Exploring the Nexus: Insurance Sector Dynamics and Economic Development in Digital Era

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Abstract

This study aims to explore the relationship between insurance sector growth and economic development using a combination of bibliometric analysis and empirical data from 2000 to 2021. The study employs bibliometric analysis to review literature on the insurance industry and economic development. Secondary data from IRDA reports and Economic Survey are utilized, and the ARDL model is employed to examine the long-run and short-run relationships. The findings reveal a significant positive correlation between insurance density, gross domestic saving, foreign currency assets, and economic growth. However, insurance penetration shows a weaker correlation with economic development. Long-run co-integration analysis indicates a robust relationship between GDP, gross domestic saving, insurance density, and foreign currency assets. Short-run co-integration analysis confirms the co-integration relationship between GDP and the aforementioned variables, except for insurance penetration. This study pays to the literature by providing empirical indication on the relationship between the insurance sector and economic development, utilizing both bibliometric analysis and econometric modeling techniques.

Keywords

Insurance sector, Economic development, Bibliometric analysis, ARDL model, Co-integration.

Introduction

The insurance industry has played a vital role in the economic expansion of a nation (Ward & Zurbruegg, 2000). Insurance industry provides infrastructure facility, health, banking and capital market, and employment to a country (Yinusa & Akinlo, 2013; Adeniyi et al., 2019). The Insurance industry is one of the dominant finance sectors that provide long term savings for economic development (Beck & Webb, 2003). Conventionally, two methods are used to represent the growth of the insurance sector in economic development: Insurance Density and Insurance Penetration. Insurance penetration is the ratio of direct premiums divided by gross domestic product (GDP). High Insurance penetration reflects the growth of the insurance sector. Insurance density is the

ratio of premiums divided by the total country population. It represents the per capita premium. Other macroeconomic factors such as saving, bank deposits, shares &debentures, etc. also influence the growth of the insurance sector (Charumathi, 2012). The total of these macroeconomic factors saving is called household saving. Household saving is part of gross domestic savings (GDS). GDS is expressed as GDP minus final consumption expenditure. GDS helps in economic development through its formation of investment. It is also a medium of foreign investment. Foreign currency assets are the most important assets of the RBI. It is the biggest component of the foreign reserve. FCA helps countries in the time of economic crisis. These macroeconomic factors significantly impact the insurance growth of economic development.

Table 1: Major Key Terms of The Economic Growth

Year	GDP (Rs. in crore)	Insurance Penetration (In percentage)	Insurance Density (Rs. in crore)	GDS (Rs. in crore)	FCA (Rs. in crore)
2000-2001	2177413	2.05	438.72	508170	249118
2001-2002	2355845	2.63	596.70	554332	341476
2002-2003	2536327	2.76	663.61	642844	466215
2003-2004	2841503	2.88	763.12	820570	593121
2004-2005	3242209	3.09	920.51	1042463	647327
2005-2006	3693369	3.42	1140.33	1224868	836597
2006-2007	4294706	4.21	1612.72	1471709	1196023
2007-2008	4987090	4.60	2013.84	1838206	1230066
2008-2009	5630063	4.48	2184.95	1733079	1149650
2009-2010	6477827	4.63	2564.71	2182970	1224883
2010-2011	7784115	4.29	2761.83	2481930	1330511
2011-2012	8736329	3.89	2802.54	3026837	1412631
2012-2013	9944013	3.52	2850.53	3369401	1660914
2013-2014	11233522	3.42	3090.38	3608193	1985458
2014-2015	12467959	3.25	3222.04	4019958	221906
2015-2016	13771874	3.36	3639.75	4282259	2244939
2016-2017	15391669	3.55	4243.83	4825114	2597569
2017-2018	17090042	3.57	4677.45	5557730	2665564
2018-2019	18899668	3.59	5144.88	6110740	3333815
2019-2020	20074856	3.79	5728.02	6002381	3924168
2020-2021	19860914	4.17	5931.51	5600777	249118

Source: Economic Survey Report, IRDA Report

Table 1 showed that the secondary data from the year 2000 to year 2021 of gross domestic product, gross domestic saving, insurance penetration, insurance density, and foreign currency assets. Data were taken from IRDA annual report and Economic Survey report. Generally increasing values of GDP over the years, indicating overall economic growth. Fluctuating values of Insurance Penetration and Insurance Density, suggesting variations in the level of insurance activity relative to economic growth and population. Rising Gross Domestic Saving, indicating increasing savings behavior within the economy. Fluctuating values of Foreign Currency Assets, reflecting changes in the country's foreign exchange reserves over time, potentially influenced by factors such as trade balances and capital flows.

Review of Literature

The literature on the nexus between insurance penetration, density, GDP, gross domestic saving (GDS), and foreign currency assets (FCA) underscores the interconnectedness of these variables and their impact on economic development. Several studies have explored the role of insurance penetration and density as indicators of the insurance sector's contribution to economic growth (King & Levine, 1993; Levine et al., 2000; Blum et al., 2002; Merton, 2004; Rousseau & Wachtel, 2005; Vadlamannati, 2008; Outreville, 2012; Mohy ul din et al., 2017). Insurance penetration, often measured as the ratio of insurance premiums to GDP, reflects the extent to which insurance services are utilized within an economy (Beck & Webb, 2003). Similarly, insurance density, calculated as premiums per capita, provides insight into the level of insurance coverage within a population (Yinusa & Akinlo, 2013).

Research has consistently demonstrated a optimistic correlation between insurance penetration, density, and economic development indicators such as GDP. Higher levels of insurance penetration and density have been associated with greater economic resilience, risk mitigation, and financial stability (Ward & Zurbruegg, 2000). Beck and Webb (2003) highlight the role of the insurance industry in mobilizing savings and allocating capital efficiently, thus facilitating investment and economic growth.

Moreover, studies have explored the relationship between insurance development and gross domestic saving (GDS), emphasizing the complementary nature of these variables in promoting economic development. GDS represents the percentage of national income that is not consumed but rather saved and invested, contributing to capital formation and economic growth (Charumathi, 2012). The insurance sector, through its role in encouraging long-term savings and investment, has been shown to positively influence GDS levels (Adeniyi et al., 2019). Additionally, the literature has examined the impact of foreign currency assets (FCA) on economic development and its relationship with insurance indicators. Foreign currency assets, including reserves held by central banks, play a crucial role in maintaining exchange rate stability, supporting external trade, and safeguarding against economic shocks (Shreshta & Bhatta, 2018). Studies have suggested that a robust insurance sector can contribute to foreign exchange reserves through premium payments

and investment activities, thereby enhancing a country's economic resilience (Yinusa & Akinlo, 2013).

This section describes the review of literature in light of the current study. The current study employed bibliometric analysis for the literature review. R-studio and Biblioshiny software have been used for the literature review. SCOPUS database has been used for extract documents.



Figure 1: Main Description of the Study

Figure 1 describes the main description of the current study. The research is restricted to the Insurance industry and economic development in business and management published from 2000 to 2023. The authors retrieved 792 documents, including articles, books, book chapters, conference papers, review papers, etc. The annual growth rate of 792 documents written by 2048 authors has -2.97 per cent. Document average age is 8.88 per cent. A total of 2097 author's keywords have been found in the documents.

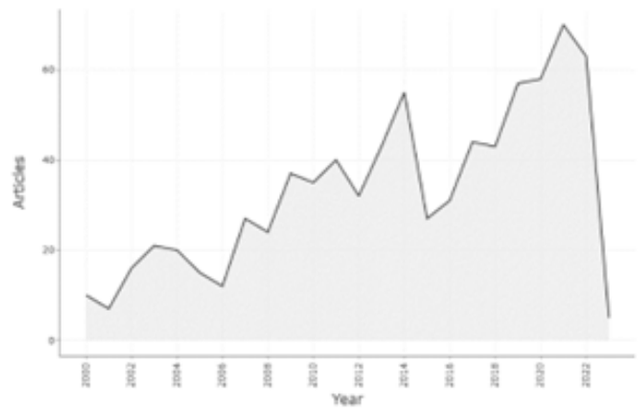


Figure 2: Annual scientific Production

Figure 2 shows the yearly publication trend of the published documents. The current study retrieved 792 documents that were published between the year 2000 to 2023. The figure represents the number of articles from 10 to 71 from the year 2000 to 2021. The year 2021 is considered the pinnacle year in this research field.

Keyword Analysis

The present study also examines the occurrence of keywords through keyword analysis. It is a process to examine the author's keywords that is showing the frequency and importance of keywords that are used in a particular time period. Keywords are the most essential element of a research article. A keyword analysis is a scientific method that develops a network of related topics. It is built in Vosviewer. The node's size on this map represents how often the keyword appears. The colour of the nodes denotes keywords, which typically contain occurring keywords with their related variables. Each cluster highlights the important and most cited keywords in the current research field

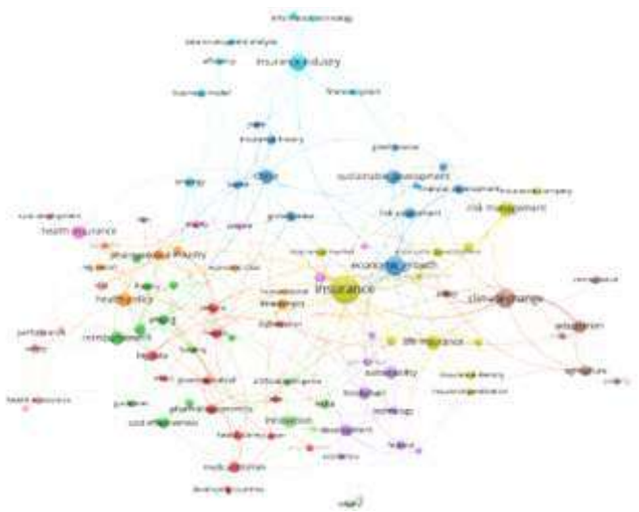


Figure 3: Analysis of Keywords

Figure 3 demonstrated the occurrences of the author's keywords. All keywords from the year 2000 to 2023, are constituted into 11 clusters. Cluster one has 13 items which highlight the digitalization and its relationship with developing countries, employment, health, health care, etc. Cluster second has 12 items which focus on artificial intelligence and its link with the decision-making, pricing, funding, guidelines, reimbursement, etc. Third cluster had 12 items which show the connection among economic growth, financial development, globalization, insurance history, sustainable, development, etc. Fourth cluster had 12 items which highlight Insurance and its connection with insurance density, life insurance, insurance penetration, non-life insurance, digital economy, economic development, financial crisis, risk management, etc. Fifth cluster had 9

items which highlight the sustainability and it's the connection with development, economics, infrastructure, etc. Cluster sixth had 8 items and show the association among information technology, insurance contract, insurance industry, financial system, etc. Cluster seventh had 8 items which highlight the investment and its link with human capital, economic crisis, investment, regulation, etc. Cluster eighth had 7 items which focus on the reinsurance, climate change, adaptation, etc. Cluster ninth had 7 items which show relationship between health insurance, rural development, vaccine, covid-19, etc. Cluster tenth had 6 items which show the association between health economics, healthcare, performance, risk, safety, and qualitative research. And last cluster eleventh had 5 items which show the relation between health services, innovation, India,

Articles Production by Country

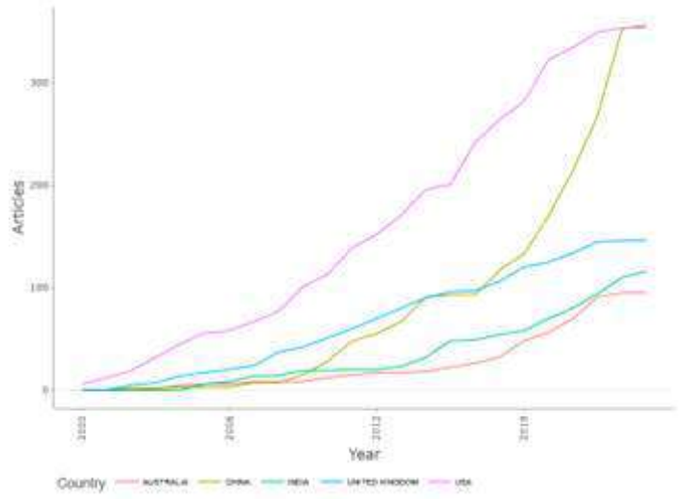


Figure 4 : Articles Production by Country

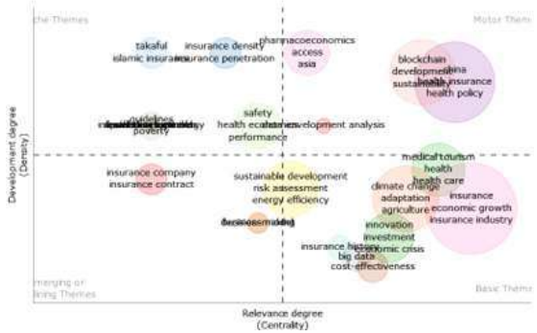
The publication growth of research articles by country has been presented in figure 4. The figure was built in biblioshiny software. It selected the top five counties by default. The top ten countries in article production are Australia, China, India, the U.K., and the USA. The USA is the top country for the production of documents but in the years 2022 and 2023 China published the highest number of documents in comparison to the USA. India started publishing their study in this field in 2005 with 6 documents and 116 documents have been published till 2023.

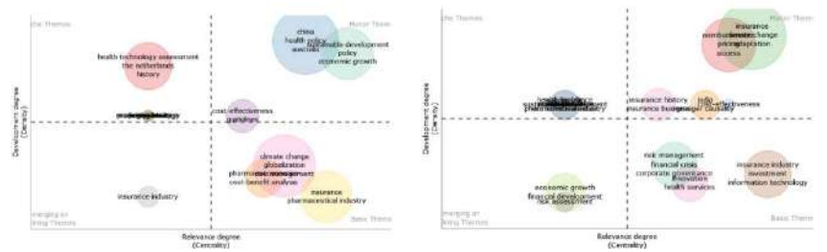
Thematic Map

The thematic map is the map that illustrates the information on a particular theme. The current

study built a thematic map of the conceptual structure of the articles in biblioshiny software. This map provides our type of theme, namely; niche theme, motor theme, emerging theme, and motor theme. In the thematic map, the motor theme is indicated by those keywords that are most important in this field and full-grown in all in the whole keywords due to high centrality and density. Likewise, the basic theme highlighted those keywords which are important for the study, but they are backward due to high centrality and low density. Additionally, emerging theme displayed those keywords which are less relevant and developed because of low centrality and density. Besides niche theme represents those keywords that are less important, but well developed due to low centrality and high density. Figure 5 shows the thematic map of author keywords. To expand the knowledge thematic evolution map is also made.

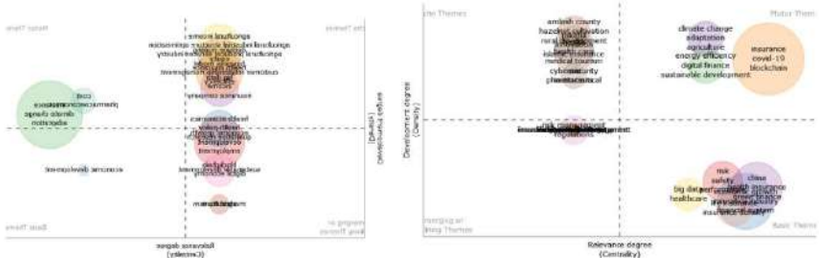
Figure 5: Thematic Map of Keywords





(a) 2000-2010

(b)2011-2015



(c) 2016-2019

(d) 2020-2023

Figure 6: Thematic evolution analysis

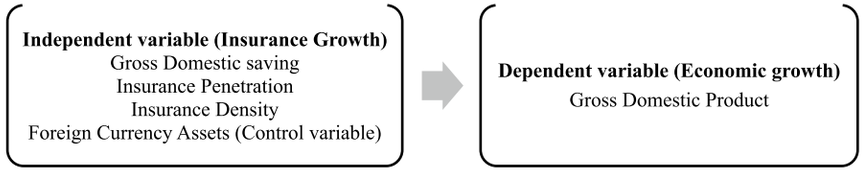


Figure 7: Conceptual Research Framework

Figure 7 shows the conceptual research framework of the study between independent and dependent variable. Insurance growth works as independent variable. Gross Domestic Saving, Insurance penetration, and Insurance Density used as substitution of Insurance growth. Gross Domestic product reserved as dependent variable. Foreign Currency assets used as the control variable of the study because it is observed that economic growth is not only affected by gross domestic saving, insurance penetration, and insurance density. Foreign currency assets has also positive impact on economic growth.

Table 2: Variable Features

Variable	Units	Symbols
Gross Domestic Product	Amount	GDP
Gross Domestic saving	Amount (Log)	LGDS
Insurance Penetration	Percentage (Log)	LIP
Insurance Density	Amount	DEN
Foreign Currency Assets	Amount	FCA

Source: Economic Survey Report, IRDA Report

Table 2 describes the features of the variables. Gross domestic product, Insurance density, and foreign currency assets are expressed in amount. Gross domestic savings is also expressed in amount but with logarithm. Insurance penetration is shown as in percentage with logarithm. The following model equation is specified for empirical analysis:

$$〖"GDP" 〗_t=β_0+ β_1 〖"LGDS" 〗_t+β_2 〖"LPEN" 〗_t+β_3 〖"DEN" 〗_t+ β_4 〖"FCA" 〗_t +U_t \quad (1)$$

The current study used time series data. Hence, some particular tests are designed for this data.

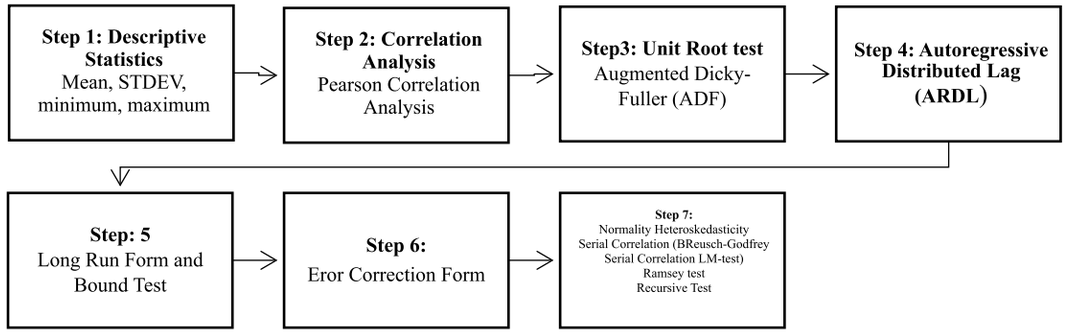


Figure 8: Data Analysis Process

Figure 8 represents the process of data analysis. Firstly, descriptive statistics was employed to encapsulate the data. Then Correlation analysis has been applied to check the relationship between the variables. Basically, the nature of the data is time series, due to this the most common problem of this data is that it is suffer from the unit root problem. So that, data is check with ADF method of Unit root. If data is stationary at level, then OLS model have to applied. On the other hand, if data is stationary both at level and 1st difference then ARDL model have to applied (Im et al., 2003 and Pesaran et al., 2001) The current study confirms that ARDL model is applied. ARDL model check the relationship of data in long run and short run.

Result and Analysis

In the data analysis process, first step is to measure the basic features of the data by Descriptive analysis. Table 2 depicted the descriptive analysis of the study variable.

Table 3: Descriptive Analysis

Analysis	GDP	GDS	PEN.	DEN.	FCA
Mean	8681520.0	6.323879	0.541998	2553.023	241756.4
Median	7130971.0	6.366919	0.548475	2663.269	259897.5
Maximum	20074856	6.786094	0.665794	5728.021	442213.0
Minimum	2177413.0	5.706009	0.312420	438.7190	39554.00
Std. Dev.	5870654.0	0.352618	0.088684	1578.214	118065.3
Skewness	0.594638	-0.360993	-0.718623	0.384654	-0.233601
Kurtosis	2.044874	1.889794	3.466297	2.202082	2.074604
Jarque-Bera	1.938869	1.461517	1.902590	1.023757	0.895530
Probability	0.379297	0.481544	0.386241	0.599369	0.639055
Sum	1.74E+08	126.4776	10.83996	51060.46	4835128
Sum sq. Dev.	6.55E+14	2.362453	0.149432	17324427	2.65E+11
Observations	20	20	20	20	20

Source: Author's Computation using Eviews 12.0

Table 3 depicted the descriptive analysis of the study variable. The mean value of GDP is 8681520.0 (Rs. in crore) while its STDEV is 5870654.0 (Rs. in crore). The maximum value of GDP is 20074856 (Rs. in crore) for the year 2019-20 while minimum value of GDP 2177413.0 (Rs. in crore) is recorded in year 2000-01. Similarly, the mean value of GDS is 6.323 while its standard deviation is 0.352. The maximum value of GDS is 6.786 for the year 2019-20 while minimum value of GDS is 5.706 in year 2000-01. Insurance penetration on average is 0.541 per cent with a standard deviation of 0.088 per cent. The highest and lowest value of Insurance Penetration are 0.665 and 0.312 per cent respectively. The average value of Insurance Density is 2553.023 (Rs. in crore) with a STDEV of 1578.214 (Rs. in crore) per cent. The maximum and minimum value of Insurance Density is 5728.021 and 438.719 respectively. The mean value of foreign currency assets is 241.756 (Rs. in crore) while its STDEV is 118065.3 (Rs. in crore). The maximum value of FCA is 442213.0 (Rs. in crore) in the year 2019-20 while the maximum value of FCA is 39554.0 (Rs. in crore) in year 2000-01.

Correlation Analysis

Correlation analysis is a mathematical method, which show the strength and relationship between variables.

Table 4: Correlation Analysis

Variable	GDP	LGDS	LPEN.	DEN.	FCA
GDP	1.000	0.928	0.271	0.981	0.912

Source: Author's Computation using Eviews 12.0

Table 4 show the correlation among all dependent and independent variables. Results indicates that GDP have a significant positive relationship with GDS (0.928), PEN (0.271), DEN (0.981), and FCA (0.912).

Stationarity Test

In time series data, stationarity test is most important test to check data is significant or not. The Augmented Dickey-Fuller (ADF) test is applied to check the data is stationary and non-stationary (Arltova & Fedorova, 2016). ADF test has applied both criteria at the level and at 1st difference.

Table 5: Unit Root Test (Augmented Dickey-Fuller)

Variable	ADF at Level		ADF at 1st difference		Order Decision
	T-statistics	P value	T-statistics	P value	
GDP	-3.377	0.0253	-1.70656	0.4114	I (0)
LGDS	0.196	0.996	-4.703	0.0072	I (1)
LPEN	-2.854	0.717	-3.119	0.0421	I (1)
DEN	0.9638	0.9936	-3.642	0.018	I (1)
FCA	-0.6588	0.8344	-5.373	0.0005	I (1)

Note: P Value Less than 0.05 Significance Level | Source: Author's Computation using EViews 12.0

Table 5 shows the results of unit root test using ADF method. Result indicated that GDP is stationary at level but GDS, PEN, DEN, and FCA is not stationary at level. However, all these variables become stationary at 1st difference level. The major part of the variables are stationary at 1st difference and only one variable is stationary at level. Hence, the mixed order decision of variable justifies the use of ARDL modelling approach in the current study (Olaiya, 2023; Shreshta & Bhatta, 2018).

ARDL Model

The ARDL modelling technique has been used extensively in previous literature by its own benefits. The ARDL model is very helpful when the data is time series in nature and capable to handle variables if their integration order is not similar. The following equation is transformed into the ARDL framework as followed by previous literature:

$$⟦\Delta GDP⟧_t = \beta_0+\sum_{i=1}^{n1}\beta_{1i}\ ⟦\Delta GDP⟧_{t-i}+\sum_{i=0}^{n2}\beta_{2i}\ ⟦\Delta LGDS⟧_{t-i}+\sum_{i=1}^{n3}\beta_{3i}\ ⟦\Delta LPEN⟧_{t-i}+\sum_{i=1}^{n4}\beta_{4i}\ ⟦\Delta DEN⟧_{t-i}+\sum_{i=1}^{n5}\beta_{5i}\ ⟦\Delta FCA⟧_{t-i}+\gamma_1\ ⟦"GDP"⟧_{t-1}+\gamma_1\ ⟦"LGDS"⟧_{t-1}+\gamma_2\ ⟦"LPEN"⟧_{t-1}+\gamma_3\ ⟦"DEN"⟧_{t-1}+\gamma_4\ ⟦"FCA"⟧_{t-1}+\varepsilon_t$$

In equation, the parameters connected with the difference operators (β_1- β_5) represent short run relationships. In the same way, the parameters associated to the lagged terms (γ_1- γ_5) stand for long-run relationship. Afterwards the estimation of equations, following hypothesis will be framed:

$$H_0 : \gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = \gamma_5 = 0$$
$$H_1 : \gamma_1 \neq \gamma_2 \neq \gamma_3 \neq \gamma_4 \neq \gamma_5 \neq 0$$

The framed hypothesis and unit root test depicted that the ARDL model is suitable for the current study. After model selection criteria, lag length criteria is the most important in ARDL model (Liew, 2006).

Table 6: Lag Length Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-565.4576	NA	2.32e+21	63.38417	63.63150	63.41828
1	-425.1950	187.0167*	7.25e+15	50.57722	52.06118	50.78184
2	-385.7702	30.66374	3.46e+15*	48.97447*	51.69505*	49.34960*

Source: Author's Computation using Eviews 12.0

Table 6 shows the lag length selection criteria. Results shows that lag two is appropriate for the ARDL model. Similarly, Previous literature show that lag two should be appropriate for annual data (Pesaran & Shin, 1999).

Long Run Form and Bound Test

After the lag selection data have check on Long Run Form and Bound Test. The F-test is the basis of the ARDL (long run form and bound test) testing. The F-test result will be compared to Narayan's

proposed critical values (2004). If the F-test value is discovered to be greater than the crucial value, then it is considered that the equation is co-integrated.

Table 7: Long Run Form and Bound Test

Dependent variable	F-Test	Decision
GDP/GDS, PEN, DEN, FCA	7.19	Co-Integrated
GDS/ GDP, PEN, DEN, FCA	8.56	Co-Integrated
PEN/ GDP, GDS, DEN, FCA	3.54	Not Co-Integrated
DEN/ GDP, GDS, PEN, FCA	90.91	Co-Integrated
FCA/ GDP, GDS, PEN, DEN	20.4	Co-Integrated
Critical values	Lower Bound	Upper Bound
10%	2.2	3.09
5%	2.56	3.49
2.50%	2.88	3.87
1%	3.29	4.37

Source: Author's Computation using Eviews 12.0

Table 7 specifies the outcomes of the Long Run Form and Bound Test. In this test, the F-statistics value of all equations are 7.19, 8.56, 90.91, and 20.4 respectively greater than the upper bound value, then it shows the data are co-integrated except the equation of penetration which is treated as the dependent variable. It is settled that there are four co-integrating equations exist out of the five equations.

Error Correction Model

After establishing the long-run relationship in the ARDL model, it is required to check the data with the Error Correction Model (ECM). ECM model is helpful in Short-run relationships. The error correction model equation is specified in following manner:

$$\Delta GDP_t = \beta_0 + \sum_{i=1}^{n1}\beta_{1i}\ \Delta GDP_{t-i} + \sum_{i=0}^{n2}\beta_{2i}\ \Delta LGDS_{t-i} + \sum_{i=1}^{n3}\beta_{3i}\ \Delta LPEN_{t-i} + \sum_{i=1}^{n4}\beta_{4i}\ \Delta DEN_{t-i}\ \sum_{i=1}^{n5}\beta_{5i}\ \Delta FCA_{t-i} + \theta_1 ECT_{t-1} + \varepsilon_t$$

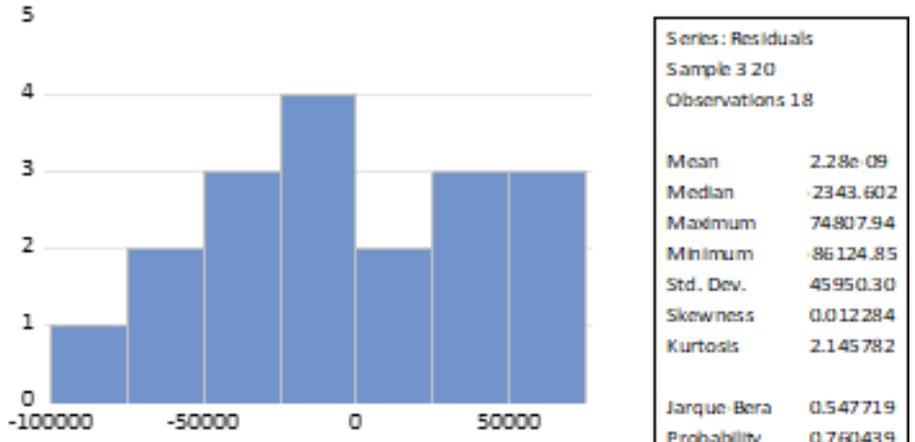
Dependent variable	Coefficient	P-Value	Decision
GDP/GDS, PEN, DEN, FCA	-1.352	0.000	Co-Integrated
GDS/ GDP, PEN, DEN, FCA	-1.135	0.000	Co-Integrated
PEN/ GDP, GDS, DEN, FCA	2.109	0.001	Not Co-Integrated
DEN/ GDP, GDS, PEN, FCA	-0.686	0.000	Co-Integrated
FCA/ GDP, GDS, PEN, DEN	-1.709	0.000	Co-Integrated

Source: Author's Computation using Eviews 12.0

Table 8 indicated the results of ECM model values. The coefficient values of all equations are -1.352, -1.135, -0.686, and -1.709 respectively and the P-value is less than 0.05, showing that the model is co-integrated in a short-run relationship. The equation of penetration in which it is treated as a dependent variable is not co-integrated because its coefficient shows a positive value.

Diagnostic Test

Diagnostic tests illustrated the model's normality, validity, and stability by many different types of tests. These tests include the Normality test with Jarque-Bera, Serial-Correlation LM Test, Heteroskedasticity with ARCH, Functional Form with the Ramsey Test, and recursive Test with the CUSUM test and CUSUM of Squares test.



Series: Residuals	
Sample 3 20	
Observations 18	
Mean	2.28e-09
Median	-2343.602
Maximum	74807.94
Minimum	-86124.85
Std. Dev.	45950.30
Skewness	0.012284
Kurtosis	2.145782
Jarque-Bera	0.547719
Probability	0.760439

Figure 9: Normality Test (Jarque-Bera)

Figure 9 indicated that the Normality Test. Results of Normality test show the P value is greater than 0.05 per cent, than it shows model is normally distributed.

Table 9: Diagnostic Test

Source: Author's Computation using Eviews 12.0

Table 9 presents the Diagnostic test values. All test p-values are higher than the 0.05, than it shows H0 is accepted (Tahir &Hayat, 2020).

Stability Test

Stability of the model is very important test in the ARDL model. The current study employed CUSUM and CUSUM of square test to assess the model stability (Im et al., 2003 and Pesaran et al., 2001).

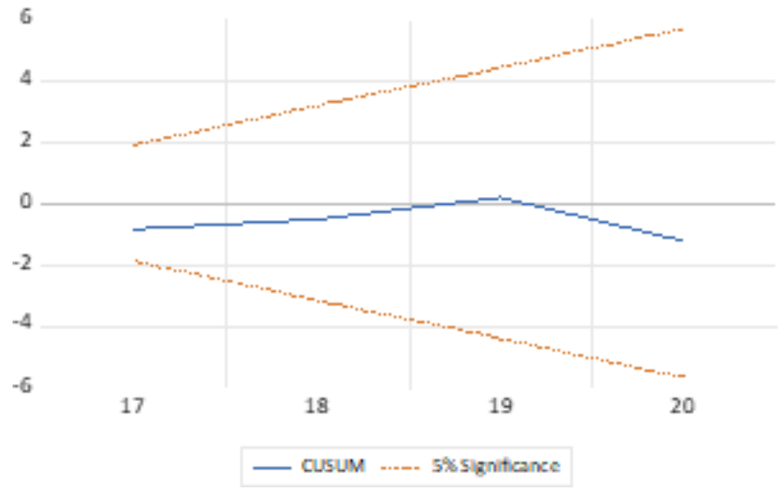


Figure 10: CUSUM Test

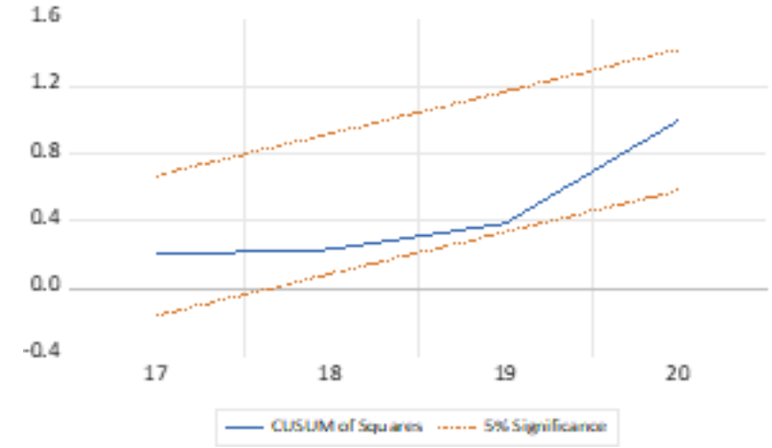


Figure 11: CUSUM of Squares Test

Figure 10 and 11 show the Stability test graphs. Both the test CUSUM and CUSUM of squares showed that the estimated line (Blue line) is lying between the critical lines (Red Line) at 5 per cent significance. Hence, it will be said that current study model is stable and reliable. It may be used for future policy formulation.

Discussion and Conclusion

The current study aims to investigate the relationship between Insurance growth and economic development, utilizing a combination of bibliometric analysis and empirical data. Firstly, the authors employed a bibliometric analysis for literature review. Second, secondary data ranging from year 2000 to year 2021 collected from various issues of IRDA reports and Economic Survey.

The data is time series in nature, so that unit root problem exist. After unit root test with ADF method, it is confirmed that ADRL model is applied in the current study. The ARDL modelling is helpful in long-run co-integration while ERC model helps in short-run con-integration. Through their research, they uncovered a robust long-run relationship between gross domestic product (GDP), gross domestic saving (GDS), insurance density (DEN), and foreign currency assets (FCA). Nevertheless, the comprehensive methodology employed in this study, including both bibliometric analysis and econometric modeling techniques, contributes significantly to the literature by offering a holistic understanding of the association between the insurance sector and economic development. This finding is consistent with previous literature that emphasizes the positive impact of these variables on economic growth (Author, Year). The result from correlation analysis indicates that Insurance density is highly correlated with economic growth with the 0.981 correlation value. Insurance penetration is lowest correlated with economic growth as compared to gross domestic saving, insurance density, and foreign currency assets. The result from long-run co-integration and short-run co-integration also stated that there is lack of co-integration relationship when Insurance penetration employed as dependent variable. According to ARDL model it is concluded that there are four variables (GDP, GDS, DEN, FCA) that show co-integrating relationship in both long-run and short-run relationship when they treated as dependent variable individually. It is concluded that gross domestic saving and insurance density played a positive role in economic development.

Additionally, control variable foreign currency assets also played a dominant role in economic development. Thereafter, stability test (Recursive test) has also proven the model stability in future. The findings have important policy implications, suggesting that policymakers should prioritize measures aimed at enhancing economic growth by promoting the insurance sector, particularly by increasing insurance density and gross domestic saving (Author, Year). Additionally, while insurance penetration may show a weaker correlation with economic development, strengthening policies in this area could still contribute to overall financial stability and risk management (Author, Year). Moreover, the study highlights the social implications of fostering the insurance industry, including improved infrastructure, healthcare, and employment opportunities, underscoring the broader societal benefits of promoting insurance sector growth (Author, Year). In conclusion, this research advances our understanding of the complex interplay between the insurance sector and economic development, offering valuable insights for policymakers and contributing to the broader body of knowledge in this field. The current study limited to insurance sector future study may held in other service sector with some other variables. This study assume GDP as dependent variable further study may be conducted with other variables. The present study employed time series data future researches can be used panel data.

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