External Macroeconomic Determinants and Financial Performance of Life Insurance Sector: Evidence from India

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ABSTRACT

This paper is an attempt to study the impact of external macroeconomic determinants on the financial performance of life insurance sector in India. Past researches indicates positive relationship between GDP and profitability of life insurance sector and mixed results are obtained between inflation and financial performance of life insurance sector in developed countries. Therefore, there is a need to conduct such study in a country like India which is an emerging market. For the purpose of this study, Correlation and Multiple Regression Analysis is used for 23 companies for a period of 10 years that is from 2009-10 to 2014-15. Data Quality is checked using autocorrelation, heteroscedasticity and multicollinearity. Findings indicate that ROA and ROE both had negative insignificant relationship with macroeconomic external determinants considered in the study.

Keywords: Profitability, Macroeconomic External Determinants, ROA, ROE

INTRODUCTION

Financial services sector, undoubtedly contributes a lot in high growth for an economy. It is also contributing in generating employment and tax revenue. With time, employment and tax collection generated by financial sector is also increasing. Another area where this sector contributes is maintaining credit line to deficit sector. In India, financial services sector has achieved dynamic growth in recent years and therefore it has taken an important place. Since independence, Role of Financial sector has attained a lot of importance in extending credit to industrial sector which can contribute in shaping fortune for Indian economy.

Unlike past, when financial sector mainly constituted of banking, in today's time, it comprises of many other financial institutions such as insurance companies, mutual funds, NBFC's, micro finance, co-operatives banks, pension funds, capital market to name a few. Banks, financial institutions and Insurance companies play very important role in contributing to the stability of financial system. Growth in economy can be expected only when these companies perform well.

Two important pillars of financial sector are Banking and insurance. According to joint report by KPMG-CII, Indian banking sector is poised to become fifth largest by 2020. As per the report, growth rate of bank credit is expected to achieve CAGR of 17 percent in coming years. Indian Insurance sector is expected to touch a value of US$ 350-400 billion in coming three years that is by 2020. Relationship of Insurance and growth has risen from last few years. As per Swiss Reinsurance Company, 1990, the annual growth rate achieved by Insurance industry globally is over 10% since 1950 which is much higher than the growth rate of global economic development.

In recent years, life insurance sector has received attention in developed as well as developing nation as it is a driving force to economic growth. (Soon, 1996; Ward and Zurbruegg, 2000; Mahdavi and Majed,

2011).Insurance Sector plays an important role in financial development of country. Growing insurance sector contributes in stability of financial system. Insurance companies help in transferring the risk and perform role of financial intermediation. (Peter Haiss and Kjell Su¨megi 2008). Ideal Insurance sector is the one which creates value for all stakeholders i.e. policy holders, shareholders, distributors and insurance company which interlinks all the entities (E and Y report of 2015). Apart from the mentioned entities, Insurance also renders poise to equity market. The funds channelized in infrastructure development by Insurance sector have grown from Rs.913 Billion from FY 2008 to Rs. 2913 in FY 2015(E and Y report of 2015). Long term value creation for all entities can be achieved only when the business earns sufficient profits.

It can be inferred that the performance of insurance industry is largely affected by the economic conditions. A report by Ernst and Young (2012) indicated that Indian Insurance Market is expected to do well in coming years as per capital income may rise, which suggest that there are macroeconomic variables which determines the performance of Insurance Market. Life Insurance Business in US was also affected by macroeconomic factors. In 2001, when the US economy sank in recession, the premium receipts of life insurance policies of Insurance Companies decreased by as much as 6.9%. (2000: 9.8% and 2002: 11.2%) [American Council of Life Insurance (ACLI), 2003]. Similar results were obtained from a study (Langkjrer-0hlenschlreger and McGaughey, 2001) in UK which cited that economic cycles pay an important role in affecting the demand of insurance products. Another study conducted by Faugere and Van Erlach, (2003) explored that one variable which is growth in gross written premiums is highly correlated with the macroeconomic environment.

Previous studies have been conducted in the context of developed countries where insurance market is also matured. Therefore, exploring the relationship of profitability of life insurance sector and external macroeconomic determinants is absolutely essential in an emerging market like India and there is dire need to develop a quantitative model which may help regulators in assessing the insurance industry performance when macroeconomic scenario changes.

For the purpose of study, twenty three out of twenty four companies for a period of six years (i.e. 2009-10 to 2014-15) are considered. Heteroscedasticity, multicollinearity and multiple regression is used for the purpose of analysis and results indicate that there exists negative and insignificant relationship between macroeconomic factors and profitability of life insurance sector in India. The results achieved are contrary with the relationship observed in developed countries. This study is an attempt to explore and evaluate the association between the two. The findings of the research will contribute to the current literature in providing empirical evidence stating macroeconomic factors profitability of insurance sector in an emerging market. The paper is organized as follows. Section 2 covers brief reviews of related literature and formulates the main research hypothesis. Section 3 explains the research methodology and describes the samples and data used in the empirical tests. Section 4 reports the basic empirical results and the results of the additional tests. Section 5 includes the conclusion.

Theory

Study by Shiu (2004) investigated the factors affecting the profitability of UK general insurance companies. Results have revealed that there is positive relation in financial performance of U.K. general insurance companies and interest rates, equity returns, solvency margin and liquidity, and negatively relation is observed between financial performance and unexpected inflation and reinsurance dependence. Liquidity, Unexpected Inflation and Interest Rate Level are statistically significant determinants of the performance of U.K. general insurance companies (Shiu, 2004) Further a study was conducted by Ćurak, and Pepur, They examined the determinants of financial performance of composite insurance companies in Croatia and their impact on the profitability. His study revealed that size, underwriting risk, inflation and equity returns have

significant impact on ROA (Ćurak, and Pepur, 2011). Oyekan also investigated the impact of determinants on the financial performance of the select firms in Nigeria and South Africa. Micro-Life insurers were considered in their study. Results revealed that cost efficiency is significantly and positively related with ROA. Leverage positively related and reinsurance negatively related with ROA. No statistically significant relationship between ROA and ownership structure. Company specific variables like company size, product mix, length of time of operations in the market (age), and macro-economic factors such as the average annual interest rates, were significantly affecting the ROA of micro-life insurers. (Oyekan, 2013). Reshid, in his study determined the factors affecting profitability of the insurance companies in Ethopia. The dependent variable considered for the study was Return on Assets (ROA) .

In contrary to this, a study conducted by Hussain in Pakistan reflected different results in terms of macroeconomic variables. Results revealed that life insurance companies' profitability is insignificantly affected by inflation, macroeconomic environment, past profitability, and underwriting risk. (Hussain 2015)

Macroeconomic Factors affecting financial performance of life insurance sector

Financial performance of life insurance sector is affected by many external macroeconomic factors. Gross domestic product, interest rate and inflation in the economy may affect the financial performance of the life insurance sector. Literature shows mixed results in context to inflation. The factors considered for the purpose of study are Gross Domestic Product, Interest and Inflation.

OBJECTIVES OF STUDY

The objective of the study is as follows:

To determine the external/macroeconomic determinants and its impact affecting the financial performance of life insurance sector in India.

Formulation of Hypothesis

From the above theory, following hypothesis are to be tested-

$H_{1.1}$: There is no significant impact of macroeconomic factors on ROA of life insurance sector

$H_{1.2}$: There is no significant impact of macroeconomic factors on ROE of life insurance sector

RESEARCH METHODOLOGY

To test the above hypothesis, following methodology is used-

Model 1 $ROA_{i,t} = \beta_0 + \beta_1 GDP_{i,t} + \beta_2 INT_{i,t} + \beta_3 INF_{i,t} + \varepsilon_{i,t}$

Model 2 $ROE_{i,t} = \beta_0 + \beta_1 GDP_{i,t} + \beta_2 INT_{i,t} + \beta_3 INF_{i,t} + \varepsilon_{i,t}$

In Model 1, ROA is Return on Assets is considered to be a dependent variable and it is determined by taking percentage of net profit to total assets, another dependent variable proposed in model 2 is ROE which is return on equity and is measured by taking percentage of net profit to stockholder's equity. Three independent variables are considered in both the model. The proxy for independent variables are as follows- GDP is taken as annual growth rate of GDP (gross domestic product), Annual Growth Rate of WPI is considered for Inflation and Annual Base Rate (%) for interest rate. Banks are not allowed to lend the amount below the minimum rate which is called as base rate therefore it is considered as proxy measure for interest rate.

Prior to applying multiple regression, data is checked for heteroscadicity and multicollinearity. Breusch-Pagan test is conducted to test the data for heteroscadicity , VIF is determined for checking the multicollinearity and durbin-watson test (test statistic d) is applied for assuring that auto-correlation does not exist in the data.

RESULTS AND DISCUSSIONS

Table 1: Correlation Matrix Regarding Model 1, ROA

		ROA	GDP	INT
GDP	Pearson Correlation	-0.734		
	Sig.(two-tailed)	0.097***		
	N	6	6	
INT	Pearson Correlation	-0.57	0.156	
	Sig.(two-tailed)	0.237	0.768	
	N	6	6	
INF	Pearson Correlation	-0.16	-0.051	-0.526
	Sig.(two-tailed)	0.976	0.924	0.283
	N	6	6	6

Model 1

Correlation (Model 1, ROA)

Table 1 presents correlation matrix between ROA and external macroeconomic variables. The results indicate that there is significant negative correlation between: Gross Domestic Product GDP and ROA. The results also indicate that there exists negative insignificant relationship between interest rate and ROA and Inflation and ROA. One of the reason for this negative relationship may be that in the economy where GDP is rising, there is higher demand for money in market which ultimately increases interest rates. In such scenario the rates offered on fixed and variable income instruments also increases. Therefore people shift their amount from life insurance to fixed income instruments. The reason being people in India do not consider life insurance as risk minimizing instrument rather it is considered to be a kind of saving instrument.

Table 2 : Coefficients of Regression Model 1, ROA

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	29.992	10.802		2.776	.109		
	GDP	-.996	.395	-.648	-2.525	.128	.974	1.026
	IntRate	-2.142	.943	-.684	-2.271	.151	.706	1.416
	Inflation	-.400	.292	-.409	-1.372	.304	.722	1.385

a. Dependent Variable: ROA

Data is checked for multicollinearity, as per table 2 value of VIF factor is lying between 0.10 and 10 for all three independent variables.

Table 3 : Regression Model Summary[b] of Model 3, ROA

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.934[a]	.872	.680	1.628743892	.872	4.535	3	2	.186	2.660

a. Predictors: (Constant), Inflation, GDP, IntRate

b. Dependent Variable: ROA

Table 3 presents summary of Regression Model which shows that there is no problem of autocorrelation in the data as the value of Durbin Watson Test is 2.660.

Table 3 also gives the output of Regression Model 1.Adjusted R-square is .680, which suggest independent variables explained 68.00% of the variation in the dependent variable. It can be concluded that the model so applied is good fit.

Table 4 : Heteroskedasticity test for ROA Model 1

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of ROA

chi2 (1)   =   .17

 Prob > chi2 =   0.6832

Data is also checked for Heteroskedasticity. Table 4 presents the results in which p-value > .05, which indicates null hypothesis is not rejected. It suggest that data is not heteroskedastic.

Table 5 : Analysis of Variance (ANOVA[a]) for Model 1, ROA

Model		Sum of Squares	Df	Mean Square	F	Sig.
3	Regression	.089	3	.030	5.431	.159[b]
	Residual	.011	2	.005		
	Total	.100	5			

a. Dependent Variable: ROA

b. Predictors: (Constant), INFLATION, GDP, INTERESTRATE

Result of Regression Model 1-

$$ROA_{i,t} = 29.992 - 0.0996GDP_{i,t} - 2.142INT_{i,t} - 0.400INF_{i,t} + \varepsilon_{i,t}$$

Referring to Table 2, GDP, Inflation and Interest had negative insignificant impact on GDP. The reason for negative relationship can be that if economy expansion happens than it creates higher demand for money which increases inflation in the economy. So, economy expansion ultimately enhances interest rates and investors divert their funds to higher yielding assets from lower yielding assets. Life insurance products cover risk and also provides component of investment. Mortality amount is deducted from total premium paid by policyholders and rest of the amount is invested in different investment avenues by life insurance companies.

The amount which is diverted towards investment component is lowered down due to the deduction of mortality amount which lowers the yield on total premium paid for life insurance products, and may be because of this increase in GDP had negative impact on ROA. Life Insurance Companies also invests their funds in fixed income instruments and when the interest rate increases, the prices of fixed income instruments declines which eventually affect the profitability negatively for life insurance companies. Same can be extended for inflation, as rise in inflation causes interest rates to increase. Therefore, it indicates that null hypotheses is not rejected. It can be inferred that GDP, interest rates and inflation have negative insignificant relationship with ROA, a proxy for measuring financial performance.

Model 2

Table 6 : Correlations for Model 2 (ROE with External Macroeconomic Variables)

		Roe	GDP	INT
GDP	Pearson Correlation	-0.72152		
	Sig.(two-tailed)	0.053***		
	N	6	6	
INT	Pearson Correlation	-0.54317	0.156165	
	Sig.(two-tailed)	0.133	0.384	
	N	6	6	
INF	Pearson Correlation	-0.08173	-0.05055	-0.52644
	Sig.(two-tailed)	0.439	0.462	0.142
	N	6	6	6

Table 6 presents correlation matrix between ROE and external macroeconomic variables. The results indicate that there is significant negative correlation between: GDP and ROE. The results also indicate that there exists negative insignificant relationship between interest rate and ROA and Inflation and ROA.

Table 7 : Coefficients of Regression Model 2, ROE

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	108.121	30.048		3.598	.069		
	GDP	-2.786	1.097	-.637	-2.539	.126	.974	1.026
	IntRate	-6.201	2.623	-.697	-2.364	.142	.706	1.416
	Inflation	-1.338	.811	-.481	-1.649	.241	.722	1.385

a. Dependent Variable: ROA

Data is checked for multicollinearity, as per table 7 value of VIF factor is lying between 0.10 and 10 for all three independent variables.

Table No. 7 suggests that ROE have negative insignificant relationship with GDP, interest rate and inflation rate. It indicates that null hypotheses(H02) is not rejected.

Table No. 8: Regression Model Summary[b] of Model 4, ROE

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
4	.937[a]	.877	.693	4.53051	.877	4.770	3	2	.178	2.651

a. Predictors: (Constant), Inflation, GDP, IntRate

b. Dependent Variable: ROE

Table 8 presents summary of Regression Model which shows that there is no problem of autocorrelation in the data as the value of Durbin Watson Test is 2.660.

Table 8 also gives the output of Regression Model 1.Adjusted R-square is .693, which suggest independent variables explained 69.30% of the variation in the dependent variable. It can be concluded that the model so applied is good fit.

Table 9 : Heteroskedasticity test for ROE Model (Model 2)

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance

Variables: fitted values of ROE

chi2 (1)   =   .03

 Prob > chi2 =   0.8576

Data is also checked for Heteroskedasticity. Table 9 presents the results in which p-value > .05, which indicates null hypothesis is not rejected. It suggest that data is not heteroskedastic

Table 10 : Analysis of Variance (ANOVAa) for Model 4, ROE

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	293.697	3	97.899	4.770	.178[b]
	Residual	41.051	2	20.526		
	Total	334.748	5			

a. Dependent Variable: ROE

b. Predictors: (Constant), Inflation, GDP, IntRate

Result of Regression Model 2-

$$ROE_{i,t} = 108.121 - 2.786GDP_{i,t} - 6.201INT_{i,t} + 1.338INF_{i,t} + \varepsilon_{i,t}$$

CONCLUSION

ROA and ROE, measure of financial performance had negative insignificant relationship with the independent variables considered in the study. Regression Model are applied to predict the impact of

macroeconomic external determinants in the study are good fit which is reflected from the adjusted R square. Both Regression Models (ROE and ROA) are good fit to predict impact of Macroeconomic external determinants on profitability of life insurance sector in India. ROE model had better explanatory power as compared to ROA model. Hence for judging Macroeconomic external determinants i.e. GDP, Interest Rate and Inflation, affecting financial performance of Life Insurance Sector, ROE models appeared justified and appropriate model.

This study contributes to the growing literature in the area of insurance in determining the relationship between financial performance of life insurance sector and external macroeconomic determinants. The findings of the study will be of the interests to policymakers, academics and investors. Policymakers can make their strategic decisions by identifying trends of the economy so that it may increase the profitability of life insurance companies and will benefit all.

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Abbreviation	Full Name
GDP	Gross Domestic Product
WPI	Wholesale Price Index