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Insurance and sectorial growth nexus: Evidence from a developing economy

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GENERAL & APPLIED ECONOMICS | RESEARCH ARTICLE

Insurance and sectorial growth nexus: Evidence from a developing economy

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economics & finance

Yakubu Awudu Sare¹, Andrew Osei Agyemang¹*, Emmanuel Caesar Ayamba², Bernard Bawuah¹ and Akua Gyaawa Koranteng³

Abstract: The insurance industry plays a substantive vitality in the growth of the economy. However, there is limited literature on the activities of the insurance industry and economic growth in Ghana. As one of the fastest-growing economies in sub-Saharan Africa before the global pandemic in 2020, there is a need to investigate the factors that influence the growth of the economy, of which insurance cannot be underscored. Moreover, proxies used to measure insurance for developing economies combined life insurance (LI) and non-life insurance (NLI) as one indicator. Also, none of the earlier studies considered the impact of insurance on sectorial arowth in Ghana. Hence, this study relies on methodological innovation to fill in the literature gap. We employed time-series data from 1989 to 2022. From the Autoregressive Distributed Lag Analysis, an affirmative link was seen between LI and sectorial growth in both short-term and long-term period. With regards to the link between NLI and sectorial growth, except for service sector which revealed a positive but insignificant association, the other variables revealed an affirmative link between NLI and sectorial growth for both short term and long term. The findings affirm that NLI contributes significantly to the three sectors of the economy than LI. In addition, the findings confirm that the activities of insurance in the service sector of the economy are much more enormous than that of the industry and agricultural sectors.

Subjects: Political Economy; Economics; Finance

Keywords: Developing economy; economic growth; insurance; sectorial growth

Jel classification: G22; G29

1. Introduction

The idea of insurance is preconceived by most people to be a protection against future financial stress due to premature mortality, injury, property damage, loss of earning capacity, legal liabilities, and other unanticipated costs (Alhassan, 2016; Asongu & Odhiambo, 2020; Sommers et al., 2015). These ideas are true and without doubt, portray the whole functionality of the insurance operations. Insurance companies around the world tend to help people de-risk their lives and properties and to live better lives amidst an unpredictable future (Olayungbo et al., 2016; Ul Din et al., 2017). The support of insurance companies sometimes goes beyond the provision of cash prizes (sum assured) to a complete restoration of lost assets of policyholders (Akhter et al., 2017;





© 2023 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent. Benyoussef et al., 2019). The activity of the insurance market whether financial intermediation or transfer of risk plus providing coverage stimulates the progress of the economy (Schwarcz & Schwarcz, 2014).

Insurance companies over the years have helped increased economic interdependence among businesses by putting more working capital into the economy (Teece et al., 2016). For more than 300 years insurance activities have been a critical driving force and played a central role in most economies (Bayar et al., 2021) from which Ghana is not exempted. The insurance industry just like any industry in Ghana plays a substantive vitality through its contributions to the economy. The contributions of insurance come in the form of employment, income taxes, corporate taxes and other corporate responsibilities (Osei-Bonsu et al., 2021).

The activities of insurance companies have long intrigued the desire of researchers in Ghana and around the world to probe into their contribution towards the various economies in which they operate. Insurance in Ghana dates back to 1924 during the colonial age when Enterprise Insurance Company which was called Royal Guardian Enterprise was formed. Gold Coast Insurance in 1955 was formed making it the premier local insurance firm which was private and in 1962, State Insurance Company followed, and by the close of 1971, 11 more firms had come into the business of insurance. Later in 1976, seven more firms joined, whereas 5 years later, one reinsurance firm and brokerage firm were added (Osei-Bonsu et al., 2021). In the year 2018, insurance firms that were licensed in the country grew from 35 to 39 (Osei-Bonsu et al., 2021).

Ghana's insurance market is facing new challenges. Since insurance is an aspect of the financial sector, the collapse of some commercial banks and financial institutions in Ghana has impacted the insurance sector negatively. Regarding the role of insurance in the economic literature, there are limited studies related to developing economies. Majority of the prior studies are centered on developed economies (Cheng & Hou, 2021; Cristea et al., 2014; Yinusa & Akinlo, 2013). The few studies on developing economies are limited in scope (Alhassan, 2016; Asongu & Odhiambo, 2019). Previous studies used real gross domestic product (GDP) or GDP growth rate as a proxy for economic growth without considering sectorial economic growth. Also, proxy used in measuring insurance combined both life insurance and non-life insurance and were mostly for panel data analysis (Sharku & Bajrami, 2021; Ul Din et al., 2017). The motivation and novelty of the current study is the introduction of sectorial growth analysis as well as separating life insurance (LI) and non-life insurance (NLI) to examine how they impact the sectorial growth in the Ghanaian economy utilizing time-series data.

This study employed quantitative methods by utilizing time series secondary data from 1989 to 2022. The study covered a 34-year period. We considered this period because the Ghana National Insurance Commission (NIC) was established in 1989 and before its establishment, the data reliability is questionable. We employed the Autoregressive Distributed Lag (ARDL) analysis since it is efficient in handling mixed-order integration.

Regarding motivation for the study, there is limited literature on the activities of the insurance industry and economic growth in Ghana. As one of the fastest-growing economies in sub-Saharan Africa before the global pandemic in 2020, there is a need to investigate the factors that influence the economy's growth, of which insurance cannot be underscored.

Regarding methodological innovation, this study differs in how insurance is measured. Majority of prior studies used insurance penetration (Pradhan et al., 2023) as measures for insurance. Other studies also used premiums as proxy for insurance. None of the earlier studies in Ghana considered life insurance and non-life insurance premiums as separate proxies for insurance. Hence, there is the need to consider insurance premiums impact on the Ghanaian economic growth. Also, earlier studies considered real GDP or GDP growth rate as an indicator of economic growth without considering the actual impact of insurance on the three main sectors of the Ghanaian economy.

Hence, this study is motivated by these methodological innovations to investigate the impact of insurance on sectorial growth in Ghana.

The findings revealed a positive link between LI and sectorial growth in both short-term and long-term period. With regards to the link between NLI and sectorial growth, except for service sector which revealed a positive but insignificant association, the other variables revealed an affirmative link between NLI and sectorial growth for both short term and long term. The findings provide the National Insurance Authorities and regulatory bodies with a deeper understanding of the insurance and sectorial growth nexus.

2. Literature review

2.1. Theoretical justification

The theory of sustainable development is not only to ensure its own supply resources but also to use efficiency improvement and reasonable configuration to maximize economic returns (Haibo et al., 2019). Since the introduction of financial channels in the theory of sustainable development, the theory has been given a new meaning, and it is beneficial to continuously develop financial resources, and organize, configure and innovate them. The sustainable development of financial resources is also conducive to pulling the economy (A. A. Osei et al., 2019).

This theory deepens scholars' understanding of traditional financial theory. Not only to guarantee the original financial channel's situation under the circumstances, the emphasis on efficiency to promote financial sustainable development has been increased, and indirectly to improve financial innovation.

Insurance aids in expanding and developing the financial sector and the entire economy at large. Premiums contributed in both LI and NLI are invested in various sectors of the economy to ensure sustainable development. The role of insurance including its connection with other sectors of the financial system cannot be underscored. This can be seen from sufficient literature on the causative correlation that links insurance and economic development as well as insurance and capital markets growth (Pradhan et al., 2023).

2.2. Empirical review and hypotheses development

Several economic concepts including sustainable development theory have deliberated on the numerous elements of insurance for the growth of the economy (Peretto, 2018; Pradhan et al., 2018; Vasylieva et al., 2018). The element of savings and effectiveness of investments as demonstrated by the Harrod–Domar model is vital to stimulating growth in the economy (Ofori-Boateng et al., 2022).

The activities of insurance companies have long intrigued the desire of researchers around the world to probe into their contribution towards economic development. Unfortunately, most of the existing literature on the nexus between insurance and economic growth did not separate the proxy for insurance. Instead, added life and non-life insurance to get one indicator for insurance. For example, Olayungbo (2015) studied the insurance effect on economic progress by the use of penetration of insurance as an insurance growth measure. The investigation made use of data from the 1995–2010 period of the Macedonia Republic where the technique of OLS was used. The study outcome displays total insurance industry growth has a positive effect on growth in the economy. Furthermore, Akinlo (2015) evaluated the causative relationship between insurance and the development of the economy in 33 SSA nations from 1994 to 2014. The results disclose bidirectional causation between the penetration of insurance and the growth of the economy.

Other studies mostly from developed economies have separated LI and NLI when examining the nexus of insurance on economic growth. For example, the studies by Uneze & Adeniran (2016) describe a homogenous bidirectional causality between NLI and the economic growth of a nation.

This causality suggests that both variables are affecting each other. In line with this argument is Oso et al. (2019), which asserts that the NLI of countries in sub-Saharan Africa is a significant element for the nation's economic growth. Regarding LI impact on economic growth from the Eurozone, Molyneux and Matheson (2022), concluded that the long-run relationship revealed a favorable connection between LI and growth in the economy in both models. Also, Alhassan and Biekpe (2016) concentrated on selected North African nations and concluded an affirmative link between LI and GDP.

Gross capital formation also affects the economic well-being of a state. It supports meeting all that is required of a growing populace in an emerging economy. When gross capital formation results in the accurate natural resources utilization and setting up of differing kinds of sectors, income growth levels and the various desires of the individuals are fulfilled. Growth in the economic well-being of citizens is a sign of economic growth (Molyneux & Matheson, 2022).

The theory of sustainable development showed that insurance ought to contribute to the progress of the economy (Sharku & Bajrami, 2021; Ul Din et al., 2017), but experimental research to form the correlation between insurance and sectorial growth is barely not available. However, based on the majority of findings, the following hypotheses are developed.

H1: A favorable connection exists between life insurance and sectorial growth in Ghana.

H2: A positive link exists between non-life insurance and sectorial growth in Ghana.

3. Methods

3.1. Research design

As one of the fastest-growing economies in sub-Saharan Africa before the global pandemic in 2020, there is a need to investigate the factors that influence the economy's growth, of which insurance cannot be underscored. Therefore, this study selected Ghana for the empirical investigations. We employed time-series data of Ghana from the year 1989 to 2022, which were extracted from the Bank of Ghana and the National Insurance Commission's website. We considered these three sources for data collection because of the credibility of the three institutions in providing accurate and timely data on the selected variables. We selected 1989 to 2022 because NIC was established in 1989; hence, it was difficult to get data for the prior years before its establishment. Therefore, to get reliable and current data for the study, we selected the period 1989 to 2022 since the needed data were readily available. Similar to the studies by Agyemang et al. (2023), A. Osei et al., (2023), Shijian and Agyemang (2022), and Twum et al. (2022), we analyzed the data using E-Views version 12.0 econometric package and Stata version 15.0.

3.2. Model specification

The author proposed a multivariate regression model for the empirical analysis. The model contains variables that are used in measuring the empirical relationship. The model is given as

$$IV_t = \beta_0 + \beta_1 LI_t + \beta_2 \mathsf{NLI}_t + \beta_3 \mathsf{GCF}_t + \beta_4 \mathsf{FD}_t + \beta_5 IR_t + \varepsilon_t \tag{1}$$

$$SV_t = \beta_0 + \beta_1 L I_t + \beta_2 N L I_t + \beta_3 G C F_t + \beta_4 F D_t + \beta_5 I R_t + \varepsilon_t$$
(2)

$$AV_{t} = \beta_{0} + \beta_{1}LI_{t} + \beta_{2}\mathsf{NLI}_{t} + \beta_{3}\mathsf{GCF}_{t} + \beta_{4}\mathsf{FD}_{t} + \beta_{5}IR_{t} + \varepsilon_{t}$$
(3)

where *IV* represents the industry sector, SV represents the service sector, and *AV* represents the agricultural sector. In addition, *LI* denotes life insurance premium within a year, *NLI* represents

non-life insurance premium for a particular year, *GCF* denotes gross capital formation, *FD* represents financial development and *IR* denotes inflation rate for a particular year. θ_0 represent the constant term, ε which represents the error term and *t* which shows the year.

3.3. Study variables

3.3.1. Dependent variable

GDP is extensively used as a measure of economic growth (Agyemang, Twum, et al., 2022). Sectorial economic growth takes into account the growth rate for the three main sectors, namely the industry sector, service sector, and agricultural sector. Industry value percentage to GDP is the proportion of GDP that is obtained from the industry sector of the national GDP. Service value percentage to GDP is the proportion of GDP that is obtained from the proportion of GDP that is obtained from the agricultural sector of the national GDP. Agricultural value percentage to GDP is the proportion of GDP that is obtained from the agricultural sector of the national GDP.

In bringing out innovation in this current study, sectorial economic growth was measured using industry value, service value and agricultural value. This makes the current study unique from previous studies on insurance and economic growth. The variables were denoted by the symbol IV, SV, and AV for industry value, service value, and agricultural value, respectively. Data for the sectorial economic growth were obtained from the Bank of Ghana.

3.3.2. Independent variables

3.3.2.1. Life insurance premium. Broadly, a manner of handling risk and a means of saving for customers is termed life insurance. Important psychological and social roles are played by life insurance. For example (Liebenberg et al., 2010), indicated, the main role life insurance plays is to safeguard against the loss of finance and losing the life of a human being. In addition to coverage of death risk, the risk of disability is also covered, a critical illness and superannuation (Benlagha & Hemrit, 2020).

The life insurance premium is proxy by the percentage of gross life insurance premium over the gross written premium for the year and it is represented by the symbol LI. Data on life insurance were extracted from the National Insurance Commission.

3.3.2.2. Non-Life Insurance premium (NLI). NLI consists of any insurance that is not ascertained to be life insurance and varies from property and fire, transnational agreements, etc. (Russell et al., 2013). Non-life insurance is measured as the gross annual premiums for non-life insurance policies over the gross written premium. It is represented by the symbol NLI. Data on life insurance were extracted from the National Insurance Commission.

3.3.3. Control variables

3.3.3.1. Gross Capital Formation (GCF). Gross capital formation is akin to a growth in the capital stock physically of a country with investment in infrastructures socially and economically. Gross capital formation can be categorized as total private local investment and total public local investment. Gross capital formation plus a net level of inventories changes is equal to gross investment domestically. Capital formation possibly points to tangible goods and intangible goods production in a nation (Aslan & Altinoz, 2021). GCF is measured as the percentage of the accumulated government and non-government investment in the country over the gross domestic product for a particular year. It is denoted by the symbol GCF. Data for GCF was extracted from the Bank of Ghana.

3.3.3.2. *Financial development*. Financial development improves the satisfaction of demanders in both quantity and quality (Musah et al., 2022), and reduces transaction costs and average costs, making investment returns relatively cheaper which enhances the development capability of the financial industry (Adamopoulos, 2010; Bara & Mudzingiri, 2016)

Financial development is proxy by the percentage of broad money to GDP and represented by the symbol FD. Financial development data were extracted from the bank of Ghana database

3.3.3.3. *Inflation rate.* According to previous studies including Caesar et al. (2017) in an economy for many banks means, estimating the replacement costs of assets which they do not own and probably never own. Inflation is proxy by the rate of change in price levels and is represented by the symbol IR.

3.4. Data processing and estimation strategy

In analyzing the stationarity of the dataset, we performed the ADF unit root test which is expressed as;

$$\Delta IV_t = \beta_1 LI_t + \beta_2 NLI_{t-1} + \beta_3 GCF_{t-2} + \beta_4 FD_{t-3} + \beta_5 IR_{t-4} + \varepsilon_t$$
(4)

where t is the trend, Δ is the first difference operator, θ_i represents the various estimated parameters of the lagged variable and ε is the error term. Based on equation 4 when H0 = $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$, the null hypothesis is rejected meaning there is stationarity. Contrarily, if the alternative hypothesis is not equal to zero, $H_1 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$, then the series is non-stationary then the alternative hypothesis is accepted.

The ARDL boundaries were used to investigate the cointegration connection which is expressed as

$$\Delta InIV_{t} = \beta_{0} + \sum_{j=1}^{a} \lambda_{1j} \Delta InIV_{t-j} + \sum_{j=0}^{b} \lambda_{2j} \Delta InLI_{t-j} + \sum_{j=0}^{c} \lambda_{3j} \Delta InNLI_{t-j} + \sum_{j=0}^{d} \lambda_{4j} \Delta InGCF_{t-j}$$

$$+ \sum_{j=0}^{e} \lambda_{5j} \Delta InFD_{t-j} + \sum_{j=0}^{f} \lambda_{6j} \Delta InIR_{t-j} + \delta_{1}InIV + \delta_{2}InLI_{t-1} + \delta_{3}InNLI_{t-1}$$

$$+ \delta_{4}InGCF_{t-1} + \delta_{5}InFD_{t-1} + \delta_{6}IR_{t-1} + \alpha_{1}T + \mu_{t}$$
(5)

$$\Delta InSV_{t} = \beta_{0} + \sum_{j=1}^{a} \lambda_{1j} \Delta InSV_{t-j} + \sum_{j=0}^{b} \lambda_{2j} \Delta InLI_{t-j} + \sum_{j=0}^{c} \lambda_{3j} \Delta InNLI_{t-j} + \sum_{j=0}^{d} \lambda_{4j} \Delta InGCF_{t-j}$$

$$+ \sum_{j=0}^{e} \lambda_{5j} \Delta InFD_{t-j} + \sum_{j=0}^{f} \lambda_{6j} \Delta InIR_{t-j} + \delta_{1}InSV + \delta_{2}InLI_{t-1} + \delta_{3}InNLI_{t-1}$$

$$+ \delta_{4}InGCF_{t-1} + \delta_{5}InFD_{t-1} + \delta_{6}IR_{t-1} + \alpha_{1}T + \mu_{t}$$
(6)

$$\Delta InSV_{t} = \beta_{0} + \sum_{j=1}^{a} \lambda_{1j} \Delta InSV_{t-j} + \sum_{j=0}^{b} \lambda_{2j} \Delta InLI_{t-j} + \sum_{j=0}^{c} \lambda_{3j} \Delta InNLI_{t-j} + \sum_{j=0}^{d} \lambda_{4j} \Delta InGCF_{t-j}$$

$$+ \sum_{j=0}^{e} \lambda_{5j} \Delta InFD_{t-j} + \sum_{j=0}^{f} \lambda_{6j} \Delta InIR_{t-j} + \delta_{1}InSV + \delta_{2}InLI_{t-1} + \delta_{3}InNLI_{t-1}$$

$$+ \delta_{4}InGCF_{t-1} + \delta_{5}InFD_{t-1} + \delta_{6}IR_{t-1} + \alpha_{1}T + \mu_{t}$$
(7)

where a-f represent the lag length of the variables, Δ denotes the difference operator and μ t represent the normally. δ_1 , δ_2 , δ_3 , δ_4 , δ_5 and δ_6 denote the long-run equilibrium, while λ_{1j} , λ_{2j} , λ_{3j} , λ_{4j} , λ_{5j} and λ_{6j} denote the dynamics of the short run.

In particular, the Error Correction Model (ECM) obtained correlations between long-term equilibrium and short-term dynamics in the following equations:

$$\Delta InIV_{t} = \beta_{0} + \sum_{j=1}^{h} \gamma_{1j} \Delta InIV_{t-j} + \sum_{j=0}^{i} \gamma_{2j} \Delta InLI_{t-j} + \sum_{j=0}^{j} \gamma_{3j} \Delta InNLI_{t-j} + \sum_{j=0}^{k} \gamma_{4j} \Delta InGCF_{t-j}$$

$$+ \sum_{j=0}^{l} \gamma_{5j} \Delta InFD_{t-j} + \sum_{j=0}^{m} \gamma_{6j} \Delta IR_{t-j} + \rho ecm_{t-1} + \alpha_{1}T + \mu_{t}$$
(8)

$$\Delta InSV_{t} = \beta_{0} + \sum_{j=1}^{h} \gamma_{1j} \Delta InSV_{t-j} + \sum_{j=0}^{i} \gamma_{2j} \Delta InLI_{t-j} + \sum_{j=0}^{j} \gamma_{3j} \Delta InNLI_{t-j} + \sum_{j=0}^{k} \gamma_{4j} \Delta InGCF_{t-j} + \sum_{j=0}^{l} \gamma_{5j} \Delta InFD_{t-j} + \sum_{j=0}^{m} \gamma_{6j} \Delta IR_{t-j} + \rho ecm_{t-1} + \alpha_{1}T + \mu_{t}$$
(9)

$$\Delta InAV_{t} = \beta_{0} + \sum_{j=1}^{h} \gamma_{1j} \Delta InAV_{t-j} + \sum_{j=0}^{i} \gamma_{2j} \Delta InLI_{t-j} + \sum_{j=0}^{j} \gamma_{3j} \Delta InNLI_{t-j} + \sum_{j=0}^{k} \gamma_{4j} \Delta InGCF_{t-j} + \sum_{j=0}^{l} \gamma_{5j} \Delta InFD_{t-j} + \sum_{j=0}^{m} \gamma_{6j} \Delta IR_{t-j} + \rho ecm_{t-1} + \alpha_{1}T + \mu_{t}$$
(10)

The short-run dynamics are specified by the parameters γ_1 , γ_2 , γ_3 , γ_4 , γ_5 and γ_7 , while the rate of adaptation is given by the parameter ρ . –And *h*–*m* are the lag lengths of the variables.

4. Results

4.1. Stationarity test

The use of nonstationary data produces spurious results. Hence, it is imperative to conduct a stationarity test (Twum et al., 2021; Zhou et al., 2022). That is, the mean, variance and autocorrelations structure are stable over time. This study utilized the Augmented Dickey–Fuller (ADF) unit root analysis, which is shown in Table 1.

From Table 1, at level, only non-life insurance (NLI) was significant for both constant and constant with intercept. Hence, NLI is integrated into order 0. Since the other variables were not integrated at order 0, the study moved to order 1. At 1(1), all the variables were integrated. This implies that we can proceed to use the ARDL estimator for the regression analysis since it performs better for mixed-order integration and a small sample size.

4.2. Cointegration analysis

Since the dependent variables are integrated at order 1, we used the ARDL bounds testing cointegration strategy to determine if the long-run effect can adequately account for the short-term fluctuation in the explanatory factors. Table 2 provides the result of the cointegration analysis.

From the ARDL bound cointegration results in Table 2, since the *F* statistics recorded in Model 1 (8.026), Model 2 (7.407) and Model 3 (7.6691) are larger than the critical values at the upper bound, supporting the alternative theory of cointegration. Consequently, the study infers that the variables are linked throughout time.

Table 1. Unit root test				
	Level		First difference	
Variables	Constant	Constant with trend	Constant	Constant with trend
IV	-3.1561**	-3.0870	-6.3536***	-6.3003***
SV	-1.7632	-1.8680	-5.7704***	-5.6910***
AG	-2.3103*	-2.5611**	-6.0207***	-6.4193***
LI	-0.2724	-2.0932	-7.0859***	-7.2312***
NLI	-714.66***	-1796.85***	-2722.54***	-2559.14***
GCF	-3.0003**	-3.1616	-5.0655***	-4.9742***
FD	-2.9489*	-3.1016	-4.1791***	-4.1026***
IR	-2.3279	-2.103	-5.3097***	-5.6467***

Notes: *** denotes 1%, ** denotes 5%, and * denotes 10%.

Table 2. ARDL bounds test						
	Model wit (F-stat	h IV as DV = 8.026)	Model with SV as DV (F-stat = 7.407)		Model with AV as DV (F-stat = 7.6691)	
Significance	I(0) bound	I(1) bound	I(0) bound	I(1) bound	I(0) bound	I(1) bound
10%	2.001	4.295	2.046	4.305	2.4124	4.7064
5%	2.295	4.692	2.756	4.5	2.1903	4.4493
1%	2.427	4.842	3.092	4.656	2.8641	4.159

4.3. Analysis of collinearity

This study examines the VIF in the model to prevent probable multicollinearity among the key variables, which might lead to discrepancies in the estimated findings. Table 3 shows the results of the collinearity test.

The VIF results in Table 3 vary between 1.18 and 1.62. The variance inflation factor results support the lack of multi-collinearity since none of the variables recorded a double-digit VIF value. Therefore, the lack of multicollinearity among the research variables is shown by the low VIF values.

4.4. Estimation results

In comparison to other cointegration methods, the ARDL cointegration test was selected because of its many advantages such as its application to a mixed-order integration in time-series variables. We employed three models for the sectorial-based analysis. In Model 1, industry value (IV) was used as the dependent variable, whereas in Models 2 and 3, service value and agricultural value respectively were used as the dependent variable. Table 4 presents the findings for the ARDL multiple regression.

From Table 4, a positive slope link that is significant at the 1% level existed between life insurance (LI) and industry value (IV). This implies that a 1% change in LI reflects in 3.1235% change in the industry value of GDP growth in Ghana. However, there was little positive correlation between NLI and IV. The short-term findings of Model 1 show a positive association between the independent variables and the dependent one. For the three control variables, a favorable and significant was found with the dependent variable in Model 1.

The long-run effect results in Model 2 of Table 4 where the service sector proportion of GDP was used as the dependent variable found a favorable and significant link was recorded between LI and service sector growth rate at the 1% level. This implies that a 1% change in life insurance reflect to 4.0438% in the service sector of GDP. Contrary to the findings in Model 1, in Model 2, a positive slope association was found between NLI and service sector proportion of GDP. This indicates that a 1% change in NLI reflects an increase of 3.0100% in the service value of GDP. Both

Table 3. VIF test results				
Variables	VIF	1/VIF		
IR	1.62	0.615637		
FD	1.43	0.697494		
GCF	1.33	0.754303		
LI	1.18	0.845908		
NLI	1.18	0.847168		
Mean VIF	1.35			

Table 4. ARDL multiple regression analysis						
Variables	Model 1 (IV as DV)	Model 2 (SV as DV)	Model 3 (AV as DV)			
Long-run estimates for ARDL (1,1,0,1,0,1)						
Dependent variable (–1)	0.7920***	0.8013***	0.8487***			
LI	3.1235***	4.0438***	1.4869***			
NLI	2.0012	3.0100**	2.0463*			
GCF	4.2958***	3.2769***	2.1567**			
FD	3.1920*	3.2183*	1.9924*			
IR	2.0790**	4.0479**	2.0973*			
Constant	6.3283***	11.9527**	4.8571**			
Short-run estimates for ARDL (1,1,0,1,0,1)						
Dependent variable (–1)	0.7102***	0.7701***	0.7525***			
ΔLI	3.0152***	4.0056***	2.8428***			
Δ NLI	2.0000*	5.0837**	1.9790**			
Δ GCF	3.0480*	3.5078***	2.8765**			
Δ FD	3.0092**	3.2001*	2.1471*			
Δ IR	2.0552**	3.0991*	2.5401**			
ECMt-1	-1.1103***	-1.5075***	-1.3820***			

Notes: *** denotes 1%, ** denotes 5%, and * denotes 10%.

explanatory variables showed an affirmative connection with the explained variable in the short term, as shown in Model 2 of Table 4. This implies that a 1% increase in LI and NLI leads to 4.0056%, and 5.0837%, changes in the service value of GDP, respectively.

From Model 3 in Table 4, a positive slope was found between LI and the agricultural value percentage of GDP. This means that the agriculture sector of the Ghanaian economy benefits by a 1.4869 percentage change for every 1% increase in LI. Similarly, NLI recorded a positive slope connection with AV in Model 3 of Table 4. Based on the positive slope, the author deduce that a rise of 1% in NLI leads to an increase of 2.0463% in agricultural value. From the short-run results in Model 3 of Table 4, both independent variables recorded a positive connection with the dependent variables recorded a positive connection with the dependent variable. This implies that a percentage increase in LI and NLI results in a 2.8428% and 1.9790% change in the agricultural value of GDP, respectively. For the three control variables in Model 3 of Table 4, the dependent variable showed a positive result for both the long and short term.

The ECMt-1 represents the residuals from the models. When the model is approaching equilibrium in the long term, the differences between the independent and dependent variables cannot increase since it will result in divergence. Hence, the disparity must decrease. This is the basis for the negative values for the ECMt-1 in all three models.

5. Discussion

Insurance is a contractual bond that subsists when the insurer agrees to reimburse the insured's loss to a stated issue. That is risk triggered by selected eventualities for consideration (Sommers et al., 2015). The activity of the insurance market, whether financial intermediation or transfer of risk plus providing coverage, might stimulate the progress of the economy by letting diverse management of risks more proficiently promising buildup of fresh funds and savings mobilization into investments that are useful domestically (Chang & Lee, 2012). Insurance can encourage development by generating financial resources through premiums accumulation (Abebe Zelalem et al., 2022; Dawd & Benlagha, 2023). Mobilization of such funds is consequently put into securities of government and stocks. That is, insurance companies facilitate the alleviation of risk and trade

stimulation and provide financial security, which promotes economic expansion and development, as explained by the theory of sustainable development. The idea of the value of human life is the basis upon which life insurance is developed. The study believed that life insurance and sectorial growth had a favorable association. Positive and statistically significant associations were found in all three models, whether looking at the long or short term. As a result, it can confirm the study's null hypothesis. This study's results are consistent with those of Alhassan & Biekpe, (2016), who concentrated on selected North African nations and concluded that life insurance was found to have a statistically significant positive connection with GDP growth. Furthermore, our results align with the findings by Kjosevski (2011), who concluded that life insurance impacts economic progress through effective penetration of insurance. However, our results contradict the findings by Singhal et al. (2022), who used panel data from Asian countries and concluded that life insurance has a positive but insignificant relationship with economic growth.

Insurance offers economic security during a specified period. The aim of insurance is not to prevent the possible damages from occurring but to allocate this damage to group members and make it possible for the burden of the damage to be carried (Cole & Xiong, 2017). However, insurance is a management of risk intended to avoid and reduce damage. Insurance is classified into life insurance and non-life insurance. Economic growth is supported by insurance, thereby stimulating the financial system's stability, trade promotion, and social programs, boosting the buildup of fresh funds and encouraging a more effective distribution. Insurance companies over the years have contributed to increasing economic interdependence among businesses by putting more working capital into the economy. This helps in the production and consumption of more goods and services that help increase people's standard of living (Teece et al., 2016). Insurance activities have been a critical driving force for over five decades and have played a central role in most economies (Weisbart, 2018). Following this background, this study assumed a positive link between NLI and economic growth. However, the findings from our analysis revealed an inconclusive conclusion. This is because, except for the link between NLI and the service sector in the long-run analysis, which revealed a favorable but insignificant connection between the two, the other analysis revealed a favorable link between NLI and sectorial growth in both the short and long run. Regarding the association between NLI and sectorial growth, the findings are contrary to Russell et al. (2013), who posit that, as NLI premium increases in India, it increases the rate of expansion of the economy. With regards to the link between NLI and industry value as well as NLI and agricultural value in both short and long terms, the findings are consistent with the findings by Herd (2020), who suggested a substantial and favorable short- and long-term association between NLI and economic growth in South Africa.

6. Conclusion and policy implications

6.1. Conclusion

Insurance is an important component of the current financial system through the use of risk diversification and financial intermediary to compensate for losses. This enables insurance to act as a stabilizer and booster for the modern economy. The insurance industry just like any industry in Ghana is expected to play a substantive role in the development of the economy through its contribution to the economy. There is limited literature on the activities of the insurance industry and economic growth for developing countries such as Ghana. As one of the fastest-growing economies in sub-Saharan Africa before the global pandemic in 2020, there is a need to investigate the factors that influence the growth of the economy, of which insurance cannot be underscored. Moreover, proxies used to measure insurance for developing economics studies used real GDP or GDP growth rate as an indicator for economic growth. None of the earlier studies considered the impact of insurance on sectorial growth in Ghana. Hence, this study relies on methodological innovation to fill in the literature gap.

This study employed quantitative methods using time series secondary data of Ghana from the year 1989 to 2022. The research covered a 34-year period because of data reliability and availability. The econometric tool E-Views version 12.0 and the statistical software Stata version 15.0 were used to examine the data. We employed the ARDL cointegration technique for the multiple regression analysis.

Three models were used to analyze the effect of LI and NLI on sectorial growth. From the ARDL analysis, the long-run relationship revealed a favorable connection between LI and the sectorial growth of the Ghanaian economy. Hence, hypothesis 1 was accepted. Conversely, the connection between NLI and sectorial growth revealed an inconclusive conclusion. That is, in the long run, except for service value, NLI recorded a positive and significant association with both industry value and agricultural value. Nonetheless, a weak positive association between NLI and service value. Therefore, the second hypothesis was rejected using the long-run analysis. Using the short-run analysis, both hypotheses were accepted for the three models

Based on the findings, life insurance has a positive relationship with service sector as compared to the agricultural and industry sectors. Hence, stakeholders in the insurance industry has to intensify the promotion of life insurance policies. Also, a greater portion of the gross premiums received from life insurance should be invested into the service sector of the economy.

6.2. Policy implications

Stakeholders in the insurance industry have to intensify the promotion of LI policies as compared to NLI policies. This will encourage more policyholders to subscribe to LI policies. When the proportion of LI to gross written premium increases, it will reflect a positive increase in the sectorial economic growth in Ghana.

In addition to the above, a comparative analysis of the three sectors revealed that service value recorded the highest coefficient in the sectorial analysis. This suggests that the impact of insurance on the service sector is relatively higher than that of the industry and agricultural sectors. Therefore, government and policymakers should direct most of the insurance gross premiums to the service sector of the economy since its impact is enormous.

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Data availability statement

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