after economic setbacks, such as the political unrest combined with the several coup d'etas and the 1983 bush fires that burned assets and businesses.

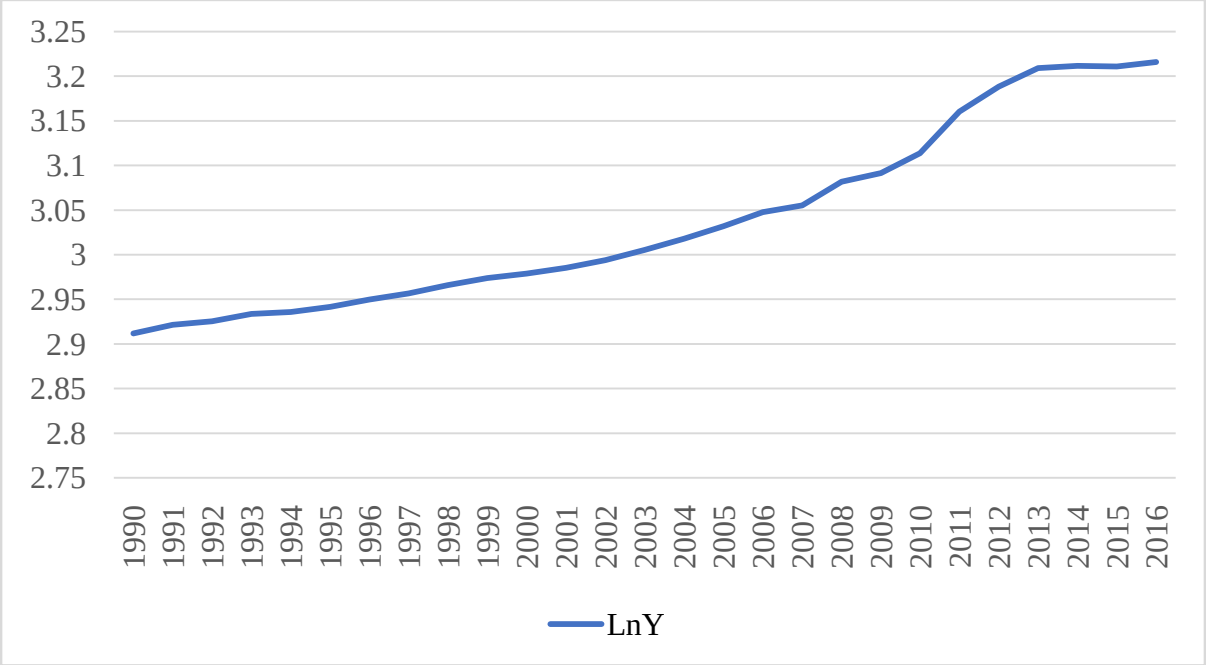

Figure 1: Annual Trend of Economic Growth in Ghana from 1990 to 2016

During this time the Government of Ghana embarked on numerous recovery programs aimed at turning the country's fortunes. The Economic Recovery Program (ERP) and the Structural Adjustment Program (SAP) were some of the policies implemented by the country aimed at reversing post-independence economic decline and fostering regional growth. This initiative, as well as other initiative initiatives such as the Ghana Investment Promotion Council (GIPC), which was set up to stimulate and facilitate investment in the region, as well as to manage investment in the country, has seen a revamp in the Ghanaian economy. Both rehabilitation programs culminated in a rise in economic growth between 1992 and 1990, respectively. However, the rate of economic growth peaked in 2005 but continued to decrease from 2006 to 2008. It began to rise in 2009 after the 2008 general election and has since maintained a steady growth rate. Generally, economic growth has ever since maintained its impressive growth rate from the 1990s although some few declines have been recorded over the years as depicted in Figure 1.

3.2 Trends in Life and Non-Life Insurance

Trends in life and non-life assurance penetration are shown in Fig 2. It is be observed that, life and non-life assurance penetration over the period of study have been increasing although they have been some series of fluctuation. Non-life assurance penetration peaked in 2012 and thereafter have maintained stable growth rates. The implementation of the Insurance Act (2016), Act 72 contributed enormously to the peak at this point of time. There was no clear distinction between life insurance and non-life insurance until the implementation of Act 724, although it was known that some firms used life insurance premiums to fund non-life insurance. The division of the two came into practice as a result of the passage of Act 724.

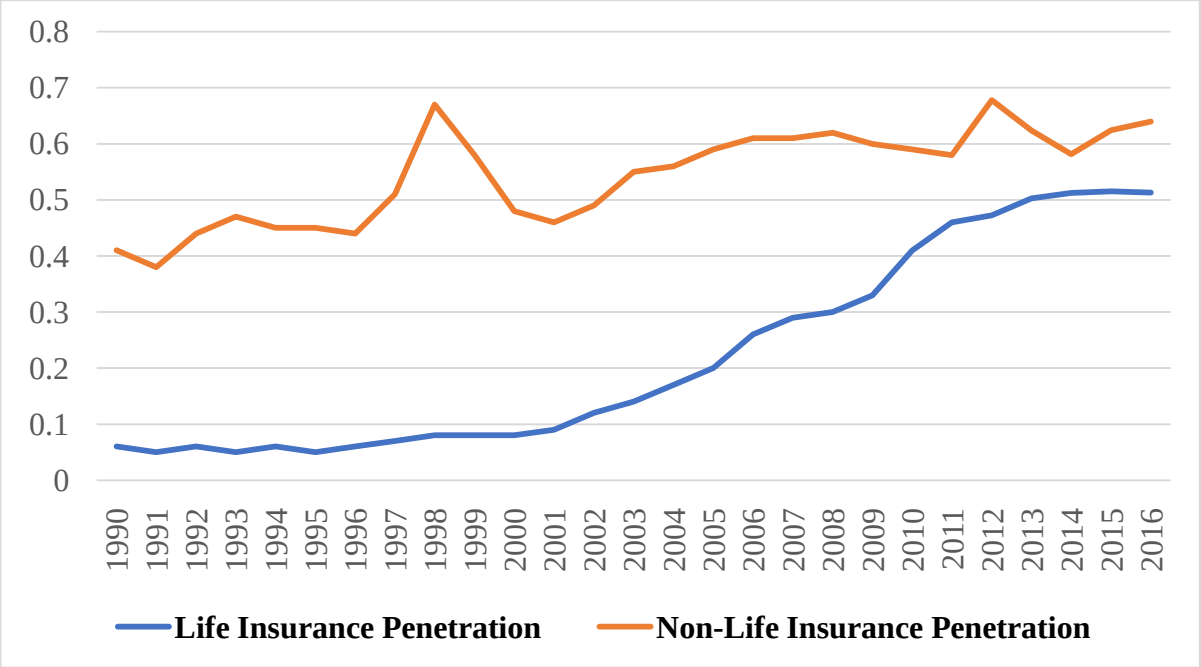

Figure 2: Annual Trend of Assurance and Non-life assurance penetration in Ghana from 1990 to 2016

Figure 2 also indicates that life and non-life assurance has risen substantially over the periods under study. This is due to the introduction of a new non-life insurance plan and the rise in the number of non-life assurance companies. In addition, certain motor insurance plans have been made obligatory and individuals are penalized for refusing to renew their contract. Life insurance is typically charged on a monthly basis and is also deducted from the client's account. Knowledge and education regarding the importance of insurance can be attributed to the growth as seen in Figure 2.

3.3 Results of the Unit Root Test

This section examines the stationary characteristics of the variables (i.e. dependent and explanatory) specified in equation 2. The aim/objective of conducting this analysis was to prevent spurious empirical results and coefficient inconsistences since most economic variables are not stationary in their plane form. The implication of unit root in time series means that shocks to non-stationary variables tend to have permanent effect while shocks to stationary variables only have temporary effect and overtime, the effect wares out.

The ADF and PP tests were employed to determine the stationary characteristics of the series. The ADF and PP tests are conducted on all series at the level and first difference. The acceptance or rejection of the null hypothesis of the presence of unit root is carried out using the probability value (p-value) as the benchmark. The stationary findings from the ADF and the PP tests are presented in Table 2.

Table 2: Unit Root Test

Levels				
	Augmented Dickey Fuller		Philip-Perron	
Variable	**Constant**	**Constant with trend**	**Constant**	**Constant with trend**
LnY	0.969608	-1.987741	1.992730	-1.503635
LnLIP	-0.200198	-2.082869	0.092623	-2.670571
LnNIP	-2.694290*	-4.800070***	-1.647956	-2.644788
LnINT	-1.322244	-1.954495	-1.342056	-1.954495
LnTO	-2.087811	-1.943856	-2.072108	-1.948359
LnINF	-4.275813***	-4.202343**	-4.260876***	-4.181564**
First Difference				
	Augmented Dickey Fuller		Philips-Perron	
Variable	**Constant**	**Constant with trend**	**Constant**	**Constant with trend**
LnY	-2.981625**	-3.407915**	-2.990385**	-3.400602**
LnLIP	-5.936709***	-5.714724***	-5.808213***	-5.622610***
LnNIP	-5.494925***	-5.401275***	-5.644442***	-6.740293***
LnINT	-4.980257***	-5.209201***	-4.980262***	-5.209201***
LnTO	-4.593025***	-4.645811***	-4.581892***	-4.639520***

Note: *, **, *** denote significance at 10%,5% and 1% respectively
Source: Estimated from Eviews 9.0

From Table 2, it is observed that at the log levels, LnINF was the only stationary variable. Hence, we refuse to accept the null hypothesis of unit root for LnINF at 5% significance level. Based on this findings we conclude that LnINF is an *I(0).*

At first differencing, it can be seen from Table 4.1 that, LnY, LnLIP, LnINT, and LnTO became stationary. Hence, the conjecture of "unit root" is rejected at the first difference. This denotes that LnY, LnLIP, LnINT, and LnTO are all *I(1).* From Table 2, it is evident that the series have clearly shown a case of mixed order integration of*I(0)* and *I(1).* In this sense, the study takes into account Pesaran*et al.* (2001)'s bounds test methodology to identify long-term relationship between economic growth and its covariates.

3.4 Results of the Bounds Test for Cointegration

The null hypothesis is specified as, the absence of any co-integration among the variables against an alternative hypothesis which says otherwise. The benchmark of (Pesaran*et al.,* 2001) is used to determine the existence of a long-term association. The calculated F-statistic is compared to the upper bound critical value before any meaningful inferences can be made. The decision to accept or reject co-integration between economic growth and its covariates is based on the computed lower critical bound *I(0)* and the upper critical bound *I(1).* The *I(0)* bound is based on the assumption that the series are integrated at levels *I(0)* implying no co-integration exists. The upper bound however is based on the assumption that variables are integrated at first difference *I(1)* implying that co-integration exists among the variables. The result of the bounds test is seen in Table 3.

Table 3: Results of the Co-Integration Relationship

LNY= f (LNIP, LNNIP, LNINT, LNTO, LNINF)		
F-Statistic	K	
6.364582***	6	
Significance	***I0* Bound**	***I1* Bound**
10%	2.12	3.23
5%	2.45	3.61
1%	3.15	4.43

Notes: *** Statistical significance at 1% level; ** Statistical significance at 5% level; * Statistical significance at 10% level.
Source: Estimated from Eviews 9.0

As depicted in Table 3, the F-statistic value of 6.36458 exceeded the upper bound 1% value of 6.36458 implying the null hypothesis of no long run link between development of the economy and its covariates is rejected. The ARDL estimation technique is applied after the study ascertained a long run connection between development of economy and its covariates. The long and short run parameters are then computed.

3.5 Long-run Relationship

The long-term association between development of the economy and the predictor variables are explored. The long-term coefficients of the development of an economy model are assessed using ARDL (1, 2, 1, 2, 1, 2) chosen on the basis of Akaike Information Criterion (AIC).

Table 4: Estimated Long run co-efficient using the ARDL Approach

25 observations used for estimation from 1990 to 2016				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LNIP	0.709066***	0.087047	8.145773	0.0000
LNNIP	0.168622	0.122930	1.371693	0.2001
LNINT	0.166772***	0.042515	3.922648	0.0029
LNTO	0.096937**	0.034850	2.781554	0.0194
LNINF	-0.279266***	0.060413	-4.622649	0.0009
c	3.062766	0.073765	41.520760	0.0000

** and *** denote statistical significance at 5% and 1% respectively and Dependent variable is LNY
Source: Estimated using Eviews 9.0

The long run estimates are in Table 4. It can be seen that life assurance penetration has a positive and noteworthy effect on development of an economy at 1%. This proposes that a percentage rise in life insurance penetration would lead to an increase of 0.709 per cent in development of the economy. This inference indicates

that the life insurance markets foster real economic activity over the long term by mobilizing their investment positions and shifting risks. In addition, most insurance companies reinvest these premiums in the productive sectors of the economy which in one way or another, contribute to the growth of the economy. This finding is consistent with the research of Olayungbo and Akinlo (2016), which analyzed eight African countries' dynamic interactions between insurance and development of the economy. The findings further affirm the studies (AlhassanandFiador, 2014; Kjosevski, 2011; Din *et al.*, 2017). The optimistic and important effect of life insurance penetration on economic growth has been identified in all these studies.

Furthermore, Table 4 shows the positive and meaningful effect of interest rate on economic development at 1%, contrary to the study's a priori expectation. As a result, a 1% rise in interest rate will result in of 0.1667% increase in economic output. Higher interest rates can be justified on the grounds of their potential to attract or induce inflows of capital into the economy. Apart from contributing to the appreciation of the cedi, the government should channel these inflows of capital into productive sectors that aim to improve economic growth.

The coefficient of openness to trade was 0.0969 means that, a percentage rise in trade results in 0.0969% rise in development of the economy, confirming to what the theory posits since trade is assumed to be growth enhancing. Trade openness is believed to boost economic development because of its effect on the integration of the world. International trade leads to specialization and exchange which broadens the productivity base of a nation. Thus, an increase in the productivity base of a country tends to boost economic growth.

In addition, the study found that inflation and economic growth had a strong negative relationship, further confirming the study's a priori expectations. Coefficient of inflation as shown in Table 4 is -0.27926. The -0.27926 coefficient of inflation implies that a percentage rise in inflation results in 0.27926% decline in development of the economy. High inflation substantially and negatively affects the economy as well as society. High inflation impacts an economy adversely. It decreases the purchasing power of a currency which in effect reduces consumption in the economy. This eventually reduces growth in the economy as well.

3.6 Short Run ARDL Model Results

This section of the discussion of results examines the short-term dynamic relationship among the variables within the ARDL (1, 2, 1, 2, 1, 2) framework.

Table 5: Estimates of the Short-run Error Correction Model

25 observations used for estimation from 1990 to 2016				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(LNIP)	0.064750	0.072636	0.891428	0.3936
D(LNIP(-1))	-0.117609*	0.054575	-2.155008	0.0566
D(LNNIP)	0.038202	0.054106	0.706056	0.4963
D(LNINT)	0.008755	0.016924	0.517338	0.6162
D(LNINT(-1))	-0.060252**	0.019415	-3.103424	0.0112
D(LNTO)	0.026776	0.016097	1.663386	0.1272
D(ININF)	0.043372	0.082527	0.525545	0.6107
D(ININF(-1))	0.212004**	0.087801	2.414602	0.0364
ECM(-1)	-0.531722***	0.108007	-4.923026	0.0006
R^2	0.998440			
$\bar{R}^2$	0.996256			
F-Statistics	457.1720***			
DW-Statistic	2.380373			

** and *** denote statistical significance at 5% and 1% respectively and Dependent variable is LNY
Source: Estimated using Eviews 9.0

The ECM of ARDL(1, 2, 1, 2, 1, 2) for economic growth is estimated and presented in Table 5 to depict how the short run reconcile with its long term economic growth model. The co-efficient of the ECM, is estimated after the co-efficient of the long-run model are estimated. The ECM is the measure of the rate at which equilibrium adjusts when there is a shock. Validity of the ECM is based on it being significant and less than zero (0). The coefficient of the ECM is -0.531722 as shown in Table 4.4. This implies that about 53.2% deviations from equilibrium can be adjusted in the long run within a year. What this means in economic terms is, when there is any disequilibrium in the variables understudy the rate at which they will be restored back to normality is 53.2%.

From Table 5, it can be seen that in the short-run, the current level of life insurance penetration was positively related to development of the economy, however, not significant. The first lag of life insurance penetration was negative and significantly related to economic growth.

The current level of non-life insurance penetration and interest rates, while insignificant in the short run, were positively linked to economic growth. However, lag one of interest rate was negative and significantly related to economic growth.

As seen in Table 5, the current levels of trade openness and inflation, while positively related to economic growth, were not significant.

Finally, the first lag of inflation was positive and significantly related to economic growth in the short term. This in economic terms shows that increases in inflation boosts economic performance in the short term. The a priori expectation of the analysis disputes this finding.

3.7 Model Diagnostics and Goodness of Fit

This section examines various diagnostics tests conducted and the goodness of fit test. The diagnostic tests carried out includes normality test, serial correlation test, stability test and heteroscedasticity test. The outcomes of these experiments are shown in Table 6.

Table 6: Model Diagnostics Test

Model Diagnostics Tests	
Diagnostics	**Test Statistic**
$F_{AUTO}(2,8)$	1.718671 [0.2394]
$F_{RESET}(1,12)$	3.748334 [0.0768]
$\chi^2{}_{NORM}$	0.922257 [0.6305]
$F_{HETERO}(14,10)$	1.067077 [0.4699]

Source: Estimated using Eviews 9.0

After performing unit root tests, co-integration tests and both long-term and short-term estimates, it is important to perform a diagnostic test to verify model validity. The model passed all the diagnostic tests presented in Table 4.6. As seen, none of the tests is significant at 5%. Both p-values were higher than the 5% significance level. Based on these results, the above regression model is known to be good for both research and policy implications.

Finally, the analysis used the CUSUM (Cumulative Sum) and the CUSUMSQ (Cumulative Sum of Squares) of recursive errors to examine the stability of the parameters in the economic growth regression model. As reported by Pesaran*et al.* (2001), the stability test indicates whether or not the parameter estimates are constant over time. The null assumption of the CUSUM and CUSUMSQ is that the vector coefficient is similar for each period. The stability test statistics are plotted against the critical bound at a 5%. If the graphs of these statistics remain within the critical bounds at the 5%, we fail to reject the null assumption and conclude that all the coefficients are stable. Diagrams to support the various model diagnostic tests are shown in the Fig 5 and Fig 6.

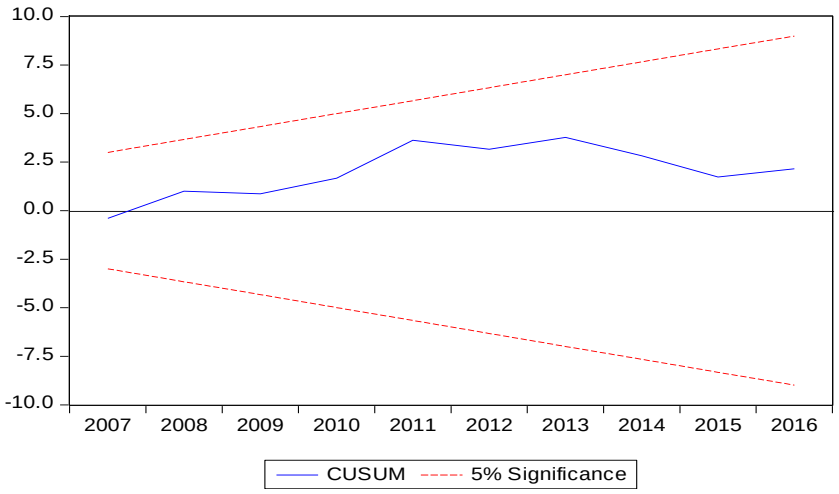

Figure 5: CUSUM

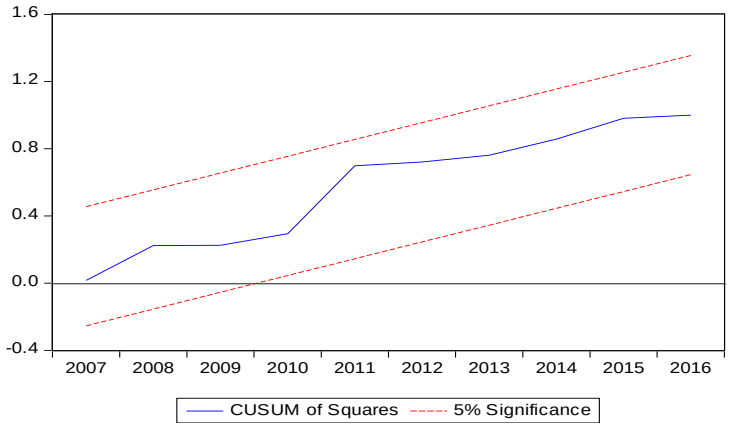

Figure 6: CUSUM Sum of Squares

IV. Conclusions And Recommendations

4.1 Conclusion

The ultimate aim of the research is to investigate the effect of insurance on economic growth in Ghana. The influence of life and non-life assurance penetration on economic growth is precisely analyzed using time series data spanning 1990 to 2016. The trend analyses revealed an increasing trend for insurance and economic growth. From the trend analysis, it was found that both insurance and economic growth peaked in 2012 and increased afterwards while some variations were noted.

The ARDL estimation analysis also showed that in the long run, life assurance penetration had a positive and significant influence on economic growth but insignificant in the short run. Also, the first lag of life assurance penetration had a negative and significant influence on economic growth. Concerning non-life assurance, the long run and short run outcomes revealed a positive influence of this variable on economic growth, though not statistically significant. The study therefore concludes that the expansion of the insurance industry is a significant factor of development of the economy in the real economy.

4.2 Recommendations

The findings of the current study have realistic, policy and theoretical implications for understanding the link between insurance and economic growth.

First, the study recommends the planning and introduction of policies to strengthen the regulatory structure for insurance operations on the basis of the positive relationship established by the analysis. In partnership with insurance providers, the National Insurance Commission (NIC) should establish an insurance market and an information network in order to improve consumer interest in the insurance industry. This can improve the demand for insurance products and its contribution towards economic growth will be inevitable.

Trade openness was identified as a significant and important determinant of economic growth. On the basis of the results, it is proposed that policymakers concentrate on an export promotion plan to boost economic growth in Ghana.

The study reveal that inflation and development of the economy had an inverse relationship, based on this revelation the study recommends that the government design policies aimed at reducing the rate of inflation in Ghana through the appropriate authorities so that economic growth can increase regardless of the Covid-19 crises been experienced globally.

Finally, from the analysis, interest rates are key to improving economic growth in Ghana. It is therefore advised that government policy concentrate on lowering interest rates to promote borrowing, especially in the private sector.

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