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INSURANCE CONSUMPTION AND ECONOMIC GROWTH IN THE POST-LIBERALIZED INDIA: AN EMPIRICAL ANALYSIS

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ABSTRACT

The present study is aimed at exploring the relationship between insurance consumption and economic growth in India during 1990–2016. Annual insurance penetration, insurance density, and per capita GDP have been used to study the relationship between insurance consumption and economic growth by employing the Johansen cointegration technique. A vector error correction model is applied to study the short-term and long-term relationship between the variables. A one-way causality originating from insurance penetration to economic growth is revealed in the long run. Similarly, insurance density also causes long-term economic growth. Insurance penetration leads to short-term economic growth in India. However, economic growth does not cause insurance penetration or density in the short run as well as in the long run. The results empirically establish the relationship between the insurance industry and economic growth in India post-liberalization. The results could help policymakers to focus on enhancing the insurance industry's performance in India to achieve higher economic growth. The existing literature on how insurance consumption and economic growth are related is focused on developed economies. It ignores the non-life insurance segment of the industry and has not taken a long time period to get a complete picture of the interrelationship. This is a novel attempt to investigate the causal relation between economic growth and the insurance industry's growth in post-liberalized India.

Contribution/Originality: This study is one of the very few studies to have investigated the causality between total insurance consumption and economic growth in post-liberalized India. Furthermore, the research enriches the literature by taking both total insurance penetration and also density as the proxies for total insurance consumption.

1. INTRODUCTION

Safety and security needs come right after the physiological needs of food, clothes and shelter for a human being in Maslow's hierarchy of needs (Maslow, 1943). When it comes to security, this includes personal security (i.e. security from threats to life); health security (i.e., security from diseases/accidents to the body); and financial security (i.e., security from the future potential economic crisis). By their very psychological nature, as stated by Maslow (1943), human beings seek protection against risk. The word 'risk' derives from the early Italian '*risicare*', which means 'to dare'. Whether it is the life of a human or a business, risk is inevitable as there is a future involved. If there were no future, there would not be any risk. The ability to quantify risk is what distinguishes modern times from the past. In the past, people used to think that the future was no more than the whim of the gods and that we had no control over it. In modern times, with the understanding of risk, the future is predicted with probability based on historical events. Risk is present because of the possession of things (Bernstein, 1996). The very concept of insurance originated from the desire of owners to safeguard their possessions. Insurance safeguards the owner from the potential financial losses that may occur in the future due to the risks to which he or she is exposed. The basis of insurance is that losses suffered by a few individuals are shared by many who are exposed to risk. Insurance fulfills the safety and security needs mentioned earlier not only at individual level but also at organizational level.

As far as the importance of the insurance industry is concerned with the economy of a nation, a sound economy is manifested by its financial health. Insurance is a crucial part of financial services. Its primary motive is to safeguard the future. A secure future boosts the risk-taking abilities of an individual or an organization. Insurance instills the habit of saving into the lives of people. At the same time, the premium collected by the insurance industry is generally a long-term investment by insurance buyers, especially in the case of life insurance. These long-term investments in insurance fulfill vital funding requirements for developing the physical and social infrastructure of a nation (Vadlamannati, 2008). The insurance industry in India, which stood at a strong USD 68.88 billion in the financial year 2015–16, has the potential to reach USD 280 billion by 2020 (Indian Brand Equity Foundation, 2017).

It has been a long time since the Indian insurance industry was opened to private players with a foreign direct investment (FDI) limit of 26% in the year 2000. However, the privatization process of the insurance industry started when the Malhotra Committee was formed in the year 1993 (Insurance Regulatory and Development Authority of India, 2007). Since then, the reforms have come a long way, and the FDI limit was increased to 49% in the year 2015 (IRDAI, 2015).

Empirical evidence reveals that the privatization of an industry results in enhanced efficiency and profitability when compared with state-owned enterprises. This is because the managers of state-owned enterprises have different objectives (not only profit maximization) and are not prone to active monitoring and scrutiny of their performance (Sheshinski and López-Calva, 2003). Considering the significant positive impact of the economic reforms ushered in by the Indian government in 1991, policymakers could not hold back on privatizing the insurance industry in India. Privatization has worked for the betterment of insurance buyers, as the number of insurance companies has increased from a meager number of six state-owned enterprises in the year 2000 (before the privatization of the industry) to 58 in the year 2018.

Against this backdrop, this paper is aimed at examining the interrelation between the insurance industry's growth and economic growth in India using (Johansen, 1991) the cointegration technique. The two most widely accepted measures for insurance consumption in any country (insurance penetration and insurance density) have been used for the study. Insurance penetration refers to the annual total insurance premium collected/written in a country taken as a fraction of the GDP of that country. Insurance density is calculated as the per capita insurance premium collected/written in a country. Now, before moving further, an overview of the insurance industry in India needs to be given.

Currently in India, there are 58 insurance companies registered with the IRDA of India. It is mandatory for an insurance company to be registered with the IRDA to conduct business in India. Out of the 57 insurance companies, 24 are life insurance companies (IRDAI, 2019a) while the remaining 34 are non-life insurance companies (IRDAI, 2019b). Of the 24 life insurance companies, only one is a public sector player, which is Life Insurance Corporation (LIC). Of the 33 non-life insurance companies, six are public sector players while the remaining 28 are private sector players.

Apart from the 57 insurance companies, there are two reinsurance companies in India (IRDAI, 2019c). Reinsurance is insurance for the insurance companies. Insurance companies buy reinsurance to transfer part of the risk to the reinsurer by sharing part of the premium received from the principal policyholder. Until the end of 2016, there was only one reinsurer in India, the General Insurance Corporation of India, a government-owned company. Now, giant reinsurance companies like Swiss Re are planning to enter the Indian market and the number of reinsurance companies is increasing.

As the total insurance premium collected represents 3.40% of the GDP in India, the insurance industry is an integral part of India's financial sector. Overall, in the insurance industry, the portion of life insurance of total insurance premiums collected is 82.83%, while a 17.17% share is held by the non-life insurance industry. The life insurance market is dominated by a single public sector company, with LIC capturing 69.70% market share, leaving only 30.30% share for private companies. By contrast, the non-life insurance market is less concentrated, with private companies having 51.07% market share against 48.93% of public sector companies (IBEF, 2018).

The next section includes a review of the literature on the relationship between insurance market growth and the economic growth of a country. Section 3 deals with the data collection and research methods employed to conduct the study. In Section 4, the results have been discussed and critically analyzed with reference to the Indian insurance industry. The last section deals with the conclusion of the study.

2. REVIEW OF LITERATURE

The necessity of a prosperous insurance market for the sound economic growth of a country was well acknowledged by several studies carried out in different countries of the world. The UN body Conference for Trade and Development (UNCTAD) also accepted this necessity in 1964. In spite of that, there has been a dearth of research on the need for insurance market development so that it can contribute to the growth of a country to the maximum. Outreville (2013) has reviewed 85 empirical papers to examine the relationship between the insurance industry and the economic growth of a country. The study points out that much of the focus has remained on the life insurance segment only, while the non-life insurance segment has been ignored, constituting only about 25% of the studies. However, most developed insurance markets have an adequate share of non-life insurance in their portfolio. Also, when it comes to the insurance industry and economic growth studies, less than 20% of the 85 studies have tested the causality between the two, and the direction of causality is ambiguous. Pradhan *et al.* (2017), in their study of 18 middle-income countries, have empirically tested the relationship between the insurance industry, economic growth, financial depth and fiscal spending for the period 1980–2012. They have used vector auto-regression to test Granger causality, which reveals a robust long-term equilibrium between the insurance industry, economic growth, financial depth, and fiscal spending. However, in the short run, a unidirectional relationship exists (i.e. insurance market causes economic growth).

Graham and Xie (2007) have discussed the trends of the US insurance markets. The total premium collected from the US life-health insurance industry crossed the USD 500 billion mark in 2003. Life-health insurance companies decreased from nearly 1,000 to 550 during 1993-2003, primarily due to mergers and consolidations among the players. Market concentration (how premium collected in the insurance market is distributed across the constituent companies) of the life-health insurance market has also increased consistently during the period 1993–2003. The total assets of the US life-health insurers have gone up from around USD 1,500 billion in 1990 to close to USD 4,000 billion in 2003. The profit margin in the US life-health industry has fluctuated between 2.22% to 4.49% during the years 1993–2003. The leading insurance market indicators, i.e. insurance penetration (total premiums collected as a percentage of GDP) in the US, improved from 9.7% to 10.5% during the year 1993–2003, and insurance density (premium collected per capita) increased from USD 2471 to USD 4138 (the highest in the world) during the same period.

Hardwick and Guirguis (2007) have analyzed the performance of the UK insurance market. As per the study, the life segment of the UK insurance market is ranked first in Europe and third in the world. Similarly, the non-life segment in the UK is ranked second in Europe behind Germany, and fourth in the world. The UK had the highest insurance penetration (14.3%) in the world in 2003. The market is considered as significantly concentrated, having more than 700 insurance companies, with the top 10 companies holding a market share of more than 50%. Pradhan *et al.* (2015), in their study of 34 major OECD countries, have evaluated the causal relationship between financial development, economic growth and insurance market development for the period 1988–2012. They have used vector auto-regression, which reveals that financial development generally causes long-term economic growth but that the insurance market causes economic growth more specifically. However, in the short run, results are bi-directional, i.e. economic growth also causes insurance market growth, and development in the financial sector. The researchers have cautioned that the economic growth of a country is not sustainable without a strong insurance market in that country.

Olayungbo and Akinlo (2016) have used the Bayesian Time-varying Parameter Vector Auto-regression (TVP-VAR) technique to assess the relationship between economic growth and the insurance industry in selected African countries during 1970–2013. Most of the results show a positive relationship between the variables, while three countries show a negative relationship. However, the researchers have not explored the reasons behind the relationship. Arena (2008) has made an attempt to quantify how the insurance industry impacts economic growth in 56 countries over a period of 29 years from 1976 to 2004. The study has measured the impact of the insurance industry using the generalized method of moments. The results reveal that the life insurance market has more impact on economic growth in developed countries. However, the life and non-life segments of the insurance industry are equally important for economic growth in developing countries. Ul Din *et al.* (2017) have evaluated the role of the insurance market in the economic growth of 20 developing and developed countries during the period 2006–2015 using panel regression. The study found that the non-life insurance industry is more significant for economic growth in developing countries compared with developed countries. Similarly, Kugler and Ofoghi (2005) in the UK, Ching *et al.* (2011) in Malaysia, Horng *et al.* (2012) in Taiwan, and Cristea *et al.* (2014) in Romania found a positive and significant role played by insurance industries in the economic growth of the respective countries. On the contrary, Omoke (2012) found no significant role played by the insurance industry in Nigeria's economic growth.

As far as Indian studies are concerned, Kaushal and Ghosh (2016) have empirically tried to establish a link between the growth of financial institutions and its impact on economic progress during the period 2004–2013. The analysis found that the economy and financial institutions grow together in the long run. The study also reveals that economic growth and insurance industry performance have a short-run positive causal effect on each other. Verma and Bala (2013) used Ordinary Least Square Regression to examine how economic growth was affected by life insurance in India during 1991–2010. The empirical results from India show a positive as well as the significant impact of life insurance on economic progress. Ghosh (2013) found a long-term effect of the life insurance industry on economic growth in India through vector auto-regression.

Through their study, Rajendran and Natarajan (2010) showed the positive impact of the economic reforms of 1991 on the largest public life insurer, the Life Insurance Corporation. This was done by comparing the overall performance of LIC before and after 1991 and the challenges posed by its competitors as well as by market conditions. The study also includes regression analysis of the business figures of LIC outside India, as well as the total business of LIC, to predict the business figures for 2012.

From this review of literature, it is found that studies carried out by scholars have been focused on insurance markets in the US and European countries. There is a scarcity of studies focused on Asian countries pertaining to the insurance industry's growth and its contribution to economic growth. Moreover, it is found that Indian studies have not focused on determining the causality between the insurance industry and post-liberalized India's economic growth. The existing studies have not considered the aggregate insurance industry nor the overall period since the economic reforms to get a complete picture of the causal effect on India's economic growth. Therefore, this paper is aimed at fulfilling the research gap by considering data for the aggregate insurance industry, including life and non-life segments, during the period 1990–2016.

3. DATA COLLECTION AND RESEARCH METHODS

3.1. Data Sources and Variables Used

The present study is based on secondary time series data. The study uses total insurance penetration, total insurance density, and per-capita GDP for the analysis of the dynamic link between the performance of the insurance industry and economic progress in India. The analysis takes into account the data for 27 years, from the year 1990 to the year 2016. The annual data on life and non-life insurance penetration are taken from the World Bank database. Total insurance penetration for a year is calculated by adding the insurance penetration of the life and non-life segments for that year. The population and the per-capita GDP (at constant 2010 prices) of India have been collected from World Bank Open Data. The total insurance premium collected for a year is calculated by multiplying the total insurance penetration by the gross domestic product of that year. After getting the total insurance premium collected, total insurance density is computed by the division of the total insurance premium collected by the population of India in that particular year. The variables used are total insurance penetration (*PEN*), total insurance density (*DEN*), and per-capita GDP (*GDP*) at constant prices.

3.2. Stationarity of the Variables

Standard regression without analyzing the properties of data may indicate that there exists a significant relationship between the variables. Therefore, studying the nature of time series becomes essential. Non-stationarity or the existence of a unit root in a time series leads to spurious regression. In spurious regression, even if the data are uncorrelated, R-square values will be high. Since the assumptions for the analysis are not valid, the analysis will exhibit aberrant behavior. Problems like t-ratios not following t-distribution arise (Gujarati and Porter, 2008).

3.3. Cointegration Test

In simple terms, if there are two or more series integrated of order one, meaning that they become stationary after subtracting their respective first lag once from the series, a cointegration test reveals if there is a long-term relationship amongst the series or not. The existence of cointegration implies that even if the given series do not move with each other in the short run, they may still have a long-term relationship or equilibrium amongst them. In this study, the cointegration test (Johansen, 1991) is employed to explore the relationship amongst the variables. Johansen (1991) suggested a method to calculate the number of cointegrating vectors in a model and also to estimate distinct relationships between them. He used the generalization of the Dickey and Fuller (1979) test. The standard Dickey-Fuller test is concerned with establishing whether the coefficient of Y_{t-1} is significantly negative. Now consider its generalization to '*n*' variables given by the following equations. Equation 1 is the classical regression equation where the independent variable (Y_{t-1}) is the past value of the dependent variable (Y_t).

$$Y_t = \beta Y_{t-1} + u_t \quad (1)$$

Then, by subtracting Y_{t-1} from both sides in Equation 1, the following Equation 2 is obtained:

$$\Delta Y_t = \beta Y_{t-1} - Y_{t-1} + u_t \quad (2)$$

Further, Equation 2 can be written as the following Equation 3:

$$\Delta Y_t = (\beta - I)Y_{t-1} + u_t \tag{3}$$

where,

Y_t is the $n \times 1$ vector of variables.

β is the $n \times n$ matrix of parameters.

u_t is the $n \times 1$ vector of the error term.

The rank of (β - I) matrix shows the number of cointegrating vectors in the model. If the rank of the matrix is non-zero, that means the variables are cointegrated.

Cointegrating vectors counts can be given by two tests, the trace test by Johansen (1988) and the eigenvalue test by Johansen and Juselius (1990). The trace test statistics give the number of linear combinations of the variables. The number of linear combinations is zero becomes the null hypothesis and should be rejected in the trace statistics. The rejection means that there is at least one linear combination which confirms the presence of cointegration amongst the series. The maximal eigenvalue test also checks for the same as the trace test does for cointegration. However, there is a difference between the alternate hypotheses of the tests. The trace test has the alternate hypothesis that there are one or more linear cointegrating combinations while the maximal eigenvalue test has the alternate hypothesis that there is only one possible linear cointegrating combination of the non-stationary variables.

3.4. Vector Error Correction Model

In Equation 3, if the rank of the matrix $B - I$ is non-zero, the variables are cointegrated. There may be a short-term disequilibrium, but equilibrium is attained in the long run. It means that u_t is the error in the short run, which corrects for disequilibrium in the long run. From Equation 3, this relationship can be expressed as follows:

$$\Delta Y_t = (\beta - I)Y_{t-1} + \alpha u_{t-1} + e_t \tag{4}$$

Equation 4 depicts that the variables are not in equilibrium if u_{t-1} is non-zero. If the value of u_{t-1} is positive, the system is above its equilibrium value. In this case, the value of α is expected to be negative to regain equilibrium. Similarly, if the value u_{t-1} is negative, the system is below its equilibrium value. The value of α is expected to be negative to make the whole term positive so that the system regains equilibrium. The value of α, error adjustment term, measures how quickly the variables adjust to attain system equilibrium (Gujarati and Porter, 2008).

4. EMPIRICAL RESULTS AND CRITICAL DISCUSSION

The Johansen (1991) cointegration technique is applied to explore the dynamic relationship amongst the variables. Time series characteristics of the data must be checked before any meaningful analysis is done. Table 1 gives the stationarity results:

Table-1. Unit root test results.

Variables	Augmented Dickey-Fuller test		Phillips-Perron test	
	Level	1st Difference	Level	1st Difference
GDP	0.4008	- 4.3404**	0.8588	- 4.3056**
DEN	- 0.3760	- 3.1019**	- 0.2479	- 3.0929**
PEN	- 1.5558	- 2.9199***	- 1.5025	- 2.9331***

Note: ** and *** denote significance level at 5% and 10% respectively.

From Table 1 it is observed that all three variables are non-stationary at the level in both the Augmented Dickey-Fuller and Phillips-Perron (Phillips and Perron, 1988) tests. The non-stationarity at the level means that the series has a mean and a variance that change with time. However, after differencing the series (meaning generating a new series by subtracting the previous period value from the current period value), the series obtained is stationary. It means that the data are first-order integrated and itis an I(1) process. The stationarity at the same level for all the variables suffices for the cointegration analysis.

Table-2. Lag order selection.

No. of Lags	LogL	SMLR	FPE	AIC	SCIC	HQIC
0	- 269.3852	NA	25.2506	20.9527	21.0978	20.9945
1	- 124.1874	245.7194*	7.1685*	10.4759*	11.0566*	10.6431*

*denotes the lag length selection (each test at 5% level).
LR: Sequential modified likely ratio test statistic.
FPE: Final prediction error.
AIC: Akaike information criterion.
SC: Schwarz information criterion.
HQ: Hannan-quinn information criterion.

After the stationarity tests, another crucial aspect of time series data is dealt with, which is lag order selection criteria. In vector autoregressive (VAR) models, lag order selection criteria reveals for how many periods in the past we want to check serial correlation in the time series. In simple terms, lag order selection tells us whether it is only the last one period value that is affecting the current value or whether the values of, for example, the last three or four periods need to be considered. The number of lags for the analysis is selected by following different lag order selection criteria. Table 2 gives the results for the lag order selection criteria.

Table 2 reveals that there are different measures to suggest the optimal lag length. However, given the limited availability of the data, it is considered that the best results are given by the Akaike information criterion (AIC), which suggests a lag length equal to one. The same is also supported by all the other measures; therefore, the optimal lag length is taken as one.

Once the stationarity of the data is checked and all of the variables are found to be integrated of the first order, the Johansen cointegration method amongst the variables is adopted. The following Table 3 and Table 4 give the results of trace statistics and maximal eigenvalue statistics in the Johansen cointegration test:

Table-3. Cointegration rank test (trace statistics).

Null Hypothesis	Test trace statistic value	95% Critical value
No. of cointegrating vectors = 0	52.7025*	42.9152
No. of cointegrating vectors ≤ 1	20.9393	25.8721
No. of cointegrating vectors ≤ 2	7.2243	12.5179

Note: * denotes the significance level at 1%.

Table-4. Cointegration rank test (maximal eigenvalue statistics).

Null Hypothesis	Test trace statistic value	95% Critical value
No. of cointegrating vectors = 0	31.7631*	25.8232
No. of cointegrating vectors ≤ 1	13.7149	19.3870
No. of cointegrating vectors ≤ 2	7.2243	12.5179

Note: * denotes the significance level at 1%.

In Table 3, Johansen's number of cointegrating vectors tests for *GDP*, *DEN* and *PEN* are estimated. In the trace test, zero or no cointegrating vector is taken as the null hypothesis. The alternate hypothesis is that there are one or more cointegrating vectors. The estimated trace statistic (52.7025) is more than the 95% critical value (42.9152). At least one cointegrating vector is suggested by this result. Subsequently, the presence of greater than one and two cointegrating vectors is tested. The trace statistic (20.9393) estimated is less than the 95% trace value (25.8721), which reveals that only one cointegrating vector is present. Along with the trace statistic, a similar procedure based on maximal eigenvalue statistic test is used with the alternate hypothesis of having $K + 1$ cointegrating vectors and the null hypothesis of K cointegrating vectors. Null hypotheses of zero, one and two cointegration vectors, against the alternative of one, two and three cointegrating vectors respectively, have been tested. The results of the tests suggest that in the model, one cointegrating vector is present.

From the trace and maximal eigenvalue statistics, it is deduced that only one cointegrating vector is present amongst the variables. It means the variables attain an equilibrium relationship in the long run. The cointegration allows for the investigation of the causality amongst the variables using the error correction mechanism. Table 5 gives the vector error correction model results. The results include both the long-term and short-run dynamics amongst the variables. With GDP, DEN and PEN as dependent variables, error correction estimates are shown in Table 5.

Table-5. VECM results.

Dependent variable	GDP	DEN	PEN	JS	ECT
PEN	0.0034 (0.3619)	- 0.05663 (0.4151)	-	0.4612 (0.6371)	0.0444 (0.5035)
DEN	0.0174 (0.6705)	-	6.4342 (0.4978)	0.2789 (0.7595)	-0.7289 (0.3259)
GDP	-	4.2233 (0.4353)	-134.9644*** (0.0523)	7.8336 (0.0031)	- 19.1338*** (0.0012)

Note: Standard errors in parentheses.
* JS: Joint Significance.
ECT: Error correction term.

In Table 5 *PEN* has an insignificant error correction term. This reveals that in the long-term, improvement in economic growth and insurance density do not lead to an improvement in insurance penetration. Similarly, *DEN* as an explained variable is insignificant, which suggests that economic growth and insurance penetration do not lead to insurance density in the long run. The variable *GDP* is significant as suggested by the error correction term in the table. This result indicates that insurance penetration and density have a causal effect on economic growth in the long term. Also, the short-term coefficient with GDP as the dependent variable and PEN as an independent variable is significant, which confirms short-term causality running on economic growth from insurance penetration.

The results shown in Table 5 strongly assert long-term one-way causality from insurance penetration and insurance density to economic growth in India. Insurance penetration and density are the two most accepted barometers of the insurance industry in a country. The expansion of economic growth requires the insurance industry to grow so that the risk exposure of economic activities is minimized. It is to be noted that insurance induces entrepreneurship by providing a shield against future uncertainties. For example, a farmer can plant high-yielding risky crops if the crops are insured. As insurance includes a thorough risk assessment, the risks known can enable efficient resource allocation. Insurance facilitates international trade by protecting against accidents in transit. Insurance premiums increase with an increase in risks; therefore, it rewards insurance buyers for adopting risk-reducing techniques, which in turn reduces economic loss in case of a mishap. In the case of natural catastrophes, insurance significantly reduces the burden on the government to pay for the damages. These are the possible reasons why insurance development leads to economic growth in India.

On the other hand, economic growth is not fostering insurance, as revealed by the results of the study. The likely reason behind this could be the low per-capita income in India, as insurance requires more disposable income. Enz (2000) describes the relationship between insurance industry growth and per-capita income as an 'S-curve'. A per-capita income between USD 3,000 and USD 5,000 causes insurance penetration and insurance density to increase at a faster rate than economic growth in a country. At lower levels of per-capita income and low insurance awareness, as in the case of India, economic growth is not able to have a significant effect on insurance industry performance.

4.1. Diagnostic Tests

Diagnostic tests to check normality, heteroskedasticity and serial correlation have been conducted. The results are presented in Table 6. Jarque–Bera (JB) statistics, with corresponding probability through a histogram, confirms the normality of the used data. Only in one case, when density is taken as a dependent variable, the residuals are found to be non-normally distributed at a 5% significance level. The remaining two results of the JB test reveal the normality of the residuals. So, it is not detrimental to the robustness of the estimated model as far as normality is concerned.

Table-6. Diagnostic tests results.

Dependent variable	Normality test	ARCH test	LM test
GDP	2.9475 (0.2291)	0.0219 (0.8822)	0.6416 (0.4231)
DEN	6.2471 (0.0440)	0.4764 (0.4901)	0.0011 (0.9732)
PEN	3.3649 (0.1859)	0.5414 (0.4619)	0.2022 (0.6529)

Note: *p*-values in parentheses.

Subsequently, heteroskedasticity presence in the model is tested through an auto-regressive condition-based heteroskedasticity (ARCH) test. Any ARCH effect existence is not shown by the results. Furthermore, the Breusch–Godfrey (GB) test, also called the Lagrange Multiplier (LM) test, is used for detecting a serial correlation in the model. No proof of serial correlation in the model is detected. These various test results indicate that the model estimation is robust and free from potential misspecifications.

5. CONCLUSION

The existing literature on the link between the insurance industry and economic growth has focused on the US and European economies. In India, previous studies have not examined the dynamic link between economic growth and the insurance industry in the post-liberalization era. Therefore, this paper has examined the causality amongst insurance penetration, insurance density and per capita GDP. The study reveals a cause-effect relationship linking the insurance industry and economic progress in India. Moreover, the direction of the relationships amongst the variables has been examined through the vector error correction mechanism. The model exhibits unidirectional relationships in short term as well as long term. A long-term causality runs from insurance penetration and density to per-capita GDP, which suggests that better performance of the insurance industry significantly contributes to economic well-being in India. Also, a short-term causality runs from insurance penetration to economic growth. This study adds to the existing literature as it incorporates not only insurance premiums as a fraction of GDP, measuring the depth of the insurance industry, but also insurance premiums per capita, measuring the width of the insurance industry in India. By taking into account post-liberalization data (i.e. 1990–2016), the time period makes the study comprehensive. The results of this study could help policymakers to focus on increasing insurance penetration, as it is critical to the economic growth of India.

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