

Strategies for Long Term Investment by Non-Life Insurance Companies in India

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Abstract

The aim of this paper is to study major determinants of long-term investment of the non-life insurance industry of India. The annual financial statements of nineteen non-life insurance companies covering a period of 5 years (2011-2015) were sampled and analyzed through panel regression. The findings indicate that, as expected, highly liquid, highly profitable and large size insurance companies have invested more in long term than lowly liquid, lowly profitable and small size companies. The researcher also find that insurance companies with higher risk retention ratio and higher leveraged ratio have invested less in long term than insurance companies with lower risk retention ratio and lower leveraged ratio.

Keywords: Non-life insurance; Investment, IRDAI, India

JEL classification: D81, G20

Introduction

Insurance industry is an important and integral component of macro economy and has emerged as a dominant institutional player in the financial market impacting the health of economy through its multidimensional role in saving and capital market [1]. It acts as a mobilizer of savings, a financial intermediary, a promoter of investment activities, a stabilizer of financial markets and a risk manager. Insurance companies generally function on two dimensional landscapes, which embrace a) underwriting activity, which is mainly centered on collecting premiums and honoring claim; b) investment activity, which is meant to dispense allowed assets into various investments to earn additional revenues [2] in the form of interest, dividends and realized capital gains [3]. Due to the complexities of insurance activities, many recent studies have attempted to use innovative techniques for designing effective strategies for the insurance firms [4].

Investment management is a backbreaking area of operation in any insurance company, which has to generate reserve for claim that might arise over a period [5] keeping in view the different risk level, regulations and a variety of investment objective implicit in mind of policyholders and shareholders [6]. Insurance companies invest their shareholder's funds, policyholder's fund and other temporally available financial resources, which have a valuable contribution to firm as well as to economy [7]. Insurance investments are oiling the wheels of economic and social development of the nation. Insurance companies decrease dependence on the banking system, acting as a shock absorber now and again for budgetary trouble ("Promoting longer-term investment by institutional investors: Selected issues and policies,". Insurers should have in place sound, systematic and objective process of determining investment pattern ("Insurance investment in a challenging global environment,") to maximize the value of shareholder as well preserve the value of policyholder [8].

Insurance companies can invest their funds in short term and long-term financial instruments viz., securities of money market and capital market. The investment portfolio is generally overwhelmed by long-term assets, but one part of funds is invested in short-term instruments for securitization of liquidity. Investment portfolio must be in accordance with liquidity need, profitability, reinsurance arrangements, leverage and stream of premium. Every portfolio should

also be rebalanced from time to time so that highest possible level of return for a given level of risk can be obtained. Insurer should determine investment portfolio by using a robust optimization framework and diversifying investment portfolio into higher income generating strategies with firm specific constraints to increase overall efficiency and risk generating return. The point of convergence for insurance investment portfolio is to ensure long-term safety, and profitability of customer's funds. Therefore, in this view of public interest, investment pattern of insurance companies is regulated in some countries [5].

The insurance industry in India is subject to comprehensive set of rules and regulations prescribed by IRDAI (The Insurance Regulatory and Development Authority of India) to ensure safety of policyholder's funds. The regulations austere specify types of securities in which insurers may invest and limit their share in total amount. Insurance companies are required to invest certain minimum amounts of their investible fund in government securities; and restrictions are likewise placed on the amount to be invested in approved investments and other investments, according to a detailed list that includes specific equities and corporate bonds as well as bank deposits. Investments in companies that have a strong multi-year dividend payment record are fall under the category of approved investments. Investments that do not fit these criteria are treated as other investments ("Report of the committee on investment pattern for insurance and pension sector"). The objective behind such across the board regulation is the preservation of the real value of funds and supports an insurer's ability to satisfy their commitment towards policyholders in coeval circumstances of an unstable investment setting [9].

The key indicators of insurance investment activities facilitate the design of policies that may improve profitability of the insurance

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industry. Investment activities of insurance firms have important macroeconomic consequences for allocation of funds between different sectors of the economy; relatively few studies investigate the investing activities of insurance companies. Majority of studies were based on theoretical aspect of investment pattern, investment regulation and financial performance of insurance companies. Investment pattern is not given due importance or adequately explored. Hence, the determinants of insurers' long term investment portfolio have attracted keen interest of investors, scientific researchers, financial markets analysts and insurance regulators. This paper seeks to cover more scientific research and academic debate into insurers' investment portfolio.

Institutional Background: An overview of the insurance industry of India

The insurance sector is a colossal one and growing at healthy rate. According to the data published by Swiss Re, India is positioned 11th among the 88 countries in life insurance sector and 21st in global non-life insurance markets. India's share in global life insurance market was 2.00 per cent during 2013. However, the share of Indian non-life insurance premium in global non-life insurance premium was small at 0.66 per cent. Since the passage of Insurance Regulatory and Development Authority Act, market share of the state-run firms has declined to 71% (2012-13) for life insurance and to 56% (2012-13) for non-life insurance. A well-developed and evolved insurance sector is a boon for economic development as it provides long-term funds for infrastructure strengthening while simultaneously fortifying the country's risk-taking ability. It is of interest to examine investment management of non-life insurance companies. Life insurance and non-life insurance have accumulated a significant amount of capital over time, which can be put productively in the economy. The mutual dependence of insurance and capital market play an instrumental role in channeling funds and investment capabilities to augment development potential of Indian economy. Insurance facilitates economic development of country through risk management, assets mobilization of savings and capital formation. Investment analysis give complete picture on efficiency with which fund entrusted to management has been deployed. In addition to these, this attempt to furnish relevant information for its various stakeholders like creditors, bankers, financial institutions, equity shareholders, suppliers, customers and government etc., for their decision making. The study further makes a modest attempt to point out that investment pattern will assume an exceptionally crucial role for becoming the Indian insurance sector become of global standard. The findings of this study would act as a source of reference for future scholars besides suggesting areas for further research where they can extent knowledge on. The findings of this study would also be valuable to policy makers on the management of investment behavior and investment efficiency in the insurance industry in India. Through the findings of this study, key regulators in the insurance industry including IRDAI would learn on the ways on how to develop rules and regulations governing the investment behavior of the Insurance industry. The findings of this study would also be valuable to investment managers in the insurance industry as it would inform them of the different ways of forming a portfolio and how it can affect investment efficiency.

Literature Review and Hypothesis Formulation

Profitability: Examination of profitability empowers financial analysts and industry regulators to assess an insurer's capacity to invest yearly surpluses efficiently so as to create new business [10]. Investment

portfolio realizations may also be managed for profit purposes [11]. Auma [12] found that there was a direct relationship between overall profitability of the insurance industry and investments in government securities and real estate; while there was an inverse relationship between overall profitability of the insurance industry and investments in stock and bank deposits. Firm with high investment return are by and large more skilled at investment related activities [13]. Moreover, return on investment activities may compensate negative consequences of risky underwriting activities that may be produced by unexpected disastrous losses [14]. Insurer's profitability may also determine its ability to increase capital by accumulating retained earnings [15]. In fact Guidara and Lai [16] suggested that profitability is positively related to risk exposure and managers are not penalized for exorbitant risk taking. Therefore, shareholders may bear stuns to their net wealth. Consequently, an insurer's superior investment performance could yield a competitive advantage, especially if the relative importance of investments surpasses that of underwriting, as a high ROI can generate better financial performances [17]. Therefore:

H1: Other things being equal, companies with high profitability will have long-term investment than companies with low profitability.

Liquidity: Liquidity indicates the capacity of a company to rapidly convert its assets to cash without having to incur significant loss. Literature has demonstrated that liquidity is an essential determinant of insurer's investment portfolio. Yet, insurance companies have customarily less risky liquidity structures than banks or certain sorts of corporate, but a large number of past failures are attributable to poor liquidity administration ("What May Cause Insurance Companies to Fail--And How This Influences Our Criteria"). Insurers ought to keep up an appropriate level of liquidity to cover loss payments and commitments when they are due. Shiu [18] illustrated that companies with more liquid assets are prone to perform better as they find themselves able to realize cash anytime to fulfill its commitment and are less exposed to liquidity risks. Shiu [18] furthermore provided that insurer with more liquid assets would be relatively unlikely to open itself to liquidity risk than would an insurer with less liquid assets. Nonetheless, there are differentiating perspectives with respect to performance and liquidity in relation to the agency theory. High liquidity could increase agency costs for owners by providing managers with incentives to misuse excess cash-flows by investing in projects with negative net present values and engaging in excessive perquisite consumption [10,19-21]. Therefore, high liquidity may lead to inefficient use of capital and reduction in return. As a consequence:

H2: Other things being equal, companies with high liquidity will have long-term investment than companies with low liquidity.

Reinsurance: As financial intermediaries, insurance companies are uncovered under different wellsprings of risk, including investment rate risk, exchange rate risk, credit risk and underwriting risk, all the more essentially, because of the sensitivity towards changes in capital level. Reinsurance is essential for the insurance companies against the exposure to the external risk elements, for assuaging the budgetary and prudent push because of imperfect capital market. Cummins and Song [22] described reinsurance as an arrangement whereby an insurance company exchange all or part of its liabilities emerging from the customer market to an alternate insurance company (reinsurer). Therefore, reinsurance will give benefit for insurance companies to fence against liquidity risk and bankruptcy risk [23]. Firms that hedge underwriting risk have the capacity to acknowledge more prominent investment risk [24]. Some authors have opposing perspective concerning reinsurance as they accept though reinsurance increases

operational stability, greater dependence on reinsurance will diminish the company's retention level and the risk of intensely reinsured company generally relies on the risk of its reinsurers which will result lower potential profitability for the insurer [18,25-29]. Similarly, Ismail [20] mentioned that reinsurance is one of the financial dynamics of insurance operation that can prompt significant variability in the overall financial results. Hence,

H3: Other things being equal, companies with low risk retention ratio will have long-term investment than companies with high risk retention ratio.

Leverage: The capital leverage ratio indicates the extent to which capital employed (defined as equity and free reserves) is leveraged for insurance business. Capital leverage ratio is calculated at both gross premium (gross premium/capital employed) and net premium (net premium/capital employed) levels. The non-life insurance industry has been prudent in its capital leverage as net written premium remained within 1.5 times the capital [30]. Increasing of leverage will increase the expected costs of financial distress and insolvency risk [31,24]. Insurers that have less capital available and higher policyholder liabilities i.e., high leverage, are expected to be less likely to meet future obligations and therefore face higher risk [32]. Insurers with high leverage will have adverse impact on the profitability [33,34]. Insurance companies could prosper by taking reasonable leverage risk or could become insolvent if risk is out of control. While, Akotey, Sackey, Amoah, and Manso [35] concluded that leverage has a positive relationship with insurers' profitability which is a reflection of the ability of insurers to convert their liabilities such as unearned premiums, contingency reserves into profitable income earning assets. Thus:

H4: Other things being equal, companies with low leverage will have long-term investment than companies with high leverage.

Size: In the finance literature, size is considered an important covariate in firm's investment portfolio. Wang and Carson [36] suggested that small firms are thought to be more prone to default than big ones. Therefore, large firms tend to have greater capacity to accommodate more risk in their investment portfolio [26,37-39]. Within this context, size assumes a vital part in affecting insurer's risk hankering through its impact on investment opportunities, the firm's access to capital and company's interest for reinsurance [40]. Larger insurance companies have economies of scale in terms of labour cost, greater capacity for dealing with adverse market fluctuations, employ specialized staff and thereby increase efficiency in underwriting

operations, investment activities and risk management [14,15,18,41-44]. Previous studies identified the impact of firm size on insurance companies operation are extensive. However, there is consensus in academic literature that economies of scale and synergies go uphill to certain level of size. Takao and Lantara [23] noted that companies get bigger and their operations become more complex, information asymmetries between different contracting bunches will be compound. It is worth noting that large organizations might bring normal performance, whilst niche players exploit their market and make higher capital returns. Large firms are normally mature organizations with less growth opportunities [45]. Accordingly:

H5: Other things being equal, large companies will have long term investment than small companies.

Research Design

Data

The empirical result of the study is primarily based on financial data of insurance companies. As on 31 March 2015, there were 28 non-life insurance companies and GIC acts as a national reinsurer. Six non-life insurance companies (including specialized insurance companies - ECGC and AIC) were working in public sector and 22 non-life insurance companies (including five standalone health insurance companies -Star Health & Allied Insurance Co., Apollo Munich Health Insurance Co., Max Bupa Health Insurance Co., Religare Health Insurance Co., and Cigna TTK Health Insurance Co.) were operating as private non-life insurance companies. Out of these companies, researcher selected 19 non-life insurance companies which include 15 private sector non-life insurance companies and 4 public sector non-life insurance companies. Two specialized insurance companies and five standalone health insurance companies are excluded as they are having different mechanism of working. Apart from that, two private non-life insurance companies established after study period excluded. Panel-based public (and audited) accounting data for 2010-11 to 2014-15 (denominated in Rs.) were obtained for 19 major non-life Indian registered insurance/reinsurance companies from IRDAI annual reports and annual reports of respective companies. This time series/cross-sectional data set represents approximately whole non-life insurance market (Figure 1).

Variables and proxies measures

Definitions of the dependent and explanatory variables of the empirical model are given in Table 1.

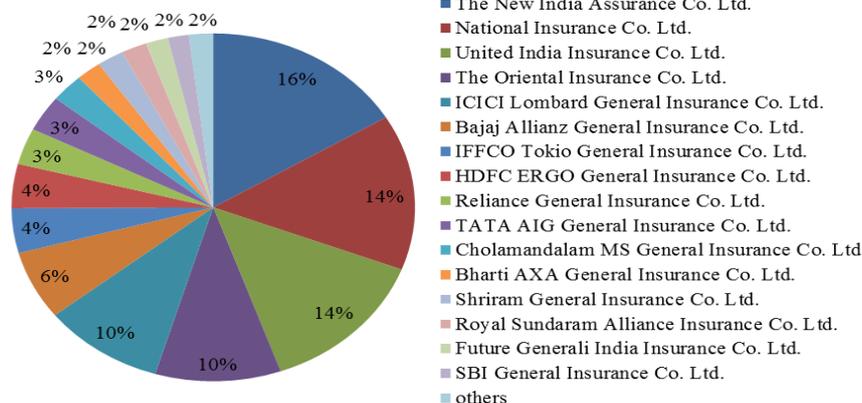


Figure 1: Market share of non-life insurance companies.

Variables	Abbreviations	Proxy measure
Dependent variable:		
Long-term investment	LTI	Long-term investment / investment
Independent variable:		
Profitability	PROFIT	Investment income/ investment
Liquidity	LIQ	Current asset/current liabilities
Risk retention ratio	RRR	Net premium/gross premium
Leverage	LEV	Net premium/capital including reserve & surplus
Size	LnSIZE	Logarithm of gross direct premium

Source: Authors' calculation

Table 1: Definitions of the dependent and explanatory variables of the empirical model.

The dependent variable long term investment (LTI_{it}) is measured by ratio of long term investment to investment. Profitability (PROFIT) is measured as the ratio of gross investment income to total investment. Liquidity (LIQ) is defined as current assets over current liabilities. Risk retention ratio (RRR) is measured as the ratio of net premium to gross premium. Leverage (LEV) is measured as the ratio of net premium to capital including reserve and surplus. Size (LnSIZE) is measured as the natural log of gross direct premium. The logarithmic transformation helps to eliminate extreme values in the data.

Model

A panel data analysis approach was embraced for the evaluation of the determinants of long term investment by non-life insurers in India. Panel data are cross-section data that are collected at various points of time, but the data concern the same panel of subjects or objects in every period [46]. Panel design has turned out to be progressively alluring in social research as it is measuring change at the individual level, controlling for omitted variable bias, obtaining larger sample sizes, reducing measurement errors [47,48]. A panel data can be analyzed in three ways: pooled OLS model, fixed effect model and random effects model. Pooled OLS models pool all observations and estimate a grand regression, ignoring the cross section and time series nature of data. Fixed effect model allow each cross section unit to have its own (intercept) dummy variable or omitted individual specific variables (B_i) are treated as fixed constants over time. Random effect model assume that the intercept value are a random drawing from much bigger population or individual specific effects, B_i like u_{it} treated as random variables [49,50]. A Hausman test at 5 percent confidence level is usually used to select either fixed or random effects for the analysis of panel regression. The random effect is used if the p-value is greater than 0.05, otherwise the fixed effect becomes the ideal model for the empirical analysis. Besides the Hausman test, Breusch- Pagan (BP) test is used to test the null hypothesis that there are no random effects. The random effect is used if the p-value is less than 0.05 or null hypothesis is rejected, otherwise the pooled OLS model becomes the ideal model for the empirical analysis. Based on the Hausman test and Breusch-Pagan (BP) test result, the study has used the random effects to estimate the parameters [51]. Random-effects model employed is thus expressed as:

$$LTI_{it} = \beta_0 + \beta_1 PROFIT_{it} + \beta_2 LIQ_{it} + \beta_3 RRR_{it} + \beta_4 LEV_{it} + \beta_5 LnSIZE_{it} + e_i + u_{it}$$

or

$$LTI_{it} = \beta_0 + \beta_1 PROFIT_{it} + \beta_2 LIQ_{it} + \beta_3 RRR_{it} + \beta_4 LEV_{it} + \beta_5 LnSIZE_{it} + w_{it}$$

Where $w_{it} = e_i + u_{it}$

Where LTI_{it} denotes long-term investment of insurer i in year t ; $PROFIT_{it}$ represent investment performance of insurer i in year t ;

LIQ_{it} represents liquidity of insurer i in year t ; RRR_{it} denotes risk retain by insurer i in year t ; LEV_{it} represents leverage of insurer i in year t ; $LnSIZE_{it}$ denotes firm size of insurer i in year t ; and w_{it} is the composite error term. The composite error term w_{it} consists of two components: e_i , which is the cross section or individual specific error component, and u_{it} , which is the combined time series and cross section error component or idiosyncratic term because it varies over cross section as well as time.

Results

Descriptive and univariate results

Table 2 provides the descriptive statistics for dependent and independent variables for the pooled firm/year observations for the sample of Indian non-life insurance companies over the period 2011-15. Descriptive statistics show that the logarithmic transformation of the company size variable reduces its variability leaving financial leverage as the variables that differ most among companies in the sample. On average, insurance companies invest 80.45 per cent of their investible funds into long term investment. Investment income as percentage of invested asset is quite low as represent by mean of 8.11 per cent. Mean liquidity ratio of insurance companies are 32.57 per cent. Mean risk retention ratio represent that on average insurance companies retain 72.84 per cent of its business underwritten. Mean leverage ratio of insurance companies are 168.12 which shows that insurance companies have finance its operation more from its underwriting operation. Table 2 shows that on an average insurance company has a size of 1.18 as measures by natural logarithm of its premium.

Multivariate results

To supplement the univariate results and allow for potential interactions among the variables, a multivariate panel data analysis was also carried out. Table 3 thus presents the random effects results for the pooled firm/year observations for the sample of Indian insurance companies for the five-year period 2011-2015 (N=95). Statistically, the overall predictive ability of a panel model is better if the p-value (that is, $prob > \chi^2$ or $prob > F$) is less than 0.0500. Estimated model have p-values of 0.000, which shows that the independent variables altogether explains the dependent variables very well.

1. Statistically significant at 0.05 (two tailed)
2. Std. Err. adjusted for 19 clusters in code

This result indicates that PROFIT and LnSIZE are statistically significant at the 0.05 level in a two tail test. RRR, LIQ and LEV are not statistically significant at the 0.05 level in a two tail test. One very interesting thing to note is that all variables have the predicted sign.

Consistent with the hypothesis (H1), PROFIT was statistically significant at the 0.05 level in a two tail test. This finding supports the hypothesis that companies with high profitability will have long term investment. This can be justified on the ground that if high profitability is due to superior investment performance and underwriting performance, an insurer with strong profitability may diminish financial unsteadiness thereby actuating less vulnerability and investor doubt.

Again in line with predicted sign, companies with high LIQ are likely to invest more in long term than companies with low liquidity. However, LIQ (H2) was not statistically significant at the 0.05 level (two tailed) but it show correct sign. Insurers ought to keep up an appropriate level of liquidity to cover loss payments and commitments

	LTI	RRR	LIQ	PROFIT	LEV	LnSIZE
Mean	80.45	72.84	32.57	8.11	168.12	1.18
Maximum	97.95	100.09	112.84	14.58	350.62	2.189
Minimum	26.5	-10.32	5.6	.34	-3.95	-1.31
Std. Dev.	17.17	18.53	19.16	2.58	98.75	.71
Obs.	95	95	95	95	95	95

Source: Results was generated from STATA

Table 2: Indian Non- Life Insurance Companies, 2011-15– Descriptive Statistics (Panel Data – 95 Company/Year Observations).

Random-effects GLS regression				Number of observation		95	
Group variable: code				Number of groups		19	
R-sq: within		0.2029		Observation per group: Minimum		5	
Between		0.6735		Average		5.0	
Overall		0.5783		Maximum		5	
Wald $\chi^2(5)$		58.13					
corr(u_i, X)		0 (assumed)		Prob> χ^2		0.000	
Long-term Investment	Predicted sign (+/-)	Coef.	Robust Std. Error	Z	P> z	[95% Conf. Interval]	
PROFIT	+	2.0457	.3417	5.99	0.000	1.376	2.715
LIQ	+	.0501	.0775	0.65	0.518	-.101	.202
RRR	-	-.0828	.0432	-1.92	0.055	-.167	.001
LEV	-	-.0048	.0163	-0.30	0.767	-.036	.027
LnSIZE	+	12.9694	4.725	2.74	0.006	3.708	22.230
_cons		53.6952	9.272	5.79	0.00	35.520	71.869
Sigma_u	8.790734						
Sigma_e	7.4112136						
Rho	.58453251 (fraction of variance due to u_i)						

Source: Results was generated from STATA

Table 3: Indian non-life insurance, 2011-15 – multivariate results (panel data – 95 company/year observations).

when they are due. The insurer with more liquid assets would be relatively unlikely to open itself to liquidity risk than would an insurer with less liquid assets.

Companies with low retention ratio are likely to invest more in long term than companies with high risk retention ratio. However, RRR (H3) was not statistically significant at the 0.05 level (two tailed) but it show correct sign. Reinsurance is essential for the insurance companies against the exposure to the external risk elements, for assuaging the budgetary and prudent push because of imperfect capital market. Reinsurance will give benefit for insurance companies to fence against liquidity risk and bankruptcy risk

LEV (H4) was not statistically significant at the 0.05 level (two tailed) but it show correct sign. Therefore, companies with low LEV are likely to invest more in long term than companies with high LEV. Insurance companies tend to be relatively highly leveraged firms. The main sources of fund are obtained by issuing more contracts with policyholders rather than raising fund from capital market. The first priority of insurance companies is to ensure that policyholder long term insurance claim and expectation are met which prevents insurance companies from locking their fund in long term.

SIZE was found to be positively related to long term investment and statistically significant at the 0.05 level (two tailed) as consistent with our expectation (H5). Within this context, large firms tend to have economies of scale in terms of labour cost, greater capacity for dealing with adverse market fluctuations, employ specialized staff and thereby increase efficiency in underwriting operations, investment activities and risk management.

Model specification and diagnostics tests

Formal diagnostic tests on the estimated model were also carried

out. First, homoscedasticity of the residuals was tested using Breusch-Pagan/Cook-Weisberg test for heteroskedasticity. The computed statistic ($\chi^2(1)=39.30$; Prob> $\chi^2=0.0000$) means the hypothesis of homoscedastic errors could not be supported at the 5% level of significance. Autocorrelation in panel data was tested using Wooldridge test for autocorrelation in panel data. Autocorrelation alludes to the serial correlation of the disturbances across periods. Estimating the model without correcting for autocorrelation leads to inefficient least squares and inferences based on the least square estimates are adversely affected [52]. The computed statistic (F (1,18)=12.611; Prob>F=0.0023) means the hypothesis of no autocorrelation could not be supported at the 5% level of significance. As a consequence the reported standard errors in Table 3 are (HAC) heteroscedasticity and autocorrelation consistent standard errors. Shapiro-Wilk W test for normal data was used to test normality of the residuals and null hypothesis of normally distributed errors was rejected. However, econometric sources such as [53], recommended that non-normal disturbances are common in small data sets and so this limitation is an unavoidable constraint of the research design. Finally, variance inflation factors (VIFs) were computed for the independent variables to ascertain the magnitude of hidden collinearity. Since none of the computed VIFs were more than 10 and mean VIF is 1.39. Thus, it can be concluded that multicollinearity is not to be a problem in this model.

A Breusch and Pagan Lagrangian multiplier test for random effects at 5 percent confidence level is usually used to select either pooled or random effects for the analysis of panel regression. The pooled model is used if the p-value (prob> χ^2) is greater than 0.05, otherwise the random effect becomes the ideal model for the empirical analysis [54]. Based on the Breusch and Pagan Lagrangian multiplier test for random effects, the study has used the random effects to estimate the parameters for equation. The computed statistic (Prob> $\chi^2=0.0000$) suggests that

random effect model should be used. Furthermore, Hausman Test at 5 per cent confidence level is usually used to select either fixed or random effects for the analysis of panel regression. The random effect is used if the p-value ($\text{prob} > \chi^2$) is greater than 0.05, otherwise the fixed effect becomes the ideal model for the empirical analysis [54]. Based on the Hausman test result, the study has used the random effects to estimate the parameters for equation. The computed statistic ($\text{Prob} > \chi^2 = 0.1600$) suggests that random effect model should be used.

Conclusion

This study performed an empirical test of the determinants of investment pattern of insurance companies using a framework derived from the organizational economics literature. There are plenty of writings in the field of insurance; no such broad and comprehensive study has been embraced by anybody with respect to determinants of investment pattern of insurance companies. This study advances the knowledge and understanding of how the various factors have affected the investment pattern of insurance companies in India. It was found that, as expected, highly liquid, highly profitable and large size companies have invested more in long term than lowly liquid, lowly profitable and small size companies. Furthermore, companies with higher risk retention ratio and higher leveraged ratio have invested less in long term than companies with lower risk retention ratio and lower leveraged ratio. This result indicates that PROFIT and LnSIZE are statistically significant while RRR, LIQ and LEV are not statistically significant at the 0.05 level in a two tail test. The results, particularly in respect of financial leverage or risk retention ratio are generally supportive of the view widely reported in the practitioner literature that insurance companies with high financial leverage or higher risk retention ratio will increase the expected costs of financial distress or bankruptcy cost. Large company size or highly profitable companies may have more space to undertake investment decision due to impressive financial aspect of scale, technical adroitness and potential trading volume. Firm with high liquidity have a cushion against risk and enable managers in insurance companies to fulfill their immediate commitments to policyholders and other creditors without having to realize its portfolio before maturity. It was acknowledged that interpretation of the results should be tempered by recognition of the limitations in the study such as the small time period used. However, where possible, one has attempted to control for these limitations by employing a panel data design and testing the model against a battery of diagnostic tests. The authors thus feel that the study could urge others to investigate ways of overcoming the data availability problem and carryout further research in Indian insurance market.

References

1. Subramaniam A (2012) Life insurance industry: Past, present and the future. In: Kumar SAS, Ramakrishnan L (2010) Emerging paradigms in insurance industry and management. New Delhi: Serial Publications.
2. Pranevičius H, Sutiene K (2008) Copula effect on investment portfolio of an insurance company, technological and economic development of economy. *Baltic Journal on Sustainability* 14: 344-373.
3. Akintola-Bello O (1986) Investment behaviour of insurance companies in Nigeria. *Savings and Development* 10: 379-407.
4. Ansari A, Riasi A (2016) Modelling and evaluating customer loyalty using neural networks: Evidence from startup insurance companies. *Future Business Journal* 2: 15-30.
5. Vaidyanathan R, Sriram K (2000) Regulatory framework for investments of insurance and pension funds in India: Emerging scenario.
6. Sadhak H (2009) Life insurance in India: Opportunities, challenges and strategic perspective. New Delhi: Sage Response.
7. Palande PS, Shah RS, Lunawat ML (2003) Insurance in India: Changing policies and emerging opportunities. New Delhi: Response Books.
8. Plantinga A, Huijgen C (2000) Performance measurement and insurance liabilities.
9. Kocovic J, Antic TR, Jovovic M (2011) The impact of the global financial crisis on the structure of investment portfolios of insurance companies. *Economic Annals*.
10. Adams M, Burton B, Hardwick P (2000) The determinants of credit ratings in the United Kingdom insurance industry. *Journal of Business Finance & Accounting* 30: 539-572.
11. Collins JH, Geisler GG, Shackelford DA (1997) The effects of taxes, regulation, earnings, and organizational form on life insurers investment portfolio realizations. *Journal of Accounting and Economics* 24: 337-361.
12. Auma M (2013) The Relationship between portfolio holding and financial performance of insurance companies in Kenya.
13. Shiu YM, Wang CF, Adams A, Shin YC (2012) On the determinants of derivatives hedging by insurance companies: evidence from Taiwan. *Asian Economic and Financial Review* 2: 538-552.
14. Curak M, Utrobicic M, Kovac D (2014) Firm specific characteristics and reinsurance-Evidence from Croatian insurance companies.
15. Shim J (2010) Capital-based regulation, portfolio risk and capital determination: Empirical evidence from the US property-liability insurers. *Journal of banking & finance*.
16. Guidara A, Lai VS (2014) Capital adjustment and insolvency risk under underwriting cycles: A study of Canadian property-liability insurance firms.
17. Lee HH, Lee CY (2011) Determinants of property-liability insurer retention: Evidence from Taiwan insurance industry. *African Journal of Business Management*.
18. Shiu Y (2004) Determinants of United Kingdom general insurance company performance. *British Actuarial Journal* 10: 1079-1110.
19. Pottier SW (1998) Life insurer financial distress, Best's ratings and financial ratios. *The Journal of Risk and Insurance* 65: 275-288.
20. Ismail M (2013) Determinants of financial performance: The case of general takaful and insurance companies in Malaysia. *International Review of Business Research Papers* 9: 111-130.
21. Adams M, Buckle M (2003) The determinants of corporate financial performance in the Bermuda insurance market. *Applied Financial Economics*.
22. Cummins JD, Song Q (2008) Hedge the hedgers: Usage of reinsurance and derivatives by PC insurance companies.
23. Takao A, Lantara IWN (2009) The determinants of the use of derivatives in Japanese insurance companies.
24. Liebenberg AP, Colquitt LL, Hollans H (2010) The determinants and potential effects of life insurer mortgage backed securities exposure. *Journal of Insurance Issues* 33: 1-30.
25. Choi BP, Park J, Ho CL (2009) Insurer liquidity creation: The evidence from U.S. property and liability insurance industry.
26. Yu T, Lin B, Oppenheimer HR, Chen X (2006) Intangible assets, going-for-broke and asset risk taking of property and liability insurance firms.
27. Gorter J, Bikker J (2011) Investment risk taking by institutional investors.
28. Adiel R (1996) Reinsurance and the management of regulatory ratios and taxes in the property-casualty insurance industry. *Journal of Accounting and Economics* 22: 207-240.
29. Pottier SW, Sommer DW (1999) Property- liability insurer financial strength rating: Difference across rating agencies. *The Journal of Risk and Insurance* 66: 621-642.
30. General Insurance Council (2014) Indian nonlife insurance industry.
31. Colquitt LL, Hoyt RE (1997) Determinants of corporate hedging behavior: Evidence from the life insurance industry. *The Journal of Risk and Insurance* 64: 649-671.
32. Zhang L, Nielson N, Haley J (2013) Risk and return determinants of US insurers.
33. Burca AM, Batrinca G (2014) The determinants of financial performance in the

- Romanian insurance market. *International Journal of Academic Research in Accounting, Finance and Management Science* 4: 299-308.
34. Malik H (2011) Determinants of insurance companies profitability: An analysis of insurance sector of pakistan. *Academic Research International* 1: 315-321.
 35. Akotey JO, Sackey FG, Amoah L, Manso RF (2013) The financial performance of life insurance companies in Ghana. *The Journal of Risk Finance*.
 36. Wang Y, Carson JM (2010) Macroeconomic factors and insurer rating transitions.
 37. Eling M, Marek S (2011) Internal and external drivers for risk taking in U.K. and German insurance markets.
 38. Chen X, Yao T, Yu T (2011) How do insurers manage credit risk exposure of corporate bond portfolios? An analysis based on background risk.
 39. Chen X, Sun Z, Yao T, Yu T (2013) Background risk and insurers' risk-taking behavior in the corporate bond market.
 40. Mankai S, Belgacem A (2013) Interactions between risk-taking, capital, and reinsurance for property-liability insurance firms.
 41. Mehari D, Aemiro T (2013) Firm specific factors that determine insurance companies' performance in Ethiopia. *European Scientific Journal* 9: 245-255.
 42. Wells B, Epermanis K, Cox LA, McShane M (2009) Asset-liability management problems in the life insurance industry: Lessons from the Past. *Journal of Insurance Regulation*, forthcoming.
 43. Zhang T (2005) Enterprise risk management, adverse selection, and the insurance industry.
 44. Cummins JD, Phillips RD, Smith SD (1996) Corporate hedging in the insurance industry: the use of financial derivatives by US insurers.
 45. Zou H, Yang C, Wang M, Zhu M (2009) Dividend decisions in the property and liability insurance industry: Mutual versus stock companies. *Rev Quant FinanAcc*.
 46. Vogelpang B (2005) *Econometrics theory and applications with Eviews*. England: Pearson Education Limited.
 47. Andreb HJ, Golsch K, Schmidt AW (2013) *Applied panel data analysis for economic and social surveys*. New York: Springer.
 48. Frees E (2004) *Longitudinal and panel data: Analysis and applications in the social science*. Cambridge: Cambridge University Press.
 49. Hsiao C (2014) *Analysis of Panel Data*. New York: Cambridge University Press.
 50. Wooldridge JM (2002). *Econometric analysis of cross section and panel data*. United State: The MIT Press.
 51. Gujarati DN, Porter DC, Gnasekar S (2012) *Basic econometrics*. New delhi: McGraw hill education (India) private limited.
 52. Greene WH (2003) *Econometric analysis*. New Jersey: Prentice Hall. Insurance Regulatory and Development Authority of India.
 53. Kmenta J (1971) *Elements of econometrics*. New York: Macmillan.
 54. Torres-Reyna O (2007) *Panel data analysis fixed and random effect using STATA*.