ECONOMIC ANNALS, Volume LXIX, No. 241 / April – June 2024
UDC: 3.33 ISSN: 0013-3264

https://doi.org/10.2298/EKA2441007A

*Taiwo AKINLO**
*Daniel Adukwu IDACHABA***

INSURANCE AND ECONOMIC GROWTH IN SUB-SAHARAN AFRICA: INSTITUTIONAL QUALITY THRESHOLD EFFECT

ABSTRACT: *This paper examines the influence of institutional quality institutional quality on the relationship between the extent of both non-life insurance and life insurance and economic growth in sub-Saharan Africa. The paper employs a dynamic threshold model for the analysis of a panel of data consisting of 34 countries over the period 1990 to 2017. The findings of the research reveal that non-life insurance exerts an significant effect on economic growth when the level of institutional quality institutional quality is high, while the association becomes insignificant when the level of institutional quality institutional quality is low. In contrast, the effect of life insurance on economic growth is insignificant at both at high and low levels of institutional quality. The paper also considered the effect of the different types of insurance in both low- and middle-income countries in the sub-Saharan region. Overall, the paper emphasises the important role of non-life insurance in enhancing economic growth, and the dependence of this effect on the level of institutional quality in a country.*

KEY WORDS: *insurance development; institutional quality; threshold regression; economic growth*

JEL CLASSIFICATION: G10, O1, O2, O33

* Adeyemi Federal University of Education, Ondo, Department of Economics, email: taiwoakinlo@yahoo.com, ORCID: 0000-0002-1415-4241
** Adeyemi Federal University of Education, Ondo, Department of Economics, email: idachabadaniela@gmail.com, ORCID: 0000-0003-1909-2278

1. INTRODUCTION

The contribution of insurance development to economic growth economic growth has been thoroughly examined in the literature across economies. Studies (e.g., Akinlo & Apanisile, 2014; Beck & Webb, 2003; Guochen & Wei, 2012; Haiss & Sümegi, 2008; Kugler & Ofoghi, 2005; Outreville, 2011) have documented the importance of insurance to economic growth. Past studies that investigated the connection between insurance and economic growth documented a positive effect of insurance on economic growth (e.g. Hou et al., 2012; Lee, Lee, & Chiu, 2013; Yinusa & Akinlo, 2013).

Some studies have begun taking into account mediating variables in the relationship between financial development financial development and economic growth based on theoretical results that advocated the joint consideration of the effects of financial development with other sectors that influence economic growth. For instance, the mediating role of the real sector between financial development and economic growth was examined by Ductor and Grechyna (2015). The level of human capital and per capita income were taken into account by Ibrahim and Alagidede (2018) as intermediary variables between financial development and economic growth. Another body of literature advocates for the consideration of institutional quality institutional quality in the relationship between financial development and economic growth. Some of these studies have attempted to incorporate financial development and institutional quality into the Solow growth model (e.g., Hausman et al., 2005; Nelson & Sampat, 2001; North, 1990; Pagano, 1993). The studies advocating for institutional quality as an intermediary variable between financial development and economic growth claim that the impact of financial development on economic growth might depend on the level of institutional quality. The argument is that when institutional quality is weak, the financial system cannot operate efficiently and the impact of financial development on economic growth will be affected. In contrast, a strong institutional quality enhances the efficiency of financial institutions by promoting efficient allocation of financial resources, which in turn enhances economic growth.

This line of reasoning implies that using institutional quality as an intervening variable between insurance and economic growth can alter the relationship between the two variables. That is, when insurance development is rooted in a

sound institutional framework, it might produce a greater impact on growth. For instance, there might be an increase in insurance development as captured by insurance premiums, but it may not lead to economic growth because of corruption and political interference in the sector. Likewise, the prevalence of information asymmetries, contract default and high-risk-taking behaviours will also limit the effect of insurance on economic growth. This implies that the intervention of strong institutional quality can result in a positive connection between insurance and economic growth. However, in the case of weak institutional quality, the reverse might be the case. Therefore, if institutional quality can alter the relationship between insurance and economic growth, could there be a threshold level of institutional quality above which insurance will promote growth and below which insurance will harm economic growth?

Earlier studies indicate that many concentrated on the impact of insurance on economic growth (e.g., Balcilar et al., 2018; Lee, Lee & Chiu, 2013; Outrevielle, 1996; Pradhan et al., 2015; Soo, 1996; Webb et al., 2002) while fewer studies focused on the relationship between institutions and insurance development (e.g., Beck & Webb, 2003; Lee, Chiu and Chang 2013; Ward & Zurbruegg, 2002). On the threshold effect of institutional quality on the insurance–economic growth nexus, Lee et al. (2016) is the only known study to have investigated this relationship but the study considered life insurance (LI) only. In sub-Saharan Africa (SSA), studies that examined the direct effect of insurance on economic growth or the effect of institutional quality on insurance development are rare. To date, there is no known study investigating the mediating impact of institutional quality between insurance and economic growth using threshold regression. This is the gap this study intends to fill.

Thus, the main focus of this study is to examine the threshold effect of institutional quality on the relationship between insurance development and economic growth in SSA. This study is different from earlier studies in the following ways. First, as earlier stated, this study will be the first to use institutional quality as an intervention variable between insurance and economic growth in the SSA region and among the income groups in the region. Second, this study considers both LI and non-life insurance (NLI) as well as total insurance (LI and NLI), unlike other studies, which considered only LI. Third, the study will be the first to identify the threshold point of institutional quality

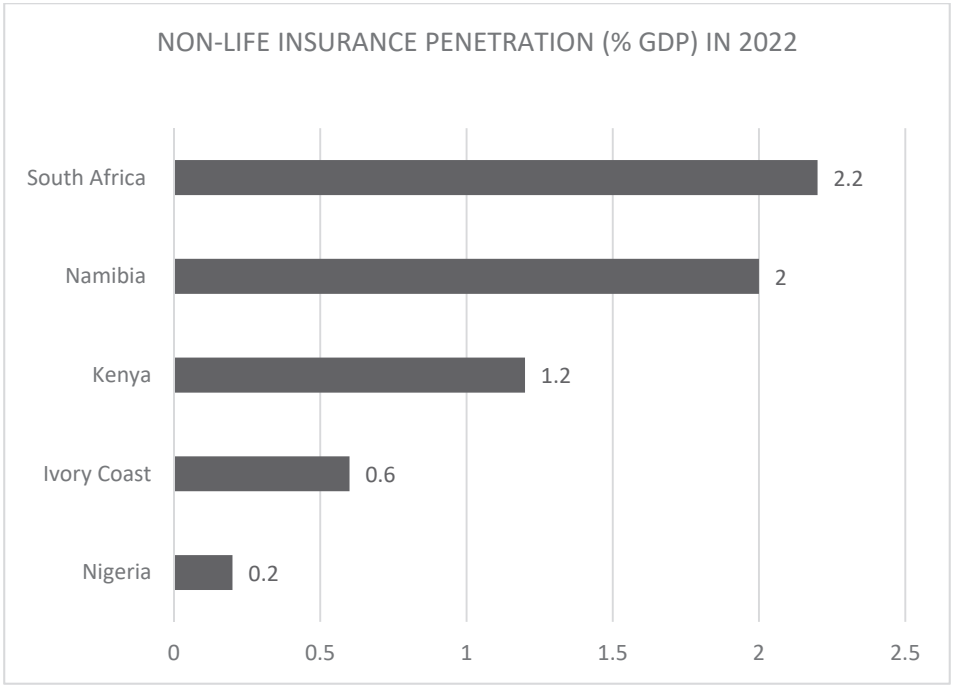
below and above which insurance will have a different effect on economic growth, thus enabling policymakers to make the decision necessary to raise the level of institutional quality to meet the threshold point. The remaining part of the study is arranged as follows. The second section offers an overview of insurance in SSA. The third focuses on the literature review. The fourth presents the methodology. The fifth discusses the data and the data source. The sixth focuses on the empirical analysis. The seventh discusses the findings. The eighth consists of the conclusion and implication of the findings.

2. OVERVIEW OF INSURANCE IN SSA

Many nations on the SSA continent are still building their insurance industries. Even though SSA is home to approximately 18% of the world's population, the region's insurance market accounts for less than 3% of all insured catastrophic losses globally. However, despite the low levels of insurance uptake, large multinational brokers, insurers and reinsurers continue to show greater interest and concentration in this area. In SSA, insurance premiums were worth a little over 50 billion USD in 2020.

According to Malabo (2023), in SSA, the level of insurance penetration is directly correlated with the level of a nation's development and economic growth. The largest and most developed insurance market in SSA is found in South Africa, which also accounts for a sizable portion of insurance premiums written on the African continent. The NLI contributions to GDP in five selected SSA nations in 2022 are shown in Figure 1. The five selected countries are those that have data regarding NLI and LI in 2022. South Africa had the highest NLI insurance premium contribution to GDP. NLI accounted for around 2.2% of South Africa's overall GDP in 2022. Regarding NLI's contribution to GDP, Namibia (2%), Kenya (1.2.%) and Coite d'Ivoire (0.6%) are ranked second, third, and fourth, respectively. This suggests that South Africa had the highest level of NLI development among the selected five SSA countries in 2022. The country that had the least contribution to GDP in terms of NLI is Nigeria. NLI constituted about 0.2 per cent of GDP in Nigeria in 2022.

Figure 1: Non-life insurance penetration in 2022

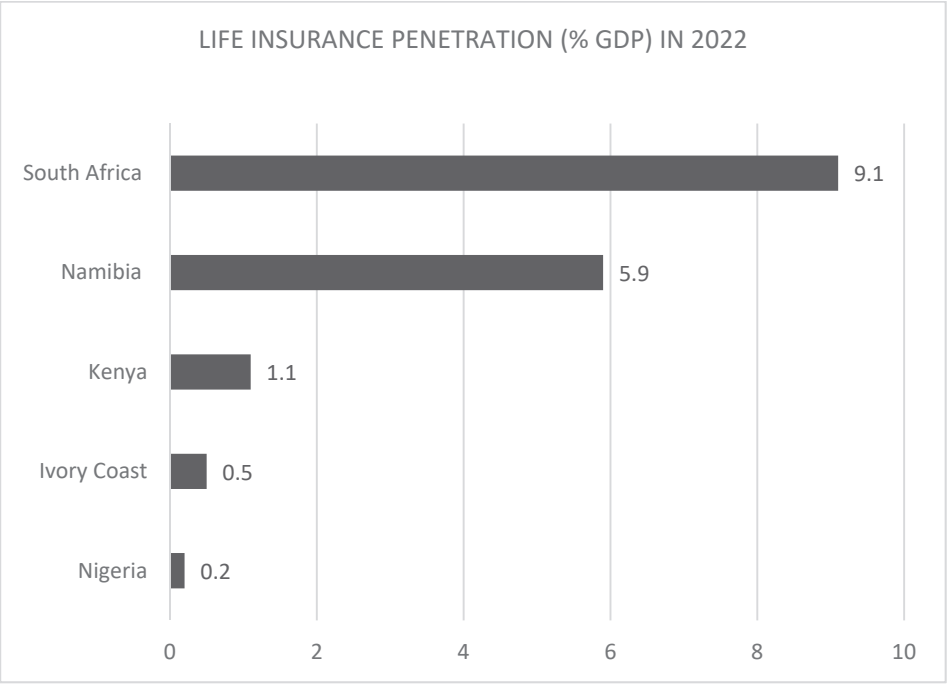


Source: Author's computation based on Swiss Re Institute Data 2023

The contribution of LI premium volume to GDP of these five SSA nations in 2022 is shown in Figure 2, according to which LI accounted for around 9.1% of South Africa's total GDP, the highest percentage among the five SSA countries. This shows that compared to other SSA nations, South Africa has a very high penetration of LI. According to KPMG (2015), South Africa is the market leader for LI, accounting for 88.6% of the continent of Africa's LI premiums in 2013. In 2022, Namibia ranked second to South Africa with an insurance premium volume contribution to GDP of 5.9%. The GDP share of LI in Kenya was approximately 1.2%, ranking third highest among the five countries in SSA. Unlike the situation in the top three nations (South Africa, Namibia and Kenya), LI makes up only a very small percentage of the GDP in Cote d'Ivoire and Nigeria. Figure 2 demonstrates that the LI insurance premium volume contributions to the GDP in Cote d'Ivoire and Nigeria are alarmingly low. They represent less than 1% of the total GDP. This suggests that the LI industry is weak in some of the SSA countries.

Comparing Figures 1 and 2, it can be seen that the markets for LI are bigger than for NLI in South Africa and Namibia, with their LI markets being sizable. According to KPMG (2015), the insurance penetration rate in South Africa is one the highest in the world and is far higher than one might anticipate given its per-capita GDP. The financial system in South Africa is quite advanced, which is frequently a key factor in the expansion of the insurance sector. In Kenya and Cote d'Ivoire, the percentage contribution of NLI to GDP is slightly bigger than that of LI, while the contributions of NLI and LI to GDP in Nigeria are the same.

Figure 2: Life insurance penetration in 2022



Source: Author's computation based on Swiss Re Institute Data 2023

The vast differences in SSA's economies are reflected in the region's various levels of insurance market maturity. The most established insurance market in the area is found in South Africa, which also provides reinsurance services to several of its nearby countries. In contrast, frameworks and institutions are far more recent in other nations. The insurance industry is thriving and expanding when strong regulatory frameworks are in place, but there is a substantial reliance on

facultative and treaty reinsurance from outside Africa. This presents unique difficulties.

3. LITERATURE REVIEW

In this section, a considerable number of previous studies that examined the link between insurance development and economic growth are reviewed. The previous empirical studies can be classified into four strands. The first strand consists of studies that examine insurance and economic growth. The second comprises studies that investigate the connection between institutions and insurance development. The third strand is made up of studies that focus on the causality between insurance and economic growth. The fourth strand consists of recent studies that consider intervening variables between insurance and economic growth. In the first strand, for instance, Outreville (1990) showed that the premium of property-liability insurance was positively related to economic growth in a sample of 55 developing countries. Beenstock et al. (1998), in a cross-sectional analysis covering 12 countries and spanning 1970–1981, found that property liability insurance premiums promote economic growth. Webb et al. (2005) concentrated on the effect of both banking and insurance on economic growth in a cross-country analysis that consisted of 55 countries. The study established that both banking and insurance contributed to economic growth. Haiss and Sumeji (2008) used panel data from 29 countries in Europe for the period 1992–2005 to analyse how insurance investment and premiums impact GDP growth. They found that LI contributed to economic growth in 15 countries. Studying how LI influences economic growth, Chen et al. (2012) found that this form of insurance enhanced economic growth. However, the impact of LI on low-income countries (LICs) is greater than on middle-income countries (MICs). Akinlo and Apanisile (2014) used panel data from 30 SSA countries to investigate the effect of insurance on economic growth. They found that insurance significantly impacted economic growth. Kozarević et al. (2013) examined the insurance market transition process in ten South-Eastern Europe (SEE) post-communist countries. They focused on determining the connection between insurance market development and the European Union (EU) integration process as well as overall economic development. Using Spearman coefficients, their study showed a very strong correlation between the transition of insurance markets and the level of economic development as well as between the transition

of insurance markets and the level of EU integration. Also, the study indicated that insurance penetration, insurance density and shares of life insurance tend to depend on the level of economic development, while aspects such as legal and institutional frameworks as well as solvency standards tend to depend more on the level of EU integration.

Regarding the second strand of literature, the studies that focused on institutions and insurance, Sepehrdoust and Ebrahimnasab (2015) used a sample of developing countries to analyse how LI was connected to economic political, and regulatory factors during the 1999–2011 period. They found that political measures such as political stability and democracy enhance LI. Furthermore, governance of law and quality of rules as regulatory measures and economic measures impact LI positively. In a similar study, Ward and Zurbruegg (2002) investigated the association between legal and political variables and LI in Asia and OECD countries using dynamic GMM estimations. The study found, in both Asia and the OECD region, that civil rights and political stability cause an increase in the demand for LI. The study by Ćurak et al. (2013) differs from earlier studies as they used primary data to investigate the social and demographic factors that determine LI in Croatia. The survey data used in the study were obtained from 95 respondents and they found that factors such as age, education and employment enhance the demand for LI in Croatia. However, the study found that gender, marital status and family size fail to significantly impact LI. Lee, Chiu, and Chang (2013) focused on the relationship between country risks and income elasticity demand for insurance. The study employed panel smooth transition regression for the analysis. In the full sample, the study found that lower country risks are associated with low-income elasticity demand for insurance. The analysis of income groups shows a similar result. Beck and Webb (2003) adopted panel data consisting of 68 nations from 1961 to 2000 in determining variations in LI consumption. The study found that inflation, income per capita and other economic variables are the major determinants of LI. Religious and institutional measures likewise are determinants of the use of LI. But other factors, such as education, life expectancy and the young dependency ratio, have a marginal association with LI consumption.

In the third strand, according to Lee, Lee and Chiu (2013), only a few studies focused on causality between insurance and economic growth as most focused on

insurance development and economic growth. Ward and Zurbruegg (2000) is among the few studies that examine this causality. They used a bivariate VAR method to determine the causal relationship between insurance and economic growth in nine OECD countries during the period 1961–1996. The study found varying results among the countries. For instance, they found that insurance leads to economic growth in Canada and Japan, while they found a bidirectional relationship in Italy. However, they found no evidence of a causal relationship in other countries. Kugler and Ofoghi (2005) were interested in the causal relationship between LI and economic growth in the U.K. Using varieties of LI premiums in the study, they found causality running from insurance to GDP in six cases, a single case of long-run causality from GDP to insurance was reported, and long-run bidirectional causality for the other two cases. Vadlamannati (2008) investigated the short-run causality between insurance and economic growth in India. Using the vector error correction model (VECM), the study found the existence of two-way causality between LI and economic growth. Adams et al. (2009) found that economic growth in Sweden has a one-way relationship from insurance to economic growth without a reverse effect. In their study consisting of 41 countries, Lee, Lee and Chiu (2013) found both short-run and long-run a bidirectional causality between insurance and economic growth. Balcilar et al. 2018 used a bootstrap panel causality test to confirm a feedback hypothesis between insurance and economic growth.

The last strand of studies consists of those that considered the intermediary between insurance and economic growth. These include Lee et al. (2016), who use an innovative dynamic panel threshold model to determine how institutional environments enhance the impact of insurance on economic growth. It was established that insurance is detrimental to economic growth in relatively weak institutional environments but above a certain level of institutional threshold, the negative significant relationship became insignificant. Lee et al. (2017) considered globalisation as an intermediary between insurance and economic growth for a pooled sample of 38 countries. Their study found that globalisation impacts economic growth positively at lower insurance activities, while the result was reversed at a higher level of insurance activities.

4. METHODOLOGY

4.1 A Dynamic Panel Threshold Model

A panel threshold estimator that is only appropriate for static and balanced panels was proposed by Hansen (1999). However, some macroeconomic factors, such as GDP growth, are incredibly persistent, making the use of a dynamic panel framework necessary. As a result, Bick (2010) and Kremer et al. (2013) developed a dynamic panel threshold for a non-linearity estimator by extending the threshold models of Hansen (1999, 2000), and Caner and Hansen (2004). The key issue is to adapt the panel threshold model in such a way that the country-specific fixed effects are eliminated without altering the distributional assumptions of both models. Fixed effects cause serial correlation when cross-section specific error terms are transformed and first-differencing, which is the standard fixed-effects removal in dynamic panels, is not possible. Hence, this is tackled by applying Arellano and Bover's (1995) forward orthogonal deviations transformation, which eliminates fixed effects while avoiding serial correlation in the converted errors. As a result, the forward orthogonal deviation transformation ensures that the threshold model's original distribution theory, as applied to static panels in Hansen (1999), is valid in a dynamic context as well.

4.2 Model Specification

This study adopts the dynamic panel threshold proposed by Kremer et al. (2013) in determining the threshold effect of institutional quality on the insurance–growth nexus. This method is preferred because it accommodates unbalanced panel data, unlike Hansen (1999) and studies such as Aydin (2017), which were applied to a small panel sample of eight countries. We specify the model as

$$GDP_{it} = \mu_i + \delta_1(ISQ_{it} \le \gamma_{it}) + \beta_1 (INS)_{it}(ISQ_{it} \le \gamma_{it}) + \beta_2 (INS)_{it}(ISQ_{it} > \gamma_{it}) + \sigma_1 GDP_{it-1} + \sigma_2 X_{it} + \varepsilon_{it}, \quad (1)$$

where GDP_{it} denotes GDP per capita growth, *ISQ* is the institutional quality, *INS* signifies insurance development, which is the threshold variable, GDP_{it-1} is lagged GDP per capita and X_{it} stands for all the control variables included. *i* denotes countries, while *t* represents time. Differences in the regime intercept suggested by Bick (2010) are taken into consideration by Kremer et al. (2013) and

captured in δ_1. The regime intercepts are included on the assumption that their differences across the countries are the same except for individual-specific ones. This will take care of the problems of omitted variables and making them the regime-dependent exogenous regressor for a given threshold is easier. Bick (2010) stated that the inclusion of regime intercepts has some implications statistically and economically. The statistical implication has to do with the reduction in the biasedness of the omission of variables and easy identification of the biased effect by the inclusion of regime intercepts. The economic implication is that the policy effect of the variables concerned becomes relevant, which relates to statistical results. Therefore, in this study, we consider regime intercepts.

By following Kremer et al. (2013) in estimating threshold value (γ_{it}), the first stage involves running a reduced form specification by regressing the endogenous variable, i.e., GDP_{it-1}, on instruments. By using the predicted values of the reduced form regression in the first step to replace the endogenous variable, Equation (1) will now be estimated by least squares for a fixed threshold value, and the associated sum of squared residuals can be produced. A set of sum of squared residuals is obtained by repeating the same procedures for a subset of the threshold variable (ISQ_{it}). The threshold value (γ_{it}) estimate with the least sum of squared residuals is used in future estimations, such as slope coefficients for various regimes.

5. DATA AND DATA SOURCE

Panel data are used in this investigation. The full sample is made up of an unbalanced panel sample drawn from 34 SSA nations between 1990 and 2017. The availability of data affected the selection of the time frame for this investigation. In line with the World Bank's classification, income classes are also taken into account in this study. 18 nations fall into the low-income category, whereas 16 belong to the middle-income category. In this study, middle-income countries are made up of lower-middle-income and upper-middle-income countries. The panel sample for both the LICs and MICs is also unbalanced. Due to the fact that only one nation in SSA belongs to the upper-income group, it is not included.

5.1. The Dependent Variable and Control Variables

The dependent variable in this study is economic growth. It is measured by the real GDP per capita growth rate. Seven control variables that are considered in the literature as determinants of economic growth are included in the study. The first control variable is lagged GDP per capita growth. This is included because Arellano and Bond (1991) and Arellano and Bover (1995) suggested using the lags of dependent and explanatory variables as tools to get around the endogeneity issue. According to the literature, lagged GDP per capita growth might be either positive or negative. The second control variable is gross capital formation. Gross capital formation as a percentage of GDP is the investment in physical capital. A positive relationship is expected between gross capital formation and economic growth because investment in physical capital increases productivity and reduces the cost of production. The third control variable is government expenditure as a percentage of GDP, which captures the consumption expenditure of the government. According to Apergis and Poufinas (2020), government expenditure can have a positive or negative effect on economic growth. Trade openness is the fourth control variable and is defined as the total of exports and imports as percentage of GDP. Trade openness is expected to impact positively on economic growth although its impacts on economic growth in the literature are mixed. The fifth control variable is inflation. Inflation is the consumer price index and measures macroeconomic stability. Inflation is expected to harm economic growth because it creates uncertainty in the economy and hence discourages investment. The sixth control variable is population growth which is defined as the annual growth rate of the population. Population growth is expected to promote economic growth because it constitutes the labour force in the economy. The last control variable is domestic credit to the private sector (DCP), which is used to proxy financial development. It is the domestic credit made available to the private sector by financial institutions. Due to important functions performed by financial institutions in the economy, financial development is expected to enhance economic growth. The data on the dependent variable and control variables are obtained from the World Bank Development Indicators (WDI) 2021.

5.2. Insurance

Insurance is measured by the insurance penetration, which is calculated as the total premium volume that the insurer earned or received during the preceding

fiscal year as a percentage of GDP. This study takes into account total insurance, NLI and LI. The NLI premium volume as percentage of GDP is used to measure NLI. The LI premium as a percentage of GDP serves as a measure for LI. The total insurance premiums collected, including both life and NLI, are added together. Data on LI and NLI are obtained from the Global Financial Development Database 2021.

5.3. Institutional Quality

Four institutional quality variables are included in the analysis. These include legal system and property rights, economic freedom index, polity2 and rule of law. The legal system and property rights is an index that captures the protection of individuals as well as their rightfully acquired property. The Economic Freedom Index (ECF index) measures the degree to which the institutions and policies of countries are compatible with economic freedom. Polity2 index is used to measure political institutional quality. Polity2 is from the polity iv dataset constructed by Marshall et al. (2018). Polity2 data is a modified version of polity data. It measures the degree of democracy and autocracy and scaled from -10 to 10. Data on the legal system and property rights and economic freedom are extracted from the Economic Freedom of the World index published in the 2019 annual report (Gwartney et al., 2019). Data on both the legal system and property rights and the economic freedom index are scaled between 0 and 10. A higher value represents a sound legal system, higher protection of life and property, and higher economic freedom, respectively. Scaled from -10 to 10, Polity2 measures the degree of democracy and authoritarianism. A score of 10 denotes a robust democracy, whereas a score of -10 indicates a high degree of dictatorship. The polity2 data is obtained from the Polity IV dataset constructed by Marshall et al. (2018). It is a modified version of polity data. The World Governance Indicator dataset created by Kaufmann et al. (2010) contains a dataset on the rule of law. The degree to which members of society uphold and trust established laws is reflected in the rule of law. The scale for the rule of law is roughly between -2.5 and 2.5. While 2.5 suggested a strong rule of law, -2.5 indicates a weak rule of law. It is a dataset that covers the period from 1996 to 2019. However, there are gaps for the years 1997, 1999 and 2001. Table 1 contains the descriptive properties of the variables. Appendix A3 contains the list of countries selected for this study.

Table 1: Descriptive statistics

Variables	Mean	Std. Dev.	Min	Max
GDP per capita growth	1.558	5.169	-47.503	37.536
NLI penetration	0.773	0.876	0.003	14.723
LI penetration	0.813	2.050	0.001	15.381
Total insurance penetration	1.312	2.465	0.004	17.023
Gross capital formation	22.188	8.955	-2.424	60.156
Government expenditure	14.165	5.955	0.911	40.444
Trade openness	61.555	31.638	11.087	165.646
Inflation	57.171	805.178	11.686	23,773.13
Population growth	2.539	1.003	-6.766	8.118
Domestic credit to private sector	18.873	24.415	0.491	160.125
Polity2	0.996	6.838	-28	10
Economic freedom	5.728	0.913	2.525	8.117
Legal system and property rights	3.990	1.220	1.217	7.321
Rule of law	-0.597	0.630	-2.130	1.077

6. EMPIRICAL ANALYSIS

The panel unit root tests employed are those of Levin et al. (2002), Im et al. (2003), and the ADF– and PP–Fisher chi-square (Maddala & Wu, 1999). The results of the unit root tests are shown in Appendix A2, and they demonstrate that some variables, such as GDP per capita growth, total insurance, NLI, government expenditure, gross capital formation, population growth, inflation, trade openness, polity2 and rule of law, are stationary at the level, but legal system and property rights, LI, DCP and economic freedom are stationary at first difference.

Tables 2 to 5 contain the results of the parameters and the estimated threshold values. In Table 2, we use polity2 as the institutional quality variable. The economic freedom index is used as an institutional quality variable in Table 3. In Tables 4, the legal system and property rights is used as institutional quality variable while in Table 5, the rule of law is used as institutional quality variable. Column 2 of each table contains the results of the NLI model, while columns 3 and 4 consist of the results of the LI and total insurance models, respectively.

In Table 2, the threshold values of 3.000, 5.000 and -7.000 are estimated for NLI, LI and total insurance, respectively. Below the threshold value, NLI and LI produce insignificant impacts on economic growth. The total insurance result differs as it enhances economic growth below the threshold level at 10%. The effect of NLI on economic growth above the threshold level is positive and significant at 1%. This indicates that NLI promotes economic growth when political rights are higher. The effect of LI is positive but insignificant, while the effect of total insurance is also positive and insignificant.

With respect to the control variable, the models produce similar results. Gross capital formation significantly impacts economic growth in all the models at 1%. Some studies, such as Akinlo (2020) and Ridha and Parwanto (2020), also found a positive effect of gross capital formation on economic growth. The coefficient of trade openness is positive but not significant in any of the models. Inflation exerts a negative effect on economic growth across the models as expected. The coefficient of population growth is positive and significant in the NLI model only, while it is insignificant in other models. Financial development enhances economic growth significantly in all the models at 10%. Concerning the regime intercept $\hat{\delta}_1$, Bink (2010) explained that it suggests that the difference in the regime intercepts is the same for all cross-sections rather than being individual-specific. This implies that within the same regime, the growth rate is indistinguishable. From the economic perspective in this study, it is a dummy of the low regime that represents the average economic growth rate of countries with weak institutional quality. Its inclusion in the model reduces the omission of variable bias from a statistical perspective. Also, in each of the models, its coefficient is significant and negative.

In Table 3, where we use the economic freedom index as institutional quality variables, the threshold values of 6.166, 5.904 and 4.579 are estimated for NLI, LI and total insurance, respectively. In the low regime, the coefficients of NLI, LI and total insurance are insignificant. This is an indication that a lower level of economic freedom limits the impact of insurance on economic growth. For the regime above the threshold, the coefficients of NLI and total insurance are positive and significant, whereas the coefficient of LI is insignificant. This suggests that higher economic freedom is advantageous to the growth impact of NLI and total insurance.

Table 2: Insurance, polity2 and growth result

Dependent variable: GDP per capita growth rate	Non-life insurance (NLI)	Life insurance (LI)	Total insurance
Threshold estimates			
$\hat{\gamma}$	3.000	5.000	-7.000
95% confidence interval	[2.014, 6.046]	[4.448, 13.630]	[-15.622,7.804]
Insurance development			
$\hat{\beta}_1$	0.188(0.206)	-0.203(0.279)	0.391*(0.205)
$\hat{\beta}_2$	0.923***(0.317)	0.093(0.086)	0.094(0.714)
Other variables			
Lagged GDP per capita growth	0.102***(0.032)	0.109***(0.032)	0.103***(0.032)
Gross capital formation	0.116***(0.198)	0.119***(0.020)	0.118***(0.019)
Government expenditure	-0.046(0.031)	-0.021(0.030)	-0.021(0.029)
Trade openness	0.004(0.006)	0.002(0.006)	0.003(0.006)
Inflation	-0.003*(0.002)	-0.004*(0.002)	-0.004*(0.002)
Population growth	0.330**(0.164)	0.245(0.164)	0.249(0.163)
Domestic credit to private sector	0.011*(0.006)	0.012*(0.007)	0.103*(0.007)
$\hat{\delta}_1$	-2.053***(0.722)	-1.941***(0.736)	-2.151***(0.714)
No of observations	952	952	952
No of countries	34	34	34

Note: Significance at 1%, 5% and 10% is indicated by ***, ** and *, respectively. The parentheses contain the standard error.

The control variables lagged GDP per capita growth and gross capital formation have a positive and significant effect on growth. Their coefficients are significant at 1% in the models. Neither government expenditure nor trade openness produces a significant effect on growth; however, while the coefficient of government expenditure is negative, it is positive for trade openness. Inflation has a detrimental effect on economic growth. The coefficient of population growth is insignificant in the models. financial development contributes to growth. The regime intercept is negative and significant across the models.

Table 3: Insurance, economic freedom and growth result

Dependent variable: GDP per capita growth rate	Non-life insurance (NLI)	Life insurance (LI)	Total insurance
Threshold estimates			
$\hat{\gamma}$	6.166	5.904	4.579
95% confidence interval	[6.003, 6.613]	[5.492, 5.975]	[4.217,7.254]
Insurance development			
$\hat{\beta}_1$	0.255(0.019)	-0.055(0.124)	1.067(0.205)
$\hat{\beta}_2$	0.899***(0.332)	0.158(0.104)	0.126*(0.069)
Other variables			
Lagged GDP per capita growth	0.104***(0.033)	0.120***(0.033)	0.105***(0.033)
Gross capital formation	0.114***(0.020)	0.118***(0.019)	0.117***(0.020)
Government expenditure	-0.030(0.029)	-0.021(0.030)	-0.019(0.030)
Trade openness	0.003(0.002)	0.004(0.006)	0.001(0.006)
Inflation	-0.0004*(0.0002)	-0.0003*(0.0002)	-0.0004*(0.0002)
Population growth	0.295(0.163)	0.249(0.163)	0.267(0.162)
Domestic credit to private sector	0.020*(0.007)	0.012*(0.007)	0.013*(0.007)
$\hat{\delta}_1$	-2.215***(0.718)	-2.048***(0.718)	-2.123***(0.714)
No of observations	952	952	952
No of countries	34	34	34

Note: Significance at 1%, 5%, and 10% is indicated by ***, ** and *, respectively. The parentheses contain the standard error.

In Table 4, the legal system and property rights is the threshold variable. The threshold estimate for NLI is 5.680, for LI 4.120 and for total insurance 3.065. The results show that a weak legal system and unsecured ownership of properties are barriers to the growth impact of insurance. This is based on the insignificant effect of NLI, LI and total insurance obtained in the lower regime. However, in the higher regime, a strong legal system and secured property rights enhance the effect of NLI and total insurance on economic growth. The coefficient of LI is insignificant in the higher regime.

The results of the control variables gross capital formation, government expenditure, trade openness, inflation and financial development are the same as

the results obtained in Tables 2 and 3. Population growth has a positive sign, but its coefficient is significant only in the NLI model. The coefficient of intercept is negative and significant in all the models. The significant negative sign of the intercept implies that the countries with weak legal systems and unsecured property rights experience a negative average growth rate.

Table 4: Insurance, legal system and property rights and growth result

Dependent variable: GDP per capita growth rate	Non-life insurance (NLI)	Life insurance (LI)	Total insurance
Threshold estimates			
$\hat{\gamma}$	5.680	4.120	3.065
95% confidence interval	[4.460, 5.595]	[4.094, 4.528]	[0.183, 6.205]
Insurance development			
$\hat{\beta}_1$	0.282(0.194)	-0.040(0.128)	-1.006(0.117)
$\hat{\beta}_2$	1.245***(0.441)	0.138(0.101)	0.172**(0.078)
Other variables			
Lagged GDP per capita growth	0.102***(0.036)	0.120***(0.033)	0.105***(0.033)
Gross capital formation	0.118***(0.020)	0.118***(0.020)	0.117***(0.020)
Government expenditure	-0.033(0.030)	-0.015(0.030)	-0.020(0.029)
Trade openness	0.002(0.006)	0.003(0.006)	0.003(0.006)
Inflation	-0.0004*(0.0002)	-0.0003*(0.0002)	-0.0004*(0.0002)
Population growth	0.316*(0.163)	0.252(0.164)	0.268(0.163)
Domestic credit to private sector	0.012*(0.007)	0.012*(0.007)	0.012*(0.007)
$\hat{\delta}_1$	-2.182***(0.718)	-2.095***(0.717)	-2.141***(0.715)
No of observations	952	952	952
No of countries	34	34	34

Note: Significance at 1%, 5% and 10% is indicated by ***, ** and *, respectively. The parentheses contain the standard error.

In Table 5, we use the rule of law as the threshold variable. We estimate a threshold value of -0.275 for NLI. The LI threshold estimate is -1.382, while the total insurance threshold estimate is -1.265. The results mean that below the threshold level, the coefficients of NLI and LI are insignificant, implying they have no effect on economic growth. However, total insurance contributes to

economic growth at 10% significance level. This suggests that a weak rule of law does not limit the effect of total insurance on economic growth.

In the higher regime, NLI significantly enhances economic growth at 1%. The results of the control variables are slightly different from the previous tables. Lagged GDP per capita growth is positive and significant. Gross capital formation and population growth contribute to economic growth. Government expenditure and inflation have negative signs but the coefficient of government expenditure is not significant. financial development promotes economic growth.

Table 5: Insurance, rule of law and growth results.

Dependent variable: GDP per capita growth rate	Non-life insurance (NLI)	Life insurance (LI)	Total insurance
Threshold estimates			
$\hat{\gamma}$	-0.275	-1.382	-1.265
95% confidence interval	[-1.427, -.0514]	[-1.295, -.0734]	[-0.151, -0.377]
Insurance development			
$\hat{\beta}_1$	0.207(0.205)	1.573(1.165)	0.350*(0.211)
$\hat{\beta}_2$	0.865***(0.312)	0.066(0.084)	0.099(0.073)
Other variables			
Lagged GDP per capita growth	0.103***(0.033)	0.111***(0.033)	0.104***(0.033)
Gross capital formation	0.116***(0.019)	0.121***(0.020)	0.118***(0.020)
Government expenditure	-0.042(0.031)	-0.014(0.301)	-0.021(0.030)
Trade openness	0.002(0.006)	0.003(0.006)	0.003(0.006)
Inflation	-0.0004*(0.0002)	0.0003*(0.0002)	-0.0004*(0.0002)
Population growth	0.312*(0.163)	0.286*(0.164)	0.262(0.163)
Domestic credit to private sector	0.013*(0.007)	0.009(0.007)	0.012*(0.007)
$\hat{\delta}_1$	-2.040***(0.724)	-2.258***(0.725)	-2.150***(0.715)
No of observations	952	952	952
No of countries	34	34	34

Note: Significance at 1%, 5% and 10% is indicated by ***, ** and *, respectively. The parentheses contain the standard error.

6.1 Investigation Among Income Groups

Generally speaking, both the level of income and the level of economic development are associated with institutional quality. Therefore, we extend the investigation to income groups in SSA. That is, we investigate if the threshold effect of institutional quality on the insurance–growth nexus differs among the income groups within SSA. The results of the income groups are presented in Table 6. Table 6 consists of both the results of LICs and MICs. However, due to limited space, this part of our study uses the legal system and property rights as institutional quality indicators.

As can be seen in Table 6, threshold values of 3.065 for NLI and total insurance are obtained in the low-income group, while the threshold value for LI is 2.689. NLI and LI impact economic growth negatively at the low regime in the LICs. This suggests that a weak legal system and property rights limit the effect of LI and NLI on economic growth. A weak legal system and property rights will discourage people from buying insurance products, as there will be no guarantee that they will get justice if there is a default. In the high regime, LI and NLI have no effect on economic growth, whereas total insurance promotes economic growth. In the MICs, 5.050 is the estimated threshold value for NLI and 5.102 for both LI and total insurance. The results show that NLI, LI and total insurance have no effect on economic growth in the low regime. In the high regime, NLI and total insurance contribute to economic growth. The coefficient of LI is not significant but positive. From these results, we observe that insurance development will contribute more to economic growth when the legal system and property rights are guaranteed.

Gross capital formation enhances economic growth in both LICs and MICs. Government expenditure and trade openness are unable to exert a significant impact on economic growth in LICs and MICs. Inflation and population growth have a significant effect on growth in the LICs. However, while the coefficient of inflation is negative, that of population growth is positive. In the MICs, on the other hand, the coefficients of inflation and trade openness are not significant. financial development is unable to promote growth in the LICs. This might be due to the small size of the financial system. In contrast, financial development is a determinant of economic growth in the MICs.

Table 6: Results of a dynamic threshold effect of the legal system and property rights on insurance–growth nexus

	Low-income countries			Middle-income countries		
Threshold estimates	Non-life insurance (NLI)	Life insurance (LI)	Total insurance	Non-life insurance (NLI)	Life insurance (LI)	Total insurance
$\hat{\gamma}$	3.065	2.689	3.065	5.050	5.102	5.102
95% confidence interval	[4.199, 5.115]	[2.246, 5.447]	[4.039, 5.276]	[-16.782, 26.166]	[-12.549, 19.062]	[-4.243, 11.486]
Insurance development						
$\hat{\beta}_1$	-3.296**(1.559)	-10.747*(6.201)	-0.632(1.102)	0.081(0.172)	-0.030(0.096)	-0.034(0.074)
$\hat{\beta}_2$	-0.030(0.821)	-0.694(0.700)	1.208*(0.669)	0.987***(0.298)	0.108(0.079)	0.128*(0.067)
Other variables						
Lagged GDP per capita growth	-0.028(0.045)	-0.024(0.045)	-0.033(0.045)	0.387***(0.045)	0.412***(0.044)	0.408***(0.045)
Gross capital formation	0.182***(0.031)	0.178***(0.031)	0.171***(0.031)	0.042**(0.023)	0.043**(0.023)	0.044*(0.023)
Government expenditure	-0.087(0.062)	-0.044(0.061)	-0.087(0.062)	-0.018(0.027)	-0.008(0.028)	-0.015(0.027)
Trade openness	0.007(0.014)	0.001(0.013)	0.001(0.014)	0.007(0.005)	0.008(0.005)	0.008(0.005)
Inflation	-0.001**(0.0002)	-0.001**(0.0002)	-0.001**(0.0002)	0.001(0.001)	0.001(0.001)	0.001(0.001)
Population growth	0.444*(0.228)	0.455**(0.226)	0.431*(0.227)	0.027(0.219)	-0.092(0.224)	-0.063(0.220)
Domestic credit to private sector	-0.002(0.017)	-0.0004(0.017)	-0.001(0.017)	0.014**(0.006)	0.011*(0.006)	0.011*(0.006)
$\hat{\delta}_1$	-2.296**(1.202)	-2.625**(1.182)	-2.364**(1.185)	-1.038(0.998)	-0.559(1.014)	-0.671(0.997)
No of observations	504	504	504	448	448	448
No of countries	18	18	18	16	16	16

Note: Significance at 1%, 5% and 10% is indicated by ***, ** and *, respectively. The parentheses contain the standard error.

7. DISCUSSION OF FINDINGS

In the case of all the institutional quality variables used in our study, we found that NLI does not significantly contribute to economic growth below the threshold level or in the low regime (see Tables 2-5). This is an indication that weak institutional quality limits the impact of insurance on economic growth in SSA. Weak institutional quality exposes insurance to the problems of adverse selection and moral hazards, resulting in the negative impact of insurance on economic growth. In the high regime, NLI significantly impacts economic growth (see Tables 2-5). This implies that a strong institutional quality enhances the impact of NLI on economic growth. This finding is in line with finance–growth studies (e.g., Demetriades & Law, 2006, Anwar & Cooray, 2012), which found that institutional quality boosts the impact of finance on economic growth. NLI will enhance economic growth as institutional quality reduces transaction costs and provides the mechanism for enforcing contracts that are necessary between the insurer and the insured. A strong institutional quality that provides information and a good environment for the efficient operation of insurance provides avenues for a greater impact of NLI on economic growth. In relation to this study, this implies that a high level of political rights, a high degree of economic freedom, and strong rule of law and protection of property rights provide a suitable environment for a greater impact of NLI on economic growth.

In contrast, LI has no observable impact economic growth below and above the threshold regime. This is in line with Nwani and Omankhanlen (2019), who found an insignificant effect of LI on economic growth. This finding is also consistent with Lee et al. (2016), who determined that LI does not significantly impact economic growth at a higher level of institutional quality. Lee et al. (2016) gave two possible reasons for this. First, they claimed that a sound institutional environment allows all the economic sectors within the economy to function very well and, as a result, the contribution of the LI might be insignificant. Second, since sound institutional quality is associated with developed economies in which the insurance sector is developed and not in the growth phase, the effect of insurance on economic growth might not be obvious in this situation. However, these two reasons might not apply to SSA. For example, the level of institutional quality is weak in SSA, so it cannot be said categorically that it allows all the

sectors to function very well. Furthermore, the economies of SSA countries are still underdeveloped and the effect of LI may not be obvious.

In the case of total insurance, we observe that its effect depends on individual institutional quality. For instance, at a low level of polity2 and rule of law, total insurance significantly contributes to economic growth. However, a higher level of political rights and rule of law does not have any influence on the impact of total insurance on economic growth. The reason for the significant impact of total insurance on economic growth at a low level of political rights and rule of law might require further investigation. In contrast, at a higher level of economic freedom and legal system and property rights, total insurance enhances economic growth.

Regarding income groups, the results reveal that a low level of institutional quality does not enhance the effect of insurance on economic growth in LICs and MICs. However, at a higher level of institutional quality, insurance had a better chance to enhance economic growth. This is in line with Demetriades and Law (2006), who found a greater effect of financial development on economic growth because the financial system was rooted in a better institutional framework. This result is expected, as weak institutional quality will prevent the insurance sector from operating efficiently and thereby limit the effect of the sector on economic growth both in LICs and MICs. Weak institutional quality will promote a high level of corruption and political interference in the insurance sector. High levels of corruption and political interference result in the waste of resources and also severely compromise the quality of insurance services. Likewise, information asymmetries, contract defaults, and high-risk-taking behaviours are products of weak institutional quality that hamper the efficiency and operations of the insurance sector.

The insignificant effect of LI and NLI on economic growth at a stronger level of institutional quality in low LICs might be due to the small size and the level of development of the insurance sector. The level of income in LICs affects the patronage of insurance products. The low patronage of insurance products affects the size of premiums in the insurance sector, and low premiums will limit the ability of the insurance sector to influence economic growth significantly. For instance, when the premium size is small, it will affect the ability of the insurance

sector to make long-term funds available for firms, businesses, and investors, thereby reducing the level of investment. Similarly, the ability of life insurance to promote economic growth at a stronger level of institutional quality in MICs indicates that life insurance might be bigger and more efficient in MICs than in low-income countries. The low level of development of the insurance sector in LICs can influence its efficiency in pooling premiums, the choice of technology, and access to modern facilities. Lack of access to modern facilities and technology will affect the operation efficiency of insurance companies by increasing the cost of operation and, as a result, making them unable to influence economic growth.

Gross capital formation contributed to economic growth in SSA. Studies like Asiedu et al. (2015) and Mputu (2016), have also found a positive influence of gross capital formation on economic growth. The capacity to produce in any economy depends on gross capital formation and its deficiency will hamper the growth rate. Government expenditure failed to significantly impact economic growth which is in line with Okungbowa and Ogbeide (2018). According to Sakyi and Egyir (2017), the outcome of the effect of government expenditure on economic growth depends on the direction of government spending. Trade openness did not exert a significant impact on economic growth in this study, which is in line with Ulaşan (2015). The connection between trade openness and economic growth is not free from controversy as some studies reported a growth-enhanced effect of trade while others reported contrary results. The inverse relationship found between inflation and economic growth is expected, as SSA countries have been unable to successfully keep inflation low over the years. Sakyi and Egyir (2017) and Zahonogo (2016) found an inverse effect of inflation on economic growth in the region. Kelsey and le Roux, (2017, 2018) stated that inflation creates uncertainty and ambiguity, which discourages investors who usually prefer a less ambiguous environment. Population growth and financial development contributed significantly to economic growth. Becker et al. (1999) and Headey and Hodge (2009) also established a positive relationship between population and economic growth .

8. CONCLUSION AND IMPLICATION OF FINDINGS

The target of this study is to investigate the threshold effect of institutional quality on the connection between insurance and economic growth in SSA from 1990 to 2017. Many studies have focused their attention on the insurance–economic

growth nexus without considering the intermediary role of institutional quality between insurance and economic growth, particularly in SSA. This paper has used dynamic panel threshold regression as the estimation method. Furthermore, it has used four institutional quality measures, including the legal system and property rights, polity2, the economic freedom index and the rule of law to provide a robust and comprehensive analysis. The study has also considered LI, NLI and total insurance for evidence to help policymakers make appropriate decisions for the improvement and expansion of the insurance sector in the region. For a more detailed and deeper analysis, the paper has extended the investigation to income groups within the region.

Generally, this paper discovered that an institutional quality threshold exists in the insurance–growth relationship, which calls for consideration of the level of institutional quality in policies aimed at improving insurance performance. The study has found that institutional quality influences the relationship between NLI and economic growth, while LI has a lesser effect on economic growth. The effect of total insurance on economic growth has also been considered. Several noteworthy policy implications have emerged from the findings of the study. At a low level of institutional quality, a positive and insignificant relationship exists between NLI and economic growth, which indicates that a weak institutional quality limits the impact of NLI on economic growth. A positive and significant effect of NLI is obtained at a higher level of institutional quality, which suggests institutional quality improves the contributions of insurance to economic growth. The policy implication from this is that there is a need for policies that will target both the development of institutional quality and NLI in the region. Any policy that targets the development of NLI without also targeting institutional quality might not achieve its objectives, as the growth effect of NLI depends on the level of institutional quality.

The study found that LI has no effect on economic growth whatever the level of institutional quality (although it may even be negative in low-income countries at low levels of institutional quality). This is an indication that the size and

improvement of LI is of little importance for enhancing economic growth in the region[1].

Another noteworthy discovery is that the effect of total insurance on economic growth depends on the institutional quality used. For instance, total insurance stimulates growth when the rule of law and political rights are weak but is unable to enhance growth at a strong level of the rule of law and political rights. However, the effect of total insurance on growth is positive and significant when economic freedom, the legal system and property rights are at a high level, and becomes insignificant when economic freedom, the legal system and property rights are at a low level.

With regard to income groups, the study found that a low level of institutional quality is not beneficial for the growth effect of insurance in both low- and middle-income countries. Specifically, LI and NLI harm economic growth in LICs while they have insignificant effect in MICs when institutional quality is low. However, a higher level of institutional quality enhances the growth impact of total insurance in LICs and LI and total insurance in MICs. This is an indication that the level of development is directly related to the level of institutional quality and that institutional quality is stronger in MICs than in the low-income group of countries. Policymakers need to target the development of institutional quality and NLI in both LICs and MICs, but especially in the former. The deployment of advanced technology and mobile phones can help to reach out to more people about insurance products. A large part of the population, particularly in rural areas, is not aware of the value of insurance and therefore need to be made aware of and educated about the benefits of insurance, especially non-life insurance. This might help to expand the size of the insurance market and improve the rate of economic growth and the level of development of the poorer countries of SSA.

[1] In most SSA countries, LI penetration is very low, which might be related to the low level of income and high levels of illiteracy. For instance, in 2013, South Africa accounted for 88% of total LI premiums in the region. In 2018, the total amount of LI premiums in SSA was 43.2 billion USD and South Africa accounted for 80% of these premiums. Aside from South Africa, the LI market is underdeveloped in SSA countries

REFERENCES

Adams, M., Andersson, J., Andersson, L.F., & Lindmark, M. (2009). Commercial banking, insurance and economic growth in Sweden between 1830 and 1998. *Accounting, Business & Financial History, 19*(1), 21–38.

Akinlo T. (2020). Financial development, real sector and economic growth in Sub-Saharan Africa: The threshold effect. *Journal of African Business*, *22*(4), 603–626.

Akinlo, T., & Apanisile, O. T. (2014). Relationship between insurance and economic growth in Sub-Saharan Africa: A panel data analysis. *Modern Economy*, *5*(02), 120–127.

Anwar, S., & Cooray, A. (2012). Financial development, political rights, civil liberties and economic growth: Evidence from South Asia. *Economic Modelling*, *29*(3), 974–981.

Apergis, N., & Poufinas, T. (2020). The role of insurance growth in economic growth: Fresh evidence from a panel of OECD countries. *The North American Journal of Economics and Finance, 53*, 101217.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies, 58*(2), 277–297.

Arellano, M., & Bover, O., (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics, 68*(1), 29–51.

Asiedu, E., Jin, Y., & Kanyama, I. K. (2015). The impact of HIV/AIDS on foreign direct investment: Evidence from Sub-Saharan Africa. *Journal of African Trade, 2*(1) 1–17

Aydin, C. (2017). The inflation–growth nexus: A dynamic panel threshold analysis for D-8 countries. *Romanian Journal of Economic Forecasting, 20*(4), 134–151.

Balcilar, M., Gupta, R., Lee C. C., & Olasehinde-Williams, G. (2018). The synergistic effect of insurance and banking sector activities on economic growth in Africa, *Economic Systems, 42*(4), 637–648.

Beck, T., & Webb, I. (2003). Economic, demographic, and institutional determinants of life insurance consumption across countries. *The World Bank Economic Review, 17*(1), 51–88.

Becker, G. S., Laeser, E. L., & Murphy, K. M. (1999). Population and economic growth. *American Economic Review, 89*(2), 145–149.

Beenstock, M., Dickinson, G., & Khajuria, S. (1986). The determination of life premiums: An international cross-section analysis 1970–1981. *Insurance: Mathematics and Economics, 5*(4), 261–270.

Bick, A. (2010). Threshold effects of inflation on economic growth in developing countries. *Economics Letters, 108*(2), 126–129.

Caner, M., & Hansen, B. E. (2004). Instrumental variable estimation of a threshold model. *Econometric Theory*, 20(5), 813–843.

Chen, P. F., Lee, C. C., & Lee, C. F. (2012). How does the development of life insurance market affect economic growth? Some international evidence. *Journal of International Development, 24*(7), 865–893.

Ćurak, M., Džaja, I., & Pepur, S. (2013). The effect of social and demographic factors on life insurance demand in Croatia. *International Journal of Business and Social Science, 4*(9), 65–72

Demetriades, P., & Law, S. H. (2006). Finance, institutions and economic growth. *International Journal of Finance and Economics, 11*(3), 245–260.

Ductor, L., & Grechyna, D. (2015). Financial development, real sector, and economic growth. *International Review of Economics & Finance*, *37*, 393–405.

Guochen, P. & Wei, S. C. (2012, July18–21). *The relationship between insurance development and economic growth: A cross-region study for China*. [Paper presentation]. China International Conference on Insurance and Risk Management, Qingdao, China.

Gwartney, J., Lawson, R., Hall, J., & Murphy, R. (2019). *Economic Freedom of the World: 2019 Annual Report*. Vancouver: Fraser Institute. https://www.fraserinstitute.org/sites/default/files/economic-freedom-of-the-world-2019.pdf

Haiss, P., & Sümegi, K., (2008). The relationship between insurance and economic growth in Europe: a theoretical and empirical analysis. *Empirica, 35*(4), 405–431.

Hansen, B.E. (1999). Threshold effects in non-dynamic panels: Estimation, testing, and inference. Journal of Econometrics, 93(2), 345–368.

Hansen, B.E. (2000). Sample splitting and threshold estimation. Econometrica, 68(3), 575–603.

Hausmann, R., Rodrick, D., & Velasco, A. (2005). *Growth diagnostics*. John F. Kennedy School of Government, Harvard University. https://growthlab.hks.harvard.edu/publications/growth-diagnostics-0

Headey, D. D., & Hodge, A. (2009). The effect of population growth on economic growth: A meta-regression analysis of the macroeconomic literature. *Population and Development Review, 35*(2), 221–248.

Hou, H., Cheng, S. Y., & Yu, C. P. (2012). Life insurance and Euro Zone's economic growth. *Procedia – Social and Behavioral Sciences, 57*, 126–131.

Ibrahim, M., & Alagidede, P. (2018). Effect of financial development on economic growth in sub-Saharan Africa. *Journal of Policy Modeling, 40*(6), 1104–1125.

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics, 115*(1), 53–74.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2010). *The worldwide governance indicators: Methodology and analytical issues*. (World Bank Policy Research Working Paper No. 5430).

Kelsey, D., & le Roux, S. (2017). Dragon slaying with ambiguity: Theory and experiments. *Journal of Public Economic Theory, 19*(1), 178–197.

Kelsey, D., & le Roux, S. (2018). Strategic ambiguity and decision-making: An experimental study. *Theory and Decision, 84*(3), 387–404.

Kozarević, S., Peressin, L., & Valentinuz, G. (2013). Efficiency of the transition of insurance markets in South-Eastern European post-communist countries. *South-Eastern Europe Journal of Economics, 11*(2),139–164.

KPMG. (2015). *Sector report: Insurance in Africa*. https://assets.kpmg.com/content/dam/kpmg/za/pdf/Insurance-in-Africa-2015.pdf

Kremer, S., Bick, A., & Nautz, D. 2013. Inflation and growth: New evidence from a dynamic panel threshold analysis. *Empirical Economics, 44*(2), 861–878.

Kugler, M, & Ofoghi, R. (2005). *Does insurance promote economic growth? Evidence from the UK*. [Paper presentation]. Money Macro and Finance (MMF) Research Group Conference, United Kingdom.

Lee, C. C., Chang, C. H., Arouri, M., & Lee, C. C. (2016). Economic growth and insurance development: The role of institutional environments. *Economic Modelling, 59*, 361–369.

Lee, C. C., Chiu, Y. B., & Chang, C. H. (2013). Insurance demand and country risks: A nonlinear panel data analysis. *Journal of International Money and Finance, 36*, 68–85.

Lee, C. C., Lee C. C., & Chiu, Y. B. (2013). The link between life insurance activities and economic growth: Some new evidence. *Journal of International Money and Finance*, *32*, 405–427.

Lee, C. C., Lee, C. C., & Chiou, Y. Y. (2017). Insurance activities, globalization, and economic growth: New methods, new evidence. *Journal of International Financial Markets, Institutions and Money*, *51*, 155–170.

Levin A., Lin C. F, & Chu, C. S. J. (2002). Unit root tests in panel data: asymptotic and fnite-sample properties. *Journal of Econometrics, 108*(1),1–24.

Maddala, G. S., & Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and Statistics, 61*(S1), 631–652.

Malambo, M. (2023). Insurance Penetration in Africa—A Systematic Literature Review. *Journal of Financial Risk Management, 12*, 87–94.

Marshall, M. G., Gurr, T. R., & Jaggers, K. (2018). *Polity IV project: Dataset users' manual version 2018*. Center for Systemic Peace and Societal-Systems Research Inc. Vienna, USA: Center for Systemic Peace.

Mputu, C. L. (2016). *Terms of trade, trade openness and economic growth in Sub-Saharan Africa* [Master's thesis, St. Cloud State University]. Culminating Projects in Economics. 3. https://repository.stcloudstate.edu/econ_etds/3

Nelson, R. R., & Sampat, B. N. (2001). Making sense of institutions as a factor shaping economic performance. *Journal of Economic Behavior & Organization, 44*(1), 31–54.

North, D. C. (1990). *Institutions, institutional change and economic performance*. New York: Cambridge University Press.

Nwani, A. T., & Omankhanlen, A. E. (2019). Insurance receivables and economic growth: The case of Nigeria. *Journal of Physics: Conference Series* (Vol. 1378, No. 4, p. 042093). IOP publishing.

Okungbowa, O. G., & Ogbeide, A. E. (2018). Openness, government expenditure and economic growth in Sub-Saharan Africa. *Journal of Economic and Development Studies,* 4(2), 139–156.

Outreville, J. F. (1990). The economic significance of insurance markets in developing countries. *Journal of Risk and Insurance, 57*(3), 487–498.

Outreville, J.F. (2011). *The relationship between insurance growth and economic development: 80 empirical papers for a review of the literature.* (ICER Working Papers 12–2011).

Pagano, M. (1993). Financial markets and growth: An overview. *European Economic Review, 37*(2–3), 613–622.

Pradhan, R. P., Arvin, M. B., & Norman, N. R. (2015). Insurance development and the finance–growth nexus: Evidence from 34 OECD countries. *Journal of Multinational Financial Management, 31*, 1–22.

Ridha, M. R., & Parwanto, N. (2020). The effect of foreign direct investment, human development and macroeconomic condition on economic growth: Evidence from Indonesia. *Journal of Indonesian Applied Economics, 8*(2), 46–54.

Sakyi, D., & Egyir, J. (2017). Effects of trade and financial developmentI on economic growth in Africa: An empirical investigation. *Transnational Corporations Review, 9*(2), 66–87.

Sepehrdoust, H., & Ebrahimnasab, S. (2015). Institutional practices and life insurance consumption: An analysis using developing countries scores. *Trends in Applied Sciences Research, 10*(2) 99–108.

Soo H. H. (1996). *Life insurance and economic growth: Theoretical and empirical investigation* (Publication No. Paper AAI9712527) [Doctoral dissertation, University of Nebraska–Lincoln]. ETD Collection for University of Nebraska–Lincoln. http://digitalcommons.unl.edu/dissertations/AAI9712527

Ulaşan, B. (2015). Trade openness and economic growth: Panel evidence. *Applied Economics Letters, 22* (2), 163–167.

Vadlamannati, K. C. (2008). Do insurance sector growth and reforms affect economic development? Empirical evidence from India. *Journal of Applied Economic Research, 2*(1), 43–86.

Ward, D., & Zurbruegg, R. (2000). Does insurance promote economic growth? Evidence from OECD countries. *Journal of Risk and Insurance, 67*(4), 489–506.

Ward, D., & Zurbruegg, R., (2002). Law, politics and life insurance consumption in Asia. *The Geneva Papers on Risk and Insurance – Issues and Practice, 27*(3), 395–412.

Webb, I. P., Grace, M. F., & Skipper, H. D. (2005). The effect of banking and insurance on the growth of capital and output. *SBS Revista De Termas Financieros, 2*(2), 1–32.

Yinusa, O., & Akinlo, T. (2013). Insurance development and economic growth in Nigeria, 1986–2010. *Journal of Economics and International Finance, 5*(5), 218–224.

Zahonogo, P. (2016) Trade and economic growth in developing countries: Evidence from sub-Saharan Africa. *Journal of African Trade, 3*(1–2), 41–56.

Received: February, 02, 2024
Accepted: April, 17, 2024

APPENDIX A2: UNIT ROOT RESULT

Variable	Levine *et al*		Im *et al*		ADF		PP	
	level	1st diff	level	1st diff	level	1st diff	Level	1st diff
GDP per capita growth	-7.469***	-19.605***	-10.498***	-25.970***	241.466***	611.935***	464.978***	816.235***
Non-life insurance (NLI)	-2.587***	-6.205***	-3.175***	-10.228***	115.212***	276.012***	120.924***	429.101***
Life insurance (LI)	-0.406	-1.486*	-1.608*	-10.243***	115.733***	260.069***	179.886***	411.820***
Total insurance	-3.090***	-9.429***	-4.446***	-13.041***	124.626***	291.743***	98.815***	449.368***
Government expenditure	-3.652***	-12.855***	-3.623***	-15.135***	107.332***	351.609***	120.930***	631.442***
Gross capital formation	-1.995**	-15.633***	-2.203**	-17.918***	87.216**	411.712***	111.004***	685.306***
Population growth	-17.376***	-21.917***	-22.743***	-25.584***	475.210***	515.972***	134.117***	150.365***
Inflation	-8.480***	-19.641***	-9.176***	-23.181***	208.749***	547.210***	264.456***	804.896***
Trade openness	-1.648**	-12.557***	-2.327**	-16.224***	83.247*	371.692***	106.591***	651.094***
Polity2	-4.982***	-7.500***	-5.829***	-14.214***	150.375***	265.844***	233.336***	376.471***
Domestic credit to private sector	-1.301*	-13.998***	0.374	-13.763***	85.342*	300.934***	50.239	477.755***
Economic freedom	0.405	1.0E+08	2.419	-12.088***	40.337	274.066***	50.491	467.562***
Legal system and property rights	0.113	4.3E+07	2.355	-12.123***	39.249	269.546***	43.624	480.190***
Rule of law	-3.283***	-8.7134***	-3.879***	-9.143***	135.414***	208.180***	173.768***	338.011***

Note: Significance at 1%, 5% and 10% is indicated by ***, ** and *, respectively. The parentheses contain the standard error.

Table A3: List of SSA Countries included

Full Sample		**Middle-income countries**	**Low-income countries**
Angola	Malawi	Angola	Benin
Benin	Mali	Cape Verde	Burkina Faso
Botswana	Mauritius	Botswana	Central African. Rep.
Burkina Faso	Mozambique	Cameroon	Chad
Cape Verde	Namibia	Congo, Rep.	Congo, Dem. Rep.
Cameroon	Niger	Cote d'Ivoire	Ethiopia
Central African Rep.	Nigeria	Gabon	Guinea
Chad	Rwanda	Ghana	Madagascar
Congo, Dem. Rep.	Senegal	Kenya	Malawi
Congo, Rep.	Sierra Leone	Lesotho	Mali
Cote d'Ivoire	South Africa	Mauritius	Mozambique
Ethiopia	Sudan	Namibia	Niger
Gabon	Tanzania	Nigeria	Rwanda
Ghana	Togo	South Africa	Senegal
Guinea	Uganda	Sudan	Sierra Leone
Kenya	Zambia	Zambia	Tanzania
Lesotho			Togo
Madagascar			Uganda