American International Journal of Business Management (AIJBM)
ISSN- 2379-106X, www.aijbm.com Volume 07, Issue 11 (November- 2024), PP 44-54

Insurance Penetration and Economic Growth in Sub-Saharan Africa: Does the quality of institutions and governance matter?

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ABSTRACT: This study examined the relationship between insurance penetration and economic growth in Sub-Saharan Africa (SSA) and examined the moderating role of institutional quality. Utilizing annual data from SSA countries, static models (fixed and random effects) were applied to analyze the data. Findings indicate that both life and non-life insurance penetration have a positive effect on economic growth within the region. Additionally, higher levels of institutional and governance quality were found to directly drive economic growth. Furthermore, the interaction between insurance penetration and institutional quality was shown to enhance the relationship between insurance penetration and economic growth. These results suggest that increasing insurance penetration in tandem with strengthening governance and institutional frameworks could further foster economic growth. The implications of these findings are significant for policymakers aiming to promote economic growth. Encouraging the expansion of the insurance sector and greater insurance participation, alongside reforms to improve institutional quality—such as enhancing government effectiveness, regulatory frameworks, rule of law, and corruption control—could serve as mutually reinforcing mechanisms to accelerate economic development in SSA.

KEYWORDS*:* Economic Growth, Insurance Penetration, Institutional Quality, Sub-Saharan Africa

I. INTRODUCTION

The global insurance industry has seen substantial growth in recent years, with Sub-Saharan African (SSA) economies also partaking in this trend ([1], [2], [3], [4]). As noted by Devarakonda [5], insurance represents a foundational pillar of financial services, essential for facilitating trade and driving economic development. Pradhan et al. [6], highlight that a robust and efficient insurance sector is crucial for economic growth, providing significant impacts at both macroeconomic and microeconomic levels by supporting the activities of businesses and individuals. Olayungbo and Akinlo [7] argue that insurance, as a risk management tool, enhances economic resilience by offering a safety net against unforeseen challenges, thus playing a transformative role. In SSA, where economies face persistent vulnerability to natural disasters, health crises, and other external shocks, understanding the impact of insurance on economic outcomes is particularly important. Apergis and Poufinas [8] further underscore the multifaceted benefits of insurance, which include generating profits, protecting life and property, and providing a mechanism for retirement savings, thereby promoting stable living standards. Over time, the insurance sector has contributed to economic development by fostering financial stability, mitigating abrupt economic fluctuations, supplementing government programs, facilitating commerce and trade, mobilizing savings, improving risk management, encouraging loss reduction, and increasing capital allocation efficiency ([6], [9], [10]).

Despite the importance of the insurance sector, its role in economic growth has been less extensively studied compared to the impact of banks and stock markets (([11], [12], [6]). While some research has examined the insurance-growth nexus ([5], [6], [7], [14], [15]), these studies primarily focus on advanced and industrialized economies, often yielding inconsistent results. For instance, studies by Akinlo and Apanisile [4], Akinlo [16], and Dawd and Benlagha [17] (2023) suggest that insurance development has a significant and positive impact on economic growth. However, Webb et al. [18] report that insurance has a negligible direct effect on growth, while Zouhaier [19] finds a negative correlation between total insurance and economic growth. Using co-integration analysis, Devarakonda and Chittineni [20] reveal a unidirectional causal relationship where economic growth drives insurance development. Conversely, Ching et al. [20] support the demand-following hypothesis, which posits that economic growth stimulates insurance sector expansion, while Alhassan and Biekpe [21] uphold the supply-leading hypothesis, suggesting that the development of financial institutions spurs economic progress. Other studies, such as those by Ghosh [23] and Haiss and Sumegi [24] indicate no significant relationship. These conflicting findings pose challenges for policymakers striving to craft informed, effective policies on how insurance penetration impacts economic growth in SSA, underscoring the need for further research into this relationship.

Furthermore, the extent of insurance penetration within a society is shaped not only by economic factors but also by the quality of its institutional framework [1]. While some studies (([25], [26]) have assessed the impact of financial markets on economic development, a focused examination of insurance's role, coupled with the quality of institutional structures, provides a valuable perspective.

Parallelly, several studies ([27], [28], [29], [30], [31]) have investigated the influence of institutional quality on life insurance penetration and density. Their findings indicate that institutional factors such as civil liberties, political stability, property rights protection, regulatory quality, contract enforcement, rule of law, and corruption control positively affect life insurance development. Additionally, Guérineau and Sawadogo [1] emphasize the role of institutional quality in shaping the relationship between economic development and life insurance, identifying factors that impact both the demand for and supply of life insurance.

This study acknowledges prior researches ([7], [32], [33]) that have explored these topics using single-country data. By leveraging aggregate data from selected representative countries in SSA, this study offers a more comprehensive analysis of the effect of insurance development on economic growth. Furthermore, this paper adopts a contingency approach by examining whether institutional quality significantly influences the insurance-growth relationship. In doing so, this study adds valuable insights to the empirical literature, aiding policymakers and other stakeholders in understanding the role of insurance in SSA's economic development.

The next section reviews theoretical perspectives on the relationship between insurance penetration and economic growth and develop the hypotheses. This is followed by a detailed account of data collected, metrics used, models specified along with the research methodology, analyses and interpretations of the result. The final sections of the study present the discussion, contribution, conclusion of the results along with the limitations of the study and future research directions.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. The Nexus Between Insurance Penetration and Economic Growth

Several studies have explored the nexus between insurance and economic growth, often focusing on the direct impact of insurance on growth (([4], [33], [34]) or the bi-directional relationship between the two. For example, Alhassan [25] investigates the link between insurance and economic development in Sub-Saharan Africa from 1990 to 2010 using ARDL and Granger causality tests. His study examines the interplay between insurance and economic growth, with the results showing that the life insurance (LIVES) model has a more substantial long-run impact on economic growth compared to non-life insurance. Similarly, Dash et al. [36] analyze the causal relationship between insurance market penetration and GDP per capita across 19 Eurozone countries from 1980 to 2014, using the Granger causality test. Their results indicate a mutual and one-directional association between deepening insurance sector penetration and GDP per capita.

In another study, Cavalcante et al. [37] examine the relationship between economic expansion and the financial development of non-life insurance (NLI) premium consumption in Brazil. Using data from various sectors, the findings reveal a positive correlation between credit, economic growth, and the NLI market. Additionally, the results suggest Granger bi-causality between NLI premiums and economic growth. Din et al. [37] further investigate the relationship between insurance and growth across 20 countries from 2006 to 2015 using a fixed-effects model. The findings indicate a significantly positive relationship between life insurance and economic growth, particularly in both advanced and emerging economies. Notably, non-life insurance is found to have a more substantial impact on growth in emerging economies than in advanced ones.

Further examining specific countries, Din et al. [17] analyze the link between insurance and economic growth in the USA, UK, Malaysia, China, Pakistan, and India, employing the Pooled Mean Group (PMG/ARDL) approach. Across all six countries, they report a positive, significant impact of aggregate insurance, measured by net premiums, on economic growth. Disaggregated findings indicate that non-life insurance is significantly associated with economic growth in all countries, while life insurance supports growth only in the UK, India, and Pakistan. In contrast, Devarakonda and Chittineni [19] conduct a co-integration analysis on GDP per capita and total insurance penetration from 1990 to 2014 within BRICS countries. Their results indicate that economic growth Granger-causes insurance development in a unidirectional relationship.

Okwonko and Eche [34] focus on Nigeria, examining insurance penetration and economic growth from 1981 to 2017. Drawing on data from the Central Bank of Nigeria's statistical bulletin and using regression analysis, they find an insignificant relationship between insurance penetration and economic growth. Similarly, Iyodo et al. [38] investigate non-life insurance penetration's influence on Nigeria's economic growth from 1998 to 2012, using insurance penetration proxies, including non-life insurance expenditures, savings, profits, and investments. Their results, derived from OLS regression analysis, show that non-life insurance positively and significantly influences Nigeria's economic growth, although profits and investment exhibit no significant relationship with growth, while savings and government expenditures negatively impact it.

Finally, Apergis and Poufinas [8] analyze the relationship between insurance growth and economic growth across OECD countries. Their findings demonstrate a significant positive association between gross

operating expenses, gross claims payments, and economic growth. The results align with previous studies, suggesting that gross premiums and insurance penetration are also positively and significantly related to economic growth. Din et al. [34] further examine life and non-life insurance's relationship with economic growth from 1980 to 2015 using the pooled mean group approach. They find that, except when insurance penetration serves as the proxy, life insurance is positively and significantly related to economic growth in both the short and long term. Additionally, non-life insurance is consistently and positively related to growth across multiple measures in both the short and long term.

Based on this review, we propose the following hypotheses regarding the association between insurance development and economic growth:

H1: Life insurance penetration is positively and significantly related to economic growth in sub-Saharan Africa.

H2: Non-life insurance penetration is positively and significantly related to economic growth in sub-Saharan Africa.

2.2. The Moderating Role of Institutional Quality in the Insurance-Growth Nexus

We examine the moderating role of institutional quality in the relationship between insurance penetration and economic growth, drawing on insights from institutional theory. According to institutional theory, the institutional environment within a country shapes the actions and strategic choices of individuals and firms, serving as the "rules of the game" ([39], [40])). The quality of institutions influences these strategic decisions, including the willingness of individuals and firms to engage in the insurance market. Consistent with institutional theory, higher institutional quality is expected to facilitate insurance penetration by fostering trust in the insurance sector. In a context where the institutional environment supports transparent and efficient functioning, individuals and firms are more likely to engage in insurance products, thereby driving higher insurance penetration.

Accordingly, we propose that institutional quality may enhance the link between insurance penetration and economic development. For instance, in countries with weak rule of law and high levels of corruption among public officials, insurance premiums may be misallocated into unproductive investments, thereby undermining the potential impact of insurance on economic growth. Conversely, strong governance and effective institutions can safeguard insurance premiums, ensure efficient investment, and promote economic growth. According to the IMF (2015), inefficiencies in public investment processes lead to the loss of about 30% of the potential benefits from public investments annually. Furthermore, Owasanoye [41] reports that African economies lose approximately $90 billion each year through illicit financial flows due to institutional weaknesses. Typically, increased insurance penetration involves the inclusion of new policyholders and higher premium volumes. In this context, institutional quality can ensure that these new policyholders are adequately protected and that premiums are invested efficiently within the African economy. Thus, institutional quality has the potential to moderate the link between insurance penetration and economic growth.

Empirical evidence supports the role of institutional quality in economic development. Epaphra and Kombe [42] investigate the effect of institutional quality on economic growth in African economies, using panel data techniques, and find that political stability is a key factor in fostering real per capita GDP growth. Radzeviča and Bulderberga [43] also identify government effectiveness, regulatory quality, financial freedom, audit standards, corporate governance efficacy, and investor protection as positively impacting economic growth. Additionally, Din et al. [33] and Devarakonda and Chittineni [19] argue that the effect of insurance development on economic progress is contingent upon national circumstances, including institutional structures and regulatory frameworks. Mensah et al. [44] emphasize that institutions and governance play a crucial role in supporting economic advancement, even at the micro level. Similarly, Rodrik [45] suggests that institutional quality not only directly influences economic growth but also affects other growth drivers, such as investment, physical and human capital, and technological advancement, thereby contributing to economic development. Based on this, we hypothesize:

H3: Institutional quality moderates the relationship between both life and non-life insurance penetration and economic growth in Sub-Saharan Africa.

III. DATA, VARIABLE DESCRIPTION AND MODEL SPECIFICATION

Our study uses annual data from Sub-Saharan Africa (SSA) over a 10-year period from 2011 to 2021, incorporating all variables relevant to the analysis. The study population includes all 48 countries in the SSA region. A purposive sampling technique was applied, resulting in the selection of five (5) specific SSA countries based on the availability of data, namely, Congo, Egypt, Rwanda, Seychelles, and Guinea. Secondary data were obtained from established international sources, including the International Monetary Fund (IMF), the World Bank, and Worldwide Governance Indicators (WGI), to compile comprehensive and standardized datasets on economic indicators, governance metrics, and regional statistics for SSA.

Following the identification of insurance penetration, economic growth, institutional quality, and governance as primary variables of interest, the study employed both fixed and random effects models. Additionally, control variables, documented in previous literature, were incorporated to further specify the model as follows:

$$\boldsymbol{GDP_{it} = \beta_0 + \beta_1 IP_{it} + \beta_2 IQ_{it} + \beta_3 GOV_{it} + \beta_4 IP * IQ_{it} + \beta_5 CONTROLS_{it}\, \varepsilon_{it}} \quad \textbf{(1)}$$

Where GDP_{it} denotes growth rate of national GDP of the sample country registered in year t; IP_{it} denotes the level of Insurance Pentation in the sample country in a specific year; $INSTQ_{it}$ denotes the level of institutional quality in the sample country in year t; GOV_{it} denotes the level governance in the sample country in year t; $IP * INSTQ_{it}$ denote the interaction of insurance penetration and institution quality in the sample country in year t; and $CONTROLS_{it}$ denote the control variables in the specified model (i.e., Trade Volume, Education, and Inflation) in the sample country for year t.

TABLE 1 below provides a description of variables and their measurement metrics along with their respective sources and adoptions of the from literature.

TABLE 1. MEASUREMENT AND SOURCES OF VARIABLES

Variables	Measurements	Sources and Adoptions
Insurance Penetration	natural logarithm of insurance premium	Alhassan and Biekpe [21] International Monetary Fund The World Bank
Economic Growth	GDP growth rate	Alhassan and Biekpe [21] International Monetary Fund The World Bank
Institutions Quality	Government Effectiveness Voice and Accountability Political Stability and Absence of Violence	Chinoda and Kapingura [46] World Development Indicators Worldwide Governance Indicators
Governance	Rule of Law Control of Corruption Regulatory Quality	Chinoda and Kapingura [46] World Development Indicators Worldwide Governance Indicators
Trade Volume	The logarithm of Net Export	Chinoda and Kapingura [46]
Education	The logarithm of Primary School Enrolment	World Development Indicators
Inflation	the inflation rate	Worldwide Governance Indicators

IV. ANALYSES AND INTERPRETATIONS

This section presents the results derived from the analysis and interpretation of the data. Descriptive statistics provide a comprehensive overview of the variables, while diagnostic tests ensure the reliability and validity of the dataset. Hypothesis testing was conducted using Two-Stage Least Squares (2SLS) regression models. The subsequent discussions offer an in-depth examination of the results, with comparisons to prior research to identify convergences and points of alignment.

4.1. Principal Component Analysis (PCA)

This study employs Principal Component Analysis (PCA) to construct an index for institutional quality. PCA is a statistical technique widely used to address high inter-variable correlations by generating uncorrelated principal components that capture the maximum variance in the original data [47]. Previous studies, such as Islam et al. [48], have used PCA to compute an institutional quality index. In PCA, the first component is regarded as the factor most effectively explaining the variation across other factors. The subsequent components, combined with the first, form an orthonormal structure to capture the remaining unexplained variance. The institutional quality index in this study is derived using PCA across six dimensions of institutional quality. According to the PCA methodology, the J^{th} factor index can be represented as follows:

$$\mathrm{IQ}_j = W_{J1}X_{P1} + W_{J2}X_{P2} + W_{J3}X_{P3} + W_{J4}X_{P4} + W_{J5}X_{P5} + W_{J6}X_{P6} \ldots \quad (2)$$

where IQ_j denotes the institutional quality index; W_j represents the parameter weight of the factor score; XXX refers to the initial value of each component; and PPP denotes the number of variables in the model. PCA was applied to create a composite index for institutional quality from the original data—specifically, the dimensions of control of corruption (COC), regulatory quality (RQ), rule of law (RL), government effectiveness (GE), political stability (PS), and voice and accountability (VA)—while minimizing information loss. Following the Kaiser [49] criterion, only principal components with Eigenvalues greater than 1 were retained for the

analysis. TABLE 2 below shows that the Eigenvalue of the first principal component (PC) was retained to construct the institutional quality index (IQ).

TABLE 2. PRINCIPAL COMPONENT ANALYSIS OF INSTITUTIONAL INDEX

Number	Eigen Value	Eigen value Proportion	Cumulative Proportion	Variable	PC 1	PC 2	PC 3	PC 4	PC 5	PC 6
1	4.746	0.791	0.791	CC	0.449	-0.138	0.050	0.222	-0.853	0.005
2	0.803	0.134	0.925	RQ	0.418	-0.375	0.137	0.666	0.463	0.088
3	0.297	0.050	0.974	RL	0.428	-0.323	-0.094	-0.592	0.121	0.581
4	0.106	0.018	0.992	GE	0.450	-0.111	0.073	-0.366	0.159	-0.787
5	0.030	0.005	0.997	PS	0.361	0.507	-0.763	0.144	0.101	0.018
6	0.018	0.003	1.000	VA	0.328	0.683	0.619	-0.035	0.090	0.184

Source: Authors analysis from WGI, data

3.2. Descriptive Statistics and Analysis

Table 3 presents the summary statistics for the key variables utilized in the analysis. On average, life insurance penetration (IPLife) in Sub-Saharan African countries is relatively low, with a mean of 5.029%, while non-life insurance penetration (IPNonlife) averages 5.368%. Both measures show significant variation across countries and time, reflected in standard deviations of 1.413 and 0.991 percentage points, respectively. Institutional quality (IQ) has an average close to zero, yet displays substantial variability across countries and years, as indicated by a high standard deviation of 2.199.

Economic growth, represented by GDP growth, averages a moderate 3.597% exhibiting a considerable fluctuation, with a standard deviation of 4.691 percentage points. Trade openness is relatively high, with an average of 72.379% of GDP, though marked heterogeneity exists across observations, as shown by a standard deviation of 41.797. Government expenditure on education averages a substantial 37.071%, yet varies widely, ranging from 11.592% to 104.291%. Inflation remains a macroeconomic challenge, with consumer prices increasing by an average of 6.761% annually, accompanied by high variability (a standard deviation of 5.580 percentage points) and periods of both deflation and high inflation.

TABLE 3. DESCRIPTIVE STATISTICS

Variable	Obs	Mean	Std. Dev.	Min	Max
IPLife	55	5.029	1.413	3.260	7.750
IPNonlife	55	5.368	0.991	4.210	7.360
IQ	55	0.000	2.199	-2.411	4.292
GDP Growth	55	3.597	4.691	-10.783	10.877
Trade volume	55	72.379	41.797	22.674	187.595
Education	55	37.071	31.229	11.592	104.291
Inflation	55	6.761	5.580	-1.015	29.507

IPLife: Insurance penetration (Life), IPNonLife: Insurance penetration (Non-life), IQ: Institutional quality index, GDP Growth: Gross domestic product growth rate.

3.3. Stationarity Test

A unit root test evaluates whether a time series variable possesses a unit root, indicating it follows a non-stationary stochastic process (Dickey and Fuller, [50]). Stationarity is a critical assumption in many statistical analyses commonly applied in economics research. The augmented Dickey-Fuller (ADF) test is a widely utilized unit root test that examines the null hypothesis of a unit root versus the alternative hypothesis of stationarity (Dickey and Fuller, 1981). Failure to reject the null hypothesis suggests the series must be differenced to achieve stationarity. The ADF test results, shown in Table 4, indicate that while GDP growth rate and inflation are stationary at level I (0), the remaining variables achieve stationarity upon first differencing, or I (1). This study, therefore, confirms that the variables are integrated at orders 0 and 1, reaching stationarity at both levels and first differences.

TABLE 4. AUGMENTED DICKEY-FULLER UNIT ROOT TEST RESULTS

Variables	Level	Conclusions
IP (Life)	-7.644***	***I (1)***
IP(Non-life)	-7.404***	***I (1)***
IQ	-7.479***	***I (1)***
GDP Growth	-4.897***	***I (0)***
Trade Volume	-7.713***	***I (1)***
Education	-7.499***	***I (1)***
Inflation	-4.129***	***I (0)***

*Note (s): t-statistics from Augmented Dickey-Fuller test results are reported. All specification takes drift (constant and linear series trend). ** and *** are 5% and 1% significance levels, respectively.*
Source: Author's analysis with WDI and WGI

3.4. Correlation Analysis

The correlation matrix in Table 5 presents the pairwise correlation coefficients between the explanatory and outcome variables. Correlation analysis serves as an essential preliminary step in multivariate modeling to identify potential multicollinearity issues prior to estimation. High correlations among independent variables can result in unreliable and unstable coefficient estimates. As a general guideline, correlation coefficients exceeding 0.7 may indicate problematic collinearity (Dormann et al., [51]). The results reveal statistically significant correlations between certain pairs of independent variables—namely, IPLife, IPNonlife, IQ, Trade Volume, and Education—yet no correlation surpasses the 0.7 threshold. The highest observed correlation is 0.574, well below the 0.7 threshold, indicating that multicollinearity is not a concern in this analysis.

TABLE 5. MATRIX OF CORRELATIONS

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) IP(Life)	1.000						
(2) IP(Nonlife)	0.560	1.000					
(3) IQ	0.450	0.527	1.000				
(4) Trade Volume	-0.465	-0.485	-0.186	1.000			
(5) Education	-0.273	-0.234	0.218	0.574	1.000		
(6) Inflation	-0.137	-0.158	-0.173	0.098	-0.198	1.000	
(7) GDP Growth	0.146	0.116	0.104	0.004	0.160	0.114	1.000

3.5. Regression Results

Given the limited number of cross-sections (5 countries) and the relatively short time frame (10 years), dynamic models such as Generalized Method of Moments (GMM) are not well-suited for this dataset ([52], [53]). GMM estimation typically requires a long panel with a large number of cross-sections (N) and a smaller time dimension (T) [52]). Consequently, static models—specifically fixed and random effects models—were employed to test the study hypotheses. The results are presented in Table 5.

Initially, a base model (Model 1 in Table 6) was developed, incorporating control variables (trade volume, education, and inflation) with GDP growth as the dependent variable. This base model is statistically significant ($Chi^2 = 143.654$, $p < .01$) and explains 19.5% of the variance in GDP growth. In Model 2 ($R^2 = .144$; $Chi^2 = 9.561$, $p < .01$), the independent variables of life and non-life insurance penetration (IPLife and IPNonLife) and institutional quality (IQ) were added. This model is also significant, explaining 14.4% of the variance in GDP growth, indicating that the independent variables contribute meaningfully to GDP growth. In this model, IPLife shows a significant positive relationship with GDP growth ($\beta = 4.115$, $p < .01$), supporting Hypothesis 1 (H1). Similarly, IPNonLife is significantly positively associated with GDP growth ($\beta = 5.067$, $p < .01$), supporting Hypothesis 2 (H2).

In Model 3 ($R^2 = .185$; $Chi^2 = 13.489$, $p < .01$), an interaction term between insurance penetration and institutional quality (IQ) was included. The interaction term for IQ with both life and non-life insurance penetration demonstrates a significant positive effect on GDP growth ($\beta = 2.128$, $p < .01$ for life insurance; $\beta = 3.126$, $p < .01$ for non-life insurance), confirming that institutional quality positively moderates the relationship between insurance penetration and economic growth, providing additional support for the study's hypotheses.

TABLE 6. REGRESSION RESULT

Variables	GDP Growth			
	Model 1	**Model 2**	**Model 3**	**Model 4**
Trade Volume	-.061***			-0055**
Education	.034			-.162**
Inflation	-.034			-.073
IP (Life)		4.115***		.349
IP (NonLife)		5.067***		-4.295
IQ		5.438***		13.306**
IPLife×IQ			2.128***	-1.165
IPNonlife×IQ			3.126***	-1.301
Constant	6.984***	10.102**	4.507***	34.379***
R-square	.195	.144	.185	.369
Chi2	14.325***	9.561***	13.489***	34.070***
Hausman Test	.828	-7.208	1.259	.420
	Random Effect	*Random Effect*	*Random Effect*	*Random Effect*

IPLIfe: Insurance penetration (Life), IPNonLife: Insurance penetration (Non-life), IQ: Institutional quality index, GDP Growth: Gross domestic product growth rate.
**** p<.01, ** p<.05, * p<.1*

3.6. Robustness Check

To test the robustness of our findings, as presented in Table 6, we re-estimated the study's models using pooled, random, and fixed effects regression techniques. The results are summarized in Table 7, which also incorporates lagged independent variables to further assess the robustness of the findings. Although the Hausman Specification Test predominantly indicates that the random effects model is most appropriate, we include results from both pooled OLS regression and fixed-effects models.

Consistent with the initial regression results in Table 5, the robustness checks in Table 6 largely affirm the primary findings regarding the relationships between insurance penetration, institutional quality, and other predictors with GDP growth over the long term. Across pooled OLS and random effects models (Models 1 through 4), the significant negative association between trade volume and economic growth remains stable in magnitude. Additionally, the relationship between education and GDP growth achieves significance under random effects modeling. The positive relationships between life and non-life insurance penetration and GDP growth also remain significant, demonstrating resilience to robustness testing through alternative estimation methods (pooled OLS and fixed-effects regression models).

Furthermore, the moderating effect of institutional quality on the relationship between insurance penetration and GDP growth continues to hold. The interaction terms in Model 3 remain positive and significant in both the pooled and random effects robustness checks, further validating the initial findings.

TABLE 7. ROBUSTNESS CHECK –DEPENDENT VARIABLE: ECONOMIC GROWTH

Variables	GDP Growth							
	Model		**Model 2**		**Model 3**		**Model 4**	
	Pooled	Random	Pooled	Random	Pooled	Random	Pooled	Random
Trade Volume	-0.059***	-0.064***					-0.053*	-.058**
Education	0.032	.037*					-0.156**	-.168**
Inflation	-0.029	-0.043					-0.058	-0.086
IP (Life)			4.024***	4.501***			-0.119	0.659
IP (NonLife)			-4.960**	-5.523***			-3.569	-4.834*
IQ					5.214*	5.438**	12.270*	14.291*
IPLife*IQ					2.056***	2.128***	-1.339	-1.039
IPNonlife*IQ					3.013***	3.126***	-0.936	-1.611
Constant	6.881***	7.17	9.984**	10.606**	4.473***	4.507***	32.677***	36.275***
R-square	0.195	0.267	0.144	0.217	0.185	0.185	0.370	0.470

IPLIfe: Insurance penetration (Life), IPNonLife: Insurance penetration (Non-life), IQ: Institutional quality index, GDP Growth: Gross domestic product growth rate.
**** p<.01, ** p<.05, * p<.1*

V. DISCUSSION, CONTRIBUTION AND CONCLUSION

Our study finds a positive association between life and non-life insurance penetration and economic growth in Sub-Saharan African countries, aligning with previous research that shows higher insurance penetration supports economic development ([24], [35], [36], [37], [6] ,[7], [13], [14], [17]). This body of research suggests that expanding the insurance sector and increasing insurance adoption among individuals and businesses may significantly foster economic growth in Sub-Saharan Africa ([24], [37]).). As more individuals and firms invest in insurance policies, the premiums generated can be reinvested by insurance companies, stimulating broader economic activity. Additionally, insurance coverage provides financial protection in adverse events, mitigating economic shocks.

Evidence from specific countries illustrates the positive impact of insurance penetration on economic growth in Sub-Saharan Africa. For instance, increased life insurance penetration in South Africa has shown a significant long-term effect on economic growth [24]. In Kenya, growth in written insurance premiums contributed to higher economic growth rates from 1986 to 2009 [4]. Similarly, studies in Nigeria reveal that an increase in non-life insurance penetration has boosted investment and profitability within the insurance sector, benefiting the broader economy (, [34], [38]). Although some studies report mixed or negligible effects in particular contexts, such as Nigeria and the BRICS nations, the literature broadly suggests that greater insurance penetration has a significant positive impact on economic growth in SSA ([24], [33], [42], [47]). This underscores the potential of expanding the insurance industry and promoting insurance penetration as pathways for economic development in the region.

Additionally, our findings indicate that institutional quality positively influences economic growth in SSA. More importantly, the combined effect of institutional quality and insurance penetration further enhances economic growth. These results demonstrate that countries with higher institutional quality experience greater GDP growth and that improvements in both insurance penetration and institutional quality correlate with improved economic performance. Consistent with prior studies, higher institutional quality has been shown to significantly advance economic growth ([19], [33], [42],[45], [43], [47]). Empirical analyses of panel data indicate that governance factors such as government effectiveness, regulatory quality, rule of law, and corruption control are positively associated with both higher GDP growth rates and per capita GDP.

Institutional theory supports these findings by positing that a country's institutional environment shapes the actions and strategies of individuals and firms, effectively establishing the "rules of the game" ([39], [40]). Institutional quality thus plays a crucial role in the strategic decisions of individuals and firms, including the decision to participate in the insurance market. As per institutional theory, high institutional quality is likely to foster insurance penetration in a country. Since individuals and firms make decisions within the context of their institutional environment, the choice to engage with insurance products is influenced by institutional quality. In settings with strong institutions, firms and individuals are more confident in the insurance sector, increasing their likelihood of purchasing insurance products, which leads to higher insurance penetration.
Conversely, in countries with weak rule of law and high corruption, premiums may be misallocated or directed toward unproductive investments, potentially undermining the impact of insurance on economic growth. Effective governance and robust institutions, however, can safeguard premiums, ensure efficient investment, and foster economic development.

This research makes significant practical contributions by addressing critical gaps in the current understanding of the relationship between insurance sector development and economic growth in developing Sub-Saharan African countries. The majority of existing literature has focused on advanced economies, with limited attention given to low-income African nations that face unique structural challenges shaping their financial industry development trajectories. While this developing region has considerable unmet needs for risk mitigation and asset growth products that well-functioning insurance markets can offer, there has been a notable lack of research examining whether insurance market maturation can also support broader economic goals, including GDP growth. This absence of context-specific, evidence-based insights has created challenges for policymakers aiming to strengthen insurance markets as a means to enhance both citizen welfare and economy-wide development.

By conducting a cross-country analysis, this study sheds light on the relationships between life and non-life insurance growth, the quality of institutional frameworks, and overall economic output, thereby filling a significant gap in the literature. The findings demonstrate that increased insurance penetration over time is strongly associated with higher GDP growth within Sub-Saharan African countries, providing policymakers with essential, data-driven evidence that expanding insurance participation can contribute to economic development. Specifically, the results offer actionable insights for policymakers, regulatory bodies, insurance industry stakeholders, and international development partners focused on strengthening risk protection and financial intermediation systems in alignment with sustainable and inclusive growth agendas.

These insights support the development of comprehensive strategies that incentivize insurance participation, enhance financial literacy to improve understanding of risk management products, and integrate

insurance market reforms with broader initiatives aimed at strengthening government effectiveness and institutional efficiency.

To conclude, this study examined the relationship between insurance penetration and economic growth in Sub-Saharan Africa (SSA), as well as the moderating influence of institutional quality. Utilizing panel data from five countries over a ten-year period, fixed and random effects regression models were employed. Results indicate that both life and non-life insurance penetration have a positive impact on economic growth within SSA. Additionally, the findings reveal that higher institutional quality significantly enhances economic growth. Furthermore, the interaction between insurance penetration and institutional quality was found to further amplify economic growth. These results suggest that increasing insurance penetration in tandem with strengthening governance and institutional frameworks could enhance economic performance across the region. The implications of these findings are relevant for policymakers aiming to stimulate growth in SSA. Specifically, promoting the expansion of the insurance industry and increasing insurance penetration, combined with reforms to improve institutional quality—including government effectiveness, regulatory standards, rule of law, and control of corruption—may serve as complementary strategies to accelerate economic development.

VI. LIMITATIONS AND FURTHER RESEARCH DIRECTIONS

While the cross-country analysis offers valuable insights, it has certain limitations, notably a small sample size of five countries over a ten-year period. Future research would benefit from expanding the analysis to include a larger number of countries within the region and extending the timeframe to 20 or 30 years, allowing for a more robust dataset to observe relationships over time. Additionally, this study relied solely on quantitative methods; integrating qualitative approaches, such as surveys, interviews, and focus groups, could provide important supplementary insights. For example, interviews with consumers, industry experts, and policymakers could offer perspectives on barriers and opportunities related to insurance uptake and the role of technology.

Further research could also conduct in-depth analyses at the individual country level. This would allow for the quantification of the specific impact of insurance and institutional quality on economic growth within each country. Additionally, future studies could model various policy scenarios, such as implementing insurance subsidies or regulatory reforms, to evaluate the effectiveness of different strategies tailored to the unique needs of each nation.

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