Life Insurance Industry in India: Competition, Efficiency & Regulation

A thesis submitted to the University of Hyderabad in partial fulfillment of the requirement for the award of

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ECONOMICS

By

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DECLARATION

I **Tapas Kumar Parida,** hereby declare that this thesis entitled "**Life Insurance Industry in India: Competition, Efficiency & Regulation"** submitted by me under the guidance and supervision of **Prof. Debashis Acharya**, School of Economics, is a bonafide research work, which is also free from plagiarism. I also declare that it has not been submitted previously in part or full to this University or any other University or Institution for the award of any degree or diploma. I hereby agree that my thesis can be deposited in Shodganga/INFLIBNET.

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CERTIFICATE

This is to certify that the research work embodied in the present thesis entitled "**Life Insurance Industry in India: Competition, Efficiency & Regulation"** has been carried out by **Tapas Kumar Parida (Registration No. 10SEPH15),** in partial fulfillment of the requirement for the award of the degree of Doctor of Philosophy in Economics, under my supervision.

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Dedicated to my Parents…

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Tapas Kumar Parida

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ABBREVIATIONS

AIC: Agriculture Insurance Company of India Ltd

AUM: Assets under Management

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AVR: Asset Valuation Reserve

BRICS: Brazil, Russia, India, China and South Africa

CAGR: Compound Annual Growth Rate

CD: Cobb-Douglas function

CI: Concentration Indices

CPI: Consumer Price Index

CRS: Constant Returns to Scale

DAR: Detailed Assessment Report

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DEA: Data Envelopment Analysis

DFA: Distribution Free Approach

DMUs: Decision Making Units

ECGC: Export Credit Guarantee Corporation of India

ENT: Entropy Index

EU: European Union

EWS: Early Warning Signals

FDH: Free Disposal Hull

FDI: Foreign Direct Investment

FE: Fixed Effects Model

FIPB: Foreign Investment Promotion Board

FIs: Financial Institutions

FMOLS: Fully Modified OLS

GDP: Gross Domestic Product

GDS: Gross Domestic Savings

GIC: General Insurance Corporation of India

HHI: Herfindahl-Hirschman Index

HKI: Hannah and Kay Index

HOV: Horvath Index

HTI: Hall-Tideman Index

IAC: Insurance Advisory Committee

IBA: Indian Banks' Association

IBNER: Incurred but Not Enough Reported

IBNR: Incurred but Not Reported

IIB: Insurance Information Bureau

IPOs: Initial Public Offerings

IRA: Insurance Regulatory Authority

IRDA: Insurance Regulatory Development Authority

IRS: Increasing Returns to Scale

KYC" Know Your Client

LIC: Life Insurance Corporation

LID: Life Insurance Density

LIP: Life Insurance Penetration

LOB: Lines of Business

M&As: Mergers and Acquisitions

MES: Minimum Efficient Scale

MLI: Modified Lilien Index

MPI: Malmquist Productivity Index

MVA: Market Value Adjustment

NAV: Norm of Absolute Values

NCAER: National Council of Applied Economic Research

OECD: Organisation for Economic Co-operation and Development

OLS: Ordinary Least Squares

PCSE: Panel Corrected Standard Errors

PFRDA: Pension Fund Regulatory and Development Authority

PLI: Postal Life Insurance

PMJDY: Pradhan Mantri Jan Dhan Yojana

PMJJBY: Pradhan Mantri Jeevan Jyoti Bima Yojana

PMSBY: Pradhan Mantri Suraksha Bima Yojana

PTE: Pure Technical Efficiency

RE: Random Effects Model

ROA: Return on Assets

ROE: Return on Equity

RPLI: Rural Postal Life Insurance

SCI: Structural Change Indices

SCP: Structure-Conduct-Performance

SE: Scale Efficiency

SFA: Stochastic Frontier Approach

TAC: Tariff Advisory Committee

TE: Technical efficiency

TFA: Thick Frontier Approach

TFP: Total Factor Productivity

TPA: Third Party Administrators

ULIPs: Unit-linked insurance plan

VAR: Vector Auto-Regressions

WPI: Wholesale Price Index

Chapter I

Motivation, Problem Setting, Objectives and Scope of the Study

1.1 Introduction

The Insurance Industry has a long presence in India but the sector opened up for private and foreign participation in August 2000, i.e. after formation of the Insurance Regulatory Development Authority (IRDA), with a cap for foreign investment fixed at 26%. With the private and foreign player's participation, the industry structure has moved towards a more competitive market from a pure monopoly. In the post-reform period (2000-01 to 2013-14), the insurance sector has recorded an impressive growth, with life insurance business at a CAGR of 18% in total premium and 21% in new business premium collections and non-life segment grew by 16%. There has also been significant expansion of the customer base, product innovations and operational innovations due to increased competition among the players. However, the insurers still grapple with a number of issues, like raising capital, pricing of the product, customer service and profitability. In addition to this sudden regulatory changes, levy of new tax structure and modification in life table etc, add to the burden of the insurance companies. The companies therefore realign their process and pricing mechanism to remain profitable in the business.

Though, the sector has developed in many aspects of insurance, compared to the developed countries like US, UK and France, the Indian life insurance sector still lags in terms of Insurance Penetration (ratio of premium volume to GDP) and Density (ratio of gross premium volume to total population in a country). Life insurance penetration in India is only 3.1% as on 2013-14. This is indicative of a huge potential for life insurance in India. To enhance insurance penetration, the Government of India has passed the insurance bill in the parliament to allow FDI limit up to 49% with Indian management control. This move may help the insurers to infuse more capital for furthering business in the sector. It is estimated that the industry is expected to attract capital inflows of about Rs 40,000 crore to Rs 60,000 crore over the next 5 years and immediate inflows of around Rs 20,000 crore. If these projected levels of capital inflows materialize, the industry is likely to expand at a CAGR of about 15% over the next 10 years (Parida; 2015).

It has been more than a decade since the sector was liberalized. The sector merits a thorough review now. In light of the above, the present study attempts to investigate the changing market structure, efficiency and profitability of the life insurance segment in India.

1.2 Evolution of the Indian Life Insurance Sector

The Indian insurance industry originated with the establishment of the *Oriental Life Insurance Company* at Calcutta in the year 1818, to cater the needs of the European Community. During the pre-independence period, there was lot of discrimination towards the Indian household in terms of interest rate and higher premiums. In 1914, the Government of India started publishing returns of Insurance Companies in India. The Indian Life Assurance Companies Act, 1912 was the first statutory measure to regulate life business. In 1928, the Indian Insurance Companies Act was enacted to enable the Government to collect statistical information about both life and non-life business transacted in India by Indian and foreign insurers including provident insurance societies. In 1938, with a view to protect the interest of the Insurance public, the earlier legislation was consolidated and amended by the Insurance Act, 1938 with comprehensive provisions for effective control over the activities of insurers.

The Insurance Amendment Act of 1950 abolished 'Principal Agencies'. However, there were a large number of insurance companies and the level of competition was high. There were also allegations of unfair trade practices. The Government of India, therefore, decided to nationalize insurance business. An Ordinance was issued on 19th January, 1956 nationalizing the Life Insurance sector and Life Insurance Corporation (LIC) came into existence in the same year. The LIC absorbed 245 Indian and foreign insurers, including 154 Indian, 16 non-Indian insurers and 75 provident societies. The LIC remain the sole life insurer till the late 1990s, when the insurance sector was reopened to the private sector. The insulated competitive market forces, the nationalized insurance monopolies of India have not really participated in the global developments. Due to this, the insurance penetration and insurance density remained at the significant low level.

The process of re-opening of the sector begun in the early 1990s, the Government of India had appointed a committee headed by former, RBI Governor Mr. R N Malhotra, in April 1993 to propose recommendations for reforms in the insurance sector. The committee gave its report in January 1994 and recommended that the private sector need to be permitted to enter the

insurance industry. The committee stated that foreign companies allowed to enter by floating Indian companies, preferably a joint venture with Indian partners. Following the recommendations of the Malhotra Committee report in 1999, the Insurance Regulatory and Development Authority (IRDA) was constituted as an autonomous body to regulate and develop the insurance industry. The IRDA was incorporated as a statutory body in April, 2000. The key objectives of the IRDA include promotion of competition, so as to enhance customer satisfaction through increased consumer choice and lower premiums, while ensuring the financial security of the insurance market. The IRDA opened up the market in August 2000 with the invitation for application for registrations. Foreign companies were allowed ownership up to 26% in equity shareholding of private companies.

As a result many companies (both in general and life insurance) got themselves registered with IRDA to operate in India. Since, opening up, the number of participants in the industry has gone up from six insurers (including LIC, 4 public sector general insurers and GIC as the national reinsurer) in the year 2000 to 53 insurers operating (September 2014) in the life, non-life and reinsurance segments, including specialized insurers, viz., Export Credit Guarantee Corporation (ECGC) and Agriculture Insurance Company(AIC). Five of the non-life insurance companies, viz., Star Health & Allied Insurance Company, Apollo Munich Health Insurance Company., Max Bupa Health Insurance Company, Religare Health Insurance Company, and Cigna TTK Health Insurance Company function as standalone health insurance companies.

Further, with a view to amend the Insurance Act 1938, the General Insurance Business (Nationalization) Act, 1972 and the Insurance Regulatory and Development Authority Act, 1999, the Insurance Laws (Amendment) Bill, 2008, was introduced in the Rajya Sabha on the 22nd December, 2008. The Bill redefines certain types of insurance and allows for foreign investors to hold up to 49% of the capital in an insurance company. It provides the nationalized general insurance companies to raise funds from capital markets with the permission of the central Government. The Bill changes norms governing the rights of policyholders and insurers with respect to insurance policies. It enhances penalties for a range of offences and prescribes a procedure for appeals against decisions by IRDA. The Bill requires life and general insurers to have a minimum capital of Rs 100 crore and health insurers are required to have a minimum capital of Rs 50 crore.

The Bill was introduced in the Parliament but referred to the Standing Committee on Finance (under the Chairmanship of Shri Anant Kumar) for examination and suggestions. The Standing Committee submitted its report to Parliament on 13th December 2011. There are a total of 111 clauses in the Insurance Laws (Amendment) Bill, 2008. However, the Union Cabinet on 11 May 2012 deferred a decision on modifications to the insurance amendment bill as it did not see great hurry in moving changes to the law if it could not increase the foreign direct investment in the sector. After the Modi led NDA Government assumed charge, the finance Minister Mr. Arun Jaitly, announced in his first Union Budget 2014-15 speech on July 10, 2014, an increase the FDI limit up to 49% from 26% with full Indian management and control through the Foreign Investment Promotion Board (FIPB) route.

In the winter session of the parliament in December 2014, the Cabinet cleared the parliamentary (Select) committee's recommendations for a composite cap of 49% on foreign investment in insurance, which includes both foreign direct investment and foreign portfolio investments. The select committee had in its report recommended 110 amendments to the Bill. In order to win Congress support, it had adopted 88 amendments proposed by the Congress earlier. However, the bill was stuck in the Rajya Sabha where the NDA was in minority.

On 26 December 2014, Government has passed the Insurance Laws (Amendment) Ordinance 2014, which is virtually the entire Insurance Bill as amended by the Select Committee. The main changes to the existing law include the following: (i) raising foreign investment cap to 49%, with management 'controlled'[1] by Indians; (ii) allowing foreign companies to open branches to undertake reinsurance business in India; (iii) permitting Lloyd's to access the Indian market as the branch of a foreign Reinsurer; (iv) the Securities Appellate Tribunal (SAT) hearing appeals against the orders or decisions of the IRDA and (v) imposing fines for carrying on insurance business without registration. Fines for other breaches of the statutory and regulatory framework have also been significantly increased. Finally, on 12 March 2015 the Insurance Laws (Amendment) Bill 2014 was passed in the Parliament.

Further, in the Union Budget 2015-16, the finance minister has announced a number of measures to increase insurance penetration in the country, especially in the health insurance segments. Some of these are: (i) Pradhan Mantri Suraksha Bima Yojana (PMSBY) covering accidental

[1] The definition of "control" is borrowed from the Companies Act 2013, and is defined as the right to appoint a majority of the directors, to control management, and to control policy decisions

death risk of Rs 2 lakh at a premium of Rs 12 per year i.e. Rs 1 per month; (ii) Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) covering both natural and accidental death risk of Rs 2 lakh. The premium will be Rs 330 per year, or less than Rs 1 per day, for the age group of 18-50 Years. Finally, (iii) raised the health insurance deduction limit under section 80D to Rs 25,000 from Rs 15,000.

1.3 Major Aspects Researched in the Literature

The review focuses on four major aspects of the life insurance industry, namely *Competition, Efficiency, Profitability and Regulation*. Some major past studies are reviewed below on the above four aspects.

Competition

Competition has been measured in the literature using concentration ratios mainly due to their ability to capture structural features of the market. Concentration refers to the degree of control of economic activity by large firms. Literature on determinants of market concentration in industrial organization dates back to Learner's (1934) seminal work on measurement of monopoly power. Stigler (1964), Hannah and Kay (1977) and Hay and Morris (1991) have studied the theoretical aspects of the issue. Curry and George (1983) provide an extensive survey of such research.

Bikker and Leuvensteijn (2008), investigate competition in the Dutch life insurance industry by analyzing several factors, which may affect the competitive nature of a market and various indirect measurement approaches. After discussing various supply and demand factors that may constitute a so-called tight oligopoly, they establish the existence of scale economies and the importance of cost X-inefficiency, since severe competition would force firms to exploit available scale economies and to reduce X-inefficiencies. Both scale economies and X-inefficiencies turn out to be substantial, although more or less comparable to those found for insurers in other countries and to other financial institutions. Further, they applied the Boone indicator, a novel approach to measure the effects of competition. This indicator points to limited competition in comparison to other sectors in the Netherlands. Further investigations of submarkets should reveal where policy measures in order to promote competition might be appropriate.

In the Indian context, *Rao D. Ti (2000)* remarks in his paper that conventional theory of competitive markets does not apply directly in the study of insurance business in less developed economies where credit and insurance markets are either thin or non-existent and in many developing economies the market is regulated. To be specific, in the insurance market, asymmetry of information leads to moral hazard and adverse selection. Being incapable of incurring high monitoring costs, the insurer/lender fails to gather sufficient information on the economic agent. Moral hazard arises when the insurer or lender is unable to discern the undertaken activities of the insured/borrower and fails to foresee the probability of an adverse event. If the insured/borrower knows his/her own risk but the insurer/lender does not, then it affects the realized ex post profitability which falls below the ex-ant profitability of a contract signaling adverse selection. The insurer may charge premiums based on its calculated average experience, but it may happen that the low risk individual being aware of the riskiness of the enterprise may not opt for insurance. And in this process low risk prone individuals end up with less insurance, but paying a low premium. Thus, the insurer is exposed to high risk leading to market failure. The paper highlights that macroeconomic implications of privatization and foreign participation in the insurance sector are far reaching but the path must be approached cautiously with a 'step-by-step' approach and should be preceded by microeconomic institutional and legal reforms.

Further, *Acharya (2012)* examines the state of competition in life and non-life insurance sectors in India primarily by using a variety of concentration measures. The results indicate that the market concentration of the life insurers is high in presence of LIC than in its absence. There is a fall in the concentration for the 9 years period (2001-02 to 2009-10) of the life insurers in both the samples including and excluding LIC. The study also summarizes the discussions and field interviews with middle and senior managers (with an average of 10-12 years of industry experience) on understanding the level of commoditization and the marketing response by the insurance companies. Most of the executives found the product offered by their companies to be homogeneous and easily inter-changeable with the competitor's offerings. Both private and public sector insurers pointed that the customers gravitate towards lowest price products and covert commission kick-backs are fairly common. Most of the executives saw no risk for the customers if they switched insurance providers. The executives felt that there has been no change in the product mix offered by the insurance companies since the start of the financial crisis. In

fact, the insurance companies had dared for product innovation through ULIPS which did not find favour with the regulators.

Efficiency

The concept of 'efficiency' comes from micro-economic theory, especially from production theory in Economics. Efficiency is defined as optimally choosing the levels, and mixes of inputs and or outputs. The idea behind efficiency measurement is to measure a company's performance relative to 'best practice' company, which is determined by the dominant, i.e., most efficient, companies in the industry. Traditionally, efficiency has been defined as sum of inputs divided by sum of outputs.

Efficiency comparisons at the international level have received significant attention in the insurance literature. The initial studies on the efficiency of U.S. life insurers, have mostly focused on scale economies. These studies tend to find evidence of significant scale economies in the industry, although larger firms generally are found to exhibit decreasing returns to scale. Cummins et al (1998) is the first cross-country comparison of efficiency and covers the US, Germany, France, Switzerland, and Japan. They find high productivity for the US and Germany. Japan shows the weakest productivity growth for the period 1975-1987. Rai (1996), in a broader cross-country study (11 OECD countries), concludes that firms in Finland and France have the highest efficiency and firms in the United Kingdom have the lowest. Donni and Fecher (1997) show for a sample of 15 OECD countries for the period 1983-1991 where average efficiency levels are relatively high, but vary across countries. Growth in productivity is observed for all countries, which is attributed to improvements in technical progress.

Cummins et al (1998) have attempted a comparative analysis of frontier cost efficiency methodologies by the application of a wide range of econometric and mathematical programming techniques to a data set consisting of 445 life insurers over the period 1988-1992. The alternative methodologies yield significantly divergent estimates of efficiency for the in-sample insurers. The efficiency rankings are quite well-preserved among the econometric methodologies; but the rank correlations are found to be lower between the econometric and mathematical programming categories and between alternative mathematical programming methodologies. Thus, the choice of methodology seems to have a significant effect on the results.

Most of the insurers in the sample display either increasing or decreasing returns to scale, and stock and mutual insurers are found to be equally efficient after controlling for firm size.

During the eighties and nineties, the US life insurance industry has experienced an unprecedented wave of mergers and acquisitions. Traditionally, the industry has been characterized by a high-cost distribution system and non-price competition. However, the insurers have increasingly faced intensive competition from non-traditional sources such as banks, mutual funds, and investment advisory firms, which captured a major share of the market for asset accumulation products such as annuities and cash value life insurance. The increased competition has narrowed profit margins and motivated insurers to seek ways to reduce costs. The more stringent solvency standards implemented under the risk based capital system adopted in 1993 also have put pressure on insurers to strengthen their financial statements. Technological advances in sales, pricing, underwriting, and policyholder services have forced insurers to become more innovative; and the relatively high fixed costs of the new systems may have affected the minimum efficient scale in the industry. In this context, *Cummins, Tennyson and Weiss (1999)* examined the relationship between mergers and acquisitions, efficiency, and scale economies in the US life insurance industry. They estimated cost and revenue efficiency over the period 1988-1995 using data envelopment analysis (DEA). The Malmquist methodology is used to measure changes in efficiency over time. They found that acquired firms achieve greater efficiency gains than firms that have not been involved in mergers or acquisitions. Firms operating with non-decreasing returns to scale and financially vulnerable firms were found to be acquisition targets. Overall, mergers and acquisitions in the life insurance industry were found to have a beneficial effect on efficiency.

Cummins and Misas (2006) discuss the effects of deregulation and consolidation in financial services markets by analyzing the Spanish insurance industry. The sample period 1989-98 spans the introduction of the European Union's (EU) Third Generation Insurance Directives, which deregulated the EU insurance market. Deregulation has led to dramatic changes in the Spanish insurance market; the number of firms declined by 35%, average firm size increased by 275%, and unit prices declined significantly in both life and non-life insurance. They analyzed the causes and effects of consolidation using modem frontier efficiency analysis to estimate cost, technical, and allocative efficiency, as well as using Malmquist analysis to measure the total factor productivity (TFP) change. The results show that many small, inefficient, and financially

underperforming firms were eliminated from the market due to insolvency or liquidation. As a result, the market experienced significant growth in TFP over the sample period. Consolidation not only reduced the number of firms operating with increasing returns to scale but also increased the number operating with decreasing returns to scale. Hence, many large firms should focus on improving efficiency by adopting best practices rather than on further growth.

Eling and Huang (2013) analyze the efficiency of non-life insurance companies in four of the fastest-growing markets in the world - the BRIC (Brazil, Russia, India, and China) countries. An innovative feature of this paper is its incorporation of uncontrollable variables in the efficiency analysis using a multi-stage DEA approach. This approach captures cross-country differences, such as the political and economic environment, and allows distinguishing between managerial inefficiency and inefficiency due to environmental conditions. The study found that the environment strongly affects the efficiency of non-life insurers operating in the BRIC countries.

In relation to Indian insurance industry, *Tone and Sahoo (2005)* were the first to study efficiency of the life insurance sector, applied a new variant of DEA model to examine the performance of Life Insurance Corporation (LIC) of India only using time series data. The findings show a significant heterogeneity in the cost efficiency scores over the course of 19 years. A decline in performance after 1994-1995 can be taken as evidence of increasing allocative inefficiencies arising from the huge initial fixed cost undertaken by LIC in modernizing its operations. A significant increase in cost efficiency in 2000-2001 is however, the cause for optimism that LIC may now be realizing a benefit from such modernization. This will stand them in good in terms of future competition. Results from a sensitivity analysis are in broad agreement with the main findings of this study.

Sinha and Chatterjee (2009) estimate technical efficiency of 13 life insurance companies for the period 2002-03 to 2005-06 using the assurance region approach. They compared the year to year mean technical efficiency scores revealed that mean technical efficiency has improved in 2003-04 relatively to 2002-03, remained on the same level in 2004-05 and declined in 2005-06.This is likely because of divergence in the performance across the life insurers. In the last two years, most of the life insurers have exhibited increasing returns to scale.

Parida and Acharya (2013) compared the performance and efficiency in terms of total factor productivity (TFP) growth of 13 Indian life insurance companies (12 private sector and 1 public

sector) in respect of Catch-up efficiency and Frontier-shift efficiency for the years ranging from 2005-06 to 2010-11 using Data Envelopment Analysis (DEA). The results found that LIC exhibited a relative catch-up efficiency of 1 indicating no significant changes in performance over the years. In comparison, the private life insurers such as Max New York Life Insurance, Kotak Mahindra Life and ING Vysya exhibited a mean relative catch-up efficiency score of more than 1 over the said period. Further, a comparison of the relative frontier-shift efficiency scores of the life insurers reflected that the public-sector life insurer is marginally ahead of its private sector counterparts with respect to efficiency in frontier technology over the years. Moreover, LIC exhibited a consistent relative Total Factor Productivity change in the index score of more than 1 over the six year time period thereby indicating a relative progress in total factor productivity growth from period t to period t+1. However, all the private life insurers exhibited a mean positive total factor productivity growth during the said period.

Profitability

In literature, a few studies are focused to determine the factors affecting the insurance industry in the World. *Greene and Segal (2004)* explore the relationship between cost inefficiency and profitability in the U.S. life insurance industry. They derive cost efficiency using the stochastic frontier (SF) method allowing the mean inefficiency to vary with organizational form and the outputs. The results suggest that cost inefficiency in the life insurance industry is substantially relative to earnings, and that inefficiency is negatively associated with profitability measures such as the return on equity. The analysis of inefficiency and organizational form suggest that stock (shareholder-owned) companies are as efficient and profitable as mutual (policy holder-owned) companies.

Al-Shami and Ahmed (2008) examine the determinants of profitability on a panel of 25 insurance companies over the period of 2006-2007 listed on UAE stock market, with a sample of variables including age of the firm, leverage, volume of capital, risk or loss ratio and firm size. The results concluded that firm size had a direct and significant relationship with profitability, volume of capital had a direct but insignificant relationship with profitability, age of the firm did not have any relationship with profitability while last two variables leverage and loss ratio had inverse and significant relationship with profitability.

Ahmed et al. (2011) investigates the determinants of performance in life insurance sector of Pakistan by using panel data of five insurance companies from 2001-2007. They explored the relationship between firm level attributes (leverage, growth, size, age, liquidity, risk and tangibility) and performance of insurance firms, and observed that leverage, size of the firm and risk were significant determinants of performance. On the other hand growth, tangibility, age of the firm and liquidity did not have any significant association with performance of life insurance firms. Further, *Javaria, Khan and Amjad (2013),* examine the determinants of profitability in insurance sector of Pakistan with a panel data set of 31 insurance firms (both life & non-life) for the period 2006-2011. The results conclude that leverage, size, earnings volatility and age of the firm are significant determinants of profitability while growth opportunities and liquidity are not significant determinants of profitability.

To examine the determinants of profitability of Life insurers in Ghana, *Akotey et al* (2013) employs a panel of 10 life insurers over a 10 year period to identify gross premium written, insurer's size, reinsurance, claims, management expenses and interest rate as the significant determinants of life insurer's profitability in Ghana. The results found that gross written premiums have a positive relationship with insurers' sales profitability, its relationship with investment income is a negative one. Also, the results showed that life insurers have been incurring large underwriting losses due to overtrading and price undercutting. The results further revealed a setting-off rather than a complementary relationship between underwriting profit and investment income towards the enhancement of the overall profitability of life insurers.

A study by *Alhassan and Addison (2013),* examine the market structure, efficiency and profitability of the insurance companies in Ghana, using a sample of 14 life and 22 non-life insurers from 2007 to 2011. They employed the panel corrected standard errors (PCSE) of Beck and Katz (1995) with return on assets (ROA) as the dependent variable whereas HHI and concentration ratio (4-firm CR) were used as proxies for market structure. Insurers Efficiency was estimated using DEA technique. Insurer's size, underwriting risk, leverage, GDP growth rate and inflation rate were controlled. The results provide ample evidence in support for efficient structure hypothesis for both life and non-life insurance markets. While conflicting results was found for SCP hypothesis in the non-life insurance market, it was rejected in the Life insurance market. The findings also point to an increasing level of competition in both life and non-life

insurance industry in Ghana though they still remain concentrated with the life insurance sector efficient compared to the non-life sector.

However, to the best of our knowledge, there is only a single study available on Indian insurance industry, which study the determinants of profitability of the life insurers (Charumathi, 2012) for the period 2008-09 to 2010-11. The author concludes that profitability of life insurers is positively influenced by the size (as explained by logarithm of net premium) and liquidity. The leverage, premium growth and logarithm of equity capital have negatively and significantly influenced the profitability of Indian life insurers. The study not found any evidence for the relationship between underwriting risk and profitability.

Market Regulation

In the last decade, certain regulatory actions by IRDA has prompted many to raise several questions about the future performance of the industry. As per *McShane et al (2010),* regulatory separation theory indicates that a system with multiple regulators leads to less forbearance and limits producer gains. Fragmented regulations of the US life insurance industry provide an especially rich environment for testing the effects of regulatory competition. The paper finds positive relations between regulatory competition and profitability measures of this industry. The results have practical implications for the debate over federal versus state regulation of insurance and financial services in US. Regulations pertaining to capital adequacy, policy forms and rates, market conduct, and agent licensing are often not uniform. Further, regulatory compliance requirements and action can vary across state regulatory systems. The regulatory competition across the states in US leads to higher profitability for regulated insurers, which suggests greater forbearance by state regulators and a 'competition in laxity'. The test results for capital adequacy measures are also consistent with those for profitability.

Ranade and Ahuja (1999) presented an overview of the evolution of insurance sector in India for the pre liberalization era wherein they discussed emerging strategic issues that need to be addressed in the awaking of liberalization. These included demographic trends (article referred to two modern trends in Indian context that had positive effect on insurance business significantly i.e., emerging trend of nuclear families and increase in elderly population to defend for themselves.), higher demand for pension plans/schemes to be provided by insurance companies (in India, apart from organized sector employees, there is hardly any social security for old age),

competition with other saving assets, selling of life insurance through postal networks and issues of pricing. It was also mentioned that information and technology could play critical role in life insurance business as it requires profiling of huge customer data.

Ahuja (2004) in his paper pointed out four areas where regulators required to do the necessary which included pensions and health (health insurance premium is growing at impressive rate, total health premium is still small given the fact that health is de-tariffed segment and recent issues with respect to third party administrators - TPA) insurance, phasing off tariffs, strengthening of self-regulation and reviewing capital requirement. As opined by the author the success ultimately would depend on the efficiency of implementation of regulations.

After liberalization of the sector, Ministry of Finance jointly with the Reserve Bank of India (RBI) reviewed the sector in 2009 and reported that the life insurance business indicators are in accordance with standard capital adequacy requirements. The committee raised concern about the solvency ratio of LIC, which was at the stipulated minimum regulatory norms by IRDA. There were no concerns about the asset quality, profitability and liquidity of the insurance companies.

In 2013, the *IMF and World Bank* assessed the sector and reflected on improved levels of compliance and significant progress made in the compliance post the self-assessment in 2009. The Detailed Assessment Report (DAR) has commended for relatively well developed insurance regulation and supervisory architecture in India particularly in the areas of licensing, consumer protection, market oversight and transparency. The report mentioned that IRDA's on-going supervision of insurance companies and market is tight and displayed a strong level of control and that the insurance industry in India has relatively large footprint compared to other forms of financial intermediation given India's income levels, in comparison with other developing countries. This is particularly apparent when measured in terms of the total assets under management (AUM). The life AUM to GDP figure of 16.8% puts India in the same general range as a number of developed countries, although underlying drivers vary. India is a clear outperformer in terms of expected life insurance penetration, and is broadly in line with expectations in the non-life sector. While the pre-conditions of effective supervision are broadly met, it has been further commented that the IRDA is taking steps to address different issues raised in the assessment report.

1.4 Research Gap

As discussed above, there are a limited number of empirical studies available on life insurance industry in India on the aspects competition, efficiency, profitability and regulation. Previous studies have emphasized the trends in the industry taking standard business indicators, through traditional methods like profitability analysis. The scarcity of literature in this field is mostly due to a shortage of historical data relating to insurers. However, in developed insurance markets, like US, France, Spain, the Netherlands etc, there are several studies available, which have examined different aspects of the insurance industry. This gap merits research in different aspects of the Indian life insurance industry.

1.5 Motivation

The motivation for the present study comes *first*, from the fact that financial market deregulation in India was intended to reduce the level of concentration and increase competition and efficiency among the insurers, which would increase penetration in the insurance market. Though foreign insurers existed in India even prior to her political independence in 1947, they were subjected to many restrictions and finally merged all for the establishment of Life Insurance Corporation of India (LIC) in 1956. *Secondly*, there is no study in the literature to our knowledge that has examined the important issues relating to competition, efficiency, profitability and regulation in the Indian context. The present study thus addresses an important gap in the literature. *Lastly*, the study has important policy implications, as it could help regulatory authorities determine the future course of action to be pursued in the matter of entry of foreign insurers as also in the context of establishing of a level playing field.

1.6 Objectives of the Study

In light of the above discussions, motivation and research gap, the present study attempts an examination of four major aspects i.e., *competition, efficiency, profitability and regulation in the post-reform period (i.e., post 2000) of the life insurance industry in India*. The specific objectives are:

- To assess the state of competition in the Indian life insurance industry (comprising of Public, Private and Foreign Players)
- To study the efficiency of the life insurance companies in India: using the non-parametric Data Envelopment Analysis (DEA) technique.

- To examine the important factors determining profitability of life insurance companies in India.
- In regulation aspect, the focus is to analyze the best international regulatory practices in insurance industry and the role of IRDA to drive the Indian insurance market in the right direction. An attempt is also being made to assess the impact of regulatory changes on the life insurance business.

1.7 Data and Methodology

a) Nature and Source of Data

All the data used in this study are secondary in nature and are of annual frequency. The data on insurance indicators are collected from different publications of IRDA like Annual Reports and Handbook of Indian Insurance Statistics, Data Supplement of the Quarterly Journal. The data on macro-economic variables, like inflation, savings and GDP, are collected from the RBI data base on Indian economy. However, some of the financial indicators of the individual life insurers are collected from the balance sheet of the respective insurers.

b) Methodology

The methods employed to achieve the above set objectives are briefly described below.

- **Market Concentration:** The market structure and state of competition in the Indian life insurance industry is examined by using a set of 10 market concentration indices. Here, it is assumed that a measure of market concentration is a function of the combined market share of all the firms in the industry (Mishra *et al*., 2011). So, the concentration indices are calculated on the basis of market share (total premium and 1-Yr premium) of the life insurers, both by including and excluding LIC in the industry. The study used the data for the period 2000-01 to 2013-14. Further, by following the criterion suggested by *Ginevicius and Cirba (2009),* an attempt is made to suggest the best concentration index to study the state of competition in the Indian life insurance industry.
- **Insurers' Efficiency:** To estimate the life insurer's efficiency, the study used the data envelopment analysis (DEA) techniques to calculate the technical efficiency (TE), pure technical efficiency (PTE) and scale efficiency (SE) of the sample 13 insurance companies for the period starting from 2002-03 to 2012-13. The DEA score of 1 (0) indicates the firm is efficient (inefficient). In the second part, to see the productivity change over a period of time,

the Malmquist productivity index (MPI) is calculated. The MPI allows for changes in productivity to be broken down into changes in efficiency (catch-up index) and technological changes (frontier-shift index). If MPI > 1 indicates a favourable development, i.e., a positive growth in total factor productivity between two periods; MPI < 1 is a negative development, i.e., a decline in total factor productivity between two periods and if equal to one, productivity remains unchanged.

To calculate the insurers' efficiency score in DEA, the study used 4-inputs (namely, number of individual agents, total commission paid, equity capital and debt capital) and 2-outputs (namely, net benefits paid to customers and liquid assets to liabilities). However, premiums seems to be the best proxy to measure of output volume in the insurance industry, but, in literature, it is argued that premium is price times of quantity, whereas output volumes should represent only quantity. So, premium is not included as an output variable.

- **Insurers' Profitability:** To assess the profitability, an attempt is made to find out the important factors determining the profitability of life insurance companies in India. Panel data models are employed to inspect the relationship of the structure, efficiency and performance of the life insurance industry, which enables a better identification and measurement of phenomenon that are not captured in either cross-section or time series models. The study adds to the existing literature in several ways; *first,* use of new data series with base year 2004-05 are considered for the economic variables like GDP, WPI etc; *secondly,* a long sample series has been included; *third,* the scope is being expanded by moving from firm specific factors to industry features like efficiency & market structure; and *finally,* Inflation and GDP growth are also controlled to account for the effect of the macro-economic environment of insurer's profitability.

  The model employs ROA as the dependent variable, which is proxy for profitability of the life insurers and a set of independent variables, including two-industry specific factors like HHI/CR5 & PE/PTE, three-firm specific variables like 'size', 'leverage' & 'risk' and two macro-economic factors like 'GDP & Inflation'. The data set includes a panel of 13 life insurance companies for the period 2002-03 to 2012-13 (11 years).

  To estimate equations, initially the linear panel models like fixed effects and random effects models are estimated. Further, to check the long run relationship between the variables, panel

cointegration tests are used. The panel cointegration analysis follows three steps: first, to avoid any spurious correlation, stationarity of the variables are checked, i.e., whether the variable has a unit root. If the variables are non-stationary, then the second step is to test the long-run relationship between the variable, which is termed as cointegration test. Finally, if cointegration is confirmed then coefficients are estimated through FMOLS.

Hadri's (2000) panel unit root methodology is used to test panel variables and Pedroni (1999) & Kao's (1999) test is employed to examine whether a long-run cointegration relationship exists among the variables. As, the cointegration results confirm that the existence of cointegration between the variables FMOLS is used to estimate coefficients.

- **Regulatory Changes:** The regulation changes in September 2010 is regarded as one of the most stringent regulatory regimes in the Asia Pacific Region. So, the year 2010 is assumed to be the year of regulatory change. This year is used as benchmark to compare the insurers' indicators (like premium underwriting, investment income etc) thereafter to see the impact of regulation change on the life insurers.

1.8 Organization of the Thesis

The rest of the thesis contains six chapters. Chapter II presents the origin, progress and performance of Indian insurance since ancient times. Chapter III examines the impact of insurance reforms on the level of market competition in the life insurance business in India. Chapter IV analyses the efficiency of the life insurance companies is analyzed in Chapter IV and Chapter V discusses the determinants of profitability of the life insurance companies in India. In Chapter VI, the regulatory changes and its impacts on the life insurance companies in their business operations after the year 2010 are discussed. Finally, Chapter VII summarizes the major findings and offers some concluding remarks. The literature has been reviewed objective wise in Chapters III, IV, V and VI, while addressing the respective objectives in these Chapters.

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Chapter II
The State of Insurance Industry in India

2.1 Introduction

In the epic 'Mahabharata', Yaksha asked Yudhisthira, *'What is the most wonderful thing in the World.'* To this Yudhisthira replied, *'the most wonderful thing in the World is the sight of men watching the dead being carried to burial ground every day and still imagine that, they are eternal'.* Death is a natural phenomenon and a sublime theme of reflection. Therefore, one should not grieve for what is inevitable and unavoidable, exhorts Lord Shri Krishna in *Shrimad Bhagwad Geeta (the Song Celestial).* In our worldly life, whenever there is uncertainty there is some element of risk involved. The instinct of securing security against such risk is one of the basic motivating forces determining human attitudes. So, as a sequel to this quest for security, it is believed that the concept of insurance must have originated. The urge to provide insurance or protection against the loss of life and property must have prompted people to make some sort of sacrifice willingly in order to achieve security through 'collective cooperation'. So, by this sense, the story of insurance is probably as old as the story of mankind.

Insurance also has a deep rooted history in India, finding mention in writings of Manu (Manusmriti), Yagnavalkya (Dharmasastra) and Kautiliya (Arthasastra). The writings speak of pooling of resources that could be redistributed in times of calamities such as floods, fire, epidemics and famine etc. This was possibly a pre-cursor to modern day insurance. In ancient Indian history, the earliest traces of insurance have been preserved in the form of marine trade loans and through carrier's contracts. The Sanskrit term *'Yogakshema'* (meaning well-being) is found in the Rig Veda and depicts that some kind of commercial insurance was practised by the Aryans in India nearly 3000 years ago. The Vedic Rishis knew about this and their songs of benevolence contained the term *'Yogakshemam'*, an idea which has been vivifying the Indian thinking since ancient times. Later on, the Indian joint family system too fulfilled the need for security to a large extent.

The first plan to form some sort of an insurance organisation in India, was proposed at the Government level. *Sir Jhon Child* (Governor of Bombay, 1681-1690) was instructed by the court of Director of East India Company, to constitute an insurance office in the Bombay Island. However, it is not known about the suggestions *(Refer: Life Insurance Compendium 1999-2000).*

The rest of the chapter is organized as: Section 2 discusses the meaning, origin, types and importance of insurance in India. Section 3 analyses the trends and progress of Indian insurance industry in the global market and Section 4 summarizes performance of the life & non-life of insurance in India, since their inception. This is important because the de-nationalisation structure brought back to play an important legal rules from 1938. The Section 5 discusses the performance of postal and rural postal life insurance (PLI). The Section 6 estimates the demand for life insurance in India. Finally, section 7 projects a future outlook of the industry.

2.2 Origin, Meaning, Types and Importance of Insurance

2.2.1 Origin of Insurance

Insurance, in its most basic form, is sharing of risks between two or more parties. It initially started as an informal exercise amongst the traders in Europe. Trade in those days was carried out by ships and the traders knew that there were definitely going to be losses and unpredictable damages due to pirates or bad weather and sometimes ice-bergs. But, the traders were not sure about, which ship would face the disaster. In any case, the trader, whose ship faced a disaster, was left in penury. This led to an informal association of sorts, where the traders contributed some money into a fund, which was used to compensate the loss of the individual trader. Thus, in the western World, life insurance evolved mainly from the maritime industry. Shakespeare speaks of *'putters out of five'* in some of his plays - an oblique reference to private financiers who used to gamble on the lives of sea-farers by offering five times the money deposited with them in case of certain contingencies.

2.2.2 Meaning & Types of Insurance

In simple term, insurance is defined as a risk-transfer mechanism that ensures full or partial financial compensation for the loss or damage caused by event(s) beyond the control of the insured. Under an insurance contract, the insurer indemnifies the insured against a specific amount of loss, occurring from particular eventualities within a specified period, with a price, called premium. The *Encyclopaedia Britannica* describes insurance as 'a social device whereby large group of individuals, through a system of equitable contributions, may reduce or eliminate certain measurable risks of economic loss common to all members of the group'. Thus, insurance is a form of risk management, which primarily used to hedge the risk against the uncertain loss/event. Broadly, insurance can be classified into *two* types/classes; a) Life insurance and b) Non-life or General insurance.

(a) Life Insurance: Life insurance is a contract between an insurance policy holder and an insurer, where the policy holder pays a *'premium'* regularly or as a lump sum and the insurer promises to pay a designated beneficiary, a sum of money (the 'benefits') upon the death of the insured person. Depending on the contract, other events such as terminal illness or critical illness may also trigger payment. The life contracts tend to fall into two major categories: *(i) Protection policies* are designed to provide benefit in case of a specified event happened against a lump sum payment. *(ii) Investment policies*, on the other hand, are to facilitate the growth of capital by single or regular premiums.

(b) Non-Life Insurance: Insurance, other than life, falls under the category of general/non-life insurance. The non-life insurance business in India is largely dominated by four segments, namely, fire, marine, motor vehicle and health insurance.

However, life insurance differs from non-life insurance in one important aspect: life insurance contract is a long term contract and therefore, the investment aspect of life insurance business becomes quite important. While in non-life insurance business, underwriting skills play an integral role in determining the premium calculations.

2.2.3 Importance of Insurance

A healthy insurance sector is of vital importance to every modern economy. It encourages the savings habit, provides a safety net to rural and urban enterprises and productive individuals, and generates long-term funds for infrastructure development. The insurance industry plays a significant role in India's economy. Insurance is necessary to protect enterprises against risks such as fire and natural disasters. Individuals require insurance services in such areas as health care, life, property and pension. Development of insurance is therefore necessary to support continued economic transformation. Social security and pension reforms also benefit from a mature insurance industry.

In the complex modern world, most importantly life insurance plays an important role as risk has increased enormously in every walk of our day to day life. To manage the uncertain risk, which can be insured, has led to growth in the life insurance business and evolution of various types of insurance covers. The life insurance products provide a range of financial services to the consumers and provide a major source of investment in the capital market. It provides individuals and the economy with several important financial solutions. Firstly, life insurance products encourage long-term saving and reinvestment of substantial sum in public and private sector projects. By leveraging their role as financial intermediaries, life insurers

have become a key source of long-term finance, encouraging development of capital markets. Secondly, in the phase of growing urbanization, population mobility, and formalization of economic relationships between individuals, families, and communities, life insurance has taken on increasing importance as a way for individuals and families to manage risk. Thirdly, by pooling risks and smoothing incomes, insurance helps avoid excessive and costly bankruptcies and facilitates lending to businesses. Finally, the availability of insurance enables individuals and entrepreneurs to undertake activities with higher risk and higher return than they would otherwise consider, thus promoting higher productivity and growth (Beck and Webb; 2003).

In macro-economic context, the link between high growth rates and savings is well known from the classical growth theory. In the context of India, a number of studies indicate that a growth rate of 8% is possible, only with a savings rate of 30%. The table specifies the trend of savings starting from 1950-51 to 2012-13. It clearly indicates that there is a strong correlation between, Gross Domestic Savings (GDS) and Gross Domestic Product (GDP), which stands at 0.99 during the period 1950-51 and 2013-14.

Table 2.1: Sector-wise Domestic Savings (Rs Billion)

	1950-51	1960-61	1970-71	1980-81	1990-91	2000-01	2005-06	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Gross Domestic Savings (GDS)	10	21	68	266	1344	5155	12352	18363	18026	21823	26217	29939	31813	34759
Household Savings (HHS)	7	12	45	181	1086	4638	8690	11183	13309	16308	18002	20146	20161	20652
Financial Savings (FS)	1	5	14	86	496	2152	4383	5802	5710	7748	7739	9335	10245	12793
Currency			4	16	63	156	522	813	922	969	1371	1062	1116	1018
Bank Deposits			8	56	188	947	2657	3890	4178	3981	5483	5259	5749	6723
Non-banking Deposits			1	4	13	30	5	13	147	185	51	186	157	185
Life Insurance Fund			2	9	56	339	835	1698	1529	2598	2101	1958	1803	1996
Provident and Pension Fund			5	21	112	509	620	715	734	1298	1411	761	959	1021
Physical Savings	6	8	32	95	590	2485	4307	5381	7598	8560	10263	13376	12846	12123
Memo:														
GDS % GDP	9.5	11.6	14.3	17.8	22.9	21.9	33.4	36.8	32.0	33.7	33.7	33.0*	31.1*	30.0*
HHS % GDP	6.5	6.8	9.5	12.1	18.5	19.7	23.5	22.4	23.6	25.2	23.1	22.4	19.9	18.2
FS % GDS	0.6	2.5	2.9	5.8	8.5	9.1	11.9	11.6	10.1	12.0	9.9	10.4	10.1	11.3
FS % HHS	9.1	37.2	30.3	47.5	45.7	46.4	50.4	51.9	42.9	47.5	43.0	46.3	50.8	61.9
Life Fund % of FS			15.1	10.6	11.3	15.7	19.0	29.3	26.8	33.5	27.1	21.0	17.6	15.6

Source: RBI, MOSPI; *As a % GNDI: Gross National Disposable Income

In literature, it is well-argued that a positive relationship between saving and insurance premium (Parida and Acharya; 2014). So, any study on insurance business needs to look into the other saving activities of the households. The household sector savings - include physical and financial saving - and accounts for around 59% of the gross domestic saving (GDS) in 2013-14 compared to 73% in 2008-09 and 68.0% in 1950-51. However, the concern is that 'financial saving' share in household savings has declined to 43% in 2012-13 from the peak of 51.9% in 2007-08. In 2013-14, the share of financial savings in total household savings increased to 61.9%, which is mainly due to the changes in methodology by CSO following the shift in the base year to 2011-12 in the calculation of GDP. Meanwhile, an increasing

trend of 'life fund' in 'financial saving', indicates that insurance business contributes more to financial savings in the country. The 'life fund' accounts around 25% share in 'financial saving' of the household sector and 5% in GDS of India. The 'life fund' share in household financial saving touched the highest 33.5% in 2009-10 from 10.6% in 1980-81 but fell to 15.6% in 2013-14, mainly due to slowdown in the economy, leading to a contraction in premium collections. There is also a strong correlation of 0.98 between the household financial saving and life fund for the period 1970-71 to 2013-14.

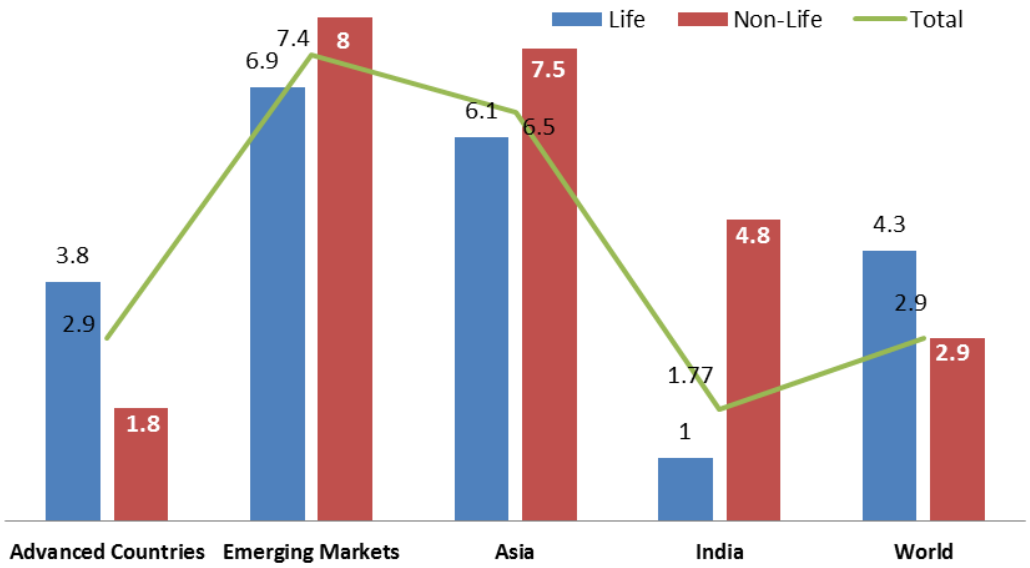
2.3 Insurance Scenario: India vs. World

The global insurance industry continued its recovery in 2014. Total direct premiums written grew by 3.7% in 2014 to $4,778 billion after a year of stagnation in 2013. Out of which, the life insurance premium collections increased by 4.3% in 2014 to $2,655 billion, compared to a decline in 1.8% in 2013. In life segment, Oceania registered solid growth, Western Europe and Japan regained momentum, and premiums in North America continued to decline. Premium growth in Emerging Asia strengthened but slowed in Latin America and Africa. In emerging markets, life premium growth improved to 9.9% in 2014 from 3.3% in 2013. In Emerging Asia premium growth accelerated to 9.9% in 2014 from 3.3% in 2013. The strong performance reflected a recovery in China (+13.4%) driven by new distribution channels such as internet sales, a recovery in bancassurance and lower surrenders. Elsewhere in the region, growth remained strong in Thailand (+11.6%), the Philippines (+13%) and Vietnam (+13%). In Indonesia, life insurance premium grew by just 3.1% as sales of investment-linked products began to level off following years of strong growth. In India, life premium growth improved from 2013 (–0.2%) but remained weak at 1.0%, reflecting sustained weakness in sales of unit linked products.

On the other hand, the global non-life total premium grew at 2.9% in 2013 to $2,124 billion, slightly higher than the 2.7% growth of 2013 and better than the pre-crisis average growth. The advanced markets were the main drivers, with regional variations. There was slightly slower but still robust 8.0% growth in emerging markets premiums, down from 8.6% in 2013, but below the pre-crisis average of 10%. In Emerging Asia, non-life premium grew by 14.6% in 2014, slightly higher than the 13.2% growth achieved in 2013. Premium growth remained strong in China (+17.4%), mainly driven by motor, guarantee & credit and agricultural insurance business. In Southeast Asia, economic headwinds weighed on non-life premiums, with Malaysia, Indonesia and the Philippines posting lower growth. The Premium growth picked up in Vietnam (+7.3%) as the economy stabilised and banking sector reform got

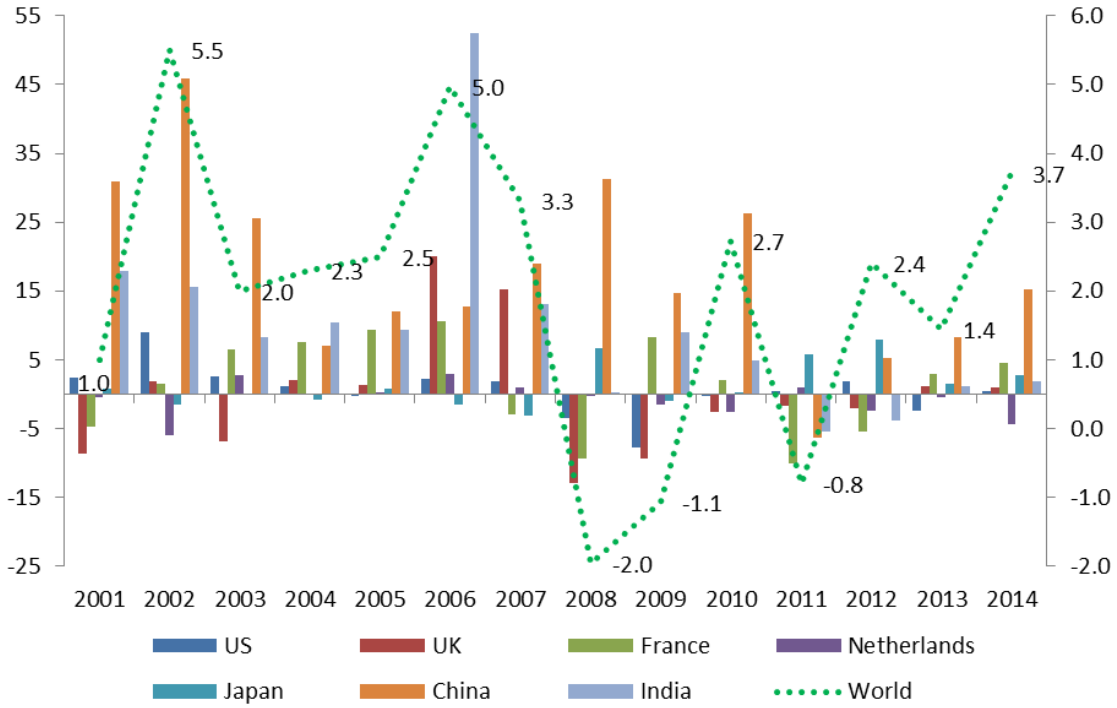
underway. Similarly, in an environment of improving business sentiment and accelerating economic growth, premium growth in India improved modestly to 4.8% in 2014 from 2.4% a year earlier. A benign claims environment persisted in 2014, with no significant natural catastrophes hitting the region, thus supporting profitability of non-life insurers.

Figure 2.2: Real Premium Growth Rate in 2014: Cross Country



Source: Sigma, Swiss Re

Figure 2.1: Global Total Premium Real Growth Rate (%)



Source: Sigma, Swiss Re

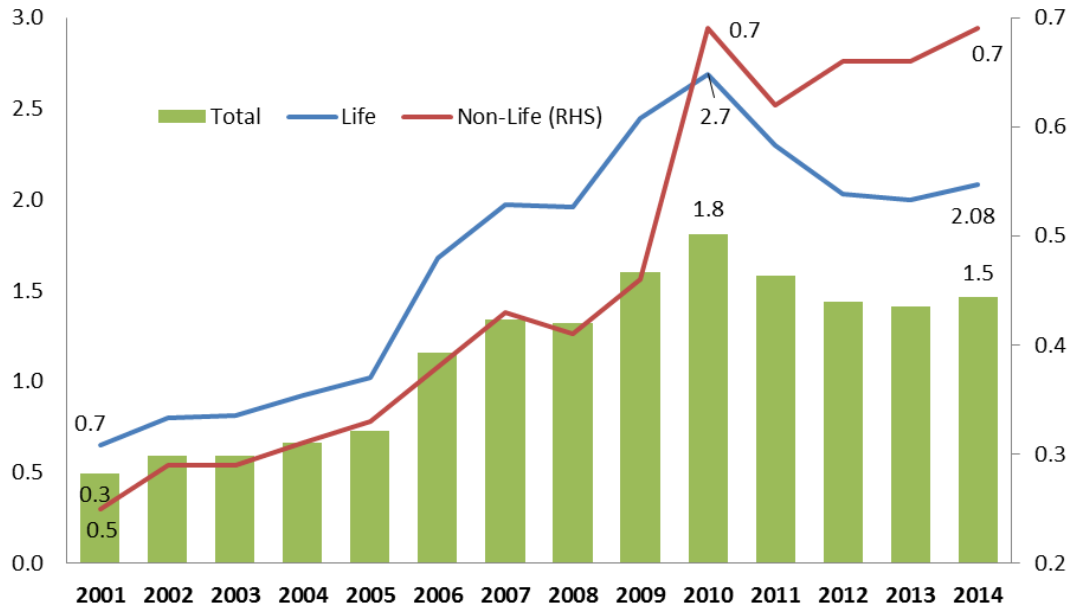
Going forward, the future prospect for life premium growth is expected to remain fairly solid in the advanced economies in 2015, and to accelerate further in the emerging markets. In North America, growth will improve as the labour market and economy strengthen, but will remain below trend. In China, the Government targets an increase in (total) insurance penetration to 5% by 2020, up from 3.2% in 2014. In India, the passage of the Insurance Laws (Amendment) Bill is expected to stimulate the market and also boost consumer confidence in insurers. On the other hand, continued loose monetary policy in Asia will put pressure on the competitiveness of life saving products relative to wealth management products offered by banks. In China, the insurance regulator recently allowed a raising of the interest rate ceiling on universal life products to 3.5% from 2.5%. This could reignite concerns about negative spreads if insurers start offering more products close to the new ceiling. (Swiss Re, 4/2015).

The outlook for the non-life insurance sector is mixed. Premium rates are expected to remain low in most markets but an improving global economy should provide some support for premium growth. In North America, growth could weaken due to slowing price increases, and the outlook in Western Europe remains likewise subdued due to the sluggish economic recovery. In Advanced Asia, the outlook is mixed. Premiums are expected to improve slightly in Japan on account of increasing trade and investment activities, while in South Korea a hike in motor rates and re-pricing of private medical insurance products should lead to higher premiums. However, the outlook remains strong in Emerging Asia in 2015, driven by solid economic performance and favourable Government policies. In China, non-life premiums are expected to benefit from the government's intent to raise insurance penetration.

2.3.1 Indian Insurance in Global Scenario

In global insurance market, India ranked 15th in total premium in 2014 (life rank: 11th & non-life rank: 20th) among 88 Countries. During 2001 to 2014, India's share in the global insurance market has improved to 1.46% in total premium (Life: 2.08% & Non-life: 0.69%) in 2014 from 0.4% (Life: 0.7% & Non-life: 0.3%) in 2001. The figure 2.3 indicate that there is a continuous improvement in India's market share in the global insurance industry till 2010, however, declined there after due to contraction in new business premium collections in the country. In 2014-15, the trend revert and is showing an upward trend.

Figure 2.3: India's Progress in Insurance Business in the World (% Share)



Source: Sigma, Swiss Re

Table 2.2: Cross Country Comparison of Insurance Penetration & Density (2014)						
Country	Insurance Density (US $)			Insurance Penetration (%)		
	Life	Non-Life	Total	Life	Non-Life	Total
US	1657	2360	4017	3.0	4.3	7.3
UK	3638	1185	4823	8.0	2.6	10.6
France	2552	1350	3902	5.9	3.1	9.1
South Africa	748	176	925	11.4	2.7	14.0
Switzerland	4391	3542	7934	5.1	4.1	9.2
Japan	2926	852	3778	8.4	2.4	10.8
India*	**44**	**11**	**55**	**2.6**	**0.7**	**3.3**
China	127	109	235	1.7	1.5	3.2
Singapore	2840	919	3759	5.0	1.6	6.7
South Korea	2014	1149	3163	7.2	4.1	11.3
World	**368**	**294**	**662**	**3.4**	**2.7**	**6.2**
Source: Swiss Re, Sigma 4/2015; * data relates to financial year 2014-15						

2.3.2 Insurance Penetration & Density in India

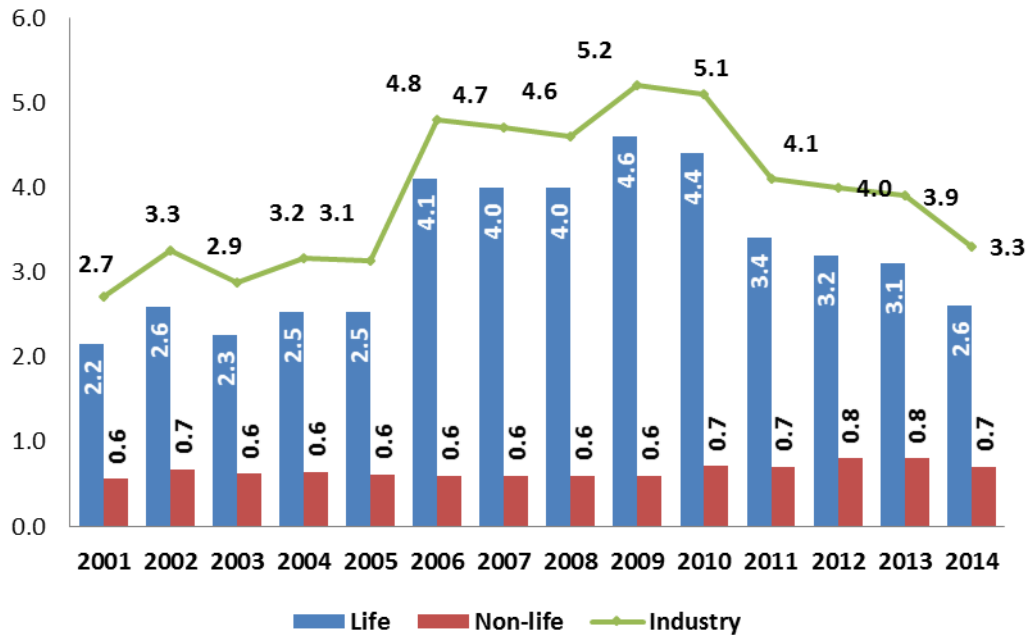
In the global market, insurance penetration[1] and density[2] is universally accepted as a measure of the performance and development of the insurance sector. In comparison with other countries in the World (refer table 2.2), India's insurance penetration is at a very low level of

[1] Insurance Penetration is measured as ratio of Premium (in US Dollars) to GDP (in US Dollars)
[2] Insurance Density is measured as ratio of Premium (in US Dollar) to Total Population

3.3% (Life: 2.6% & Non-life: 0.7%) in 2014, which is much lower than the World average of 6.2% (Life: 3.4% & Non-life: 2.7%). Although, the penetration of Indian insurance is higher than that of some South Asian countries like Pakistan (0.8%), and Sri Lanka (1.1%), however, it lags behind other developed countries like US (7.3%), UK (10.6) and Asian countries like Japan (10.8%), South Korea (11.3%) and Singapore (6.7%). Further, India's insurance density is also at a very low level of $55 in 2013 (Life: $44 & Non-life: $11), compared to World average of $662 (life: $368 & non-life: $294).

As shown in figure 2.4, the trend line of insurance penetration indicate that India's insurance penetration has consistently gone up from 2.7% in 2001 (Life 2.2% and Non-life 0.6%) to 5.2% (Life 4.6% and Non-life 0.6%) in 2009, before it fell to 3.3% (Life 2.6% and Non-life 0.7%) in 2014.

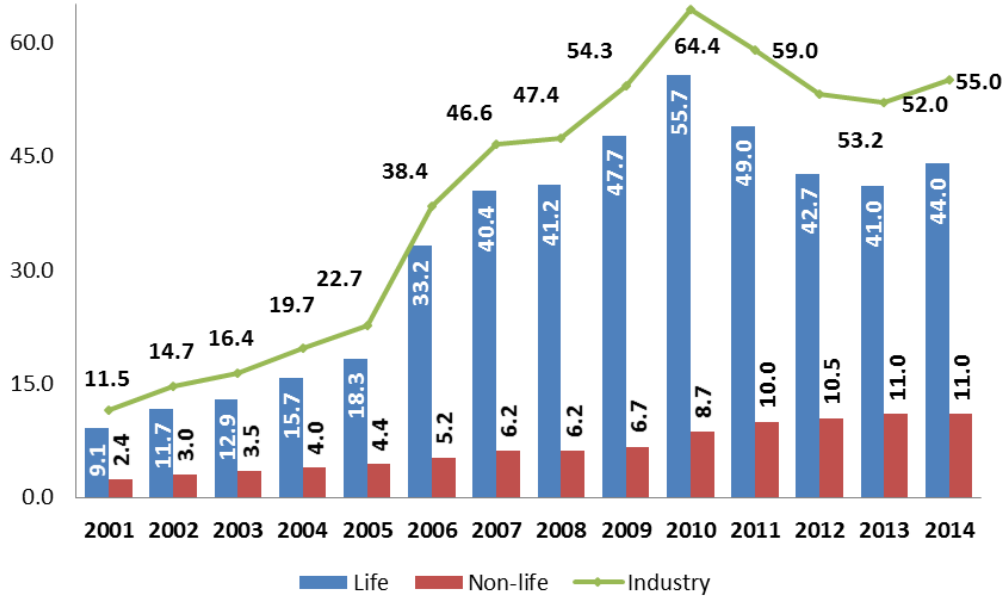
Figure 2.4: Insurance Penetration in India (% GDP)



Source: Sigma, Swiss Re

The second indicator, i.e., insurance density, indicates a consistent rise up to the year 2009 and fall thereafter (refer figure 2.5). The life insurance density in India has gone up from $11.5 (life $9.1 and non-life $2.4) in 2001 to $55.5 (life $44.0 and non-life $11.0) in 2014 though it reached the peak of $ 64.4 (life $55.7 and non-life $8.7) in 2010.

Figure 2.5: Insurance Density in India (USD)



Source: Sigma, Swiss Re

2.3.3 Reasons of Low Insurance Penetration & Density in India

Prior to deregulation of the sector, it was perceived that the low level of insurance penetration was mainly due to ineffective market strategies adopted by the insurers. The advertising initiatives were limited to only print and electronic media, which mainly promoted life insurance products as a tax saving tools for individuals. However, in the post-deregulation period, the level of insurance penetration and density in the country increased but still at a low level, as compared to other countries like US, UK, France and South Africa. This may be due to a number of factors like economic slowdown, population rise and slowdown in premium collections etc.

In a survey report by NCAER[3] (2011) found that apart from macro-economic issues, the insurance penetration in India is low due to a number of other factors, like low consumer preference, untapped rural markets and constrained distribution channels. In urban areas, life insurance penetration is approximately 65% and is considerably lesser in the low-income unbanked urban areas. The life insurance penetration in the banked rural segment is estimated to be approximately 40% and negligible in the unbanked rural areas. According to feedback received in the survey, the problem has been exacerbated due to: (i) agents' inability to clearly explain the features of the products; (ii) lengthy documents that are not user friendly; and (iii) the perception that agents are only concerned with their commissions.

[3] Pre-Launch Survey Report of Insurance Awareness Campaign by NCAER in 2011; funded by IRDA

2.4 Evolution of Insurance in India

The study divides the history of the existence and working of insurance organisations in India in to three phases (refer table 2.3).

Table 2.3: An Aggregative View of Indian Insurance Industry

Phase I		
a) Life Insurance	▪ 1818 to 1956 (about 138 years)	▪ Many (245) private companies: ***Competitive market***
b) General Insurance	▪ 1950 to 1972 (about 122 years)	▪ Many (107) private companies: ***Competitive market***
Phase II		
a) Life Insurance	▪ 1956 to 2000 (about 44 years)	▪ Nationalisation, Public Sector ***Monopoly***; Only 1 company
b) General Insurance	▪ 1972 to 2000 (about 28 years)	▪ Nationalisation, Public Sector ***Monopoly***; One Company with 4 Subsidiaries
Phase III		
c) Life Insurance	▪ After 2000	▪ Opened to the entry of private domestic and foreign companies
d) General Insurance		▪ Mixed of Public & Private companies; **Oligopoly Market**

Source: Bhole L M (2004) & Author's Compilation

2.4.1 Phase I of Insurance Evolution (Before Nationalisation)

Life Insurance in the modern form had its origin in England and made its debut in India in the year 1818, with the establishment of the *Oriental Life Insurance Company* in Calcutta followed by the Bombay Assurance Company in 1823 but the Oriental Insurance company failed in 1834. In 1829, the Madras Equitable had begun transacting life insurance business in the Madras Presidency. These companies were operating in India but did not insure the lives of Indians. Their services were to cater the needs of the European Community living in India. However, some of the companies later started insurance services for the Indians but they were treated as 'substandard'[4]. In this case, the common adjustment made was a 'rating up' of five to seven years to normal British Life in India. This meant, treating p(x), the (conditional) probability of dying between x and x+1, for an x year old Indian male as if it was p(x+5) or p(x+7) of a British male. So, the Indian lives had to pay an ad hoc extra premium of 20% or more. This was a common practice of the European companies at the time whether they are operating in Asia or Latin America. The first company to sell policies

[4] Substandard in insurance parlance refers to lives with physical disability.

to Indian with ‘fair value’ was the Bombay Mutual Life Assurance Society that started in 1871.

Due to the failure of a number of insurance companies in India, the British Government enacted the British Insurance Act in 1970. There was an increasing demand to start a State controlled life insurance company, which the Government turned down without any reasons. In the last three decades of the nineteenth century, the Bombay Mutual (1871), Oriental (1874) and Empire of India (1897) were started in the Bombay Presidency. This era, however, was dominated by foreign insurance offices which did good business in India, namely Albert Life Assurance, Royal Insurance, Liverpool and London Globe Insurance and the Indian offices were up for hard competition from the foreign companies.

The first general insurance company to operate in India was the Triton Insurance Company, established in 1850. This was British owned and operated company. The Indian Mercantile Insurance Company Ltd, established in Bombay 1907, was the first indigenous insurance company. Insurance business was conducted in India without any specific regulation; however, the companies were subject to the Indian Companies Act 1866. In 1912, two sets of regulations were passed: (i) the Indian Life Insurance Companies Act and (ii) the Provident Insurance Societies Act. In this legislation, there were a number of remarkable features available; First, this was the first legislation in India that particularly targeted the insurance sector. Second, the legislation left the general insurance business out of it, as the Government did not feel the necessity to regulate it. Third, they restricted activities of the Indian insurers but not the foreign insurers. After all, the ***Insurance Act 1912*** provided the first legislation aimed at regulating the insurance companies.

The only significant legislative changes before the insurance Act 1938 was **Act XX of 1928**. It helped the Government of India to collect information about (i) Indian Insurance Companies operating in India, (ii) Foreign Insurance Companies operating in India and Indian Insurance Companies operating in foreign countries. The last two points were missing in the Insurance Act 1912. Thus, the collected information helped to compare the size of the average face value of Indian Insurance Companies against their foreign counterparts. As per the Indian Insurance Commissioner’s Report, the average size of the policy sold by Indian companies fell to $532 in 1938 ($619 in 1928) compared to $1,188 ($1,150 in 1928) for the foreign companies. This was basically due to the robustness and better performance of foreign companies in India.

Table 2.4: Growth of Life Business in India in Pre-Nationalisation Period (1914-1955)							
Year	No of Insurers	of which Indian*	New Business		Business in Force		Life Fund
			No of Policies (000)	Sum Assured (Rs crore)	No of Policies (000)	Sum Assured (Rs crore)	(Rs Crore)
1914	49	36		3.2	-	-	6.36
1915	-	40		2.25	-	-	6.77
1920	-	43	28	5.16	-	-	8.47
1925	-	49	43	8.15	-	-	12.57
1930	68	68	145	27.5	564	124	20.53
1935	-	215	239	43.5	1095	235	35.19
1940	195	179	206	36.11	1553	286	62.41
1945	215	198	599	136.3	2392	557	107.4
1950	209	185	498	139.5	3280	780	181.5
1955	245	229	831	260.8	4782	1220	299.7
Source: EPW, Privatisation and Foreign Participation in (Life) Insurance Sector, March 25, 2000 * includes Indian Insurers and Provident Societies							

By the year 1938, more than 100 insurance companies were doing business in India but the industry was plagued by fraud and mismanagement of funds. In 1937, the Government of India set up a consultative committee under the Chairmanship of Mr. Shusil C. Sen, a well-known Calcutta solicitor. Finally, the **Insurance Act, 1938** was passed to give order to the industry; it also brought other fundamental changes, including the creation of an insurance wing in the Ministry of Finance. This piece of legislation was the first comprehensive one in India and covered both life and general insurance companies. The important legislations include: deposits for the life insurance business, supervision of insurance companies, investments, commission of agents and directors appointed by the policy holders among others. However, this Act lost its importance after the nationalisation of life Insurance in 1956 and General insurance in 1972 respectively. With the privatization/deregulation of the sector in late 20th century, the Insurance Act 1938 has turned out as the backbone of the current legislation of insurance companies, as Insurance Regulatory and Development Authority Act of 1999 was superimposed on the Insurance Act 1938.

2.4.2 Phase II of Insurance Evolution (Nationalisation Era)

2.4.2.1 Life Insurance in India

The enactment of the Insurance Act 1938 provided stability to the growing insurance business and the earlier legislations were consolidated and amended to protect the interest of the insuring public. There were a large number of insurance companies and the level of

competition was high. However, there were also allegations of unfair trade practices. The Government of India, therefore, decided to nationalize insurance business. An Ordinance was issued on 19th January, 1956 nationalizing the Life Insurance sector and *Life Insurance Corporation (LIC)* came into existence under the introduction of the Life Insurance Act on 01 September, 1956. The LIC absorbed 245 Indian and foreign insurers, including 154 Indian, 16 non-Indian insurers and 75 provident societies. By the LIC Act, the Government of India has contributed Rs 5 crore. The then Finance Minister, Shri C.D. Deshmukh, while piloting the bill, outlined the objectives of LIC: (i) to conduct the business with the utmost economy, in a spirit of trusteeship; (ii) to charge premium no higher than warranted by strict actuarial considerations; (iii) to invest the funds for obtaining maximum yield for the policy holders consistent with safety of the capital; and (iv) to render prompt and efficient service to policy holders, thereby making insurance widely popular. Thus, nationalisation aimed at overcoming the inefficiency and malpractices involved during the period of private insurance operations, to make life insurance widespread under Government control, to restore public confidence and to ensure maximum security to the policy holders' capital. At the same time, nationalisation also aimed at using the funds available with LIC for development under 5-yr plans[5].

Further, LIC formulated its objectives in pursuance of recommendations of the Administrative Reforms Commission. Since nationalisation, LIC has built up a vast network of 2,048 branches, 100 divisions and seven Zonal offices spread over the country. The Life Insurance Corporation of India also transacts business abroad through joint ventures, subsidiaries and also through own offices. LIC plays an important role in the economy for two reasons: (a) as a national insurance agency it serves to pool and redistribute risks associated with the policy holders in millions of households, and (b) as a major savings institution, it serves to mobilise a large number of small savings. LIC is a dominant financial intermediary in the economy as it serves to channel investible funds into productive sectors of the economy. These two aspects of LIC together raise a number of issues concerning its present state and future role in the economic development of India. During the period 1956 to 1999, LIC emerged as a giant financial institution and the sole organisation purveying life insurance, if we ignore the minimal presence of postal life insurance. The institution

[5] In 1974 as a follow up to the recommendations suggested by the Administrative Reforms Committee, appointed by Government of India, the LIC explicitly aimed at bringing all possible sections of the society under life insurance by making it cheaply available, maintaining it economically and increasing the productivity of the personnel.

succeeded in penetrating many areas and segments of the population and in garnering public money for public welfare.

Major Achievements of LIC

The major achievements of the Indian Life insurance industry after the nation's independence can be best visualised through the performance of LIC vis-a-vis fulfilment of its objectives. Some of them are outlined below:

- **Spread of Insurance at a Reasonable Cost:** This was the first and foremost objective of the Corporation. At the time of nationalisation, the total new business of the 245 erstwhile insurance companies was around Rs 200 crore of sums assured. The table 2.5 indicates that the business growth numbers are robust, as the number of policies increased by 15 fold and sum assured rose by 194 fold during the period 1957 to 1998. The individual business in force of the Corporation as on 1998 stands more than 850 lakh policies for a sum assured of over Rs 4 lakh crore, which can be observed from the following table:

Table 2.5: LIC's Business Performance

Year	Individual New Business			Individual Business in-force	
	Policies (in lakhs)	Sum Assured (Rs. In Crores)	First Year Premium (Rs. Crore)	Policies (in lakhs)	Sum Assured (Rs. in Crores)
1957*	9.3	328.1	13.1	56.9	1,474.0
1969-70	14.0	1,025.8	41.4	140.4	6,425.0
1979-80	21.0	2,733.1	134.3	220.9	19,242.6
1989-90	73.9	23,219.5	1,053.8	404.0	94,823.2
1997-98	133.1	63,617.7	3,371.5	850.0	400,747.9

Source: Life Insurance Compendium, 1999-2000, * 16 months

Table 2.6: Rural Thrust (Individual Insurance)

Year	Policies (in Lakh)			Sum Assured (Rs. in Crore)		
	Total	Rural	% to Total	Total	Rural	% to Total
1960-61	16.62	5.34	36.53	598.79	182.59	30.49
1969-70	13.97	4.61	33.00	1,025.80	251.76	24.54
1979-80	20.96	5.91	28.20	2,733.11	603.77	22.09
1989-90	73.92	30.48	41.23	23,219.53	8,086.35	34.83
1997-98	133.11	68.40	51.40	63,617.69	27,550.69	43.00

Source: Life Insurance Compendium, 1999-2000

- **Spreading Insurance to Rural Areas:** In the pre-nationalisation period, life insurance was largely an urban phenomenon. It became the responsibility of the national insurer (LIC) to take insurance to every nook and corner of the country. In 1998, around 51% of the new policies were being sold in the rural areas and the impetus on rural thrust can be further observed from the fact that nearly half of LIC agents were from rural areas and over half of its branches were in village areas.

- **Mobilising Savings and Deployment of the funds to serve the Best Interest of Policy Holders and the Nation:** Another important goal of the LIC was to mobilise savings from the different pockets through insurance-linked saving schemes and invest these funds for the planned development of the country. The rate of mobilising savings increased steadily. In 1957, the total premium income was Rs 88.7 crore. By 1980, it had grown 10 times and by 1998, it crossed 200 times.

Table 2.7: LIC's Total Premium Income & Life Fund

Year	Total Premium (Rs. Crore)	Annualized Growth (%)	Life Fund (Rs. in Crores)	Annualized Growth (%)
1957*	88.7		447.8	4.5
1969-70	260.4	10.9	1,611.0	6.1
1979-80	875.4	13.0	5,818.1	7.9
1989-90	4,489.4	30.8	23,471.8	11.1
1997-98	19,252.1	18.6	105,832.9	12.4
1998-99	22,805.8	18.5	127,389.1	20.4

Source: Life Insurance Compendium, 1999-2000, * 16 months

The steady increase in premium collections has resulted reservoir of life fund, which has grown from a deficient Rs 410 crore in 1957 to over Rs 1,05,832 crore in 1998. In the meanwhile, the extent of contribution of LIC's investments to the nation's planned development is immense.

Table 2.8: LIC's Investment during Five Year Plan Period

Plan	Year	Investments (Rs Crore)
II	1956-57 to 160-61	184
III	1961-62 to 1965-66	285
IV	1969-70 to 1973-74	1530
V	1974-75 to 1978-79	2942
VI	1980-81 to 1984-85	7140
VII	1985-86 to 1989-90	12969
VIII	1992-93 to 1996-97	56097
IX	1997-98 to 2001-02	19477

Source: Life Insurance Compendium, 1999-2000

Table 2.9: LIC's Performance at a Glance								
Year	**1957**	**1969-70**	**1974-75**	**1979-80**	**1995-96**	**1996-67**	**1997-98**	**1998-99**
TOTAL NEW BUSINESS								
Individual (Rs. In Crore)	336.37	990.03	1772.61	2744.33	5207.53	56993.94	63927.83	-
Group (Rs. In Crore)	-	46.05	1339.82	5262.06	62697.99	77559.34	66085.61	76619.21
BUSINESS IN FORCE								
Individual (Rs. In Crore)	1476.52	6348.09	11852.25	19242.55	295758.05	344619.35	400747.88	-
Group (Rs. In Crore)	5.29	77.17	1457	6137.46	64651.54	64606.6	74798.75	-
No of Polices in Force (In Lakhs)	56.86	140.4	188.2	220.94	709.6	777.5	850.3	-
Total No of lives covered under Group (In Lakhs)**	-	-	23.34	58.41	250.68	244.5	281.93	-
Life Fund (Rs. In Crore)	410.40	1611.03	3033.79	5818.09	72780.06	87759.963	105832.89	123789.06
INVESTMENT (Rs. In Crore)								
a) Book value of total investments	381.90	1514.26	2798.43	5747.51	65057	82665	98948	120445
b) Book value of socially oriented investments	-	513.21	1218.52	2472.29	50446	6107	73082	88831
Claims Settlled Number (In Lakhs)	-	3.21	4.68	7.19	41.67	49.49	56.52	
First Year (Rs. In Crore)	13.72	41.90	85.67	135.11	2379.02	2877.24	3382.98	4071.73
Renewal Premium (Rs. In Crore)	74.35	214.71	411.70	690.15	10770.55	12946.05	15166.34	17710.22
Source: Life Insurance Compendium, 1999-2000 ** Including Capital Redemption and Annuity Insurance Business								

2.4.2.2 Non-life Insurance in India

The history of non-life insurance can be stressed back to the early civilisation. As civilisation progressed the incidence of losses started to increase by giving rise to the concept of loss sharing. Loss sharing was also practised by the Aryans through their village cooperatives. It was also practised by the Mediterranean merchants in 4th century BC through the issue of Bottomry Bonds. The code of Manu indicates that there was a hint of marine insurance being carried out by the traders in India with Sri Lanka, Egypt and Greece. The earliest transaction of insurance as practised today can be traced back to the 14th century AD in Italy when ships were only being covered. This practice of Marine Insurance gradually spread to London and during the 16th century it was established in the mercantile transactions. The history of marine insurance is closely linked with the origin and rise of the Lloyds Ship-owners. Captains and Merchants used to gather in a coffee-house to deal with the various problems. Individual merchants started adopting marine risks to their other line of activities. The Lloyd's Act was framed to set up the Lloyd's by which they were empowered to transact other classes of insurance. Today, Lloyds is regarded as the largest insurance underwriter in the world.

General insurance in India was originated from UK, where the British transacted general insurance business through their agencies in India. The first general insurance company, Triton Insurance Company Ltd, was established in Calcutta in 1850, whose shares were held mainly by the British. The first insurance company to be set-up by the Indians for transacting all classes of general insurance business was Indian Mercantile Insurance Company Ltd at Bombay in the year 1907. The British and other foreign insurers had a good share of insurance business, about 40%, at the time of Independence. However, this share declined

progressively thereafter. In 1957, the General Insurance Council, a wing of the Insurance Association of India, was set up, which has framed a code of conduct for ensuring fair conduct and sound business practices in general insurance. In 1968, the Insurance Act 1938 was amended to regulate investments and set minimum solvency margins. The Tariff Advisory Committee (TAC) was also set up and became a statutory body. The TAC was seen as an independent, impartial, scientifically driven body for rate making in general insurance. However, after the nationalisation of general insurance, TAC became handmaiden, as members of TAC are from Chairman of the general insurance companies.

Further, with the passing of the General Insurance Business (Nationalisation) Act 1972, general insurance business was nationalized with effect from 1st January 1973. The then existing 107 insurers were amalgamated and grouped into four subsidiary companies of GIC, namely the National Insurance Company Ltd., the Oriental Insurance Company Ltd, the United India Insurance Company Ltd and the New India Assurance Company Ltd. Collectively, these 4-subsidiaries are known as ***NOUN*** for their initials. The General Insurance Corporation of India (GIC) was incorporated as a company in 1971 and it commenced its business on 1st January 1973. The GIC also designated the National Reinsurer (GIC Re). The new structure of General Insurance has several objectives, like (i) the subsidiary companies were expected to 'set up standards of conduct and sound practices in the general insurance business and rendering efficient customer service'; (ii) the GIC was to help with 'controlling their expenses'; (iii) it was to help with investment of funds; (iv) to spread general insurance to the rural areas and (v) all the 4 subsidiaries are supposed to compete with each other.

Table 2.10: Growth of General Insurance Business (1973 to 1998)

Particulars	1972-73	1984-85	1992-93	1995-96	1997-98
Gross Direct Premium*	-	-	10173	15548	19627
% growth	-	-	14.9	17.9	9.1
Net Premium Income	2223	11905	7683	11316	14027
Net Claim Incurred	1129	7949	6155	9504	11543
Commission, Expenses of Magt. Etc	680	2866	1495	2903	3495
Operating Surplus	-	-	33	-1091	-1011
Profit after Tax	139	1567	770	469	1485
Total Assets	-	-	18314	31148	40333

Source: General Insurance Compendium, * within & Outside India

Some of the important milestones in the General Insurance Business in India are outlined in the following table:

Table 2.11: Milestone's in the General Insurance Business in India

Year	Significant Regulatory Event
1907	• The Indian Mercantile Insurance Ltd. set up, the first company to transact all classes of general insurance business
1957	• General Insurance Council, a wing of the Insurance Association of India, frames a code of conduct for ensuring fair conduct and sound business practices
1968	• The Insurance Act amended to regulate investments and set minimum solvency margins and the Tariff Advisory Committee set up.
1972	• The General Insurance Business (Nationalization) Act, 1972: nationalized the general insurance business in India with effect from 1st January 1973. • 107 insurers amalgamated and grouped into four companies viz. the National Insurance Company Ltd., the New India Assurance Company Ltd., the Oriental Insurance Company Ltd. and the United India Insurance Company Ltd. GIC incorporated as a company.

Thus, nationalisation of both life and non-life insurance industry in 1956 and 1972 respectively, transformed the competitive, private insurance industry into a monopolistic and oligopolistic State or Public Sector insurance industry in India. However, the insulated from competitive market forces, the nationalized insurance monopolies of India have not really contributed to the economic development of India and the insurance penetration and density remained at low level.

2.4.3 Phase III of Insurance Evolution (Post-Deregulation)

The process of re-opening of this sector had begun in the early 1990s, when Government of India had appointed a committee headed by Mr. R.N. Malhotra in April 1993 to propose recommendations for reforms in the insurance sector. The committee submitted its report in January 1994 and recommended that the private sector should be permitted to enter the insurance industry. Following the recommendations of the Committee, in 1999, the Insurance Regulatory and Development Authority (IRDA) was constituted as an autonomous body to regulate and develop the insurance industry. The IRDA was incorporated as a statutory body in April, 2000. The key objectives of the IRDA include promotion of competition so as to enhance customer satisfaction through increased consumer choice and lower premiums, while ensuring the financial security of the insurance market.

The IRDA opened up the market in August 2000, to private players with a foreign investment cap of 26% in equity shareholding. With the private and foreign players' participation, the

Indian insurance industry is transforming from a monopoly (2001) to a competitive market structure. As of September 2014, the industry constitutes a total of 53 insurers, of which 24 are in life insurance business (1 Public & 23 Private) and 28 are in non-life insurance business (6 Public; 4 non-life and 2 specialised insurers, namely ECGC & AIC & 22 Private includes 17 non-life and five Standalone Health Insurance[6] Companies). In 2013-14, Cigna TTK Health Insurance Company started its operation with an equity capital of Rs 100 crore in the health insurance business segment. In 2000, the total number of insurers in the industry was only six (including LIC, 4 public sector general insurers and GIC as the national reinsurer).

Table 2.12: Registered Insurers in India*

Type of Business	2000	2014		
	Public Sector	Private Sector	Public Sector	Total
1. Life Insurance	1	23	1	**24**
2. Non-life Insurance	4	22	6	**28**
Specialised Insurers	1	-	2	**2**
Health Insurance	-	5	-	**4**
3. Reinsurance	1	-	1	**1**

Source: IRDA *as on 30 September 2014

Further, the Government raised the FDI cap up to 49% in the insurance business in India in 2014-15, with the provision that the 'management and control' of these companies will be with Indians. The 49% FDI cap will be a composite of both foreign portfolio investment (FII) and foreign direct investments (FDI). However, the clarity on 'ownership and control', has created uncertainty for promoters of insurance companies that were majority owned by foreign investors, such as Housing Development Finance Corp. Ltd (HDFC) and ICICI Bank Ltd. Foreign holding in both ICICI Bank and HDFC is more than 70%. On 24 June 2015, finance minister hinted that Government will soon clarify on what ownership and control means in the Indian insurance sector. The move could come as a major relief for promoters of insurance companies that are majority owned by foreign investors.

[6] namely Star Health & Allied Insurance Company, Apollo Munich Health Insurance Company, Max Bupa Health Insurance Company, Religare Health Insurance Company and Cigna TTK Health Insurance Company

2.4.3.1 Life Insurance Performance

Since liberalization, Indian life insurance industry has gone through two cycles; *first* one is characterized by a period of high growth (CAGR of approx. 29% in new business premium in 2000-01 to 2010-11) and the second one, is noted as a negative growth period (CAGR of -2% in new business premium in 2010-11 to 2013-14). Today, LIC is competing with 23 private-sector insurers in the industry, who have commenced operations over the period 2000-14. After the entry of private players in the life insurance business in India, LIC lost its market share from 100% in FY01 to 69.8% in FY11, however, interestingly in the last three years, LIC gained market share and reach at 75.5% in FY14. While the private life insurers business growth is declining. In 2013-14, out of the 23 private life insurers, 12 companies in total premium and 14 companies in first year premium (including single premium) registered a negative growth. However, on a positive note, on a cumulative basis both LIC and private insurers together have covered 93.2% of all districts in the country. The number of districts with no presence of life insurance offices stood at 36 in the country. Out of these, 23 districts belong to six of the north eastern states namely Arunachal Pradesh, Assam, Nagaland, Manipur, Mizoram and Sikkim. At the end of March 2014, all the 24 life insurers complied with the stipulated requirement of solvency ratio of 1.5. (LIC: 1.54).

Table 2.13: Business Performance of Life Insurance Sector

Particulars	**2000-01**	**2001-02**	**2005-06**	**2010-11**	**2011-12**	**2012-13**	**2013-14**
No. of Insurers	5	12	15	23	24	24	24
No. of Branch Offices	2,199	2,306	3,865	11,546	11,167	10,285	11032
Number of New Policies issued (in lakhs)		253.7	354.6	481.5	441.9	441.9	408.7
1Yr Prm (including Single Prm Rs Crore)	9,707	19,857	38,786	126,381	113,942	107,361	120,320
% Growth		104.56	47.93	15.01	-9.85	-5.78	12.1
Total Premium (Rs Crore)	34,898	50,094	105,876	291,605	287,072	287,203	314,283
% Growth		43.54	27.78	9.85	-1.57	0.05	9.4
LIC Market Share (on Total Prm)	**99.98**	**99.46**	**85.75**	**69.78**	**70.68**	**72.70**	**75.39**
Individual Business in Force (no of policies) (in '000)	-	-	193,601	329,187	335,284	336,112	-
Individual Business in Force (Sum Assured) (Rs crore)	-	-	1,554,045	3,856,219	4,311,470	4,719,832	-
No. of Individual Agents (Nos.)	-	476,902	1,423,839	2,639,392	2,358,885	2,122,757	-
Commission Expense Ratio (Total Premium)*	-	-	-	6.29	6.46	6.71	6.63
Life Fund (Rs. Crore)	194,010	230,369	397,189	841,075	974,620	1,120,000	1,288,225
PAT (Rs Crore)	291	594	-452	2,657	5,974	6,948	7,588

Source: IRDA * is the ratio between commission expenses and the premium underwritten by life insurers

Performance of Channels of Distribution

The new insurers have contributed to the sector's development significantly by enhancing product awareness, promoting consumer education & information and creating more organized distribution channels like agency, bancassurance, broking, direct, corporate agency amongst others. The development of bancassurance channel has helps the private sector players to break into the market quickly and gain market share. In eight years (2006-07 to 2013-14) of 'bancassurance' in India, the life insurance premium (both individual and group) collection by banks registered a CAGR growth of 20%, compared to 6% growth in total life premium through all other channels. The 'Corporate Agents - Banks' channel, accounts for about 15.6% share in new business life insurance (individual) for 2013-14, compared with 5.6% share in 2006-07. The decline in share by the 'Corporate Agents-Banks' channel in 2013-14, can be attributed to policy uncertainty regarding bancassurance in the country. Though this channel is gaining importance in India, it still remains low as compared to the developed markets (Spain 65%, France 60%, Belgium 50%, UK 16%, China 56%, Brazil 50%, South Korea 37% and 63% in Taiwan).

Table 2.14: Channel Wise New Business Performance of Life Insurers in Individual Policies Segment (% Share)

Channels	FY14	FY13	FY12	FY11	FY10	FY09	FY08	FY07
Individual Agents	78.4	77.5	78.7	79.0	79.6	79.6	83.8	90.5
Corporate Agents-Banks	15.6	16.2	15.0	13.3	10.6	9.7	8.0	5.6
Corporate Agents- Others	1.3	2.1	2.7	3.6	4.3	4.9	4.4	3.0
Brokers	1.6	1.6	1.8	1.8	1.4	1.1	0.6	0.6
Direct Selling	3.1	2.6	1.9	2.4	4.1	4.8	3.3	0.4
Total	100	100	100	100	100	100	100	100

Source: IRDA

Issues in Bancassurance Model in India

In the Union Budget speech of 2013-14, the Finance Minister permitted banks to act as insurance brokers, for better insurance penetration and to reduce mis-selling of insurance products by existing Agents. As brokers, banks apart from being able to give customers products of multiple insurers would also be responsible for the sale of that product because of the fiduciary responsibility they would shoulder as brokers. However, as agents they always represent the interest of the insurer and not that of the policyholder. Consequently, RBI and IRDA have issued guidelines on insurance broking norms. The move definitely will help in expanding the insurance distribution base and enable banks to boost their fee based income.

The new guidelines also propose to avoid any conflict of interest, - for instance banks undertaking insurance broking business will not be allowed to enter into agreements either for corporate agency or for referral arrangements for insurance, either departmentally or through subsidiaries/group companies. A recent paper by Parida (2014), it has been shown that banks are more comfortable with corporate agency arrangements and are resistant to take additional risk on insurance broking. The main reasons are noted below:

- On an average, less than 2% of a bank's profit comes from selling insurance policies. So, if one accounts for the cost involved for banks to set up separate departments and train their staff for insurance broking, it does not seem a viable option. Also under the broking business, banks would earn less commission (30% of first year premium and 5% on renewal for selling a life insurance policy) as compared to corporate agency model (commission 40% of first year premium and 7.5% on renewal for selling a life insurance policy). So, this may not motivate the banks to go for broker model with high risk and low return.
- There is a cap on business from one client (50%) and on business from the promoter group (insurance company) at 25%. This does seem prudent from a risk management point of view, it also militates against common sense from another angle. But, the issue is *"why would a company put in so much capital and effort in order to see the Bank branches sell just 25% of its products while it can earn 75% of income from its competitor's products?"*. However, there are many big banks that are already doing insurance business through subsidiary route. The caps on business may work as a disincentive for banks to apply for insurance broking license. In our view, some relaxation in the stringent limits on income earned from sale of subsidiaries' insurance products may be given before finalization of the draft guidelines.
- Besides, for banks and insurance companies, there are also issues of technology investments and training of workforce. Even integrating an insurance company's system with a bank's core banking system can take months and is often riddled with hiccups. So, the difficulties of doing that with four or five companies would increase the operational cost to manifold (training, department set-up, regular reporting & scrutiny and system integrations etc.)
- It is clear that the directives may have been framed without reference to ground realities. It is time for the Finance Ministry and the RBI to re-look the matter to observe the ground

realities and find a way forward for a sustained bancassurance model, in which all the stakeholders, i.e., banks, insurers and customers, will benefit while also achieving the objective of inclusion.

Finally, research suggests that some of the products of insurance, especially from the long-term savings point of view, closely resemble term deposits of banks, so there are apprehensions that insurance products would supplant bank products instead of supplementing them. However, if the commission is more than the return on deposits then banks would be motivated to adopt insurance business as one of their key areas of operations.

2.4.3.2 Non-Life Insurance Business Performance

The non-life industry which grew at around 10% in the period 1996-97 to 2000-01, has reported an average annual growth of 16.2% in the period 2001-02 to 2013-14. However, in 2013-14, the non-life business sector growth declined but better than the life insurance business. In addition, it is a concern that total expenses is growing at a robust rate.

Table 2.15: Business Performance of Non-Life Insurance Sector

Particulars	**2000-01**	**2001-02**	**2005-06**	**2010-11**	**2011-12**	**2012-13**	**2013-14**
No. of Insurers (incl reinsurer)	9	13	15	25	25	27	28
No. of Offices				6,660	7,050	8,099	9,872
No of New Policies issued (in lakhs)			511	793	857	1,070	1,025
Gross Direct Premium^ (Rs Crore)		12,385	21,339	43,842	54,578	62,973	70,610
% Growth			15.6	22.4	24.2	19.1	12.1
Market Share of PSUs*		96.2	74.9	60.2	59.1	55.6	54.7
Incurred Claims Ratio#	88.0	78.3	88.4	93.3	88.9	82.8	81.7
Profit After Tax (Rs Crore)	-14	-72	1,747	-1,019	25	3,282	4,439

Source: IRDA, * excluding GIC, AIC & ECGC, ^ Within & outside India, # net incurred claims to net premium

Table 2.16: Market Share Segment Wise Non-Life Insurance in Gross Direct Premium (India)

LOB	FY06	FY 07	FY 08	FY 09	FY10	FY11	FY12	FY13	**FY14**	**CAGR (%)**
Fire	**18.54**	**16.59**	**12.43**	**11.15**	**11.18**	**10.70**	**10.27**	**10.57**	**10.47**	**8.76**
Marine	6.31	6.54	6.47	6.44	6.26	5.92	5.44	4.81	4.47	11.89
Motor	42.90	42.95	45.59	43.94	43.46	42.70	45.84	47.05	47.90	18.44
Health	**10.91**	**13.33**	**17.59**	**20.06**	**21.12**	**23.36**	**22.27**	**22.19**	**22.18**	**27.66**
Others	21.35	20.60	17.92	18.41	17.98	17.33	16.18	15.37	14.98	11.76
Total	100	100	100	100	100	100	100	100	100	17.5

Source: IRDA

In the last few years, the health insurance segment has been growing constantly unlike other lines of business (LOB). The high CAGR growth (27.66% during FY06 to FY14) of health insurance led to a noticeable rise in gross direct premium to Rs 15,663 crore in FY14 from Rs 2,221 crore in FY06 (almost 7-times). The business share also increased to 22.18% in FY14 from 10.91% in FY06. The premium collection by the fire insurance LOB, however, was at Rs 7392 crore in FY14, compared to Rs 3,774 crore in FY06, registering the lowest CAGR growth of 8.45% among the entire LOB.

Measuring Structural Change in the Non-life Insurance

To measure the structural change, the Structural Change Indices (SCI) is commonly used. The SCIs are important indicators, which are computed to assess the quantum of structural change in an industry or sector over time. In our analysis discussed below, the most simple and widely accepted SCI, is used to measure the structural change in the Indian non-life insurance industry.

a) **Norm of Absolute Values (NAV):** The simplest form of SCI is known as the Norm of Absolute Values (NAV) and is defined as:

$$\mathbf{NAV = 0.5 \sum_{i=1}^{n} I\, Xit - Xis\, I}$$

Where, the terms x_{it} and x_{is} are the share of i^{th} line of business at points of time t and s. The absolute (modulus) values of the difference of the two is taken and summed over all lines of business. This index is also known as the Michaely index or Stoikov Index. It varies from 0 to 100 (if shares are expressed in per cent) or from 0 to 1 (if shares are expressed in proportions). The following table provides the NAV for various components of non-life business. The advantage of NAV index is that it is very simple to compute and understand. One of the disadvantages of NAV is that there might be similar impact due to huge movements in a few components and due to light movement in many components.

Table 2.17: Norm of Absolute Values (NAV) Index for the period 2005-06 to 2013-14

LOB	FY06	FY 07	FY 08	FY 09	FY10	FY11	FY12	FY13	FY14
Fire	0.00	0.97	3.05	3.69	3.68	3.92	4.14	3.98	4.03
Marine	0.00	0.11	0.08	0.07	0.02	0.20	0.44	0.75	0.92
Motor	0.00	0.03	1.35	0.52	0.28	0.10	1.47	2.08	2.50
Health	0.00	1.21	3.34	4.58	5.11	6.22	5.68	5.64	5.64
Others	0.00	0.38	1.72	1.47	1.68	2.01	2.58	2.99	3.19
Total	0.00	2.70	9.54	10.33	10.78	12.45	14.31	15.44	16.28

Source: IRDA

b) Modified Lilien Index (MLI)

The alternative proposed therefore is the index namely, the Modified Lilien Index (MLI), which is defined as:

$$\mathbf{MLI = Square\ root\ [\Sigma\ x_{it} * x_{is} * (\ln x_{it} / x_{is})^2\ ],\ t > s}$$

The MLI overcomes the limitations of NAV Index. Further, the influence of a particular component is a function of its weight as well as its relative growth. The computed values of MLI are provided in the following table:

Table 2.18: Modified Lilien Index (MLI) for the period 2005-06 to 2013-14

	FY06	FY 07	FY 08	FY 09	FY10	FY11	FY12	FY13	FY14
Fire	0.00	3.79	36.80	53.42	53.07	59.95	66.44	61.80	61.19
Marine	0.00	0.05	0.02	0.02	0.00	0.15	0.76	2.23	2.07
Motor	0.00	0.00	7.27	1.09	0.32	0.04	8.67	17.27	17.58
Health	0.00	5.84	43.83	81.19	100.55	147.68	123.83	122.12	122.05
Others	0.00	0.57	11.74	8.65	11.33	16.12	26.55	35.43	34.53
Total	0.00	3.20	9.98	12.02	12.86	14.96	15.04	15.45	15.41

Source: IRDA

It is interesting to note that the 'Fire and Health' insurance segments have influenced the structure of non-life insurance in the last 9 years. The high growth in the Health insurance premium, so far, has largely been demand-driven and the segment may continue to dictate the structure of non-life insurance industry in India in future.

2.4.3.3 Micro Insurance in India

Micro insurance regulations issued by the IRDA have provided a fillip in propagating micro insurance as a conceptual issue. With the positive and facilitative approach adopted under the micro insurance regulations, it is expected that all insurance companies would come out with a progressive business approach and carry forward the spirit of regulations thereby extending insurance penetration to all segments of society. The number of micro insurance agents at the end of March 2014 stood at 20,057; of which 18401 agents are those belonging to LIC and the remaining are from the private sector insurance companies. In micro-insurance-life, the individual new business premium in 2013-14 was Rs 95.6 crore for 27.7 lakh policies and the group business amounted to Rs 141.7 crore premium for 1.32 crore lives.

2.5 Evolution and Progress of Postal & Rural Postal Life Insurance in India

2.5.1 Postal Life Insurance (PLI)

Postal life insurance was introduced on 01 February 1884 with the express approval of the Secretary of State (for India) to Her Majesty, the Queen Empress of India. It was essentially a scheme of State Insurance mooted by the then Director General of Post Offices, Mr. F.R. Hogg in 1881 as a welfare scheme for the benefit of Postal Employees and was later extended to the employees of Telegraph Department in 1888. In 1894, PLI extended insurance cover to female employees of P&T Department at a time when no other insurance company covered female lives. It is the oldest Life insurer in this country. PLI is an exempted insurer under Section 118 (c) of the Insurance Act of 1938. It is also exempted under Section 44 (d) of LIC Act, 1956.

Initially, the upper limit of life insurance was only Rs 4000/- which has now been increased to Rs 10 lakhs for all schemes combined - Endowment Assurance and Whole Life Assurance. Over the years, PLI has grown substantially from a few hundred policies in 1884 to 54,06,093 policies as on 31 March 2014. It now covers employees of Central and State Governments, Central and State Public Sector Undertakings, Universities, Government aided Educational institutions, Nationalized Banks, Local bodies etc. PLI also extends the facility of insurance to the officers and staff of the Defence services and Para-Military forces. Apart from single insurance policies, Postal Life Insurance also manages a Group Insurance scheme for the Extra Departmental Employees (Gramin Dak Sevaks) of the Department of Posts.

Table 2.19: POSTAL LIFE INSURANCE (PLI) (Amount in Rs Crore)

Year	No of Policies in Force	% Growth	Premium income	% Growth	Sum Assured Amount	% Growth	Corpus of Fund	% Growth
2001-02	20,08,575	..	502	13.2	11,870	..	5,090	..
2002-03	20,98,577	4.5	591	17.7	13,677	15.2	5,797	13.9
2003-04	22,08,683	5.2	698	18.2	15,918	16.4	6,620	14.2
2004-05	28,57,797	29.4	905	29.6	18,747	17.8	7,678	16.0
2005-06	30,98,248	8.4	1,079	19.2	22,952	22.4	8,934	16.4
2006-07	32,97,825	6.4	1,212	12.3	26,753	16.6	10,343	15.8
2007-08	35,50,084	7.7	1,480	22.2	31,469	17.6	12,082	16.8
2008-09	38,41,539	8.2	1,861	25.7	38,403	22.0	14,153	17.1
2009-10	42,83,302	11.5	2,413	29.7	51,210	33.3	16,656	17.7
2010-11	46,86,245	9.4	3,003	24.5	64,078	25.1	19,802	18.9
2011-12	50,06,060	6.8	3,681	22.6	76,591	19.5	23,011	16.2
2012-13	52,19,326	4.3	4,557	23.8	88,896	16.1	28,190	22.5
2013-14	54,06,093	3.6	5,352	17.4	1,02,276	15.1	32,716	16.1

Source: Directorate, PLI, Department of Post

However, Postal Life Insurance is not for investors who are looking for new-age products like unit-linked insurance policies (ULIPs) and pension plans. The postal department offers six plain vanilla plans, i.e., Suraksha (whole life assurance), Santosh (endowment assurance), Suvidha (convertible whole life insurance), Sumangal (anticipated endowment assurance), Yugal Suraksha (joint endowment) and Children's Policy. These policies just offer death cover while LIC and other insurance companies offer accidental death benefit with extra premiums.

2.5.2 Rural Postal Life Insurance (RPLI)

Rural Postal Life Insurance came into being as a sequel to the recommendations of the Malhotra Committee for Reforms in the Insurance Sector. The committee had observed that in 1993 that only 22% of the insurable population in this country have been insured; life insurance funds accounted for only 10% of the gross household savings. The committee also observed that the 'Rural Branch Postmasters who enjoy a position of trust in the community have the capacity to canvass life insurance business within their respective areas'.

Table 2.20: RURAL POSTAL LIFE INSURANCE (RPLI) (Amount in Rs Crore)

Year	No of Policies in Force	% Growth	Premium income	% Growth	Sum Assured	% Growth	Corpus of Fund	% Growth
2001-02	11,33,013	..	95	39.8	4,404	..	341	..
2002-03	17,95,070	58.4	171	80.9	7,465	69.5	511	49.7
2003-04	26,66,485	48.5	245	43.2	12,385	65.9	756	48.1
2004-05	37,96,773	42.4	38,087	55.3	18,896	52.6	1,128	49.1
2005-06	47,02,776	23.9	475	24.7	25,230	33.5	1,625	44.1
2006-07	52,46,673	11.6	601	26.5	33,866	34.2	2,285	40.6
2007-08	61,67,928	17.6	665	10.6	41,846	23.6	3,004	31.5
2008-09	73,56,446	19.3	879	32.3	53,072	26.8	3,994	33.0
2009-10	99,25,103	34.9	1,357	54.4	59,573	12.2	5,525	38.3
2010-11	1,22,03,345	23.0	1,111	-18.1	66,132	11.0	6,608	19.6
2011-12	1,35,47,355	11.0	1,559	40.3	69,754	5.5	9,141	38.3
2012-13	1,46,64,650	8.3	1,703	9.3	75,154	7.7	11,388	24.6
2013-14	1,50,14,314	2.4	1,960	15.1	79,466	5.7	13,352	17.5

Source: Directorate, PLI, Department of Post

The Government accepted the recommendations of Malhotra Committee and allowed Postal Life Insurance to extend its coverage to the rural areas to transact life insurance business with effect from 24 March 1995, mainly because of the vast network of Post Offices in the rural areas and low cost of operations. The prime objective of the scheme is to provide insurance cover to the rural public in general and to benefit weaker sections and women workers of rural areas in particular, and also to spread insurance awareness among the rural population. The growth of the RPLI is satisfactory over the years, as shown in the table above (2.20).

2.6 Measuring Demand for Life Insurance in India

The above discussions revolve around the evolution and performance of life and non-life insurance companies. So, the factors determining life insurance consumption in India are discussed here. The study adds to the existing literature in several ways; first, new data series with base year 2004-05 are considered for the economic variables like personal disposable income (PDI), WPI inflation etc and second, a long sample series has included. Third, life insurance penetration and density is used as the measure of insurance demand. The data used in this study are of annual frequency for the period 1971-72 to 2012-13, and are secondary in nature. All economic variables such as PDI, WPI, etc are collected from RBI, while Insurance Penetration and Density is computed from 'Life Fund' of RBI Handbook Database. The variables were transformed by taking its natural logarithm; except, variables expressed as rates and ratios. The unit root tests like KPSS & ADF test are used to check the stationary properties of the variables. To examine the model stability, we used CUSUM square plots, developed by Brown, Durbin and Evans (1975).

In the literature, life insurance demand has generally been modelled in the life cycle framework, in which households maximize the expected utility of their lifetime consumption. There is no unique integrated theory of savings, though several models of the demand for life insurance products have been developed and tested empirically. Nearly all theoretical work on the demand for life insurance takes Yaari (1965) as a starting point. He points out that the demand for life insurance is properly considered within the context of the consumer's lifetime allocation process. It is assumed here that each utility-maximizing household has the same degree of relative risk aversion, although some evidence indicates that inter country differences are likely to reflect differences in the degree of relative risk aversion and therefore affect the demand for life insurance.

Demand measurement of life insurance is not new for the western researcher, due to the robustness of insurance market, high level of penetration and well educated customers. There are many eminent authors like Yaari (1965), Lewis (1989), Cargill and Toxel (1979), Babbel (1985 and Outreville (1996). A number of theoretical models for the demand for life insurance developed by Fischer (1973), Pissarides (1980), Campbell (1980), Karni and Zilcha (1985, 1986), Lewis (1989), and Bernheim (1991). The models view life insurance as the means by which uncertainty in the household's income stream, related to the possible premature death of a household's primary wage earner, are reduced. Thus, the demand for

life insurance increases with the probability of the primary wage earner's death, the present value of the beneficiaries' consumption, and the degree of risk aversion. It decreases with the policy loading factor and the household's wealth. A summary of existing literature on life insurance consumption is mentioned in the above table 2.21.

Table 2.21: A Summary of Existing Life Insurance Consumption Studies

Determinants	Relationship	Existing Research Studies
Income	+ ve	Yaari (1965), Fisher (1973), Beenstock, Dickinson and Khajuria (1986), Truett and Truett 91990), Browne and Kim (1993), Outerville (1996), Enz(2000), ward and Zurbruegg (2000, 2002), Beck and Webb (2003), Zhuo (1999), Hwang and Gao (2003), Hwang and Greenford (2005), Debabrata and Amlan (2010), Sadhak (2006)
Inflation	+ ve	Cargil and Troxel (1979), Rubayah and Zaidi (2000), Lim and Heberman (2005), Debabrata and Amlan (2010)
	- ve	Green (1954), Fortune (1973), Babble (1981), Browne and Kim(1993), Outerville (1996), Ward and Zurbruegg (2000, 2002), Beck and Webb (2003), Sadhak (2006)
Interest Rates	+/- ve	Cargil and Troxel (1979), Rubayah and Zaidi (2000)
	I	Outerville (1996),
	- ve	Debabrata and Amlan (2010)
Financial Development	+ ve	Outerville (1996), Beck and Webb (2003) and Debabrata and Amlan (2010)
Savings	+ ve	Sadhak (2006)

Note: I = Insignificant relationship, - ve = Negative Relationship, + ve = Positive Relationship

2.6.1 Model for Insurance Demand in India

On the basis of existing theoretical and empirical literature, the study employs six socio-economic characteristics and market conditions, for which data are available, that may possibly affect the demand for life insurance. The factors are (i) Personal Disposable Income (PDI), (ii) inflation rate (WPI), (iii) interest rate/ deposit rate (DR), (iv) financial development (BCGDP), (v) level of employment (EMPT) and (vi) household savings (HHS). Thus, the demand for life insurance is defined as the average unit price of insurance policy multiplied by the quantity of life insurance policies purchased in a country during that period. The functional form of the proposed model with the expected sign for each variable is as under:

Demand for Insurance = f {Personal Disposable Income (+), Inflation (-), Financial Development (+/-), Interest rate (-), Household Savings (+), Employment (+)}

$$\mathbf{Ln\ (D_{li}) = \alpha_0 + \beta_1\ ln\ (PDI) + \beta_2\ WPI + \beta_3\ HHS + \beta_4\ LNEMPT + \beta_5\ BCGDP + \beta_6\ DR + e_i}$$

Where,

D_{li} = Demand for Life Insurance (LID and LIP)

α_0 β_i = Constants, i = 1, 2, 3, 4, 5 & 6

e_i = the random error term.

LNPDI: LN Personal Disposable Income

HHS: Household Savings

LID: Life Insurance Density (Rs) (defined as ratio of Life Fund to total Population)

LIP: Life Insurance Penetration (Life Fund/GDP*100)

LNEMPT: Employment Level

WPI: Inflation Rate

BCGDP: Financial Development (Bank Credit/GDP*100)

DR: Deposit Rate above 5 Yrs

To test our hypothesis, the above said model has been estimated by Ordinary Least Squares (OLS) method. Two versions of the model are estimated. The model is estimated first with 'life Insurance Density (LID)' as the measure of insurance consumption using data from 1971-72 to 2012-13. The second version of the model uses data from 1971-72 to 2012-13 with life insurance penetration (LIP) as the measure of insurance consumption.

2.6.2 Empirical Results & Discussions

Before estimating the above demand function, log-transform of the variables is undertaken whenever required. In the second step, stationary of the variables is checked using KPSS & ADF unit root tests. The KPSS & ADF unit root test results has been tabulated in the following table:

Table 2.22: Unit root Test Results

	KPSS Test	**ADF Test**
	H0: Variable is Stationary	**H0: Variable has a Unit Root**
Variables	**Level (Intercept)**	**Level (Intercept)**
LID	**0.58***	**7.19***
LIP	**0.68***	**2.27****
LNPDI	0.29*	-4.42*
FINHS	0.31*	-3.37**
LNEMPT	0.71*	-5.8*
WPI	0.25*	-4.57*
BCGDP	0.66*	0.72
DR	0.18*	-2.67**
* Significant at 1% level, ** Significant at 5% level		

Model 1: Estimation for 'Life Insurance Density (LID)'

The estimated results of the said demand function having LID as dependent variable are reported in the Model-1 of table 2.23.

$$LID = \alpha_0 + \beta_1 LNPDI + \beta_2 WPI + \beta_3 FINHS + \beta_4 LNEMPT + \beta_5 BCGDP + \beta_6 DR + + e_i$$

The estimated result of the above equation is as follows:

$$LID = -11.12 + 1.32 * PDI - 0.75 * WPI + 0.35 * FINHS + 5.55 * LNEMPT + 0.57 * BCGDP - 0.23 * DR$$

It is observed from table 2.23, that the independent variables (PDI, WPI, FINHS, LNEMPT, BCGDP and DR) collectively explain about 99.8 per cent of variance in the demand for life insurance in India. The variables like PDI, FINHS, LNEMPT and BCGDP are significant and positively related with LID, as theoretically expected. On the other hand, WPI and DR are significant and negatively related with LID, as expected. There is no autocorrelation in the model as D-W statistic (1.85) is close to two.

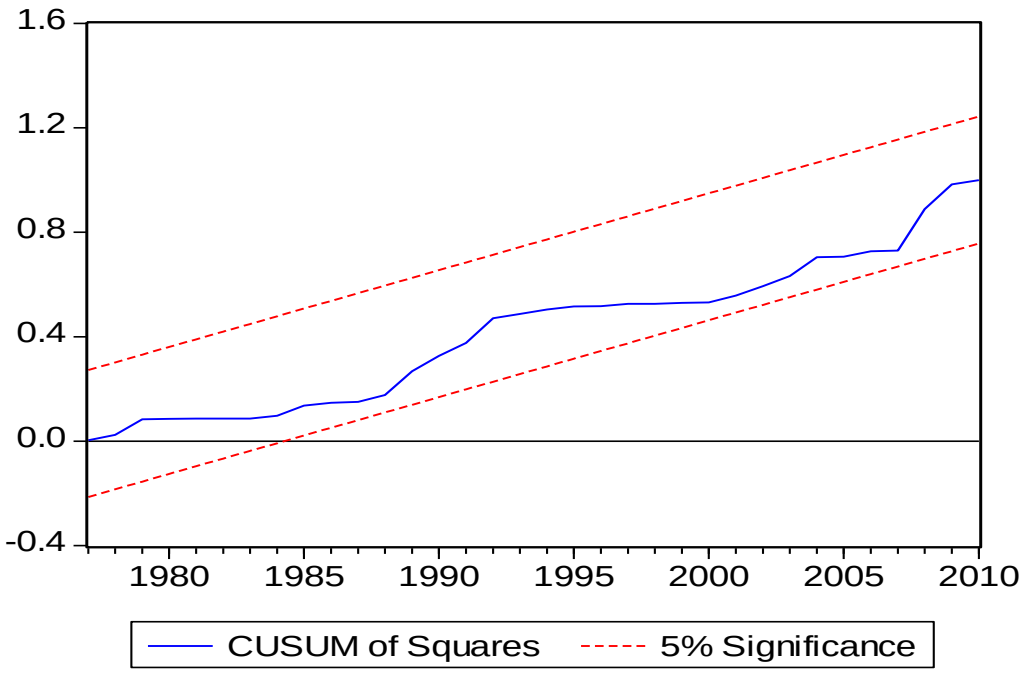
Table 2.23: OLS Results for LID, LIP and LIS

Model-1 (Dependent Variable-LID)			**Model-2 (Dependent Variable-LIP)**		
Regressor	**Coefficient**		**Regressor**	**Coefficient**	
C	-11.12 (-13.49) [0.00]	$\bar{R}^2$ =0.99	C	-8.85 (-4.62) [0.00]	$\bar{R}^2$= 0.96
PDI	1.32 (7.32) [0.00]	D-W Stat. = 1.85	PDI	0.94 (2.25) [0.03]	D-W Stat = 2.21
WPI	-0.75 (-3.37) [0.00]	F-stat = 6349.62 [0.00]	WPI	-1.43 (-2.77) [0.01]	F-stat = 198.69 [0.00]
FINHS	0.35 (2.18) [0.04]		FINHS	0.05 (0.12) [0.01]	
LNEMPT	5.55 (3.24) [0.01]		LNEMPT	9.66 (2.43) [0.02]	
BCGDP	0.57 (1.87) [0.07]		BCGDP	3.63 (5.11) [0.00]	
DR	-0.23 (3.71) [0.01]		DR	1.56 (6.21) [0.04]	

Note: Figures in (#), [#] implies t-statistics and P-values respectively

The model stability is examined through CUSUM square plots developed by Brown, Durbin and Evans (1975). In the CUSUM square test, the test statistic, viz. CUSUM Square (S_t) is plotted against time and the plot is examined in terms of 95% confidence interval around its mean E (S_t). If the cumulative sum (St) plots strays outside the confidence bounds, the null hypothesis of no parametric instability is rejected. That is, a structural shift in the parameters is said to have occurred at the corresponding break points. The CUSUM square plot of LIF is given in figure 2.6 and it is observed that, there is no instability in the demand equation of LIF.

Figure 2.6: CUSUM Square Plot of Life Insurance Fund



Model 2: Estimation for 'Life Insurance Penetration'

The estimated demand function for 'LIP' of the following form and the results are reported in Model 2 of table 2.23:

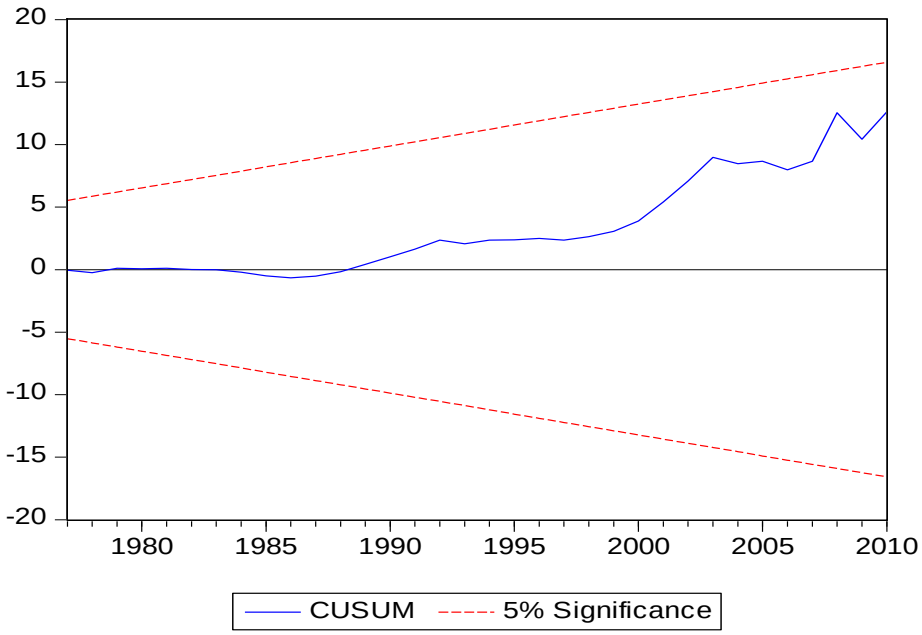
$$LIP = \alpha_0 + \beta_1 \ln (PDI) + \beta_2 WPI + \beta_3 HHS + \beta_4 LNEMPT + \beta_5 BCGDP + \beta_6 DR + + e_i$$

LIP= -8.85+ 0.94 * PDI - 1.43 * WPI + 0.05 * HHS + 9.66 * LNEMPT + 3.63* BCGDP + 1.56 DR

It is observed from the table 2.23 (Model 2) that, the dependent variable (LIP) is explained 96 per cent by the independent variables, i.e., PDI, WPI, HHS, LNEMPT, BCGDP and DR. Except WPI, all the variables are significant and positively related with LIP, while WPI is

significant but negatively related with LIP. The DR is positively related but we expected it to be negative. The D-W statistic is 2.21, which implies no autocorrelation problem in the error terms. CUSUM square plot of LIP is plotted in figure 2.7 and signifies that there is no instability in the LIP demand function.

Figure 2.7: CUSUM Square Plot of LIP



The results highlight that Personal Disposable Income (PDI), Financial Development (BC/GDP), Household Savings (HHS) and Employment as the most significant and positive factors in driving life insurance demand but inflation (WPI) bears a negative relation and Interest rate (Deposit Rate) shows positive and negative relation in two different models. Interestingly, it may be noted that life insurance consumption is not driven only by consumer demand. Important supply side factors affect the availability and price of life insurance. Insurance companies need human and information resources to effectively measure the pricing and reserve requirements for products as well as adequate investment opportunities in financial markets. Adequate protection of property rights and effective enforcement of contracts also facilitate the investment function of life insurers. These supply factors are expected to affect the costs of life insurance products. However, the supply side factor is beyond the scope of this study. This is reasonable to assume that when less insurance is supplied the price of insurance will be higher and the amount consumed will be lower (Acharya & Parida; 2014).

2.7 Challenges, Opportunities and Future Outlook

The Indian insurance industry is facing now a wave of structural change generated by shifting macro-economic and demographic conditions, demand for new products and services, and increasing regulatory pressure, which may put a number of insurers to confront new and far reaching challenges to remain successful in their business operations. However, the emerging economic environment also presents exciting opportunities for those insurers, who aspire to recognize and are able to adapt it. The key to success for the companies that are committed to grab a greater pie in the Indian insurance market will be greater focus on: (i) achieving cost efficiency, (ii) data analytics and (iii) product innovation with lower premium, which is needed to create growth and competitive advantage.

2.7.1 Challenges

In terms of regulation, the Indian insurance industry may be a challenge for the Government and IRDA, as there are 53 insurers, each represented by thousands of agents, brokers and intermediaries. On one hand, the regulator needs to promote competition in the market to bring efficiency, which will lower the premium price and on the other hand, to safeguard the interests of the policy holders, regulation is needed. So, proper care needs to be taken, so that excess control and regulation does not affect the growth and expansion of the insurers. There is a need for certain degree of autonomy in the functioning of insurance companies, which will give more space to the companies to carry out their business properly. To regulate the sector, our view is that IRDA, given its regulatory reach and qualified personnel, is eminently equipped to embark on the task of overseeing the sector. There is also a proposal to constitute a federation of insurance companies similar to the Indian Banks' Association (IBA), which will provide clear principles, lay down a code of insurance ethics and generally act as a facilitator for both the life and non-life industry with the Government and regulator.

At present, the insurance companies are facing difficulty in building their brand image and carving a niche in the minds of the public or prospective customers, particularly in life insurance business, as life insurance is deemed to a push market and there is no demand for the products. So, to convince the customers who are comparatively not well informed about the intangible benefits of life insurance is indeed an enormous task for the insurance companies. The next major difficulty faced by the insurance companies relates to setting up infrastructure and reaching out to as many areas as possible. Further, there is a need for innovating new products to meet the changing demands of the people. Managing the funds in

a fickle scenario to remain profitable in business for a longer period of time is another challenge.

2.7.2 Opportunities

The population in India is indeed vast and the existing dominant player LIC has managed to cover only 5% of the total population of the country. Further, in India, the ratio of assets of insurance companies to those of banks is only 3% while the ratio in US is 10%. This serves as another indicator of the potential that the industry can go forward to tap the vast market available in the country.

Going forward, the IRDA will play a key role in laying down the ground rules and paving the way for the sector's growth and development. In addition, the sector will be next only to the banking industry in creating employment opportunities in the country. Further, a number of web portals and financial magazines are exclusively devoted to insurance and also a few training institutes are being set up to create awareness of insurance in the country. Many of the universities and management institutes have already introduced courses on insurance to educate the technicalities of the insurance business, which will help students to make a career in insurance. Additionally, the Indian pension market is at a nascent stage and expected to witness a sea change in the coming years with huge expansion in terms of premium and number of policies. Finally, health insurance is likely to get a boost from the Government with a separate tax deduction under 80C, which ultimately will push improvement in the quality of medical treatment and facilities in the country.

2.7.3 Future Prospects

The future of India's insurance sector looks bright, as the country has a favourable demographics, growing awareness, and investment friendly Government. The Government and regulator (IRDA) are constantly looking to increase awareness among the people, liberalising policies to attract foreign investment and tax benefits to customer etc, to give businesses the best possible environment to grow. It is estimated by Boston Consulting Group (BCG) that the India's insurable population may touch 75 crore by 2020, with life expectancy at 74 years. In addition, life insurance is projected to comprise 35% of total savings by the end of this decade from 15% in 2013-14. Improving consumer sentiment and financial market conditions will also support demand for unit-linked and pension products in India.

Further, the Government's initiative towards 'micro-insurance' and 'health insurance' is another grey area of business opportunities. In a study of World Bank on *'Government-*

Sponsored Health Insurance in India: Are You Covered?' indicate that by 2015, almost half of the country's population would be covered under the health insurance and the spending through health insurance is likely to reach around 10% of total health spending of the country.

In the Union Budget 2015-16, the Government announced a number measures to increase insurance penetration in the country. These include: (i) Pradhan Mantri Suraksha Bima Yojana (PMSBY) covering accidental death risk of Rs 2 lakh at a premium of Rs 12 per year i.e. Rs 1 per month; (ii) Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) covering both natural and accidental death risk of Rs 2 lakh. The premium will be Rs 330 per year, or less than Rs 1 per day, for the age group of 18-50 Year; and (iii) raising the health insurance deduction limit under section 80D to Rs 25,000 from Rs 15,000. On 12 March 2015 the government passed the *Insurance Laws (Amendment) Bill 2014* in the Parliament, which raised the FDI cap in insurance from 26% to 49%. Further, the accidental insurance benefit of Rs 1 lakh and Rs 30,000 of life insurance under PMJDY saw the opening of over 13 crore bank accounts which has boosted premium collection.

Given the low levels of penetration of insurance and pension, PMJDY as it progresses further will enable the beneficiaries to avail other financial products like life insurance, personal accident insurance and Atal pension scheme. Government plans to launch a new insurance scheme for farmers in order to protect their incomes against price and production risks, which may help the affected farmer's capacity to invest in advanced crop varieties and impede capital formation in the sector. This will help to spread the micro-insurance business in the country. Finally, to predict the future of Indian insurers turning global players, this would be too early to address, as Indian industry holds only 1.46% (Sigma 4/2014) of the global market. We expect the industry will consolidate its position in the domestic market before venturing abroad.

2.8 Concluding Remarks

The Indian insurance industry has always been an attractive market for global insurers to expand their business, mainly due to the demographic profile and untapped business opportunities. However, the FDI limit for insurance in India is the lowest globally. China, Indonesia and Malaysia have an FDI limit of 50%, 80% and 51% respectively. Japan, South Korea, Vietnam, Hong Kong and Taiwan allow 100% FDI. In this context, the Government's move to increase the FDI limit in insurance to 49% is a welcome move, which aims at the

global investors and is expected to bring in the much required foreign capital to meet the needs of the industry. This may help the insurers to expand their footprint to support Government's objective of financial inclusion in the country. With tax sops in the Budget and Insurance Bill, this is a positive step and the beginning of *'acche din (better days)'* for the insurance industry, as this will encourage people to invest in long term savings instruments.

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Annexure 2.1: List Life Insurance Companies

LIFE INSURANCE COMPANIES OPERATING IN INDIA*							
Sl. No.	**Insurers**	**Foreign Partners**	**Date of Registration**	**Year of Operation**	**Head Office**	**Equity Capital (Rs Crore)**	**FDI (%)**
1	Life Insurance Corporation of India	---	01.09.1956	1956-57	Mumbai	100	-
2	HDFC Standard Life Insurance Company Ltd.	Standard Life Assurance, UK	23.10.2000	2000-01	Mumbai	1995	26.0
3	MaxLife Insurance Company Ltd.	New York Life, USA	15.11.2000	2000-01	Gurgaon	1945	26.0
4	ICICI Prudential Life Insurance Company Ltd.	Prudential Plc, UK	24.11.2000	2000-01	Mumbai	1429	25.9
5	Kotak Mahindra OM Life Insurance Company Ltd.	Old Mutual, South Africa	10.01.2001	2001-02	Mumbai	510	26.0
6	Birla Sunlife Insurance Company Ltd.	Sun Life, Canada	31.01.2001	2000-01	Mumbai	1901	26.0
7	TATA AIA Life Insurance Company Ltd.	American International Assurance Co., USA	12.02.2001	2001-02	Mumbai	1954	26.0
8	SBI Life Insurance Company Ltd.	BNP Paribas Assurance SA, France	29.03.2001	2001-02	Mumbai	1000	26.0
9	Exide Life Insurance Company Ltd.	---	02.08.2001	2001-02	Bangalore	1600	-
10	Bajaj Allianz Life Insurance Company Ltd.	Allianz, Germany	03.08.2001	2001-02	Pune	151	26.0
11	PNB Metlife India Insurance Company Ltd.	Metlife International Holdings Ltd., USA	06.08.2001	2001-02	Bangalore	2013	26.0
12	Reliance ife Insurance Company Ltd.	---	03.01.2002	2001-02	Mumbai	1196	-
13	Aviva Life Insurance Company Ltd.	Aviva International Holdings Ltd., UK	14.05.2002	2002-03	Gurgaon	2005	26.0
14	Sahara India Life Insurance Company Ltd.	---	06.02.2004	2004-05	Lucknow	232	-
15	Shriram Life Insurance Company Ltd.	Sanlam, South Africa	17.11.2005	2005-06	Hyderabad	175	0.0
16	Bharti AXA Life Insurance Company Ltd.	AXA Holdings, France	14.07.2006	2006-07	Mumbai	1978	22.2
17	Future Generali Life Insurance Company Ltd.	Generali, Italy	04.09.2007	2007-08	Mumbai	1452	25.5
18	IDBI Federal Life Insurance Company Ltd.	Ageas, Europe	19.12.2007	2007-08	Mumbai	800	26.0
19	Canara HSBC OBC Life Insurance Company Ltd.	HSBC, UK	08.05.2008	2008-09	Haryana	950	26.0
20	Aegon Religare Life Insurance Company Ltd.	Aegon ,Netherlands	27.06.2008	2008-09	Mumbai	1307	26.0
21	DHFL Pramerica Life Insurance Company Ltd.	Prudential of America, USA	27.06.2008	2008-09	Gurgaon	340	26.0
22	Star Union Dai-ichi Life Insurance Company Ltd.	Dai-ichi Mutual Life Insurance,Japan	26.12.2008	2008-09	Mumbai	250	26.0
23	IndiaFirst Life Insurance Company Ltd.	Legal & General Middle East Limited, UK	05.11.2009	2009-10	Mumbai	475	26.0
24	Edelweiss Tokio Life Insurance Company Ltd.	Tokio Marine Holding Inc,Japan	12.05.2011	2011-12	Mumbai	180	26.0
Source: IRDA * as on September 2014							

Annexure 2.2: List of Non-Life Insurance Companies

NON-LIFE INSURANCE COMPANIES OPERATING IN INDIA*							
Sl. No.	**Insurers**	**Foreign Partners**	**Regn. No.**	**Year of Operation**	**Head Office**	**Equity Capital (Rs Crore)**	**FDI (%)**
PUBLIC SECTOR							
1	The New India Assurance Company Ltd.	---	190	1919-20	Mumbai	200	-
2	National Insurance Company Ltd.	---	58	1906-07	Kolkata	100	-
3	The Oriental Insurance Company Ltd.	---	556	1947-48	New Delhi	150	-
4	United India Insurance Company Ltd.	---	545	1919-20	Chennai	150	-
PRIVATE SECTOR							
5	Royal Sundaram Alliance Insurance Company Ltd.	Royal Sun Alliance, UK	102	2000-01	Chennai	315	26.0
6	Reliance General Insurance Company Ltd.	---	103	2000-01	Mumbai	123	-
7	IFFCO Tokio General Insurance Company Ltd.	Tokio Marine Asia Pte. Ltd, Japan	106	2000-01	Gurgaon	269	26.0
8	TATA AIG General Insurance Company Ltd.	American International Group (AIG), USA	108	2000-01	Mumbai	505	26.0
9	Bajaj Allianz General Insurance Company Ltd.	Allianz, Germany	113	2001-02	Pune	110	26.0
10	Cholamandalam MS General Insurance Company Ltd.	Mitsui Sumitomo, Japan	123	2002-03	Chennai	299	26.0
11	ICICI Lombard General Insurance Company Ltd.	Fairfax Financial Holding Ltd, Canada	115	2001-02	Mumbai	445	25.7
12	HDFC ERGO General Insurance Company Ltd.	ERGO, Germany	125	2002-03	Mumbai	529	25.9
13	Future Generali India Insurance Company Ltd.	Participatie Maatschapij Graafsschap Holland NV, Netherlands ("Generali")	132	2007-08	Mumbai	710	25.5
14	Universal Sompo General Insurance Company Ltd.	Sompo, Japan	134	2007-08	Mumbai	350	26.0
15	Shriram General Insurance Company Ltd.	Sanlam, South Africa	137	2008-09	Jaipur	258	26.0
16	Bharti AXA General Insurance Company Ltd.	AXA Holdings, France	139	2008-09	Bangalore	977	22.2
17	Raheja QBE General Insurance Company Ltd.	QBE, Australia	141	2008-09	Mumbai	207	26.0
18	SBI General Insurance Company Ltd.	Insurance Australia Group Limited (IAG), Australia	144	2009-10	Mumbai	175	26.0
19	L & T General Insurance Company Ltd.	---	146	2010-11	Mumbai	495	-
20	Magma HDI General Insurance Company Ltd.	HDI-Gerling International Holding AG, Germany	149	2012-13	Kolkata	100	25.5
21	Liberty Videocon General Insurance Company Ltd.	Liberty City State Holdings Pte Ltd.	150	2012-13	Mumbai	359	22.1
HEALTH INSURERS							
22	Star Health & Allied Insurance Company Ltd.	Individual Promoters, UAE	129	2006-07	Chennai	334	25.7
23	Apollo Munich Health Insurance Company Ltd.	Munich Re	131	2007-08	Gurgaon	331	25.5
24	Max BUPA Health Insurance Company Ltd.	Bupa Finance PLC, UK	145	2009-10	New Delhi	669	26.0
25	Religare Health Insurance Company Ltd.	---	148	2012-13	New Delhi	250	-
26	Cigna TTK Health Insurance Co. Ltd	Cigna Corporation, US		2013-14	Mumbai	100	26.0
SPECIALISED INSURERS							
27	Export Credit Guarantee Corporation of India Ltd.	---	124	1957-58	Mumbai	1100	-
28	Agriculture Insurance Company of India Ltd.	---	126	2003-04	New Delhi	200	-
REINSURER							
29	General Insurance Corporation of India	---	112	2001-02	Mumbai	430	-
Source: IRDA * as on September 2014							

Chapter III
Competition in Indian Life Insurance: Issues & Evidences

3.1 Introduction

In an industry, competition is desirable for the maximization of social welfare and existence of Pareto efficiency. In other words, a competitive market ascertains that there is allocative & productive efficiency as well as dynamic efficiency in the market. As in other industries, competition in insurance sector is also needed for efficiency and maximization of social welfare. However, insurance sector has specific features that make it of particular importance to an economy and properties that may distinguish it from other industries. Insurance sector contributes significantly to economic growth by providing long term capital for investment and growth of the economy. However, there is extensive research on the causal relationship between bank lending and economic growth, what is often ignored is the relationship between insurance & economic growth. Out of all the financial intermediaries, an insurer plays a vital role in transmission of growth impulses from the financial system to the real economy. The insurance companies collect funds by issuing policies and transfer these funds to entities in the real sector, thus helping to finance real investment. Insurance companies, thus perform two very important roles: *(i)* the role of financial intermediation and *(ii)* the role of risk transfer and compensation payment, enabling the promotion of economic growth by providing efficient risk management.

To promote competition in the Indian insurance industry, Government of India has opened up the sector to private players with 26% foreign equity capital participation of the company. This has been raised to 49% in 2015. It has now been more than a decade since the sector was liberalised in 2000 and this is time to review the industry by studying the trends emerging and benchmarking its status with respect to that prior liberalisation. In other words, there is a need to access the implications of deregulations of the Indian life insurance industry, for which it is necessary to investigate the impact on the market structure and performance of the insurers.

This chapter is organised into seven sections. Section 2 discusses the theoretical development of competition and section 3 summarise some of the important literature on competition and market structure of the insurance industry around the world. The state of competition in the Indian life insurance industry is discussed in section 4 and section 5 states the objective and methodology of the study. Empirical results are analysed in the section 6 and finally in

section 7, the level of commoditization and the marketing response by the insurance companies in the wake of changing competition due to entry of new players are summarised.

3.2 Competition: Theoretical Development

The notion of competition has been differently perceived in the discipline of Economics. One school of thought views competition as a *process* of rivalry and another views competition as the state of affairs that is the end result of competition among sellers and buyers (Blaug, 1997). Going back to the writings of Adam Smith one finds the term 'competition' as a pattern of business behaviour 'to compete' to characterise the process of bringing 'market prices' in line with the 'natural prices' (i.e., cost-covering prices). Thus, the conceptualisation of competition as a state of affairs in the mainstream economics takes *end state* as the one in which market prices totalled with the so-called 'natural prices' (Blaug 1997). It was, however, never mentioned explicitly in the Eighteenth Century write-ups the necessary pre-requisites to secure these end-results such as number of rivals and market information which was taken up by Cournot and then by Edgeworth into modern definition of perfect competition in terms of large number of sellers, homogenous product, perfect factor mobility and knowledge. These ideas were further developed by Robinson and Chamberlin and linked to concepts of imperfect competition and monopolistic competition.

The inadequacies underlying the above conceptualisation of competition in capturing the real world situations led to the Structure-Conduct-Performance (SCP) paradigm (Mason, 1939). The SCP model was then used in theory and public policy. The empirical regularities in many American industries prompted Mason and Bain to propose the observable structural characteristics of a market to determine the behaviour of firms in the market and market performance. Initially, market structure was taken only in terms of number of firms. Conduct i.e., behaviour of firms was taken to be collusion and profits were taken to reflect market performance. The underlying reasoning was, fewer the firms higher the scope for these to collude, to maximise their profits. The concept of market structure was later widened to include size of firms, entry and cost conditions. The number of firms with their size distribution served as a proxy for market concentration. The incumbent firms would worry less about potential competition if it is more difficult or costly for new firms to enter the market. Costly entry implies that there is a clear cost advantage that incumbents enjoy over new entrants possibly due to information asymmetry economies of scale.

The SCP approach has been criticised for being unidirectional where market structure is taken as given ignoring the interrelations among market structure, conduct and performance. However, subsequently market structure has been mainly captured through sellers' concentration that is measured by concentration ratios, the most important measure being Herfindahl index i.e., sum of squares of market shares of existing firms.

3.3 Review of Literature

There are a few empirical studies available on the Indian insurance sector and most of them are aims to investigate performance of the insurance companies by analysing the profitability ratios. However, there are substantial literatures available on the issue of 'measuring competition' applied to a number of other sectors like manufacturing, banking etc. The scarcity of empirical studies in this field is mostly due to a shortage of historical data relating to insurers. However, in developed insurance markets, like US, France, Spain, Netherlands etc, there are several studies available, which have examined different aspects of the insurance industry. Before, proceeding to the next section, a brief overview on available literature is pertinent. So, a brief overview of the past studies on measuring competition in insurance industry around the World is discussed below:

Ungern and Sternber (1996) in their study mentioned something similar in nature when they analysed the case of limits of competition in housing insurance sector against fire and natural damages in Switzerland. With the comparison between seven cantons where the housing insurance market is competitive and remaining 19 where there are local state monopolies, the study concludes that state monopolies outperform private sector competition. This is a particularly worrisome observation, since the introduction of competition is usually irreversible decision. Economic theory tells us that irreversible decision should be taken only if there is a very high probability that the result is a net increase in a social welfare. The study points out that real world competition might not always lead to socially desirable results. Oligopolistic firms may spend excessive amounts on advertising, monopolistic competition may lead to unnecessary duplication of fixed costs and lack of transparency in the market may lead to high price-cost margins. The authors believe that in most markets there is a certain amount of market failure and in most government activities there is a certain amount of government failure. After analysing the premium rates, damage rate, premium-damages and premium/damages, they find that competition may tend to favour customers with bargaining power, while state monopolies favour low income groups. The author sees no reason why first the alternative should preferable to the second.

The paper also suggests that it might be useful to have distinct geographic areas where there are state monopolies, while in others private insurance is free to operate. In their view, the advantage of no direct competition is really one of the most interesting aspects of the market. It is well known that in very many consumer markets producers spend huge amount in advertising (of various types) to differentiate essentially similar products or to establish their brand. There is very little empirical or theoretical evidence that these unavoidable side effects of competition have any social use. The creation of a monopoly permits the producer to avoid these huge selling costs. The best way to improve performance in this market is not to increase competition, but to eliminate monopoly completely. The paper indeed makes policy makers think more carefully about the relative advantages of both market structures an follow the one that leads to economic efficiency. Similar experience was there in the case of insurance in Baden-Wurttemberg (BW) when transition happened from monopoly to competition on July 1, 1994 until when housing insurance was a state-run compulsory insurance of the monopoly type.

Another study by *Epple and Schaffer (1996)* highlight the negative consequences had on consumers. The study found that risk limitation for the monopoly insurer differs fundamentally and by the nature of the system from that of competitiveness. In monopolized risk community of BW, the prescribed territorial protection with its legal exclusion rights was commensurate with the comprehensive coverage of elementary damage offered for all buildings. It prevented negative risk selection, provided strength due to size, and guaranteed a good price. In contrast, competitive insurers 'negotiate' insurance coverage and must, as a result of market-related adverse selection, limit the risk and tailor their product. They have to incorporate specific risks into their basic insurance package by means of risk mark-ups, exclusion of liability, sum limitations, and if necessary high deductibles; they therefore automatically and unavoidably provide narrower insurance coverage. The study emphasized on two points *(i)* the importance of increase in prices due to additional costs imposed by competition and *(ii)* the difficulty of maintaining global coverage against natural damages that was one of the hallmarks of the monopoly situation. In case of BW, housing insurance monopoly had its roots in the ideals of social welfare and of mutual cooperative solidarity based on the legal requirement for an insurance collective. It never acted on the theory of maximum profits for a monopolist. The consequence of the introduction of competition was the necessity to pass the additional cost on to the customers and premium rates were also increased (including rise in insurance tax).

Rothschild and Stiglitz (1997) raise an important point when they describe the insurance markets from being different from most other markets because in insurance, market competition can destroy the market rather than working better. One dimension along which insurance companies compete is underwriting, i.e. trying to ensure that the risks covered are 'good' risks or that if a high risk is insured; the premium charged is at least commensurate with the potential cost. The resulting partitioning of risk limits the amount of insurance that potential insurance customers can buy. In the extreme case, such competitive behaviour will destroy the insurance market altogether. The paper concludes that an important problem both for theory and policy is to devise ways for providing health insurance that use the power of competition to bring about efficiencies without severely limiting people's ability to insure against misfortune. Envisioning competition and insurance twenty years from then, the author states that as the ability to predict health outcome improves, this issue will become more salient. To date policy makers have not had enough good information about health status to make risk adjustment practical. It may be possible that revolution in genetic science will provide insurers and regulators with enough information to make real risk adjustment possible.

Rao Tripati D (2000) remarks in his paper that conventional theory of competitive markets does not apply directly in the study of insurance business in less developed economies where credit and insurance markets are either thin or non-existent and in many developing economies the market is regulated. To be specific, in the insurance market, asymmetry of information leads to moral hazard and adverse selection. Being incapable of incurring high monitoring costs, the insurer/lender fails to gather sufficient information on the economic agent. Moral hazard arises when the insurer or lender is unable to discern the undertaken activities of the insured/borrower and fails to foresee the probability of an adverse event. If the insured/borrower knows his/her own risk but the insurer/lender does not, then it affects the realized ex post profitability which falls below the ex-ant profitability of a contract signalling adverse selection. The insurer may charge premiums based on its calculated average experience, but it may happen that the low risk individual being aware of the riskiness of the enterprise may not opt for insurance. And in this process low risk prone individuals end up with less insurance, but paying a low premium. Thus, the insurer is exposed to high risk leading to market failure. The paper highlights that macroeconomic implications of privatization and foreign participation in the insurance sector are far reaching

but the path must be approached cautiously with a 'step-by-step' approach and should be preceded by microeconomic institutional and legal reforms.

The cautious approach mentioned by *Rao Tripathi D (2000)* above is extremely important while taking necessary steps in India and as literature does provide examples in some cases (internationally) where competitiveness did not lead to economic efficiency as it is generally expected by policy makers in insurance industry.

A study by *Bernard van den Bert et al (2008)* on 'preferences and choices for care and health insurance (in Netherland) provides initial evidence on the preferences of Dutch consumers (since legislation that came into effect in 2006) and how they view trade-offs between various aspects of health insurance product design. A key feature of the analysis is comparison between the responses of high and low risks individuals, where risk is refined by the presence of a costly chronic condition. This contrast is critically important for understanding incentives facing insurers and for identifying potential unanticipated consequences of market competition. The results from conjoint analysis suggest that not only high risk but also low risk individual are willing to pay substantially more for insurance products that be shown to provide better health outcomes. This suggests that insurance products are more expensive and provide better quality care but may also attract low risk individuals. Development and dissemination of good, reliable and understandable health plan performance indicators may effectively reduce the problem of adverse selection.

Eling & Luhnen (2008) analyze price competition in German motor insurance market since 1994 (1996-99 & 2005-06) are two price war periods and times of intense competition in this industry) and compare it to that of other property-liability lines of business. The authors conclude that the motor insurance market has experienced intense price competition since regulation of the European insurance markets in 1994. An indicator of this development is the steady decline in premiums per vehicle since 1994. The average premiums per vehicle declined by 18 per cent from €484 in 1994 to €393 in 2006, whereas average premium in other lines of property-liability insurance remained stable or increased.

Vladimir N., Dragan S. and Dragan M. (2011), investigate the market structure, liberalisation and performance relationship for the non-life insurance industry in the ex-yugoslavia region. They used country-specific fixed effects models for panel data allowing each cross-sectional unit to have a different intercept term serving as an unobserved random variable that is potentially correlated with the observed regressors. Three models were presented, each

placing market structure, liberalisation and profitability in distinct surroundings defined by related control variables. The research results indicate strong influence of market structure and liberalisation on market profitability.

Bikkera J. A. and Leuvensteijn M. (2008), examine competition in the Dutch life insurance industry by analysing several factors which may affect the competitive nature of a market and various indirect measurement approaches. After discussing various supply and demand factors which may constitute a so-called tight oligopoly, they establish the existence of scale economies and the importance of cost X-inefficiency, since severe competition would force firms to exploit available scale economies and to reduce X-inefficiencies. Both scale economies and X-inefficiencies turn out to be substantial, although more or less comparable to those found for insurers in other countries and to other financial institutions. Further, they applied the Boone indicator, a novel approach to measuring the effects of competition. This indicator points to limited competition in comparison to other sectors in the Netherlands. Further investigations of submarkets should reveal where policy measures in order to promote competition might be appropriate.

Gulumser., Roger and Johanne., in their study used a large sample of cross-sectional data for 1998 of companies operating in the general insurance industry and attempt to shed some light on the issue of competition in this industry. Companies offering products and services in the general insurance market are believed to trade under very competitive conditions. In order to test this widely-held claim, the study investigates whether firms' pricing policies reflect competitive or monopolistic market features. Under competitive conditions companies are forced to pass on any increase in costs in prices and thus their revenues will rise *pari passu* should wages, underwriting costs or other expenses increase also increases. By contrast, a firm operating under monopolistic competition responds to an increase in marginal and average costs by increasing price and reducing output, resulting in a less then complete pass-through in revenue; profit falls. The study claims that is the first to apply this research methodology to the general (causality/liability) insurance industry. Firms in this industry generate revenue through underwriting of insurance risks and from investing their assets. As underwriting and capital markets are in general segmented (catastrophe bonds apart), our empirical approach is based on the insurance and portfolio behaviour of firms and not on an integrated view of both. Previous investigations of this kind have focussed on the banking industry. Contrary to widely held views we find that competition is less than perfect.

Rastogi and Sarkar (2010), identify the causes and the objectives with which the sector was reformed in 2000 to conclude that only in the last decade, the hybrid model of privatization with regulation adopted by the Government has yielded positive results and the sector has started to look up. The sector in its present form looks promising for the consumers, the insurers and the nation as a whole. Thus the firms, the industry and the nation are healthier than ever before having adopted this model.

Ping Weia, Philip Hardwickb and Li Yanga (2012), adopt traditional structural and profit index approaches and the Boone relative profit measure to explore the changes in the intensity of competition in the Chinese life insurance market before and after WTO entry. The study over the period 2000-2009 shows conflicting but interesting findings. Structural measures, such as the concentration ratio and the Herfindahl-Hirschman index, seem to suggest a consistent increase in the degree of competition over the ten-year period. Measures that focus on price and profitability, however, seem to suggest that the Chinese life insurance market might not have been as competitive as is commonly believed after WTO accession. The Relative Profit (RP) and price-cost margin (PCM) measures both indicate gradually intensified competition from 2003 to 2007, but suggest that the degree of competition has been much more erratic in more recent years.

Beck, Demirguc-Kunt and Levine (2006), assess the impact of national bank concentration, bank regulations, and national institutions on the likelihood of a country suffering a systemic banking crisis. Using data on 69 countries from 1980 to 1997, they found that crises are less likely in economies with more concentrated banking systems even after controlling for differences in commercial bank regulatory policies, national institutions affecting competition, macroeconomic conditions, and shocks to the economy. Furthermore, the data indicate that regulatory policies and institutions that thwart competition are associated with greater banking system fragility.

Bikker and Haaf (2000) computed the Herfindahl- Hirschman index and the k bank concentration ratios, for k = 3, 5 and 10, based on market shares in terms of total assets of banks in 20 countries. Differences across countries in the HHI relate most heavily to the number of banks, whereas differences in the CRk are mainly due to the skewness of the bank-size distribution, in particular of its large-bank end. On the whole, apart from a few exceptions, the rankings of countries are rather similar for the various indices considered, which raises confidence in the appropriateness of these indices. Surprisingly, the ranking of the HHI and the 3-bank CR bear the closest resemblance (with a correlation of 0.98), whereas

the ranking of the 5 and 10-bank CRs differ more from the HHI (with, respectively, correlations of 0.94 and 0.86). The CR3 and the CR10 are least similar. This observation puts into perspective the many ponderous considerations in the literature regarding the neglect of smaller banks in the k bank CR indices as compared to the HHI, which takes all banks into account.

Bikker and Haaf (2002) discuss the theoretical characteristics of ten market concentration measures and numerical examples illustrate differences and similarities between these concentration indices in operation. Measures of competition can be divided into structural and non-structural ones. In structural approaches concentration ratios take a central position in order to describe the market structure, forging a natural link between concentration and competition. The impact of market concentration on market performance has its roots in both the oligopoly theory and the structure-conduct-performance (SCP) paradigm. Non-structural approaches to measuring competition do not depend on concentration. The survey includes empirical results of the various methods applied to the European banking industry.

Ginevičius and Čirba (2009), examine effectiveness of the additive measures to assess market concentration most effectively. The analysis shows that all currently used measures, including the most widely used Herfindahl index, have some limitations and, therefore, cannot adequately describe the market state. This index is still widely used because it is easy to calculate. However, now, when calculation is computer-aided, this argument has hardly any sense. A possibility to assess the state of the market much more accurately, searching for new, more precise measures, is more relevant now. The accuracy of some particular measures may be defined by the total difference between the relative value of market criterion bearers in the market and their value calculated by the formula of a particular concentration measure. The smaller the total difference between the relative value of the criterion bearer in the market and relative value calculated by the formula of an additive measure, the more accurate is the additive measure. A new formula suggested in the paper, i.e. GRS index, which yields zero deviation, therefore, it may be used both in theoretical research and practical calculations.

Mishra, Mohit and Parimal (2011), attempt to examine the accuracy of the conventional additive measures of market concentration by using the criteria as suggested by Ginevicius and Cirba (2009) in relation to Indian Manufacturing Sector. The study found that the GRS Index of Ginevicius and Cirba (2009) is a more accurate measure of market concentration. The Herfindahl- Hirschman Index, the most widely used measure of market concentration,

deviates far from accuracy. Hence, examining market concentration on the basis of the conventional indices may result in misleading conclusions and hence guide policy formulations in wrong directions.

Boone (2004), in his paper introduced a new way to measure competition based on firm's profits. Within a general model, he derives conditions under which this measure is monotone in competition, where competition can be intensified both through a fall in entry barriers and through more aggressive interaction between players. The measure is shown to be more robust theoretically than the price cost margin. This allows for an empirical test of the problems associated with the price cost margin (PCM) as a measure of competition.

Boone J, Jan C. van Ours, Henry van der Wiel (2013) used a new competition measure, the profit elasticity, which is more robust than Price Cost margins (PCM). The study is based on the Dutch insurance industry and the result concludes that competition changes the probability that PCM points in the wrong direction increases with industry concentration.

Cetorelli Nicola (1999), discusses the competition in the banking industry, highlighting a very fundamental issue: How do we measure market power? Do regulators rely on accurate and effective procedures to evaluate the competitive effects of a merger?. The results of a specific empirical application of this methodology to the Italian banking industry suggests that a steady convergence toward competitive conditions, providing evidence that changes in market concentration may not always provide correct information about the exercise of market power.

Sathye (2002) examines the impact of the presence of foreign banks on concentration and competition in the Indian banking system. Concentration is measured by using the Herfindahl-Hirschman Index (HHI) of concentration and regressed on a set of explanatory variables derived from relevant theory and prior studies. A dummy variable has been added to measure the impact of ownership on concentration to answer our research question most directly. The results of the study show that entry of foreign banks did not have significant impact on reducing the level of concentration in the Indian banking market. This may be because of many restrictions still in place on foreign bank activities in India. Hence the current efforts being made to establish level playing field among all banks need to be continued so as to make Indian banking market competitive.

Mishra and Rao (2014), compare the market structure in different industries using conventional additive measures and various indices of firm size inequality. The study found

that levels or changes in market structure are not exactly consistent across various measures. However, as compared to additive measures, inequality indices give more consistent results, and hence can be used to examine the structure of markets in different industries. As, there are inconsistencies across different inequality indices, efforts should be made by the researcher towards formulating a suitable criterion for selecting the most appropriate measure.

Miller (1995) tries to examine the significance of various measures of monopoly power and concentration for both economic analysis and public policy. It is perhaps a sign of the immaturity of the Science of economics that the notion should persist that the competitiveness of the economy or of a sector of the economy can ultimately be characterized by some single number or set of numbers. One might have supposed that theoretical and empirical developments in the last two decades would have brought home the essentially heterogeneous nature of our industrial structure and behaviour. But the illusion still persists in influential quarters that there is some simple key which will enable us to separate the monopolistic from the competitive. This paper was designed not to disparage progress to date but rather by underlining its limitations to suggest the magnitude of the task ahead.

Bikkera and Leuvensteijn (2008) investigate competition by analysing several factors which may affect the competitive nature of a market and various indirect measurement approaches. After discussing various supply and demand factors which may constitute a so-called tight oligopoly, we establish the existence of scale economies and the importance of cost X-inefficiency, since severe competition would force firms to exploit available scale economies and to reduce X-inefficiencies. Both scale economies and X-inefficiencies turn out to be substantial, although more or less comparable to those found for insurers in other countries and to other financial institutions. Further, they applied the Boone indicator, a novel approach to measuring the effects of competition. This indicator points to limited competition in comparison to other sectors in the Netherlands. Further investigations of submarkets should reveal where policy measures in order to promote competition might be appropriate.

Further, *Acharya (2012)* examines the state of competition in life and non-life insurance sectors in India primarily by using a variety of concentration measures. The results indicate that the market concentration of the life insurers is high in presence of LIC than in its absence. There is a fall in the concentration for the 9 years period (2001-02 to 2009-10) of the life insurers in both the samples including and excluding LIC. The study also summarized the discussions and field interviews with middle and senior managers (with an average of 10-12

years of industry experience) on understanding the level of commoditization and the marketing response by the insurance companies. Most of the executives found the product offering by their companies to be homogeneous and easily inter-changeable with the competitor offering. Both private and public sector insurers pointed that the customers gravitate towards lowest price products and covert commission kick-backs are fairly common. Most of the executives saw no risk for the customers if they switched insurance providers. The executives felt that there has been no change in the product mix offered by the insurance companies since the start of the financial crisis. In fact, the insurance companies had dared for product innovation through ULIPS which did not find favour with the regulators.

Literature and the associated empirical evidences, illustrate both advantages and disadvantages of concentration in the service led industry like, banking and insurance (Beck et al; 2006). The advantages are: (a) the impact of systematic crisis is expected to be less in a more concentrated market; (b) it is often argued that it is easier to supervise a few large players than a number of small players in the industry. However, on the flip side, (a) high concentration is often associated with higher price (premium) resulting from a collusion among the insurers; (b) the risks of too-big fail are more acute in the highly concentrated sector; (c) it is observed that more competitive the industry, the country will suffer less from any crisis or market failure.

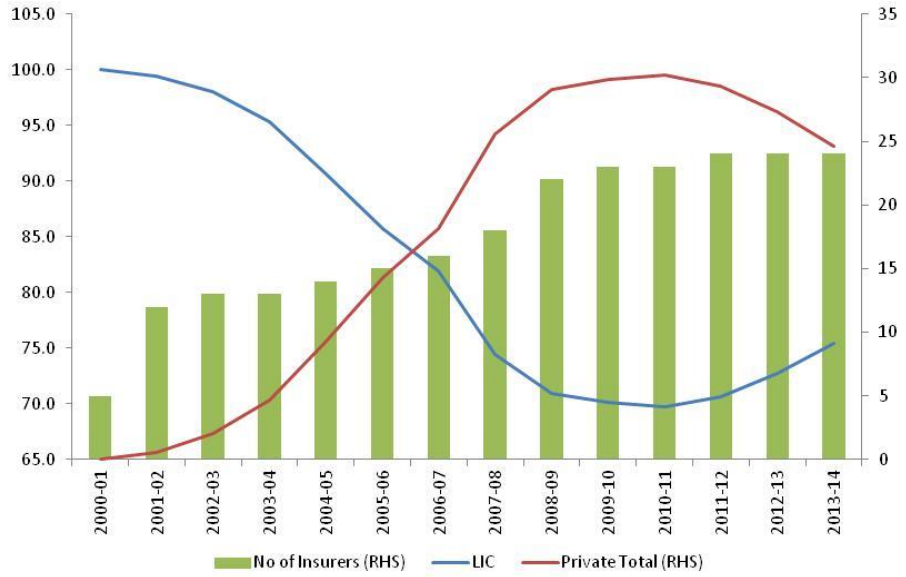
3.4 State of Competition in Indian Life Insurance Industry

Over the years, the structure of the Indian life insurance industry has noticeably changed, in terms of, number of insurers, products, innovative instruments, regulation or pricing. In the initial years of deregulation, four private insurers entered the hitherto untapped market, which reached 12 by the end of the 2001-02. Thereafter, a steady slow increase in entry of new insurers into the market has been observed. But, after the global financial crisis in 2007-08, there was a spurt in the number of foreign players, who entered the Indian market, with huge business motivation and aspiration. At present, there are a total 24 life insurers (including LIC competing in the same field of operations. The industry is growing at an average CAGR of 18% (during the period 2000-01 to 2013-14), though in the last two years, some slowdown has been noticed, perhaps due to slower economic growth. Going forward, the industry is showing a recovery in premium collections and expected to boost in the next few years, as Government is taking a number of reform measures, which may affect the industry positively.

Analysis of Market Share of the Life Insurers

To have a clear insight into the structure and growth pattern of the Indian life insurance industry, the study analysed the market share of the top 10 insurers both by including and excluding LIC, in the sample for the period 2000-01 to 2013-14. To calculate the market share of the life insurers, we took the 'total premium' and 'first year premium (includes Single Premium)' into consideration. The figure 3.1 indicate that LIC is continuously gaining market share (based on total premium) in the last few years, despite the efforts of the private insurers to capture the market. In the private sector, ICICI Prudential holds the number one position in market share, followed by HDFC Standard Life, SBI Life and Bajaj Allianz. The top 10-insurer together holds 95% of the total market share and the remaining 14 insurer accounts for only a 5% of the business in total premium in the life insurance industry in India.

Figure 3.1: Life Insurers Market Share: LIC vs Private Insurers (in Total Premium)



Source: IRDA

(a) Market Share: Including LIC

The market share of LIC in both 'total premium' and 'first year premium' is declining after the entry of new private sector players in 2000. However, in the last two years, the regulatory policy changes in ULIPs and economy slowdown helped LIC to gain the market share in both 'total premium' and 'first year premium'. Though, private life insurers are marketing their products aggressively to customers, yet LIC continues to holds a major market share as compared to its competitors mainly due its huge geographical coverage and vast network of experienced agents.

Table 3.1: Market Shares (%) of the top 10 Insurers including LIC (for Total Premium)														
Insurers	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14
Bajaj Allianz	--	0.0	0.1	0.3	1.2	3.0	3.4	4.8	4.8	4.3	3.3	2.6	2.4	1.9
Birla Sun Life	0.0	0.1	0.3	0.8	1.1	1.2	1.1	1.6	2.1	2.1	1.9	2.1	1.8	1.5
HDFC Standard	0.0	0.1	0.3	0.4	0.8	1.5	1.8	2.4	2.5	2.6	3.1	3.6	3.9	3.8
ICICI Prudential	0.0	0.2	0.7	1.5	2.9	4.0	5.1	6.7	6.9	6.2	6.1	4.9	4.7	4.0
Kotak Mahindra	--	0.0	0.1	0.2	0.6	0.6	0.6	0.8	1.1	1.1	1.0	1.0	1.0	0.9
Max Life	0.0	0.1	0.2	0.3	0.5	0.7	1.0	1.3	1.7	1.8	2.0	2.2	2.3	2.3
Reliance	--	0.0	0.0	0.0	0.1	0.2	0.6	1.6	2.2	2.5	2.3	1.9	1.4	1.4
SBI Life	--	0.0	0.1	0.3	0.7	1.0	1.9	2.8	3.3	3.8	4.4	4.6	3.6	3.4
TATA AIA	--	0.0	0.1	0.4	0.6	0.8	0.9	1.0	1.2	1.3	1.4	1.3	1.0	0.7
LIC	**100.0**	**99.5**	**98.0**	**95.3**	**90.7**	**85.8**	**81.9**	**74.4**	**70.9**	**70.1**	**69.8**	**70.7**	**72.7**	**75.4**
Private Total	**0.0**	**0.5**	**2.0**	**4.7**	**9.3**	**14.2**	**18.1**	**25.6**	**29.1**	**29.9**	**30.2**	**29.3**	**27.3**	**24.6**
Source: IRDA														

Table 3.2: Market Shares (%) of the top 10 Insurers including LIC (for First Year Premium)														
INSURER	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14
Bajaj Allianz	--	0.0	0.4	0.9	3.3	7.0	5.7	7.1	5.1	4.1	2.7	2.4	2.8	2.2
Birla Sun Life	0.0	0.1	0.8	2.3	2.4	1.7	1.2	2.1	3.2	2.7	1.6	1.7	1.7	1.4
HDFC Standard	0.0	0.2	0.8	1.1	1.9	2.7	2.2	2.9	3.0	3.0	3.2	3.4	4.1	3.4
ICICI Prudential	0.1	0.6	2.1	3.8	6.0	6.7	6.8	8.6	7.8	5.8	6.2	3.9	4.5	3.1
Kotak Mahindra	--	0.0	0.2	0.6	1.4	1.0	0.8	1.2	1.5	1.2	1.0	1.0	1.1	1.1
Max Life	0.0	0.2	0.4	0.7	0.9	1.2	1.2	1.7	2.1	1.7	1.6	1.7	1.8	1.9
Reliance	--	0.0	0.0	0.1	0.3	0.5	1.2	2.9	4.0	3.6	2.4	1.6	1.3	1.6
SBI Life	--	0.1	0.4	1.0	1.8	2.1	3.4	5.1	6.2	6.4	6.0	5.7	4.8	4.2
TATA AIA	--	0.1	0.4	0.9	1.1	1.2	0.9	1.0	1.3	1.2	1.1	0.8	0.5	0.4
Private Total	**0.1**	**1.4**	**5.7**	**12.3**	**21.2**	**26.5**	**25.7**	**36.0**	**39.1**	**34.9**	**31.2**	**28.2**	**28.6**	**24.5**
LIC	**99.9**	**98.6**	**94.3**	**87.7**	**78.8**	**73.5**	**74.3**	**64.0**	**60.9**	**65.1**	**68.8**	**71.8**	**71.4**	**75.5**
Source: IRDA														

(b) Market Share: Excluding LIC

For a better comparison of market share of private life insurers, here the study exclude LIC from the group and calculated the market share, in which ICICI Prudential leads the pack with the maximum market share in total premium and also in the first year single premium. Interestingly, it is observed from the table 3.4 and 3.5 that in the year 2013-14 the market share in first year premium has increased for four insurers, out of 12 insurers (as reported) but in 'total premium' it has increased for 6 and rest of 6 has declined. This is due to failure in renewal policy payment, which is a concern for the industry as a whole. Now, the question is; *why have customers not renewed the policy?.* This may be due to mis-selling by the insurers or due to lack of proper investment return as compared to other financial instruments like: mutual funds, bank fixed deposits etc.

Table 3.3: Market Shares (%) of the Insurers Excluding LIC (for Total Premium)														
INSURER	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14
Aviva	--	--	1.2	2.6	3.3	4.0	4.1	3.7	3.1	3.0	2.7	2.9	2.7	2.4
Bajaj Allianz	--	2.6	6.2	7.1	13.0	20.8	18.9	18.9	16.5	14.4	10.9	8.9	8.8	7.6
Birla Sun Life	5.0	10.4	12.9	17.2	11.8	8.4	6.3	6.3	7.1	6.9	6.4	7.0	6.7	6.2
HDFC Standard	0.0	12.3	13.3	9.5	8.9	10.4	10.1	9.4	8.6	8.8	10.2	12.1	14.4	15.6
ICICI Prudential	92.6	42.7	37.3	31.7	30.6	28.2	28.0	26.3	23.8	20.8	20.3	16.7	17.3	16.1
Exide Life	--	1.5	1.9	2.8	4.4	2.8	2.5	2.2	2.2	2.1	1.9	2.0	2.2	2.4
Kotak Mahindra	--	2.8	3.6	4.8	6.0	4.1	3.4	3.3	3.6	3.6	3.4	3.5	3.5	3.5
Max Life	2.5	14.3	8.6	6.9	5.4	5.2	5.3	5.3	6.0	6.1	6.6	7.6	8.5	9.4
PNB MetLife	--	0.2	0.7	0.9	1.1	1.4	1.7	2.2	3.1	3.2	2.8	3.2	3.1	2.9
Reliance	--	0.1	0.6	1.0	1.4	1.5	3.6	6.3	7.6	8.3	7.5	6.5	5.2	5.5
SBI Life	--	5.4	6.5	7.2	7.8	7.1	10.4	10.9	11.2	12.7	14.7	15.6	13.3	13.9
TATA AIA	--	7.8	7.3	8.1	6.4	5.8	4.8	4.0	4.3	4.4	4.5	4.3	3.5	3.0
Source: IRDA														

Table 3.4: Market Shares (%) of the Insurers Excluding LIC (for Single Premium)														
INSURER	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14
Aviva	--	--	1.4	3.2	3.5	4.0	3.7	3.1	2.1	2.1	1.9	2.5	2.2	2.0
Bajaj Allianz	--	2.7	6.6	7.4	15.4	26.5	22.1	19.8	13.2	11.6	8.8	8.5	9.7	8.8
Birla Sun Life	5.0	10.5	13.4	18.4	11.2	6.6	4.5	5.8	8.3	7.7	5.3	6.0	6.0	5.8
HDFC Standard	0.0	12.2	13.4	8.6	8.7	10.2	8.5	8.0	7.8	8.5	10.3	12.0	14.4	13.7
ICICI Prudential	92.6	42.2	37.7	30.8	28.5	25.3	26.6	23.8	19.9	16.5	20.0	13.8	15.6	12.7
Exide Life	--	1.6	1.8	3.0	5.1	2.8	2.4	2.1	2.0	1.7	1.7	2.0	2.1	1.9
Kotak Mahindra	--	2.8	3.6	5.1	6.7	3.9	3.2	3.3	3.9	3.5	3.2	3.6	3.9	4.3
Max Life	2.5	14.5	7.0	5.6	4.2	4.6	4.7	4.7	5.4	4.8	5.2	5.9	6.2	7.7
PNB MetLife	--	0.2	0.8	1.0	1.0	1.4	1.8	2.4	3.4	2.8	1.8	3.4	2.7	2.3
Reliance	--	0.1	0.7	1.1	1.6	1.9	4.8	8.2	10.3	10.2	7.7	5.6	4.5	6.6
SBI Life	--	5.5	7.4	8.5	8.7	8.1	13.2	14.2	15.8	18.3	19.3	20.3	16.9	17.2
TATA AIA	--	7.9	6.2	7.4	5.3	4.5	3.3	2.9	3.3	3.4	3.4	2.9	1.8	1.5
Source: IRDA														

3.5 The Present Study, Data and Methodology

3.5.1 Present Study

This study tries to examine the market structure and level of competition in the Indian life insurance industry, through a set of concentration measures available in literature. Additionally, the study also attempts to evaluate the outcomes or the determinants of competition in the life insurance industry and also whether the industry has really benefitted from the reforms undertaken by the Government.

3.5.2 Data

To assess the level of competition in the Indian life insurance industry, the study used insurer wise data on 'total premium' and 'first year premium' for the period 2000-01 to 2013-14. All

the data are of annual frequency and are secondary in nature. The data of the insurers are collected from different publications of IRDA like Quarterly Journal, Annual Reports and Handbook of Indian Insurance. However, some of the financial indicators of the individual life insurers are collected from the balance sheet of the respective insurers. As competition needs to be calculate for the life insurance industry as a whole, so here we include all the companies operated in the study period.

3.5.3 Methodology

In economics, "competition is defined as the effort of two or more parties, who are performing independently, trying to get what other party are seeking at the same time like sales, profit, and market share, by offering the best feasible combination of price, quality, and service". Though, this definition clearly defines the meaning but doesn't offer an insight on 'how to measure competition'. To measure competition in a market, it is a well-accepted practice to use the concentration ratios mainly due to their ability to capture structural features of the market. In industrial economics, concentration ratio is a measure of the total output produced in an industry by a given number of firms in the industry. This ratio reflects the changes in market concentration as a result of the entry or exit of a company into the market or caused by a merger. In literature, there are mainly two approaches to measure competition in any market economies are: (a) Structural Approach and (b) Non-Structural Approach.

A. The Structural Approach

The structural approach is based on the traditional industrial organisation literature and centres on the Structure-Conduct-Performance (SCP) paradigm. The SCP paradigm makes links between structure and performance of industries. *Structure* refers to mainly the concentration in the market. *Conduct* refers to the behaviour of firms in various dimensions such as pricing, research and development, advertising, etc. *Performance* refers to efficiency, mainly defined by extent of market power, a greater market power imply a lower efficiency. The paradigm is based on the hypotheses that structural influences conduct (lower concentration leads to more competitive behaviour of firms); conduct influences performance (more competitive behaviour leads to less market power, less profits and greater efficiency) and structure therefore influences performance (lower concentration leads to lower market power). Hence the causality goes from structure to performance. Generally speaking, the SCP paradigm argues that greater concentration causes less competitive firm conduct and leads to

greater market power and profitability of the insurer. Moreover, SCP paradigm assumes that since market structure is related to competitive conduct, competition can be approximated by the degree of concentration. Hence, competition is measured by market structure measures.

Measures of Concentration

Concentration ratios are often used in structural models to explain the competitive behaviour in the insurance and banking industry. In general, the concentration indices (CI) exhibiting the following form:

$$CI = \sum_{i=1}^{n} Si\ Wi \qquad \ldots\ldots (3.1)$$

Here, *Si* is the market share of the firm/company, *wi* is the weight attached to the market share and *n* is the number of firms/companies in the industry.

Before going ahead, a theoretical foundation of the various market concentration indices is needed. So, the mathematical formulae and the basic properties of each of the measures are discussed below (Bikker and Haaf; 2000).

(a) The K-Concentration Ratio (CR_k)

In empirical literature, k-concentration coefficient is being used mainly due to its simplicity and limited data requirements. The ratio is defined as the sum of market shares of n largest insurer in the market and it takes the form:

$$CRk = \sum_{i=1}^{k} Si \quad \ldots\ldots\ldots\ldots\ldots\ldots (3.2)$$

Where, *Si* is the market share of insurer *i* and *k* is the number of insurance companies in the industry (*i = 1 2…k*). Under this method, the concentration ratio gives equal emphasis to all the 'k' leading insurers and neglects the effect of many small companies in the market. There is no general rule determining the optimal value of *'k'*. However, in the empirical analysis, *'k'* is generally determined to be 3, 4 or 5. The ratio ranges between 0 and 1. It approaches zero, if there is an infinite number of very small insurance companies in the system and it equals 1, if there is a single insurer in the market. If the industry consists of 'k' equally sized insurance companies, then CRk = $\sum_{i=1}^{k} Si = \sum_{i=1}^{k} \frac{1}{n} = k/n$, which is a decreasing function of the number of insurance companies in the market.

To estimate the index, by and large, the market shares of the insurer, in 'total premium' & 'first year premium' are being used. The index provides information only about shifts in market shares between the top *n* insurers and the remaining small insurance companies, but

does not capture changes in distribution within these two groups. Moreover, it ignores the structural changes in the part of the industry which is not included in concentration ratio and also neglects the competitive influence of small companies on the decisions of the large banks in the market (Bikker and Haaf; 2002).

(b) Herfindahl-Hirschman Index (HHI)

The HH Index is defined as the sum of the squares of the relative sizes (expressed as proportions of the total size of the market) of the firms/companies in the market. The formula takes the form as:

$$HHI = \sum_{i=1}^{n} s_i^2 \quad \ldots\ldots\ldots\ldots\ldots\ldots \ (3.3)$$

Where, *Si* stands for the market share of the i^{th} company in the industry. HHI stresses the importance of larger firms by assigning them a greater weightage than smaller firms, and it incorporates each firm individually, so that random cut-offs and insensitivity to the share distribution are avoided. This index ranges between 0 to 1 (0 to 10,000, if market shares are expressed in terms of percent rather than in fractions). The values of 0 and 1 represent perfect competition and monopoly respectively. Usually, a value in the range 0 to 0.10 indicates highly competitive market (non-concentration), a value within 0.10 to 0.20 indicates that there is no adverse effect on competition. However, the value above 0.20 is a concern and needs to increase competition further in the industry.

In empirical literature and also in practice, HHI is the most common measure to measure concentration in the industry, largely due to its simplicity. For example, in the United States, the HHI plays a significant role in the enforcement process of antitrust laws in banking. An application of two banks will be approved without further investigation if the basic guidelines for the evaluation of the concentration in deposits markets are satisfied. Those guidelines imply that the post-merger market HHI does not exceed 0.18 and that the increase of the index from the pre-merger situation is less than 0.02 (Cetorelli, 1999). However, the flip side of HHI is that it assigns higher weight to the bigger firms and smaller weights to the smaller firms. This not only raises the importance of the larger firms in the index, it is also reduces the effects of the smaller firms even if they are very large in number, giving a distorted measure of market concentration. Such a measure also limits the scope for understanding the role of the smaller firms in market competition.

(c) GINI Coefficient

GINI is computed by taking in to account the ratio of the area between the Lorenz Curve and the equality line to the total area under the equality line. Being a ratio of two similar quantities, GINI is also a dimensionless measure and hence is comparable across industries. Mathematically, GINI can be computed as

$$\text{GINI} = \frac{1}{\bar{x} * n^2} \sum_{i=1}^{n} \sum_{j=1}^{n} |x_i - x_j| \quad \text{.....(3.4)}$$

The GINI coefficient varies between 0 and 1. The closer the value to zero, greater is the extent of competition in the market

(d) LR Index

LR index refers to the Concentration Coefficient associated with the Lorenz curve and is worked out using the formula:

$$LR = 1 - \sum (X_{k+1} - X_k)(Y_{k+1} + Y_k) \quad \text{.....(3.5)}$$

Where, *k* starts from 0 and end at *n-1*, X refers to cumulative proportion of entities and Y refers to cumulative proportion of share in premium. The coefficient ranges between 0 and 1, with 0 indicating perfectly equal shares and 1 indicating monopoly. This measure remains insensitive to the number of entities.

(e) The Hall-Tideman Index (HTI)

The concentration indices developed by *Hall and Tideman (1967)* is bring forward a number of properties which concentration measures should satisfy and emphasised the need to include the number of companies in the calculation of a concentration index, because it reflects some extent, the conditions of entry into a particular industry. It is estimated by using the following formula:

$$HTI = 1/(2\sum_{i=1}^{n} iS_i - 1) \quad \text{..... (3.6)}$$

Here, the market share of each insurer is weighted by its ranking in order to ensure that the emphasis is on the absolute number of insurer, and that the largest insurance companies receives weight i = 1. The HTI ranges between 0 and 1, being close to 0 for an infinite number of equal-sized companies, and reaching 1 in the case of monopoly. Like the

Herfindahl-Hirschman index, the HTI equals 1/n for an industry with *n* equally sized insurance companies and the numbers equivalent of the index is defined as *ne= 1/HTI.*

(f) Horvath Index (HOV)

The Horvath index (1970) of market concentration is capable of reflecting both relative dispersion and absolute magnitude. The index is defined as the sum of the proportional share of the leading company and the summation of the squares of the proportional sizes of each company, weighted by a multiplier reflecting the proportional size of the rest of the industry.

The index owes its intellectual heritage to the HHI and is defined as:

$$HOV = s_1 + \sum_{i=2}^{n} s_i^2(2 - s_i) \quad \ldots\ldots\ldots\ldots(3.7)$$

Here, s_1 represents market share of the largest firm in the industry. The value of the index ranges between $\frac{3n^2-3n+1}{n^3}$ *(for n ≠ 2)* and 1, i.e., $\frac{3n^2-3n+1}{n^3} \leq HOR \leq 1$ with n being the number of firms in the industry. This index assigns larger weights to all the market players, compared to HHI. This index is also known as a "comprehensive concentration index (CCI)" as it accounts for market share of the largest firm in a discrete manner and that of other firms in a weighted form.

(g) The Hannah and Kay Index (HKI)

Hannah and Kay (1977) proposed a summary index of concentration of the form:

$$HKI = \left(\sum_{i=1}^{n} S_i^{\alpha}\right)^{1/(1-\alpha)};\ \alpha>0 \text{ and } \alpha \neq 1 \quad \ldots\ldots(3.8)$$

where α is an elasticity parameter to be specified and intended to reflect their ideas about changes in concentration as a result of the entry or exit of a company, and the sales transfer among the different companies in the market. The freedom to choose α allows for alternative views on what is the appropriate weighting scheme and for the option to emphasise either the upper or the lower segment of the firm size distribution. Therefore, in addition to the distribution of the companies in the market, the value of the index is sensitive to the parameter α. For $\alpha \to 0$, the index approaches the number of firms in the industry, and for $\alpha \to \infty$, it converges towards the reciprocal of the market share of the largest company.

(h) Entropy Index (ENT)

The Entropy measure has its theoretical foundations in information theory and measures the ex-ante expected information content of a distribution. The Entropy measure is defined as,

$$ENT = \sum_{i=1}^{n} s_i \ln\left(\frac{1}{s_i}\right) \quad \ldots\ldots\ldots\ldots (3.9)$$

This index generally measures the degree of uncertainty faced by a firm in the marketplace. The value of the Entropy varies inversely to the degree of concentration. In case of monopoly there is no uncertainty in the market and the index takes the value zero. On the other hand, when there is *'n'* number of firms and all of them are equal in size, there are uncertainties in the market and the index takes the value *ln (n)*. Hence, the index ranges between *0* and *ln (n),* and is therefore not restricted to *[0, 1],* as most of the other measures of concentration presented above.

This index is criticised for using the logarithm of the market share rather than its value as the weight. As a result, the importance of the larger firms decreases, while that of the smaller ones relatively increases.

(i) Ginevicius Index

The Ginevicius Index is given by the formula

$$GIN = \sum_{i=1}^{n}\left(\frac{si}{1+n(1-si)}\right) \quad \ldots\ldots\ldots\ldots\ldots\ldots (3.10)$$

This index is intended to assess two basic market indicators, the number of firms in the industry and their market share in a balanced way. It is based on the assumption that larger the number of suppliers, greater is the competition hence higher is the uncertainty in the market. The degree of this uncertainty depends on market shares of the firms when there is monopoly *GIN = 1*. On the other hand, as $n \rightarrow \infty$, $GIN \rightarrow 0$. In other words, as the number of firms in the industry increases, the degree of seller's concentration in the market declines. Hence, this index takes the; $0 \leq GIN \leq 1$.

On a positive note, that GIN index gives emphasis to both the number of firms in the industry and their market share. However, it fails to represent the true scenario of market concentration, particularly when the distribution of market share is highly skewed towards few firms.

(j) GRS Index

The GRS Index suggested by Ginevicius and Cirba (2009) is an attempt to overcome the weighting problem and thereby to provide a more accurate measure of market concentration. In this index, the weights to different firms are assigned in such a way that (i) the value of the index ranges from *0 to 1, i e,* $0 \leq GRS \leq 1$, (ii) if all firms in the industry have equal market

share, i e, if $s_i = \frac{1}{n}$, $GRS = \frac{1}{n}$, and (iii) it gives a more accurate measure of market concentration. Accordingly, the index is defined as,

$$GRS = \sum_{i=1}^{n} \left(\frac{n^2 s_1 + 0.3\, s_i^2}{n^2 + 0.3 n s_1 s_i}\, s_i\right) \ldots\ldots\ldots\ldots\ldots\ldots (3.11)$$

Where, s_1 stands for market share of the largest firm in the industry.

(k) The U index

Davies (1979) defines the 'U' index in terms of inequality and the number of banks in the industry reflecting his perception that most of the earlier developed concentration indices are attached too much weightage to either inequality or the number of banks in the market. It takes the form:

$$U = I\alpha n\text{-}1 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.12)$$

Where, $\alpha \geq 0$ and I is s a generally accepted measure of inequality. The index allows flexibility in the weight given to size inequality *(I)* and the number of banks *(n)* by varying α, which is an innovation compared to the concentration measures presented earlier. The choice of α is not arbitrary. To obtain the value of α, Davis proposes to estimate a simple model of inter-industry variance in price cost margins of the form: $\Pi i = \alpha\, Ci\beta$, where πi and Ci are respectively, the price-cost margin and concentration in industry *i.* Replacing *Ci* by the *U* index and taking logarithms, the regression equation can be written as:

$$Log\ \pi i = log\ \alpha + \beta 1\ log\ I\ i + \beta 2\ log\ ni + vi$$

Since $\beta 1 = \alpha\beta$ and $\beta 2 = -\beta$, the estimated value of $\alpha = -\beta 1/\beta 2$. Theoretically, Davies derives the *U* index as:

$$U = \left(n \sum_{i=1}^{n} S_i^2\right) \alpha n\text{-}1 = (n(\alpha\text{-}1)/\alpha \sum_{i=1}^{n} S_i^2)\alpha = (\sum_{i=1}^{n} S_i(\sin(\alpha\text{-}1)/\alpha))\alpha$$

by defining inequality as $I = 1 + c2 = \sum_{i=1}^{n} x_i^2/nx2 = (\sum_{i=1}^{n} x_i^2/n)X2/n2 = n \sum_{i=1}^{n} s_i^2$. Hence *I* is a simple transformation of the coefficient variation *c2.* Davies investigates the reaction of the U index to new entries and mergers in order to shed light on the role and the possible values of the α parameter. It appears as if the *U* index delivers theoretically as well as empirically satisfactory results only if $\alpha = 1$, for which $U = HHI$.

(l) The Hause Indices

Based on a discussion of the various interpretations of the Cournot model, Hause (1977) introduces six criterias, which a theoretically reasonable measure of industrial concentration

should satisfy. He claims that none of the earlier measures meet all of his criteria, and he attempts to derive two measures of concentration that do. Both depend on a parameter α that captures the effects of collusion in an oligopoly model. Hause furthermore provides numerical evidence that the tendency towards more competition as n increases is much slower for low values of α, i.e. a high degree of collusion, than implied by the HHI index.

The multiplicatively modified Cournot measure takes the form:

$$Hm(\alpha,\{si\}) = \sum_{i=1}^{n} s_i^{2-(Si(HHI-Si^2))\wedge\alpha} \quad \text{.....(3.13)}$$

Where *HHI* is the HH index and α is the parameter capturing the degree of collusion. To ensure that the index is a decreasing, convex function of the equivalent number of equally sized banks implied by the index, it appears necessary to restrict $\alpha \geq 0.15$. The α parameter decreases inversely to the degree of collusion, and for $\alpha \rightarrow \infty$ the index approaches the HH index. Assuming a two-bank industry, Hause derives the range for the expression raised to the power of α as [0,2(1/3)0.15 = 0.39], so that the exponent on s_i always exceeds unity (provided $\alpha>0$). The validity of the index in theoretical terms depends quite crucially on the specification of α.: only if $\alpha \rightarrow \infty$ will the weights attached to the banks' market shares grow to equal those of the HHI. The index equals one in the monopoly case, it converges to zero for an indefinite number of equally sized firms/companies in the market and it takes the value *(1/n)1-((n-1)/n^3)^α* if the firms in the industry are of equal size, converging to Herfindahl result, i.e. 1/n, for large n.

Hause, furthermore proposes the additively adjusted Cournot measure of concentration, which is defined as:

$$H\alpha\ (\beta,\ \{s_i\}) = \sum_{i=1}^{n}((si2 + \big(si(HHI - si2)\big)\beta) \text{ ..... (3.14)}$$

with $\beta > 1$. This restriction assures the convergence of the index to the HH index for larger numbers of banks, and the measure becomes *(n-1 + n1-2b (1- n-1)β),* if all banks in the market are of equal size.

Among the above discussed approaches to measure the concentration in an industry, the choice of the concentration index is mainly dependent on the policy makers'/researchers' perception of the relative influence on competition attached to large and small firms or companies. The Herfindahl-Hirschman index and the K-concentration ratio appear most frequently, both in theory and practice. The simple structure of these two indices and the limited data requirement of the CR_k contribute to this success. Applied to various markets,

these indices appear to bring forth virtually similar rankings, which add to their suitability in practise. The theoretical justification of the CR_k and the HHI as measures of concentration was derived in connection with the relationship between market structure and market performance.

Table 3.5: Features of Concentration Measures

Index Type	*Defined as*	*Range*	*Features*
CRk	$CRk = \sum_{i=1}^{k} Si$	0<*CRk=1*	▪ Takes only large companies into account; arbitrary cut off
HHI	HHI = $\sum_{i=1}^{n} s_i^2$	1/n=HHI=1	▪ Considers all insurers; sensitive to entrance of new companies
Horvath	CCI = HOR = $s_1 + \sum_{i=2}^{n} s_i^2(2 - s_i)$	0<*CCI=1*	▪ Address relative dispersion and absolute magnitude; ▪ Suitable for cartel markets
Entropy	ENT = $\sum_{i=1}^{n} s_i \ln(\frac{1}{s_i})$	0=ENT=Ln(n)	▪ Uses the logarithm of the market share rather than its value as the weight value; ▪ Importance of larger firms decreases while smaller ones relatively increases
Ginevicius Index	GIN = $\sum_{i=1}^{n}(\frac{si}{1+n(1-si)})$	0≤GNI≤*1*	▪ It emphasises both the number of firms and their market share; ▪ fails to represent true scenario of market concentration particularly when the distribution of market share is highly skewed towards few firms
LR Index	LR = 1 - ∑ (Xk+1 – Xk) (Yk+1 + Yk)	0≤LR≤*1*	▪ Accounts all firms in the market; shows inequality in the distribution
GRS Index	GRS = $\sum_{i=1}^{n}(\frac{n^2 s_1 + 0.3\, s_i^2}{n^2 + 0.3 n s_1 s_i} s_i)$	0≤GRS≤*1*	▪ Attempt to overcome the weighting problem to provide a more accurate measure of market concentration
GINI	GINI = $\frac{1}{\bar{x} * n^2} \sum_{i=1}^{n} \sum_{j=1}^{n} \lvert x_i -$	0≤GINI≤*1*	▪ Accounts all firms in the market; shows inequality in the distribution
HTI Index	$HTI = 1/(2\sum_{i=1}^{n} iS_i - 1)$	0<HTI=*1*	▪ Market share of each insurer is weighted by its ranking in order to ensure that the emphasis is on the absolute number of companies
HKI Index	$HKI = (\sum_{i=1}^{n} S_i^{\alpha})^{1/(1-\alpha)}$; α>0 and α≠ 1	$1/s_1$=HKI=n	▪ Intended to reflect ideas about changes in concentration as a result of the entry or exit of a company
U Index	*U = Iαn-1*	1/n=U=8	▪ Index in terms of inequality and the number of companies ▪ For α = 1, the U index correspond to HHI
Hause Index	*Hm(α,{si}) =* $\sum_{i=1}^{n} s_i^{2-(Si(HHI-Si^2))\wedge\alpha}$ *Hα (β, {si}) =* $\sum_{i=1}^{n}$ *(si2 + (si(HHI-si2))β)*	0<Hm=1	▪ Suitable for highly collusive markets

B. The Non-structural Approach

The non-structural measures don't assess the competitive conduct of the firms through the analysis of market structure, but rather measure firms' conduct directly. The new industrial organization approaches provide non-structural measures such Lerner Index, Iwata model, Bresnahan and Lau model and Panzar and Rosse model to circumvent the problems of the competition measures based on traditional industrial organization approach.

3.6 Empirical Results & Discussions

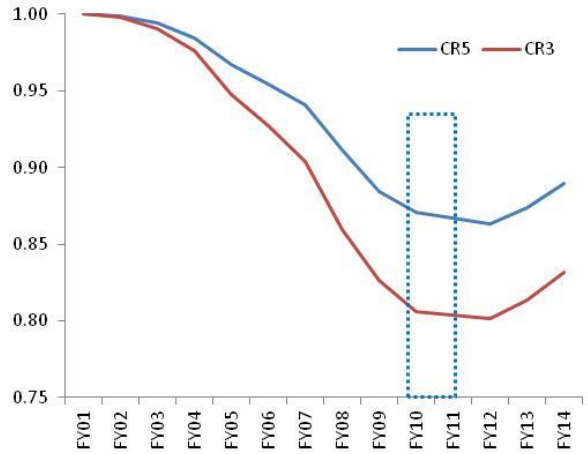
In literature, it is well evident that concentration in a market weakens competition by promoting collusive behaviour between the firms. More specifically, competition in an industry depends on the degree of concentration in the sector. In market economics, read in micro-economics, a market is classified into four categories, viz Monopoly, Oligopoly, Monopolistic Competition and Perfect competition, which is linked with the level of market competition/concentration. In perfect competition, there is no concentration of power and the concentration index would be zero. However, in monopoly, the index would be one. Here, the results are calculated by using 10 concentration indices to measure market concentration in the Indian life insurance industry. The indices are calculated for two set of variables, namely 'total premium' and 'first year premium' for both including and excluding 'LIC', to have a clear insight of the market structure.

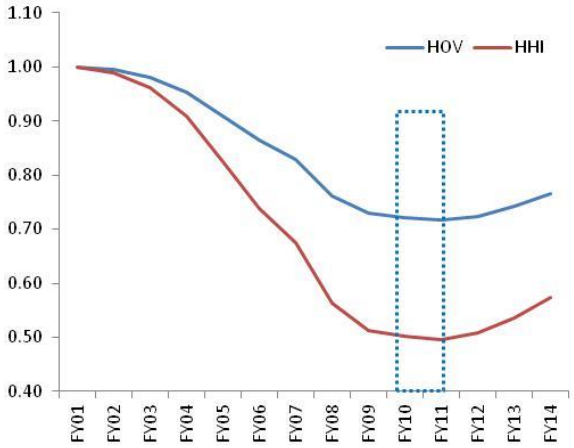
3.6.1 Concentration Indices based on 'Total Premium'

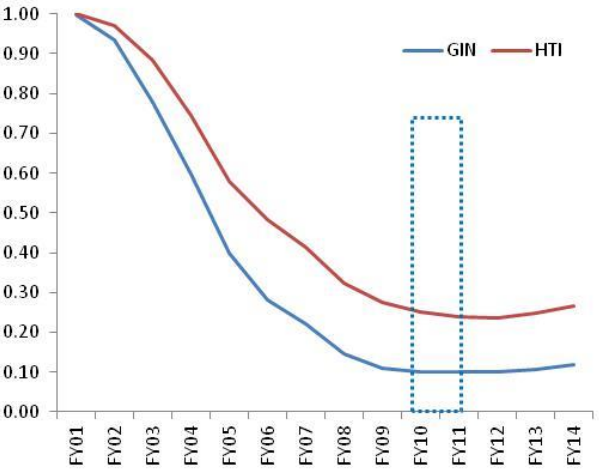
(a) Including LIC: The calculated results of concentration indices (including LIC) for 'total premium' of the insurer are presented in the table 3.6 and figure 3.2 (concentration curve). The table 3.6 indicates that the average of HHI, HOV, ENT and GRS indices indicates the presence of high market concentration in the life insurance business. However, the average HTI and GIN index values shows a low concentration for the same period. The figure 3.3 on the concentration curve indicates a downward trend up to 2011-12, i.e. the competition level in the industry has been increasing, since the industry was opened up to private players. However, since 2012-13, the index value increased, mainly due to LIC's gain in market share.

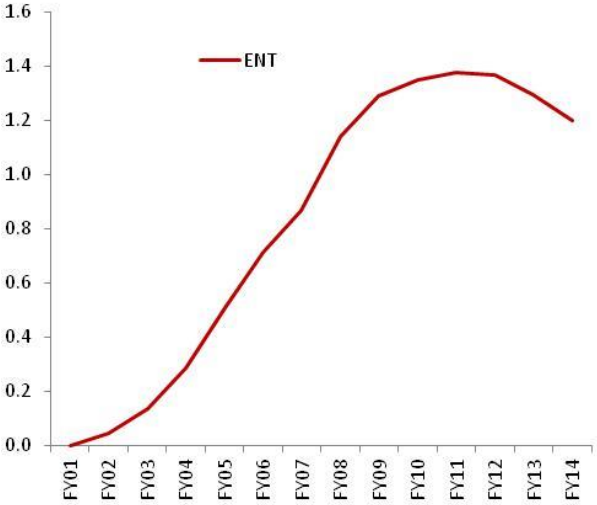
Table 3.6: Trends in Concentration Ratios of Life Insurers in India^ (including LIC)											
Year	No of Insurers	CR3	CR5	CR10	HHI	ENT	HOV	HTI	GIN	GRS	LR
FY01	5	1.000	1.000	-	1.000	0.002	1.000	1.000	0.999	0.955	0.800
FY02	12	0.998	0.999	1.000	0.989	0.043	0.995	0.971	0.934	0.973	0.914
FY03	13	0.990	0.994	1.000	0.960	0.138	0.980	0.884	0.779	0.961	0.913
FY04	13	0.976	0.984	0.998	0.909	0.287	0.954	0.745	0.596	0.936	0.897
FY05	14	0.947	0.967	0.995	0.823	0.511	0.909	0.579	0.400	0.894	0.877
FY06	15	0.927	0.954	0.992	0.739	0.713	0.864	0.484	0.282	0.848	0.862
FY07	16	0.904	0.941	0.985	0.676	0.869	0.829	0.413	0.221	0.811	0.849
FY08	18	0.860	0.912	0.977	0.563	1.141	0.762	0.324	0.147	0.739	0.829
FY09	22	0.826	0.884	0.967	0.513	1.289	0.730	0.277	0.109	0.706	0.836
FY10	23	0.806	0.871	0.959	0.501	1.351	0.720	0.252	0.102	0.698	0.828
FY11	23	0.803	0.867	0.953	0.496	1.379	0.716	0.240	0.101	0.695	0.819
FY12	24	0.801	0.863	0.948	0.508	1.366	0.723	0.236	0.100	0.704	0.823
FY13	24	0.814	0.874	0.949	0.536	1.297	0.741	0.247	0.107	0.724	0.832
FY14	24	0.832	0.889	0.953	0.574	1.199	0.765	0.266	0.119	0.750	0.836
Average	**-**	**0.892**	**0.929**	**0.977**	**0.699**	**0.828**	**0.835**	**0.494**	**0.357**	**0.814**	**0.851**
Note: ^based on Total Premium of the Insurers											

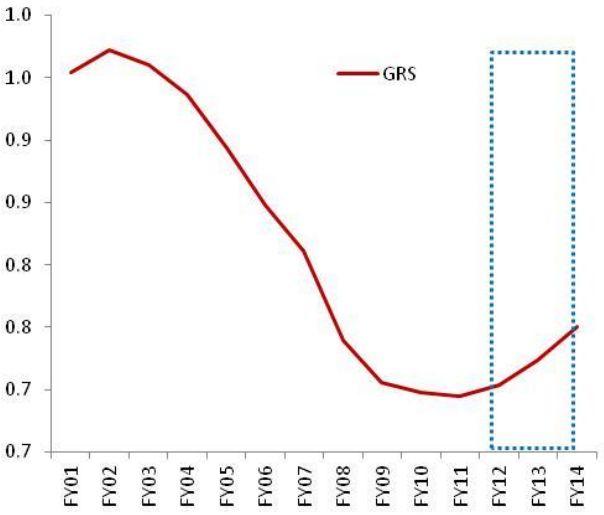
Figure 3.2: Concentration Curve of Life Insurance Industry (Total Premium)*











Where,

- CR3: 3-firm Concentration Index
- CR5: 5-firm Concentration Index
- CR10: 10-firm Concentration Index
- HOV: Horvath Index
- HHI: Herfindahl-Hirschman Index
- ENT: Entrophy Index
- GIN: Ginevicious Index
- GRS: GRS Index
- HTI: Hall and Tideman Index

Note: ENT index indicate that '0' means higher concentration, i.e. monopoly in the industry

Note: * including LIC

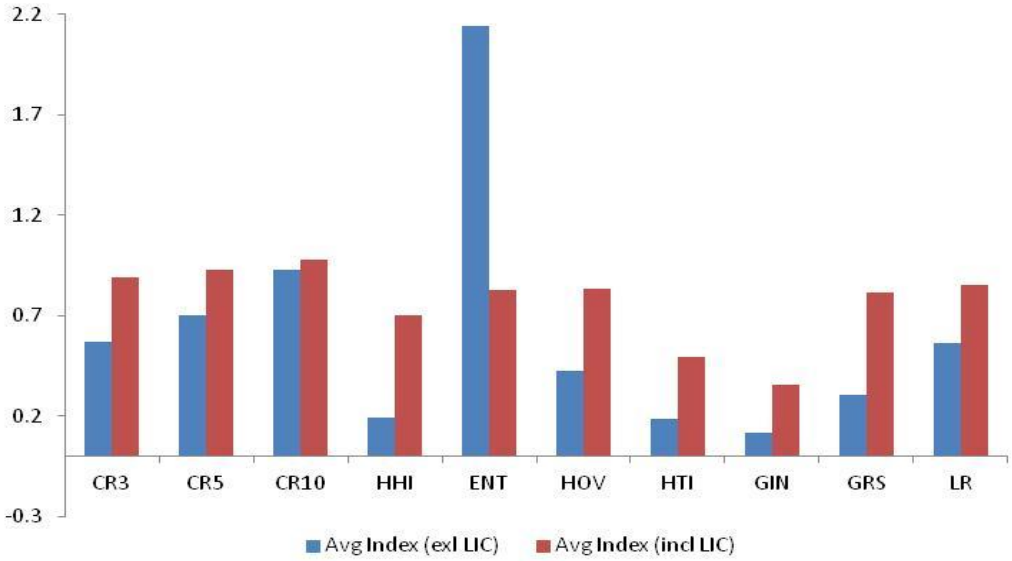
(b) Excluding LIC: Interestingly, the table 3.7 indicates a significant fall in the level of concentration (all index in the private sector), in the period 2000-01 to 2011-12. While in 2012-13, this marginally increased. The HHI, ENT, HTI and GIN indices results show a very low concentration among the private life insurer, as the index is below 0.10 threshold level. Overall, it can be concluded that the market concentration is very low for life insurance firms in private sector which can be noticed from the table 3.7 below.

Table 3.7: Trends in Concentration Ratio of Life Insurers in India^ (Excluding LIC)

Year	No of Insurers	CR3	CR5	CR10	HHI	ENT	HOV	HTI	GIN	GRS	LR
FY01	4	1.000	-	-	0.860	0.315	0.932	0.833	0.729	0.888	0.700
FY02	11	0.693	0.874	0.999	0.239	1.767	0.534	0.219	0.111	0.426	0.586
FY03	12	0.635	0.794	0.987	0.196	1.964	0.481	0.180	0.096	0.373	0.537
FY04	12	0.585	0.738	0.981	0.165	2.089	0.438	0.158	0.092	0.317	0.473
FY05	13	0.554	0.721	0.975	0.152	2.154	0.418	0.147	0.084	0.306	0.476
FY06	14	0.594	0.749	0.969	0.156	2.133	0.424	0.154	0.079	0.282	0.536
FY07	15	0.573	0.737	0.949	0.149	2.188	0.412	0.146	0.074	0.280	0.542
FY08	17	0.561	0.718	0.943	0.141	2.233	0.398	0.140	0.065	0.263	0.580
FY09	21	0.515	0.677	0.918	0.124	2.359	0.365	0.125	0.052	0.238	0.619
FY10	22	0.479	0.651	0.894	0.110	2.477	0.334	0.112	0.049	0.208	0.595
FY11	22	0.459	0.635	0.873	0.105	2.535	0.324	0.106	0.049	0.203	0.570
FY12	23	0.444	0.609	0.854	0.096	2.596	0.296	0.099	0.046	0.167	0.562
FY13	23	0.450	0.623	0.843	0.097	2.603	0.299	0.099	0.046	0.173	0.559
FY14	**23**	0.456	0.625	0.837	0.097	2.607	0.295	0.098	0.046	0.161	0.562
Average	-	0.571	0.704	0.925	0.192	2.144	0.425	0.187	0.116	0.306	0.564

Note: ^based on Total Premium

Figure 3.3: Life Insurers Average Concentration Index: Excluding vs Including LIC (in Total Premium)



Source: IRDA

The figure 3.3 implies that the average concentration index of the life insurers (excluding LIC), is lower than the index of the life insurers (including LIC). This indicates that the market concentration of the life insurers is high in presence of LIC than in its absence. To conclude, though the level of market concentration in the life insurance sector (including LIC) declined but at a higher side in 'total premium', as LIC accounts for around 3/4th of the industry market share.

3.6.2 Concentration Indices based on 'First Year Premium'

In life insurance business in India, renewal premium contributes around 60% of the total premium collection in a year and the rest 40% is from the 'first year premium (including single premium[1])'. In other words, 'first year premium' is the actual business generated by an insurer during a year by selling new products/policies to the customers. This can be termed as 'new business' indicator, which is necessary for an insurer to be profitable and sustain in the market for a long term.

(a) Including LIC: The table 3.8 indicates the calculated results of the concentration indices (including LIC) for the period 2000-01 to 2013-14 by taking 'first year premium' as a variable to estimate the market shares of the life insurers. All the indices indicate a decline in concentration in the market, however, in 2013-14, the trend is reversing, as most of the private insurer registered a negative growth and LIC at a positive growth in new business.

Table 3.8: Trends in Concentration Ratios of Life Insurers in India^ (including LIC)

Year	No of Insurers	CR3	CR5	CR10	HHI	ENT	HOV	HTI	GIN	GRS	LR
FY01	5	1.000	1.000	-	0.999	0.006	0.999	0.999	0.996	0.954	0.800
FY02	12	0.994	0.997	1.000	0.973	0.096	0.987	0.930	0.850	0.965	0.910
FY03	13	0.972	0.984	0.998	0.890	0.330	0.944	0.728	0.546	0.927	0.894
FY04	13	0.937	0.958	0.994	0.771	0.633	0.882	0.522	0.346	0.864	0.853
FY05	14	0.881	0.923	0.987	0.627	0.978	0.801	0.375	0.213	0.780	0.810
FY06	15	0.872	0.921	0.983	0.552	1.136	0.758	0.339	0.165	0.730	0.803
FY07	16	0.868	0.924	0.978	0.563	1.124	0.763	0.337	0.161	0.738	0.815
FY08	18	0.797	0.878	0.967	0.428	1.458	0.675	0.256	0.106	0.638	0.783
FY09	22	0.749	0.840	0.953	0.388	1.616	0.643	0.213	0.081	0.607	0.787
FY10	23	0.773	0.849	0.946	0.436	1.530	0.676	0.216	0.087	0.649	0.799
FY11	23	0.811	0.870	0.947	0.485	1.408	0.710	0.233	0.098	0.686	0.813
FY12	24	0.815	0.872	0.941	0.524	1.330	0.734	0.238	0.104	0.715	0.825
FY13	24	0.807	0.876	0.947	0.517	1.343	0.730	0.239	0.102	0.711	0.825
FY14	24	0.830	0.883	0.957	0.575	1.203	0.766	0.262	0.120	0.751	0.825
Average	**-**	**0.865**	**0.913**	**0.969**	**0.623**	**1.014**	**0.790**	**0.420**	**0.284**	**0.765**	**0.824**

Note: ^based on First Year (including single Premium) Premium of the Insurers

[1] Single-premium life (SPL) is a type of life insurance in which a lump sum of money is paid into the policy in return for a death benefit that is guaranteed to remain paid-up till the policy holder death

(b) Excluding LIC

The concentration indices calculated by using 'first year premium' as a variable indicated that there is significant reduction in market concentration in Indian life insurance (excluding LIC). The average HHI and GIN index indicate a low concentration in the market by excluding LIC (refer table 3.9). This means, the market concentration of the life insurers' is high in the presence of LIC than in its absence. There is a fall in the concentration for the same period in CR3, HHI, ENT, HTI, GIN and GRS indices of the life insurers for both the group of insurers, including and excluding LIC. However, while comparing both the variables (total premium and first year premium) taken for calculating market share, it is seen that total premium as variable shows somewhat high concentration than first year single premium.

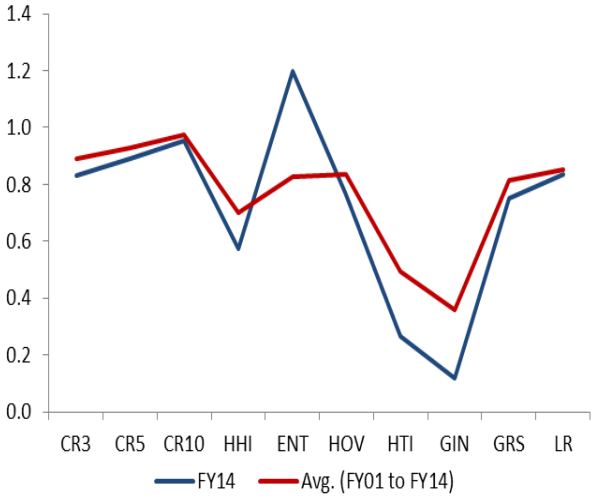
Table 3.9: Trends in Concentration Ratios of Life Insurers in India^ (Excluding LIC)

Year	No of Insurers	CR3	CR5	CR10	HHI	ENT	HOV	HTI	GIN	GRS	LR
FY01	4	1.000	-	-	0.860	0.315	0.932	0.833	0.729	0.888	0.700
FY02	11	0.689	0.872	0.999	0.236	1.776	0.531	0.218	0.110	0.421	0.582
FY03	12	0.645	0.789	0.985	0.199	1.961	0.484	0.180	0.097	0.376	0.536
FY04	12	0.578	0.737	0.979	0.162	2.102	0.434	0.156	0.092	0.307	0.465
FY05	13	0.550	0.725	0.973	0.146	2.172	0.407	0.146	0.084	0.285	0.473
FY06	14	0.619	0.766	0.963	0.164	2.107	0.434	0.157	0.080	0.264	0.544
FY07	15	0.619	0.752	0.946	0.155	2.158	0.421	0.150	0.074	0.266	0.556
FY08	17	0.578	0.740	0.938	0.139	2.236	0.390	0.141	0.064	0.238	0.582
FY09	21	0.489	0.674	0.912	0.113	2.422	0.338	0.119	0.051	0.199	0.599
FY10	22	0.465	0.652	0.874	0.105	2.529	0.318	0.106	0.049	0.183	0.572
FY11	22	0.495	0.660	0.852	0.112	2.528	0.333	0.105	0.049	0.200	0.565
FY12	23	0.462	0.607	0.823	0.099	2.611	0.314	0.097	0.046	0.203	0.551
FY13	23	0.469	0.628	0.841	0.099	2.597	0.302	0.099	0.046	0.169	0.559
FY14	23	0.436	0.600	0.846	0.094	2.597	0.302	0.096	0.046	0.172	0.558
Average	-	0.578	0.708	0.918	0.192	2.151	0.424	0.186	0.115	0.298	0.560

Note: ^based on First Year Premium (including Single Premium)

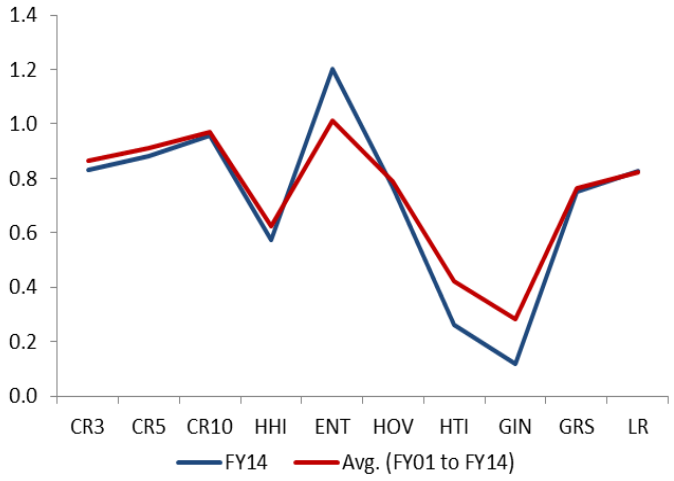
To conclude from the above analysis, all the concentration index values indicate two different patterns very clearly, that is: (i) there exists a uniform trend across various measures; and (ii) although reform process reduced concentration in the insurance industry, the speed of reduction is noticeably slow. Thus, in the study period all the calculated concentration ratios indicates a decreasing trend, which reflects that concentration in Indian life insurance industry reduced but the regulator needs to increase competition further, as the index value ranges between 0.30 to 0.60.

Figure 3.4: Concentration Index Results (Total Premium): FY14 & Avg. for FY01 to FY14



Source: IRDA

Figure 3.5: Concentration Index Results (1Yr Premium): FY14 & Avg. for FY01 to FY14



Source: IRDA

3.6.3 Testing Accuracy of Concentration Indices

In order to investigate the accuracy of the concentration indices used to compute the level of market concentration in the life insurance industry in India, the study followed the criterion suggested by Ginevicius and Cirba (2009). The criterion takes the form:

$$R_j = \sum_{i=1}^{n} |Sij - Sij^*| \ldots\ldots\ldots\ldots (3.14)$$

Here, 'R_j' is the criterion of accuracy of j-th concentration measure; S_{ij}* is the relative value of the market share as per the formula of j-th concentration measure and S_{ij} is the actual calculated market share.

According to Ginevicius and Cirba (2009), a concentration measure will be most accurate, when $R_j = 0$, it ideally reflects the market situation. The calculated R_j values are presented in table 3.15, which indicates that none of the concentration measures is ideally accurate, i.e., R = 0. The difference between the actual market share and the relative market share is more than zero in all the cases. So, to find out a more accurate measure of concentration and not the most accurate measure, it is assumed that smaller the 'R', the more accurate is the measure of market concentration. To have a better insight, the values of 'R' in table 3.10, ranked by assigning 1 to the lowest value and then 2 to the next value in ascending order. The ranking of the measures by accuracy is shown in table 3.11.

Table 3.10: Comparison of the Accuracy of Concentration Measures														
Year	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14
Index	**Value of 'R' in Life Insurance (Total Premium) Variable**													
GRS	0.000	0.000	0.001	0.002	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002
GIN	0.000	0.010	0.036	0.082	0.155	0.221	0.263	0.322	0.341	0.345	0.347	0.345	0.337	0.323
HOV	0.000	0.011	0.040	0.092	0.181	0.270	0.339	0.465	0.526	0.545	0.552	0.542	0.508	0.462
HHI	0.000	0.011	0.040	0.093	0.183	0.276	0.348	0.479	0.541	0.559	0.566	0.554	0.519	0.472
HTI	0.000	0.030	0.121	0.279	0.484	0.597	0.681	0.762	0.822	0.861	0.882	0.898	0.897	0.887
ENT	1.798	1.739	1.671	1.588	1.466	1.346	1.262	1.102	1.040	1.033	1.031	1.054	1.097	1.153
Index	**Value of 'R' in Life Insurance (First Year Premium) Variable**													
GRS	0.000	0.001	0.002	0.003	0.004	0.004	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002
GIN	0.001	0.025	0.099	0.195	0.288	0.321	0.319	0.343	0.344	0.352	0.348	0.341	0.343	0.323
HOV	0.001	0.027	0.111	0.236	0.392	0.471	0.461	0.617	0.677	0.624	0.564	0.521	0.529	0.462
HHI	0.001	0.027	0.113	0.240	0.404	0.488	0.477	0.636	0.693	0.640	0.578	0.533	0.541	0.471
HTI	0.001	0.072	0.297	0.550	0.716	0.727	0.737	0.791	0.836	0.877	0.887	0.910	0.899	0.896
ENT	1.767	1.692	1.551	1.389	1.191	1.072	1.094	0.889	0.844	0.936	1.012	1.079	1.069	1.156

The table 3.11 indicates that GRS is more accurate measure of concentration, followed by GIN index and HOV index, in both the variables (total premium & first year premium). HHI ranked at fourth places in both the variables. Thus, it may conclude that GRS index is the more ideally accurate measures of concentration in case of the Indian life insurance industry.

Table 3.11: Ranking of Concentration Measures by Accuracy														
Year	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14
Indices	**Life Insurance (Total Premium)**													
GRS	1	1	1	1	1	1	1	1	1	1	1	1	1	1
GIN	2	2	2	2	2	2	2	2	2	2	2	2	2	2
HOV	3	3	3	3	3	3	3	3	3	3	3	3	3	3
HHI	4	4	4	4	4	4	4	4	4	4	4	4	4	4
HTI	5	5	5	5	5	5	5	5	5	5	5	5	5	5
ENT	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Indices	**Life Insurance (First Year Premium)**													
GRS	1	1	1	1	1	1	1	1	1	1	1	1	1	1
GIN	2	2	2	2	2	2	2	2	2	2	2	2	2	2
HOV	3	3	3	3	3	3	3	3	3	3	3	3	3	3
HHI	4	4	4	4	4	4	4	4	4	4	4	4	4	4
HTI	5	5	5	5	5	5	5	5	5	5	5	5	5	5
ENT	6	6	6	6	6	6	6	6	6	6	6	6	6	6

3.6.4 GRS Index Results

As GRS index is tested as the more ideally accurate measures of concentration in the context of the Indian life insurance industry. The calculated GRS index values for the indicators 'total premium' and 'first year premium' both including LIC and excluding LIC are presented in the table 3.12. The table shows that the average GRS index value for the period 2000-01 to 2013-14 is high in the presence of LIC than in its absence. It is also indicated that the GRS index value over the years has declined but still there is adequate scope for the regulator to promote competition in the life insurance industry in India.

Table 3.12: Trends in GRS Concentration Ratio: Best Accuracy Measure

Year	Total Premium		1Yr Premium	
	(including LIC)	(excluding LIC)	(including LIC)	(excluding LIC)
FY01	0.955	0.888	0.954	0.888
FY02	0.973	0.426	0.965	0.421
FY03	0.961	0.373	0.927	0.376
FY04	0.936	0.317	0.864	0.307
FY05	0.894	0.306	0.780	0.285
FY06	0.848	0.282	0.730	0.264
FY07	0.811	0.280	0.738	0.266
FY08	0.739	0.263	0.638	0.238
FY09	0.706	0.238	0.607	0.199
FY10	0.698	0.208	0.649	0.183
FY11	0.695	0.203	0.686	0.200
FY12	0.704	0.167	0.715	0.203
FY13	0.724	0.173	0.711	0.169
FY14	0.750	0.161	0.751	0.172
Average	**0.814**	**0.306**	**0.765**	**0.298**

3.7 Competition and Marketing Orientation in Life Insurance

In the previous section, a low market was seen concentration implying increasing competition in the life insurance sector. Here, the discussions are made out of a survey by Acharya (2012) with middle and senior managers (with an average of 10-12 years of industry experience) on understanding the level of commoditization and the marketing response by the insurance companies is being summarized. *M Reimann et al.* define industry commoditization as "an increase in similarity between the offerings of competitors in an industry, an increase in consumers' price sensitivity, a decrease in customers' switching cost and an increase in the stability of the industry".

- **Homogeneity of Product:** Most of the executives found the product being offered by their companies to be homogeneous and easily inter-changeable with the competitor's offering. They felt that the insurance products especially in the general insurance are essentially identical in both quality and performance with those that are being offered by their competitors. They even pointed to the complete homogeneity of markets and technology used in the industry. Most of the executives cited the IRDA's regulatory stance especially those dealing with product guidelines and review as the prime drivers of the homogeneity in the market.
- **Price Sensitivity of Consumers:** Both private and public sector insurers pointed that the customers gravitate towards lowest price products and covert commission kick-backs are fairly common. Both business and retail insurance buyers rely on price for choosing the product and would shop around for low prices even for low-price products. Executives find that the customers are very price sensitive.
- **Switching Cost:** Portability of life insurance policy made the switching cost negligible and at times cost advantageous for the customers. Most of the executives saw no risk for the customers if they switched their insurance provider. The insurance companies' executive also felt that the customers find it easy and quick to process the change in insurance providers.
- **Industry stability:** The executives felt that there has been no change in the product mix offered by the insurance companies since the start of the financial crisis. In fact, the insurance companies have dared for product innovation through ULIPS which has not been favourable for the regulators. There has been no significant change in the customer preferences for the insurance products and older product are still in the market indicating slow product obsolescence. Most executives as well as the industry watchers who were contacted felt that the industry looks very stable but is actually in a pause mode because of the uncertainty in the regulatory framework. All key alignments as well as mergers and acquisitions are on hold and all key players both domestic and foreign are waiting for the regulatory clarity to emerge on the FDI. This situation could now change with the Government notification of hike in FDI cap in insurance to 49% from 26%.

Marketing Strategy in Commoditized Life Insurance Market in India

Marketing strategy for commoditized insurance market can use the value disciplines framework of *Tracy and Wiersema (1993).* The companies can deliver superior customer

value through three disciplines of – operational excellence, product leadership and customer intimacy.

- Insurance companies with operational excellence can strive towards optimizing their business processes and aim at creating highly competitive cost structures. They can do so by achieving efficiency and operational cost reduction. There have been examples of process audits of insurance sales and distribution to determine inefficiencies and cost escalators. There has been emphasis on non-personal sales channel especially online and process like back office verification of the customer details to avoid incomplete/fraudulent policy issuance. So the strategic input for the insurance companies would be to have an internal/cost orientation to succeed in the commoditized market. In other words, the companies should strive to cut costs across all marketing and related primary activities including administration, operations and logistics.
- Product leadership can help companies to break the clutter in the commoditized market place. This would involve focus on innovation and continuous development of product portfolio. They also create innovative designs and brand image. The strategic input would be to have an innovation orientation and create an atmosphere of openness and promotion of change within the company. This innovation could be the result of bringing new skills, human resource and technologies. Innovation orientation can help firms to survive in long run and enhance market share and beat competition. Innovation orientation can help a firm not only in times of stability by giving an edge over competitions which has a established product but also in turbulent times by meeting the dynamic customer demands.
- Customer intimacy involves a thorough understanding of the customers need and creating right product portfolio. The companies with customer intimacy value spend on pursuing their customers through spending on advertising and promotions. Such companies also have employees who maintain productive and mutually beneficial relationships with their customers. In an industry like insurance where the customers have too many options and also have access to wide range of alternatives, it is better to have a customer orientation. Customer orientation requires understanding both the latent and manifest customer needs. It also includes product modification and adjustments to suit the dynamic needs of the current and potential customers. The present customer education campaigns of some Indian insurance companies can surely lead to customer intimacy which can help them to flourish in current commoditized market.

3.8 Concluding Remarks

To assess the state of competition and market structure of the Indian life insurance industry, concentration indices were calculated by using a set of 10 market concentration indices. Here, it was assumed that a measure of market concentration is a function of the combined market share of all the firms in the industry (Mishra *et al*., 2011). So, the concentration indices are calculated on the basis of market share (total premium and 1-Yr premium) of the life insurers, both by including and excluding LIC in the industry. The study used the data for the period 2000-01 to 2013-14. Further, by following the criterion suggested by Ginevicius and Cirba (2009), an attempt is made to suggest the best concentration index to study the state of competition in Indian life insurance industry.

The concentration indices indicate that: firstly, there exists a uniform trend across various concentration measures, showing a fall in the concentration across all indices of the life insurers for both the samples including and excluding LIC in case of both the variables (total premium & first year premium). Secondly, though reform process reduced concentration in the life insurance sector, the speed of reduction is noticeably slow. Among all the concentration measures, HHI, HTI and GIN indices depict the low market concentration of life insurance companies, compared to other indices. However, since 2012-13, the indices indicate a reverse in trend, as LIC has gained the market share around 5% in the said period. By following the Ginevicius and Cirba (2009) criterion, GRS index is the most accurate index to measure concentration in the life insurance sector in India. The GRS index value indicates that though the concentration in the market has declined but still it remains at a relatively higher level. So, there is adequate scope for the regulator to promote competition in the life insurance industry in India.

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Chapter IV

Life Insurance in India: Some Evidence on Efficiency

4.1 Introduction

Efficiency has become a buzz word in financial market in general and in banking and insurance in particular. Researchers around the world have explored and probed every aspect of efficiency and a substantial research effort has gone into measuring the efficiency of financial institutions (FIs). Efficiency measurement has captured a great deal of attention, not only in services industries like insurance, banking, but also in industries like manufacturing, mining etc. The measurement of efficiency of insurers serves two important purposes; first, it helps to benchmark the relative efficiency of an individual insurer against the 'best practice' insurer(s) and second, helps to evaluate the impact of various policy measures on the efficiency and performance of these institutions. However, efficiency measurement in insurance is not straight forward, due to difficulty in defining the inputs and outputs of an insurer. Further, the insurance companies are not homogeneous with respect to the types of products they offer. There is also question of various concepts of efficiency that can be employed to compute relative efficiency scores of individual insurers. However, once the efficiency scores are worked out, the next question arises with regard to their empirical correlates, which can throw light on the sources of the observed inefficiency.

Prior to liberalisation, the policy makers have recognized that inefficiency is an important factor for the high cost of insurance services in India. So, the sector has been liberalised in 2000 to enhance operational efficiency of the sector as a whole, as well as of individual insurers. This has been more than a decade and it's time to do a detailed analysis of the overall efficiency and assessment of its performance of insurers in India. The present study focuses to evaluate the relative efficiency of life insurance companies and to find out the productivity change of these companies over a period of time. This may render light on policy design and implementations for future development of the life insurance industry in India. Further, this may help to fill the gap in the literature by evaluating efficiency of the Indian life insurance industry.

The chapter is organized into seven sections. Section 2 discusses the theoretical development of efficiency measurement, including various approaches to measure efficiency like parametric and

non-parametric methodologies. Section 3 discusses the methodology to measure productivity change in an industry over a period of time. The literature relevant to insurance efficiency, both in domestic and global level, has been reviewed in section 4 and section 5 presents the methodology and data description. The empirical results are discussed in section 6. Finally, section 7 concludes with a brief summary.

4.2 Efficiency: Theoretical Framework

The concept of 'efficiency' comes from micro-economic theory, especially from production theory in economics. Efficiency is defined as optimally choosing the levels, and mixes of inputs and or outputs. The idea behind efficiency measurement is to measure a company's performance relative to 'best practice' company, which are determined by the dominant, i.e., most efficient, companies in the industry. Traditionally, efficiency has been defined as:

$$\textbf{Efficiency} = \frac{\textbf{Sum of Outputs}}{\textbf{Sum of Inputs}} = \frac{\sum_i \boldsymbol{Yi}}{\sum_j \boldsymbol{Xj}}$$

To measure efficiency, traditionally, a number of methods like, Index Numbers Approach, Composite Index Number Approach using principal component analysis, is being used in India from 1978. However, in recent empirical works one finds two major ways to measure the performance of companies.

The first is the ***classical approach***, based on simple profit-cost analysis, which is the simplest and most naive measure of efficiency. This approach is represented by conventional performance ratios which concentrate on examining financial ratios such as return on equity (ROE), return on assets (ROA), capital asset ratio, growth rate of total revenue, and cost/income ratio all of which are commonly used by regulators, financial institution managers and industry consultants to evaluate performance. The conventional performance ratios fail to control the influences of input price, output price and other exogenous market factors, which constrain the standard performance ratios from reaching closer estimations of the true performance. So, the conventional financial ratios are not meaningful output measures for financial intermediaries like banks and insurance companies. The principal reason is that such intermediaries don't exist to produce financial ratios; rather, seek to produce financial services. So, output measures should thus proxy for the volume of financial services provided *(Tone and Sahoo, 2005).* For instance, if inputs increased by 10%, then output should increase by 10% (under CRS), which doesn't

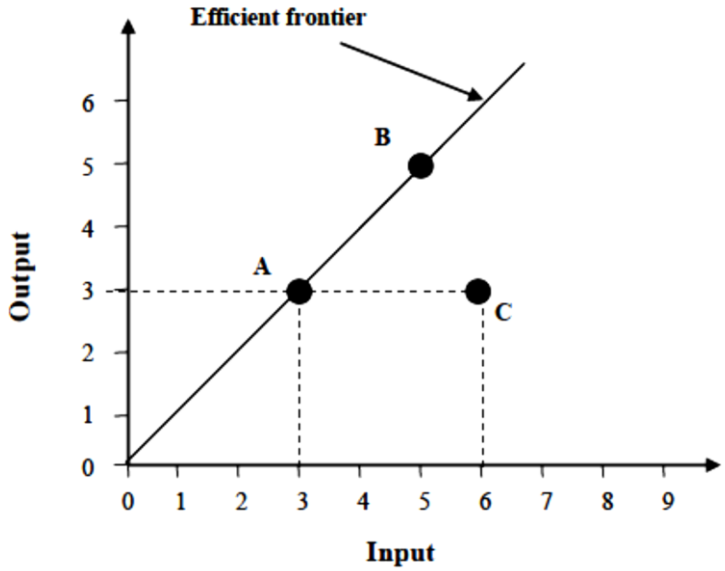
necessarily occur with financial ratio, since a larger ratio is not necessarily better than a smaller one. For many ratios such as capital-to-assets or the liquid assets ratio, there is likely to be some optimal value for the ratio, such that the firm is a worse off if the ratio is lower or higher than the optimum. For example, investing more in liquid assets is fine, up to a point, beyond which the firm might begin to encounter operating constraints due to under investment in non-liquid (capital) assets such as computers etc. Another problem with the use of financial ratios is that financial ratios are quality variable, not output proxies. Quality variables certainly have a role to play in evaluating firm, but they should generally not be used to represent output quantities.

The second approach is the ***frontier efficiency (or X-efficiency) approach***, to measure the performance of financial institutions. Frontier efficiency measures the deviations in performance from that of 'best-practice firms' on the efficient frontier. In other words, it measures how well the financial institution performs relative to the predicted performance of the best firms facing the same market conditions in the industry. It represents the ability of management to control costs and use resources to produce output. Frontier efficiency measures summarize firm performance in a single statistic (efficiency score) that can control differences among firms in a sophisticated multidimensional framework that has its roots in economic theory. So, frontier efficiency approach appears to be superior to conventional performance ratios and obtains better estimates of the underlying performance of firms. The calculated efficiency value is lies between 0 and 1, with the most (least) efficient firm receiving the value of 1 (0). The difference between a company's assigned value and the value of 1 determines the company's improvement potential in terms of efficiency.

There are different types of efficient frontiers can be estimated. In the simplest case, a production frontier is estimated, assuming that companies *minimize inputs conditional on given output levels (input-orientation) or maximize outputs conditional on given input levels (output-orientation).* The basic case for input orientation is illustrated in figure 4.1, by assuming a constant returns to scale (CRS) with 1 input and 1 output model. Firms A and B dominate the other firms in terms of efficiency, since they only consume 1 input to produce 1 output . They build an efficient frontier and are assigned an efficiency score of 1. In comparison, firm C uses 2 inputs to produce 1 output. The efficiency score of firm C is determined by dividing the optimally needed amount of inputs to produce 1 output, - 1 in this case - by the actually consumed amount of inputs - 2 in this case. The resulting score is 0.5. Firm C is therefore half as efficient as Firms A and B. The

production frontier can be interpreted to measure a company's success in employing technology. In this case, an inefficient firm should move closer to the efficient frontier, i.e., improve its efficiency, by upgrading its technology to state of the art.

Figure 4.1: Efficient Frontier Example
(One Input, One Output & CRS)



Source: Cooper *et al.* (2007)

4.2.1 Concepts of Efficiency

Koopmans (1991) first proposed a measure of efficiency, followed by Debreu (1951), who empirically evaluates the efficiency. In literature, there are three principal efficiency aspects, which can be defined as S*cale efficiency, Scope efficiency, and X-efficiency*. Farell (1957) is the first who shows *that productive or economic efficiency (*or also called as *X-efficiency/cost efficiency)* can be divided into two components; technical efficiency (TE) and allocative efficiency (AE).

4.2.1.1 Technical, Allocative and Cost Efficiency

- ***Technical Efficiency*** refers to the ability to avoid waste by producing as much as output as input usage allows, or by using as little input as production allows. In other words, *TE is defined as the ratio of the production unit's actual performance to potential performance*.

Thus, the analysis of technical efficiency can have an *output augmenting orientation and input conserving orientation.* The other is the allocative or price component, refering to the capacity of the production unit to mix optimal proportions of inputs and outputs appropriate to their current prices. The analysis of efficiency carried out by Farrell (1957) can be best illustrated, for a single output and two inputs case in the unit isoquant diagram (figure 4.2), by assuming CRS.

The technological set is fully described by the unit isoquant YY' that captures the combination of the inputs (x_1, x_2) by which the firm can produce a certain output when it is perfectly efficient. In the other words, YY' shows a minimum combination of inputs needed to produce a unit of output. Thus, under this framework, every package of inputs along the unit isoquant is considered as technically efficient while any point above and to the right of it, such as point P, is defined as a technically inefficient producer since the input package that is being used is more than enough to produce a unit of output. Hence, the distance RP along the ray OP measures the technical inefficiency of a producer located at point P. This distance (RP) represents the amount by which all inputs can be reduced without decreasing the amount of output. Geometrically, the technical inefficiency level associated with package P can be expressed by the ratio RP/OP and, therefore, the technical efficiency (TE) of the producer under analysis would be given by the ratio OR/OP, which takes a value of 0 to 1. A value of 1 (0) implies that the firm is fully technically efficient (inefficient). Thus,

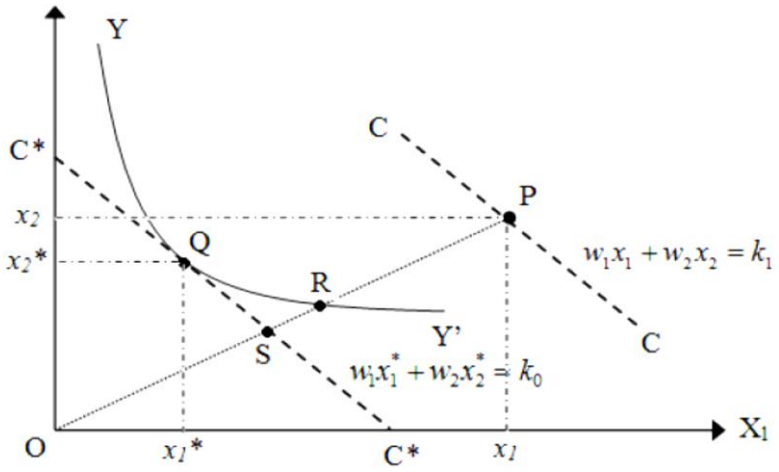
$$\textbf{Technical Efficiency (TE)} = \frac{\textbf{OR}}{\textbf{OP}}$$

- ***Allocative efficiency (AE)*** involves the selection of an input mix that allocates factors to their highest value uses and introduces the opportunity cost of factor inputs to the measurement of productive efficiency. Allocative inefficiency can also be derived from the unit isoquant plotted in figure 4.2. Given information on the market prices of inputs (w_1, w_2), the iso-cost line CC through P is associated with $w_1x_1 + w_2x_2 = k_1$ and the slope of this line reflects the input price ratio. However, this cost can be further reduced by moving this line in parallel fashion until it is tangential to the isoquant at Q. The coordinates of CC then give $w_1x^*_1 + w_2 x^*_2 = k_0$ achieving the minimal cost at the prescribed output level. Now, we can similarly determine the relative distances of S and R to obtain the ratio OS/OR. With respect to the least cost combination of inputs given by the point Q, the above ratio indicates the cost

reduction that a producer would be able to achieve if it moved from a technically but not allocative efficient input package (R) to both a technically and allocative efficient one (Q). Therefore, the allocative efficiency that characterizes the producer at point P is given by the ratio OS/OR. Thus,

$$\textbf{Allocative Efficiency} = \frac{\textbf{OS}}{\textbf{OR}}$$

Figure 4.2: Technical, Allocative and Cost Efficiency



Source: Cooper *et al.* (2007, p.258)

- ***Economic/Cost Efficiency:*** A cost efficient firm will choose its inputs and mixes according to their prices so as to minimize total cost. Cost inefficiency may arise from two different sources. One is deficiency in applying the technology (technical inefficiency) and another is sub-optimal allocation of resources (allocative inefficiency). Thus, total overall cost efficiency can be presented as the product of technical efficiency and allocative efficiency:

$$\textit{Overall Cost (Economic) Efficiency} = \textit{Allocative Efficiency} \times \textit{Technical Efficiency}$$

$$= \frac{\textbf{OS}}{\textbf{OR}} \times \frac{\textbf{OR}}{\textbf{OP}} = \frac{\textbf{OS}}{\textbf{OP}}$$

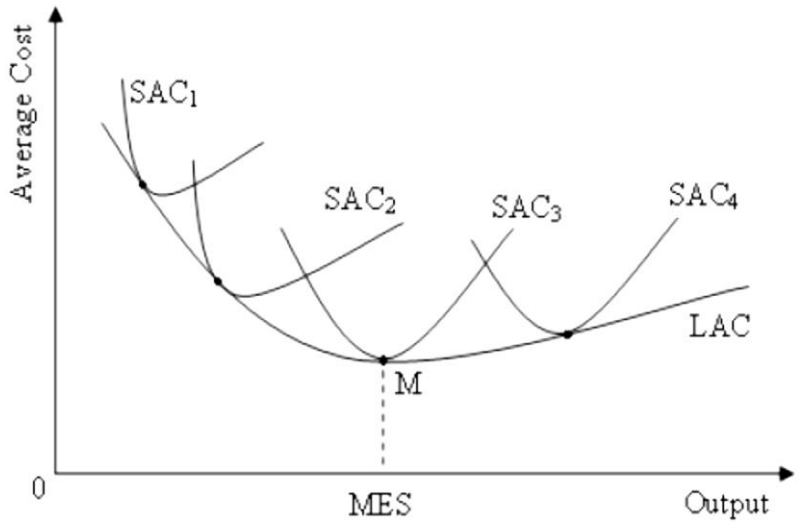
So, the X-efficiency measures the performance of a firm referring to best firms in the industry and with the same market conditions. To measure efficiency we must specify an objective function. There are four key functions that can be defined as a reference to measure efficiency; production, cost, revenue and profit function. These functions represent an economic foundation

for studying firms' efficiency and therefore, they allows to make some economic optimisations while taking account of market prices, competition and other business conditions, rather than being based exclusively on using technology.

4.2.1.2 Economies of Scale

Economies of scale (or returns to scale) refers to the rate at which output changes as all factor quantities are varied and measures whether firms with similar production and managerial technologies are operating at an optimal size. Specifically, increasing returns to scale (IRS) exist, over a given mix of outputs, if a proportionate increase in firm's outputs would lead to a less than proportionate increase in its total costs. Constant returns to scale (CRS) occur if a proportionate increase in a firm's outputs would lead to the same proportionate increase in its total costs. Economies of scale actually are based on the shape of the average cost curve as depicted in figure 4.3.

Figure 4.3: Cost Curves and Economies of Scale



Source: Humphrey *et al* (1990)

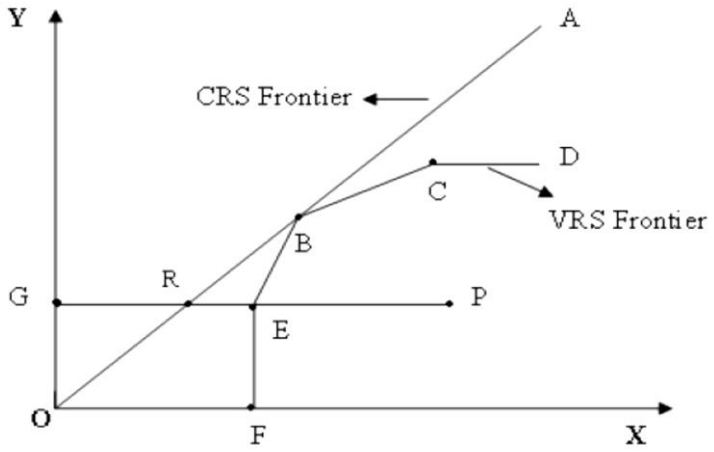
The long-run average cost curve is traced out from the SACs where each point of the LAC is to a point of tangency with a corresponding short run cost curve and it shows the least cost method of production for any level of output. Scale economies appear as the slope of an average cost curve indicating how costs vary with output. *The downward-sloping LAC reflects economies of scale,*

because average costs of production decline as output increases. This cost characteristic exists only up to a certain firm size known as the minimum efficient scale (MES). A firm achieves the lowest attainable average cost at the point M and experiences constant returns to scale around that point. *Beyond point M, the upward-sloping LAC indicates diseconomies of scale, because the average cost of production increase as output increases.*

4.2.1.3 Pure Technical Efficiency and Scale Efficiency

In figure 4.1, the use of the unit isoquant assumes CRS, but this assumption does not always hold. A firm using more of both inputs than the combination represented by R may exhibit VRS. Thus, in general, technical efficiency can be further decomposed into measures of pure technical efficiency (PTE) and scale efficiency (SE). So, in figure 4.4, by assuming a simple case of 1 input X and 1 output Y, P represents an existing Company. In the figure, OA represents the constant returns to scale frontier. Firms can either lie on, or below the frontier but cannot lie above it. Therefore, the ratio of GR/GP represents the measure of technical efficiency of firm P which corresponds to OR/OP in Figure 4.1.

Figure 4.4: Pure Technical Efficiency and Scale Efficiency



Source: Cooper *et al.* (2007)

The concept of scale efficiency ascertains whether or not the firm operates at an optimum size. In order to measure scale efficiency, the assumption of variable returns to scale replaces that of constant returns to scale. In the above figure, FEBCD represents a variable returns to scale frontier. For the firm at point P, *pure technical efficiency (PTE) equals the ratio of GE / GP.*

Scale efficiency (SE) is the ratio of GR/GE or equal to TE divided by PTE. The value of SE=1 when operating under CRS; SE <1, reflect scale inefficiency. Scale inefficiency could be caused by the firm having to operate under increasing returns to scale or decreasing returns to scale. In order to investigate this, the non-increasing returns to scale frontier is developed, represented by OBCD. If SE is not equal to unity and PTE is equal to GR/GP, decreasing returns to scale exists. If PTE is not equal to GR/GP which is based on the frontier OBCD, then the scale inefficiency is due to increasing returns to scale.

4.2.2 Measuring Efficiency

Farrell (1957) suggested constructing the efficiency frontier using the observed sample of firms in the industry. The firms in the constructed frontier are defined to be efficient. Each firm is compared to a point on the efficient unit iso-surface then a relative measure of efficiency is determined. So, measuring efficiency and identifying peers by graphical techniques is only possible in simple cases. However, when a firm has many inputs and outputs, more sophisticated techniques must be used to solve this problem. There are two main approaches in efficient frontier analysis, which represent the empirical foundation to Farrell's best practice concept (Farrell, 1957) for the estimation of efficiency:

4.2.2.1 Parametric (Econometric) Approach

This approach is characterized by a functional form pre-specification to estimate efficiency frontier. However, in most industries, especially in the services sector, the exact production or cost function is not known but the most commonly used functions are Cobb-Douglas functional Form and Translog functional Form.

- **Cobb-Douglas (CD) functional Form:** The CD function is widely used to represent the relationship of inputs to outputs, and was developed by Cobb and Douglas (1928). The Cobb-Douglas form of the cost function is

$$TC = \alpha_0 \prod_{i=1}^{n} y_i^{\alpha_i} \prod_{j=1}^{m} p_j^{\beta_j}$$

$$\text{Ln } TC = \text{Ln } \alpha_0 + \sum_{i=1}^{n} \alpha_i \text{Ln } y_i + \sum_{j=1}^{m} \beta_j \text{Ln } p_j$$

where, TC is total costs, y_i is the i^{th} output, p_j is the price of the j^{th} input and α_0, α_i and β_j are parameters to be estimated, symbolizing the cost elasticities of the outputs and input prices. The CD cost function is homogeneous of degree one in input prices, only if $\sum_{j=1}^{m} \beta_j = 1$. This

linear homogeneity restriction is imposed in the estimation of the cost function and implies a proportional increase of all input prices results in the same proportional increase of total costs.

- **Translog functional Form:** The translog (transcendental logarithmic) production function by Christensen *et al* (1973) uses a second-order Taylor expansion as a local approximation to some unknown 'true' underlying production function. Murray and White (1983) first used the translog function to estimate economics of scale for the banking industry, and since then the translog functional form has become one of the most popular functional forms to estimate bank efficiency. The translog cost function can be specified as follows:

$$\text{Ln TC} = \alpha_0 + \sum_{i=1}^{n} \alpha_i \text{Ln } y_i + \sum_{j=1}^{m} \beta_j \text{Ln } p_j + \frac{1}{2}\sum_i^n \sum_k^n \delta_{ik} \ln y_i \ln y_k + \frac{1}{2}\sum_j^m \sum_h^m \Upsilon_{jh} \ln p_j \ln p_h + \sum_i^n \sum_j^m \delta_{ij} \ln y_i \ln p_j + \varepsilon$$

Where, TC is total costs, y_i is the i^{th} output, p_j is the price of the j^{th} input and ε is the error term. Because the duality theorem requires that the cost function should be linearly homogeneous in input prices, the following restrictions are imposed on the parameters of the cost function equation in order to satisfy the homogeneity condition: $\sum_j^m \beta_j = 1$; $\sum_j^m \delta_{ij} = 0$; $\sum_j^m \Upsilon_{jh} = 0$. In addition, symmetry restrictions are imposed on the second-order parameters, that is, $\delta_{ik} = \delta_{ki}$; $\delta_{ij} = \delta_{ji}$ and $\Upsilon_{jh} = \Upsilon_{hj}$.

The parametric approaches to efficiency measurement are the stochastic frontier approach (SFA), thick frontier approach (TFA), and distribution free approach (DFA); Parametric studies aim at improving the standard OLS estimates with the addition of an asymmetric structure for the residuals, so as to account for the distance between empirical observations and the theoretical efficient frontier.

a) Stochastic Frontier Analysis (SFA): As a very popular method for estimating efficiency, the stochastic frontier analysis proposed by Aigner et al. (1977), Battese and Corra (1977), and Meeusen and van Den Broeck (1977), is motivated by the idea that deviations from the frontier might not be totally under the control of the DMUs being studied. SFA allows for random errors associated with the choice of the functional form, resulting in a stochastic frontier. It is often referred to as a composed error model where the part representing

statistical noise follows a symmetric distribution and the other part, representing inefficiency, follows a particular one-sided distribution[1].

b) Thick Frontier Approach (TFA); The thick frontier approach (TFA) was developed by Berger and Humphrey (1991, 1992). It specifies a functional form for the frontier cost function as do the other parametric frontier approaches. But this approach estimates a thick frontier rather than frontier edge for measuring efficiencies and also avoids distributional assumptions for cross-sectional data.

c) Distribution Free Approach (DFA): The distribution free approach (DFA) is a panel estimation method which avoids imposing distributional assumptions on the error component. DFA was introduced by Schmidt and Sickles (1984) and Berger (1993). DFA specifies a functional form for the efficiency frontier as does SFA, but it uses a different way to separate the inefficiencies from the residual. DFA disentangles inefficiencies from random errors by assuming that inefficiencies are relatively stable and should persist over time. Random errors are ephemeral and should tend to cancel one another out over time by averaging. In particular, a cost or profit function is estimated for each period of a panel data set. The residual in each separate regression is comprised of the inefficiency and random error terms. Since the random error component is assumed to average out over time, the average of a firm's residuals from all of the regressions is an estimate of the inefficiency of the firm. Because no restrictive assumptions are imposed on the distribution of either inefficiency or the random error, the distribution-free approach is easier to implement than the stochastic frontier approach because it does not require the use of maximum likelihood methods to estimate the cost or profit function.

4.2.2.2 Non-Parametric (Mathematical Programming) Approach

Non-parametric approaches are a linear programming technique for the evaluation of multiple-input/multiple-output firms. The non-parametrc approahes includes data envelopment analysis (DEA), free disposal hull (FDH). However, the most widespread mathematical programming approach is DEA, which was first introduced by Charnes *et al.* (1978). DEA is a non-parametric approach and employs linear programming to construct an efficient frontier that envelopes all

[1] Statistical noise represents those external events which cannot be controlled by firms, such as luck, labor market conflicts, climate, topography and machine performance.

input-output combinations of firms in the sample. Efficient firms' input-output combinations are situated on the envelope, i.e., on the efficient frontier, while inefficient firms' input-output combinations are below the frontier. However, the free disposal hull (FDH) approach is a special configuration of the DEA model, which was first proposed by Deprins *et al.* (1984).

a) Data Envelopment Analysis (DEA)

The idea of the non-parametric efficiency approach was originally from Farrell (1957) paper but his empirical work had been limited to the single-output case and did not deal with applications where large data sets with multiple input-outputs are involved. Moreover, this mathematical programming idea did not receive much detailed attention for about two decades, until the paper by Charnes *et al* (1978) was published. In this classic paper, they proposed a mathematical programming algorithm, termed data envelopment analysis (DEA), for assessing the performance of a set of homogeneous entities called decision making units (DMUs), which convert multiple inputs into multiple outputs. This approach forms an empirical production frontier or envelopment surface and measures and calculates efficiency relative to the constructed frontier. Since the pioneering work by Charnes *et al.* (1978) numerous papers have appeared which have extended and applied DEA methodology. Seiford (1997) lists over 400 papers in a comprehensive bibliography and Cooper et al. (2007) lists over 2000 DEA references. Such rapid growth and widespread acceptance of DEA is testimony to its strengths and applicability. In the management science literature DEA is typically represented as a generalized ratio:

$$\textbf{Efficiency Ratio} = \frac{\textbf{Weighted sum of Outputs}}{\textbf{Weighted sum of Inputs}} = \frac{\sum_i \boldsymbol{QiYi}}{\sum_j \boldsymbol{PjXj}}$$

Where, Y_i and X_j are outputs and inputs respectively while Q_i and P_j are firm-specific weights to be calculated by the DEA technique. (These are counterparts of the regression coefficients.) Each company is given a single efficiency score from 0 to 1. The closer the score to 1, the firm is more efficient. DEA allocates specific weights (Q_i and P_j) for each company, on the basis of giving the highest possible score. This is sometimes expressed as putting a company 'in the best possible light'.

DEA Models: The most simple and basic DEA models, which are the backbone of efficiency, studies in literature, are discussed in the below:

(i) CCR Model

The CCR model is the most basic DEA model, which was proposed by Charnes, Cooper, and Rhodes (1978). This model is used to measure the overall technical efficiency of decision making units (DMUs). They introduced a measure of efficiency for each DMU that is obtained as a maximum of a ratio of weighted outputs to weighted inputs. The ratio for every DMU has to be less than or equal to one. Here, it is possible to reduce the multiple-output / multiple-input situation for each DMU to a single virtual output and a single virtual input ratio. This ratio provides a measure of efficiency for a given DMU, which is a function of the weights of the virtual input-output combination. Formally, the efficiency for each DMU can be obtained by the following mathematical programming approach:

$$\text{Max } h_0 = \frac{\sum_{r=1}^{s} u_r y_{r0}}{\sum_{i=1}^{m} v_i x_{i0}}$$

subject to:

$$\frac{\sum_{r=1}^{s} u_r y_{rj}}{\sum_{i=1}^{m} v_i x_{ij}} \leq 1;\ j = 1, 2, 3\ldots,n$$

$$u_r, v_i \geq 0;\ r = 1, 2, \ldots,s;\ I = 1, 2, 3,\ldots,m \qquad \ldots\ldots\ldots\ldots\ldots\ldots (4.1)$$

Where it is should be noted that x_{ij} is the observed amount of input of the i^{th} type of the j^{th} DMU ($x_{ij} > 0$, i=1,2,….,m, j = 1,2,…,n) and y_{rj} is the observed amount of output of the r^{th} type for the j^{th} DMU ($y_{rj} > 0$, r = 1,2, ….,s, j = 1,2,….,n). In other words, j^{th} DMU uses an m-dimensional input vector to produce an s-dimensional output vector. Here, (x_{i0}, y_{r0}) is the input-output vector of the producer being evaluated. The objective function h_0 tries to maximize the ratio of virtual output to virtual input subject to the constraint that this kind of ratio for each DMU must be less than or equal to 1.

The variables u_r and v_i are the weights of output and input which must be non-negative and are determined by the above programming approach. However, a notable problem with this particular fractional formulation is that it has an infinite number of solutions; if (u*, v*) is optimal, then (αu*,αv*) will also be optimal for non-negative α. Thus Charnes et al. (1978) have transformed the above problem into an equivalent linear programming problem. They added an

additional constraint $\sum_{i=1}^{m} v_i x_{i0} = 1$ so that above transformation is achieved and the non-uniqueness problem identified above can be avoided. The notation changes from (u, v) to (μ, ν) to reflect the transformation. The new linear programming problem is equivalent to the equations in (4.1). It can be written:

$$\left.\begin{aligned} & max_{\mu}\ z_0 = \sum_{r=1}^{s} u_r y_{r0} \\ & \sum_{r=1}^{s} u_r y_{rj} - \sum_{i=1}^{m} v_i x_{ij} \leq 0,\ j = 1,2,\ldots n \\ & \sum_{i=1}^{m} v_i x_{i0} = 1 \\ & \mu_r,\ v_i \geq 0;\ r = 1,2,\ldots,m \end{aligned}\right\} \quad \ldots\ldots\ldots\ldots(4.2)$$

The above equations are known as the multiplier form of the DEA linear programming problem. Because the concept of duality exists in linear programming, the dual for DMU0 can be derived as:

$$\left.\begin{aligned} & min_{\lambda}\ z_0 = \theta_0^{CCR} \\ & \textit{Subject to} \\ & \sum_{j=1}^{n} \lambda_j y_{rj} \geq y_{r0}, \qquad r = 1,2,\ldots,s \\ & \sum_{j=1}^{n} \lambda_j x_{ij} \leq \theta_0^{CCR} x_{i0},\ i = 1,2,\ldots,m \\ & \lambda_j \geq 0,\ j = 1,2,\ldots,n \end{aligned}\right\} \quad \ldots\ldots\ldots\ldots\ldots\ldots(4.3)$$

The above problem is referred to as the envelopment form of DEA. Optimal solutions (θ, λ) are obtained for each of the DMUs being evaluated. The value of θ is the efficiency score for the particular DMU_0 and this efficiency score is a radial measure of technical efficiency, according to the Debreu-Farrell definition. A set of constraints assures that the value of θ is always less than or equal to unity and the efficiency score for each observed DMU is relative to other DMUs. DMUs for which θ = 1 are identified as the technically efficient while when θ < 1 we have a relatively inefficient DMU. The optimal λ can identify a project (boundary) point located on the constructed production frontier when the problem seeks the radial contraction of the input vector. Färe et al. (1994) point out that the CCR model imposes a feasible production set which is closed and convex, and presents constant returns-to-scale and strong disposability of inputs and outputs. In later sections, some extension DEA models which relax some of its restrictive properties will be discussed.

The above DEA problem yields a piece-wise linear surface and some sections of this surface run parallel to the axes. So this radial efficiency measurement causes a difficulty in that for an efficient point, it is possible to reduce inputs without altering outputs or increase output without altering inputs. These input savings or output expansions are referred to as input or output slacks. Some authors (e.g., Ali and Seiford, 1993; Cooper *et al.* 2004) develop the following linear programming algorithm to deal with these slack problems:

$$
\begin{aligned}
&\min \quad \theta_0 - \varepsilon\left(\sum_{i=1}^{m} s_i^{-} + \sum_{i=1}^{s} s_r^{+}\right) \\
&\theta, \lambda, s_i^{-}, s_i^{+} \\
&\textit{subject to:} \\
&\sum_{j=1}^{n} \lambda_j y_{rj} - s_r^{+} = y_{r0}; \quad r = 1,2,\ldots,s \\
&\sum_{j=1}^{n} \lambda_j x_{ij} + s_i^{-} = \theta_0 x_{i0}; \; i = 1,2,\ldots,m \\
&\lambda_j, s_r^{+}, s_i^{-} \geq 0, \; j = 1,2,\ldots n
\end{aligned}
\qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.4)
$$

Here the s_r^{+}, $s_i^{-}$are slack variables and ε is an infinitely small positive number. The above linear programming problem is solved by the two-stage procedure. The first stage minimizes θ by solving (5.3). θ is known as weak efficiency and also called Farrell efficiency. Then we maximize the sum of slacks without altering the value of θ obtained from the first-stage results. DMUs attain full efficiency if and only if θ = 1 and all slacks: $s_r^{+} = s_i^{-} = 0$. This full strong efficiency satisfies the conditions for Pareto-Koopmans efficiency[2]. In sum, this two stage procedure ensures the identification of an efficiency frontier point by maximizing the sum of slacks required to move from a Farrell efficient frontier to a Koopmans efficient frontier (Coelli, *et al.*, 2005).

(ii) BCC MODEL

In Charnes *et al.* (1978)'s original paper, it was pointed out that the model assumes constant returns to scale (CRS). This assumption is appropriate only when all DMUs are operating at an optimal scale. But in the real world many factors such as constraints on finance, Government regulations and imperfect competition may cause some DMUs not to operate at the optimal

[2] Pareto-Koopmans efficiency is a more strict definition of technical efficiency when contrasted with Farrell's definition. It defines a DMU as achieving efficiency if and only if it is not possible to improve any input or output without worsening any other input or output.

scale. Therefore, in this situation, the measures of technical efficiency using the CCR model will be confounded by scale inefficiencies. Subsequently Banker, Charnes and Cooper (1984) drop the CRS assumption. They propose a model that takes into account the effect of returns to scale within DMUs called the variable returns to scale (VRS) model or *BCC model.* The purpose of the VRS assumption is to attempt to determine the most efficient scale size for each DMU and at the same time, to identify its technical efficiency. Thus, the primary difference between BCC model and the CCR model is the treatment of returns to scale. The CCR model is the treatment evaluation of constant returns to scale (CRS). The BCC version is more flexible and allows variable returns to scale (VRS).

Banker *et al.* (1984) adds a convexity condition for λ_j: $\sum_{j=1}^{n} \lambda_j = 1$, which ensures that an inefficient DMU is only compared with similar sized DMUs. With this added constraint, the reference set is changed from the conical hull in the case of the CCR model to the convex hull in the case of the variable returns to scale model. This change ensures that the tested DMU is compared with a lesser number of combinations. Thus, technical efficiency scores provided by the CCR model are greater than or equal to those in the BBC model.

The input-oriented BCC model for DMU_0 in envelopment form can be written formally as:

$$
\begin{aligned}
&\min_{\theta,\ \lambda,\ s_i^-,\ s_i^+} \quad \theta_0^{BCC} - \varepsilon\left(\sum_{i=1}^{m} s_i^- + \sum_{i=1}^{s} s_r^+\right) \\
&\textit{subject to:} \\
&\sum_{j=1}^{n} \lambda_j y_{rj} - s_r^+ = y_{r0}; \quad r = 1,2,\ldots,s \\
&\sum_{j=1}^{n} \lambda_j x_{ij} + s_i^- = \theta_0\, x_{i0}; \ i = 1,2,\ldots,m \\
&\sum_{j=1}^{n} \lambda_j = 1 \\
&\lambda_j,\ s_r^+,\ s_i^- \geq 0,\ j = 1,2,\ldots n
\end{aligned}
\qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.5)
$$

Solving the above problem for each DMU, BCC efficiency scores, θ, are obtained. These scores are also called the *pure technical score* since they are obtained from a model which allows for variable returns to scale and eliminates the problem of scale efficiency from the analysis. Furthermore, if $\sum_{j=1}^{n} \lambda_j = 1$ is replaced by $0 \leq \sum_{j=1}^{n} \lambda_j \leq 1$, then the non-increasing returns to scale (NIRS) envelopment model is obtained. That is if we replace $\sum_{j=1}^{n} \lambda_j = 1$ with $\sum_{j=1}^{n} \lambda_j \geq 1$, then we obtain the non-decreasing returns to scale (NDRS) envelopment model.

In the preceding analysis, DEA models are called *input-orientated* DEA models. *The input-orientated DEA model maximizes the proportional reduction in inputs as much as possible, given the current level of outputs.* On the other hand, it is also possible to seek the proportional augmentation in outputs keeping at most the current level of inputs. Thus the output direction can also be applied in the above models. In the oriented models the envelopment surface (efficiency frontier) remains the same for either VRS or CRS. But the measures of inefficient firms may differ between the two methods. The choice of an appropriate orientation is made according to which quantities (inputs or outputs) the managers have most control over. Thus, for example, if producers are required to meet market demands, and if they can freely adjust input usage, then an input-oriented model seems to be appropriate. Or the firms may be given a fixed quantity of resources and asked to produce as much output as possible. Then an output-oriented model would be more appropriate. However, some researchers have pointed out that the choice of orientation has only a minor effect on the scores obtained and therefore it may not be a crucial issue.

(iii) DEA Models of Economic Efficiency

The above DEA models only use quantity data to capture technical efficiency and cannot account for allocative efficiency. However, if price data are available, it is possible to extend DEA models so that they measure economic efficiency. The objective of extended DEA models is to minimize cost or maximize revenue or profit. For the case of VRS cost minimization DEA, economic (cost) efficiency can be solved by employing the following linear programming problem:

$$
\begin{aligned}
&min_{\lambda,xi}\ w_{i0}\, x_{i0}^{*} \\
&\textit{subject to} \\
&\textstyle\sum_{j=1}^{n} \lambda_j\, y_{rj} \;-\; y_{r0} \geq 0, \quad r = 1,2,\ldots,s \\
&\textstyle\sum_{j=1}^{n} \lambda_j\, x_{ij} \;-\; x_{i0}^{*} \leq 0, \; i = 1,2,\ldots,m \\
&\textstyle\sum_{j=1}^{n} \lambda_j = 1 \\
&\lambda_j \geq 0, \; j=1,2,\ldots,n
\end{aligned}
\qquad \Big\} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.6)
$$

Where x_{i0}^{*} is the cost minimizing input quantities for the evaluated firm, given the input prices w_{io} and output levels y_{ro}. Based on an optimal solution (x_{ij}^{*}, λ_j) of the above linear programming

problem, the cost efficiency (CE) of the evaluated firm is calculated as the ratio of the minimum cost to observed cost, that is, CE = $\frac{Wij\ Xij*}{Wij\ Xij}$. The estimation of revenue efficiency is similar to that of the estimation of cost efficiency. However, the *objective here is to maximize revenues by using an output-oriented approach rather than to minimize costs by an input-oriented approach.*

Evaluation of DEA Analysis

DEA is a theoretically sound framework for performance analysis that offers many advantages over traditional methods such as performance ratios and regression analysis. DEA does not require the assumption of production function, and therefore avoids many subjective factors. Traditional econometric methods have to assume the production function and the random errors. Based on those assumptions, regressions and tests can be conducted, and the modified production frontier can be finally fixed. Next, at attempt has been made to measure the distance between the actual production point and the frontier, which will result in deriving the efficiency score. However, DEA directly compares a DMU with other DMUs or their convex combination. Furthermore, DEA allows the researchers and practitioners to select input and output variables according to their particular goals. DEA can also work well with multi-inputs and multi-outputs, which means the DEA score contains much more information than the normally used ratio analysis

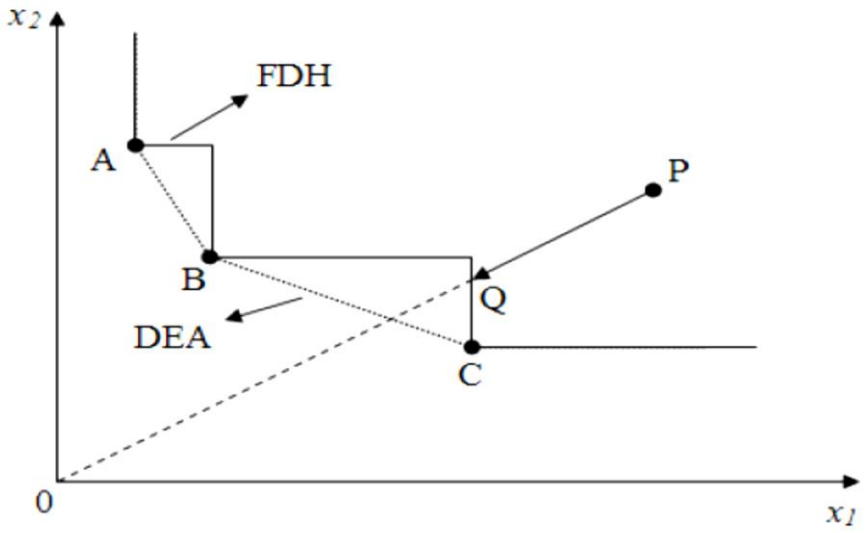
DEA has fewer limitations than other performance measurement approaches. However, the efficiency measure obtained by DEA is sensitive to the combination of input(s) and output(s). If the input(s) and output(s) are properly chosen, DEA can provide crucial information. The most important problem with DEA is this method ignores the random errors in its model. That means the result of DEA is not accurate from the perspective of statistics. Some departures from the frontier line are not due to the inefficiency. They may be actually caused by inaccurate data resource, measurement errors, and such random factors. In statistics, these random factors cannot be regarded as inefficiency.

b) Free Disposal Hull (FDH)

The Free Disposal Hull (FDH) model was first formulated by Deprins *et al.* (1984) and extended by Tulkens (1993). The FDH approach can be viewed as a special case of the DEA model. The FDH approach relaxes the assumption of convexity and presumes that no linear substitution is

possible between observed input or output combinations on a piecewise linear frontier. The FDH production possibilities set is composed only of the DEA vertices and the free disposal hull points interior to these vertices and this ensures that efficiency evolutions are affected from only actually observed performances. The FDH model is formulated by adding to equation (4.6) the additional constraints λjε {0, 1}, j = 1,…,n to relax convexity. The FDH problem is a mixed integer programming problem. The DEA and FDH frontiers are compared in Figure 4.4. The FDH frontier has a staircase shape and envelops the data more tightly than the DEA frontier does. Therefore, the FDH approach typically generates larger estimates of the efficiency score than does the DEA approach. Consequently, slack is much more serious problem in FDH than in DEA.

Figure 4.4: Free Disposal Hull (FDH)



Source: Lovell et al (1993)

4.3 Total Factor Productivity (TFP) Growth Models

The TFP is often used in combination with efficiency studies in literature as the efficiency scores obtained, by DEA approach to measuring firm efficiency, from a particular sample are confined to that particular sample and cannot be compared with another sample in a different time period. TFP growth is measured as the change in total outputs net of the change in total input usage. Measuring TFP growth is important to gauge the effects of changing industry structure such as the wave of mergers and acquisitions (M&As) underway in the industry. It is also important to measure the effects of changes in management practices and the introduction of new

technologies. In literature, there are principally three measures of TFP used: *(i) Tornquist, (ii) Fisher and (iii) Malmquist indices.* Tornquist and Fisher use price information along with quantity data to construct indices of output and input. The TFP index is the ratio of the output and input quantity indices. However, both are descriptive measures of productivity change. Neither of the two measures requires knowledge of the underlying production technology faced by the firm.

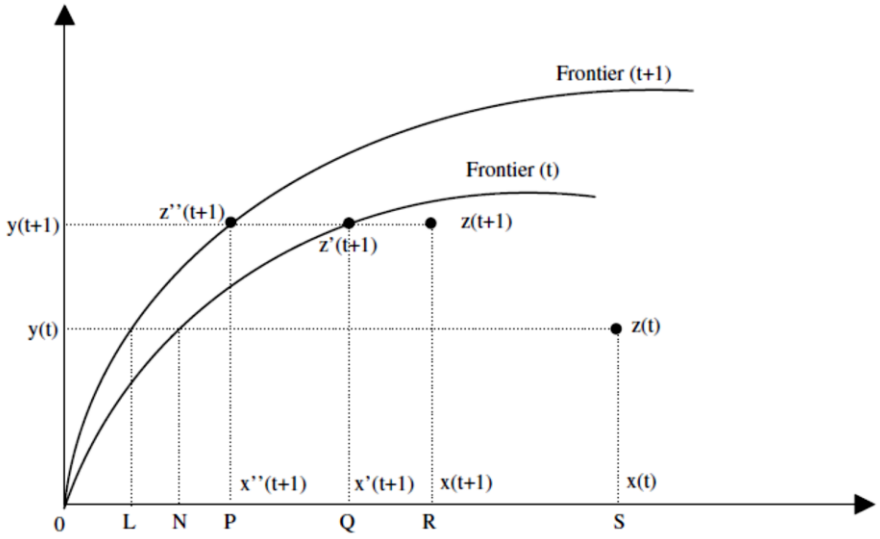
4.3.1 Malmquist Productivity Index

The *Malmquist Productivity Index (MPI*) introduced by *Caves, Christensen and Diewert (*1982*)* is a normative measure that constructs a production frontier representing the technology and uses the corresponding distance functions evaluated at different input-output combinations for productivity comparisons that is by comparing the proportion of output to input over two periods of time. The index ascertains the extent to which input in period 2 could be decreased by holding the output at the same level as in period 1. For computing the index, either of the periods could be taken as a reference point. In case technology in period 1 is taken as reference and computed value index exceeds, it implies gain in productivity. On the other hand, index less than 1 indicates decline in productivity. The Malmquist productivity index allows for changes in productivity to be broken down into changes in technical efficiency and changes in technological efficiency.

To illustrate the MPI productivity measurement, we adopt the framework presented in figure 4.5, which shows two observations of the input (x) and output (y) bundles used by a firm in an industry at time t and t+1. The aim is to measure productivity growth between t and t+1 in terms of the change from input-output bundle z (t) to input-output bundle z (t+1). The production frontier represents the efficient levels of maximum output (y) that can be produced from a given level of input (x). If the firm is technically efficient in period t, it produces along the frontier the maximum output attainable, y(t). Point z (t) = [x(t),y(t)] corresponds to a technically inefficient firm, which uses more than the minimal amount of input to produce a given level of output. The input x (t) should be multiplied by the horizontal distance ratio, ON/OS, in order to make production of y (t) technically efficient. By analogy, and assuming frontier t as reference, the input x (t+1) should be multiplied by the horizontal distance ratio, OQ/OR, in order to achieve technical efficiency in the production of output y (t+1), that is bundle z(t+1). Since the frontier

has shifted in the meantime, z (t+1) is technically inefficient in t+1. In order for the firm to be efficient in period t+1, input x(t+1) must be reduced by the horizontal distance ratio, OP/OQ, resulting in bundle z'(t+1). Globally, the input ratio inefficiency in t+1 is OP/OR.

Figure 4.6: Malmquist Index and Productivity Changes



Source: Barros *et al.* (2005)

The Malmquist index of productivity growth (MI) is the ratio of the input inefficiencies at t+1 and t.

$$\mathbf{M} = \left[\frac{\frac{OP}{OR}}{\frac{ON}{OS}}\right] = \left[\frac{\frac{OQ}{OR}}{\frac{ON}{OS}}\right] \times \frac{OP}{OQ}$$

Caves *et al* (1982) showed that productivity movements can be measured by a multi-input, multi-output Malmquist index when input and output data are available in physical units, so that no price index problems arise. They argue that the distance function d(x, y) can be used in the construction of the Malmquist index and measure the Malmquist index of change between t and t+1 as the ratio $[d^T (x^{t+1},y^{t+1})/d^T(x^t,y^t)]$. The malmquist index of total factor productivity change is as the geometric mean of two indices based on the technology for year t and year t+1 respectively. In otherwords,

$$M\,(x^{t+1},y^{t+1},x^t,y^t) = \left[\frac{d^t\,(x^{t+1},y^{t+1})}{d^t\,(x^t,y^t)} \times \frac{d^{t+1}\,(x^{t+1},y^{t+1})}{d^{t+1}+\,(x^t,y^t)}\right]^{1/2}$$

Equivalently,

$$M\,(x^{t+1},y^{t+1},x^{t},y^{t}) = \frac{d^{t}\,(x^{t+1},y^{t+1})}{d^{t}\,(x^{t},y^{t})}\left[\frac{d^{t}\,(x^{t+1},y^{t+1})}{d^{t+1}\,(x^{t+1},y^{t}+1)} \times \frac{d^{t}\,(x^{t},y^{t})}{d^{t+1}+\,(x^{t},y^{t})}\right]^{1/2}$$

The ratio outside the brackets is the index of change in technical efficiency (i.e. catch-up index) between years t and t+1, while the bracketed term is the index of change in technology (frontier-shift index) between two periods evaluated at x^t and x^{t+1}. If M > 1, it indicates a favourable development, i.e., a positive growth in total factor productivity between two periods; M < 1 is a negative development, i.e., a decline in total factor productivity between two periods and if M equals to one, productivity remains unchanged.

Unlike the econometric stochastic frontier approach, MPI offers a different rate of technological change for each individual, which is more appropriate for analysing technological change by companies. Moreover, since it is estimated with a non-parametric methodology (DEA), it needs neither to impose any functional form on the data nor to make any distributional assumptions for the inefficiency term.

4.4 Review of Literature

Most empirical research studies on efficiency are primarily concentrated on the developed countries, on assessing bank performance using measures of efficiency and productivity across countries using various methodologies in arriving at different conclusions. In relation to insurance industry, a relatively few number of studies are available, which analyse the efficiency of insurance firms, using a variety of approaches, parametric and non-parametric.

4.4.1 International Studies

Efficiency comparisons at the international level receive a significant attention in the insurance literature. The table 4.1 delivers a detailed overview of international studies, including their sample periods, lines of business covered, and types of efficiency analysed.

Weiss (1991) is the first cross-country comparison of efficiency and the study provides (bilateral) divisia and multilateral divisia indexes of output, input, and productivity for the property-liability (P-L) insurance industry for the countries, United States, West Germany, Switzerland, France, and Japan. The time period studied is 1975 to 1987. The results indicate that considerable

diversity exists among different countries, with Japan showing the weakest productivity growth. The United States and West Germany are associated overall with high productivity.

Rai (1996), examines the cost efficiency of insurance firms in 11 countries over a period of five-year, 1988-1992. Two X-inefficiency measures are derived, one from the stochastic cost frontier model and the other from the distribution-free model. The results show that x-inefficiencies not only vary by country but by size and specialization. Firms in Finland and France have the lowest x-inefficiency, while firms in the United Kingdom have the highest. On average, small firms are more cost efficient than large firms worldwide. Finns grouped into those offering single or specialized services also operate more cost efficiently than those offering a combination of life and nonlife services (combined firms). The results also indicate that the X-inefficiency estimates derived from the stochastic cost frontier model are more suitable for this sample of data than those derived from the distribution-free model.

Donni and Fecher (1997) measure the technical efficiency levels in 15 OECD insurance industries over the period 1983-1991 and to decompose productivity changes into technical progress and efficiency variations. The study indicate that the growth in the productivity observed in all countries is essentially imputable to improvements in technical progress. The study is a step towards a comprehensive efficiency comparative study of the OECD insurance markets especially desirable in this period of increasing integration and deregulation of the market.

Cummins and Zi (1998) made comparative analysis of frontier cost efficiency methodologies by the application of a wide range of econometric and mathematical programming techniques to a data set consisting of 445 life insurers over the period 1988-1992. The alternative methodologies gave significantly divergent estimates of efficiency for the in-sample insurers. The efficiency rankings were quite well-preserved among the econometric methodologies; but the rank correlations were found to be lower between the econometric and mathematical programming categories and between alternative mathematical programming methodologies. Thus, the choice of methodology had a significant effect on the results. Most of the insurers in the sample display either increasing or decreasing returns to scale, and stock and mutual insurers were found to be equally efficient after controlling for firm size.

In the eighties and nineties, the US life industry has experienced an unprecedented wave of mergers and acquisitions (M&As). In this context, *Cummins, Tennyson and Weiss (1999*) examine the relationship between mergers and acquisitions, efficiency, and scale economies in the US life insurance industry. They estimate cost and revenue efficiency over the period 1988-1995, using data envelopment analysis (DEA). The Malmquist methodology is used to measure changes in efficiency over time. The results suggested that the acquired firms achieve greater efficiency gains than firms that have not been involved in mergers or acquisitions. Firms operating with non-decreasing returns to scale (NDRS) and financially vulnerable firms are more likely to be acquisition targets. Overall, mergers and acquisitions in the life insurance industry have had a beneficial effect on efficiency.

Greene and Segal (2004) explore the relationship between cost inefficiency and profitability in the U.S. life insurance industry. They derive cost efficiency using the stochastic frontier (SF) method allowing the mean inefficiency to vary with organizational form and the outputs. The results suggest that cost inefficiency in the life insurance industry is substantial relative to earnings, and that inefficiency is negatively associated with profitability measures such as the return on equity. The analysis of inefficiency and organizational form suggest that stock (shareholder-owned) companies are as efficient and profitable as mutual (policy holder-owned) companies.

Hao and Chou (2005) estimate the Translog cost function for 26 Taiwan life insurance companies over the period of 1977-1999. They used the distribution free approach (DFA) and Battese and Coelli (DFP) model to estimate inefficiency. The research suggests that, i) assets excluded from solvency regulations are potentially productive to the firm, ii) firms with a larger market share are more profitable; iii) diversification of product strategy is unable to help a firm improve its operational efficiency, because Taiwan’s life insurance firms always observe the standardized policy regulation; iv) if the firm is increasing its ordinary life insurance premium revenue, then the firm must be seeing an improvement in its investments and v) the price of claims rises, the firm will see a downside in the price of labour.

Cummins and Misas (2006) discuss the effects of deregulation and consolidation in financial services markets by analyzing the Spanish insurance industry. The sample period 1989-98 spans the introduction of the European Union's (EU) Third Generation Insurance Directives, which

deregulated the EU insurance market. Deregulation has led to dramatic changes in the Spanish insurance market; the number of firms declined by 35%, average firm size increased by 275%, and unit prices declined significantly in both life and non-life insurance. They analyzed the causes and effects of consolidation using modem frontier efficiency analysis to estimate cost, technical, and allocative efficiency, as well as using Malmquist analysis to measure total factor productivity (TFP) change. The results show that many small, inefficient, and financially underperforming firms were eliminated from the market due to insolvency or liquidation. As a result, the market experienced significant growth in TFP over the sample period. Consolidation not only reduced the number of firms operating with increasing returns to scale but also increased the number operating with decreasing returns to scale. Hence, many large firms should focus on improving efficiency by adopting best practices rather than on further growth.

Wei Huang (2007) calculates the efficiency, especially the cost efficiency and profit efficiency of China's insurance industry for the period 1999-2004. The results show that for the cost efficiency, the life insurance industry, non-state-owned companies and foreign companies are superior to the property insurance industry. But for the profit efficiency, while the life insurance industry still surpasses the property insurance industry, the state-owned companies and domestic companies are better than their counterparts.

Cummins and Xie (2008) analyze the productivity and efficiency effects of mergers and acquisitions (M&As) in the US property-liability insurance industry during the period 1994-2003 using DEA and Malmquist productivity indices. They wanted to determine whether M&As are value-enhancing, value-neutral, or value-reducing. The analysis examines efficiency and productivity change for acquirers, acquisition targets, and non-M&A firms. They also examined the firm characteristics associated with becoming an acquirer or target through probit analysis. The results provide evidence that M&As in property-liability insurance were value-enhancing. Acquiring firms achieved more revenue efficiency gains than non-acquiring firms, and target firms experienced greater cost and allocative efficiency growth than non-targets. Factors other than efficiency enhancement are important factors in property-liability insurer M&As. Financially, vulnerable insurers are significantly more likely to become acquisition targets, consistent with corporate control theory, and we also find evidence that M&As are motivated to achieve diversification. However, there is no evidence that scale economies played an important role in the insurance M&A wave.

Eling Martin Luhnen Michael (2008) provide an overview and new empirical evidence on frontier efficiency measurement in the insurance industry, a topic of great interest in the academic literature during the last several years. Different methodologies, countries, organizational forms, and company sizes are compared, considering life and non-life insurers. The study found that a steady technical and cost efficiency growth in international insurance markets from 2002 to 2006, with large differences across countries. Denmark and Japan have the highest average efficiency, whereas the Philippines is the least efficient. Furthermore, the analysis shows that mutuals are more efficient than stock companies. Only minor variations are found when comparing different frontier efficiency methodologies (data envelopment analysis, stochastic frontier analysis).

Chen et al (2009) evaluated the relative efficiency of Chinese life insurers between 2000 to 2003, using DEA, estimated the technical efficiencies, pure technical efficiencies, and scale efficiencies between different groups of life insurers. The results indicated that the TE scores of life insurers in China are dispersed. The traditional life insurers were technical efficient during the sample years. This reflects the market situation that traditional life insurers still have the monopolizing power, and smaller life insurers are not competitive enough. The empirical result also shows that the average technical efficiency of the life insurance industry is decreasing year by year. One hand, the efficiency of new-coming insurer is forced to be low by the large investment and slow return. On the other hand, together with the result of Malmquist index, it showed that life insurers are facing more furious competition and greater challenge nowadays in China.

Eling and Luhnen (2009) conducted a broad efficiency comparison of 6462 insurers from 36-countries. Different methodologies, countries, organizational forms, and company sizes are compared, considering life and non-life insurers. They found that a steady technical and cost efficiency growth in international insurance markets from 2002 to 2006, with large differences across countries. Denmark and Japan have the highest average efficiency, whereas the Philippines the least efficient. Regarding organizational form, the results are not consistent with the expense preference hypothesis, which claims that mutual should be less efficient than stocks due to higher agency costs. Only minor variations are found when comparing different frontier efficiency methodologies (data envelopment analysis, stochastic frontier analysis).

Lin et al (2009) adopted the DEA model to analyse the business efficiency of Taiwan's life insurance industry for the period 2005-2009. The research results showed that the average technical efficiency of Taiwan's life insurance industry was relatively low and most life insurance companies should further enhance and improve efficiency; in the respect of productivity, most life insurance companies continuously grow in productivity, while a small number of companies slightly decline. The average productivity of various life insurance companies grew in 2008-2009 by 4.1%, with technical advancement as the major source of productivity changes; according to technical efficiency and productivity changes, life insurance companies can be classified by development into high growth and high efficiency type, high growth and low efficiency type, low growth and high efficiency type, and the low growth and low efficiency type.

Abidin and Cabanda (2009) evaluate the relative efficiency of 23 Non-Life Insurance companies in Indonesia, using Data Envelopment Analysis (DEA) model. The empirical results suggest that bigger insurance companies are found to be more efficient than smaller firms. Moreover, companies with captive market and the company's group with non-captive market have relatively the same result.

Eling and Huang (2011) discuss the efficiency of non-life insurance companies in four of the fastest-growing markets in the world - the BRIC (Brazil, Russia, India, and China) countries. An innovative feature of this paper is its incorporation of uncontrollable variables in the efficiency analysis using a multi-stage DEA approach. This approach captures cross-country differences, such as the political and economic environment, and allows distinguishing between managerial inefficiency and inefficiency due to environmental conditions. The study found that the environment strongly affects the efficiency of non-life insurers operating in the BRIC countries.

Saad and Idris (2011) examine the efficiency of the life insurance industry in Brunei and Malaysia. DEA is used to explore the contributions of technical and efficiency change to the growth of productivity in the Malaysian and Brunei life insurance industries by applying the generalized output-oriented Malmquist index for the year 2000-2005. The output-input data consists of a panel of 9 life insurance firms in Malaysia and 2 life insurance companies in Brunei that is selected as the sample of the study. This study utilizes two inputs and two outputs, namely, commission and management as well as premium and net investment income,

respectively. It is found that, on average, the TFP of the life insurance industry is mainly due to both efficiency and technical changes where the main source of the efficiency change is scale efficiency rather than pure efficiency.

Saad (2012) analyse the efficiency of general or non-life takaful and insurance industry in Malaysia during the period 2007 to 2009 by using DEA technique. In order to measure their efficiencies, the output-input data consists of a panel of 28 general or non-life takaful and insurance companies are used. It is found that, on average, the TFP of the non-life takaful and insurance industry in Malaysia is mainly due efficiency change and the main sources of the efficiency change are both scale efficiency and pure efficiency.

A paper by *Khalid and Said (2012)* estimate the technical efficiency of insurances in the GCC countries using DEA methodology and Malmquist Productivity Index (MPI) to decompose the change in the efficiency into an intrinsic component reflecting the individual change in technical efficiency and a second component reflecting the impact of the change in the market technology on the individual technical efficiencies of insurance companies. The study considers 39 insurance firms in the region, with a panel data covering the period 2005-2007. The authors found that the insurance industry in the GCC is moderately efficient and there is large room for improvement.

4.4.2 Studies in India

Research on the Indian insurance industry is very limited. Most of the past studies analyse the structure and financial performance of the insurance industry. However, a few numbers of empirical papers are available in literature that employed DEA to evaluate efficiency / productivity of the insurance companies in India.

In the Indian context, *Tone and Sahoo (2005)* are the first to study efficiency of the life insurance sector by employing a new variant DEA model to examine the performance of Life Insurance Corporation (LIC) of India only using time series data. The findings show a significant heterogeneity in the cost efficiency scores over the course of 19 years. A decline in performance after 1994-1995 can be taken as evidence of increasing allocative inefficiencies arising from the huge initial fixed cost undertaken by LIC in modernizing its operations. A significant increase in cost efficiency in 2000-2001 is, however, cause for optimism that LIC may now be realizing a benefit from such modernization. This will stand them in good stead in terms of future

competition. Results from a sensitivity analysis are in broad agreement with the main findings of this study.

Sinha (2007) assessed the total factor productivity growth in the life insurance industry for the period 2003-05 using Malmquist Total Factor Productivity Index. Comparison of technical efficiency scores of the life insurance companies indicate that the private insurance companies are still way behind the LIC. Under the assumption of CRS the inefficient firms are penalized more in terms of distance from the best practice frontier the mean technical efficiency score of the life insurers under CRS is much lower than under VRS. For all the observed years, LIC and SBI Life have a technical efficiency score of 1. All other life insurance firms are technically inefficient (technical efficiency score of less than 1). For 2002-03 and 2003-04, accepting LIC all other insures exhibited increasing returns to scale. For 2004-05, ING Vysya and Max New York Life exhibited decreasing returns to scale. All the life insurers exhibited positive total factor productivity growth. Obviously, the total factor productivity growth rate of the private life insurers is much higher than LIC. Among the private life insurers, OM Kotak Life exhibited highest total factor productivity growth rate followed by Aviva Life insurance.

Garg and Deepti (2008), compared the technical and scale efficiency of 12 general insurance companies in India from the financial year 2002-03 to 2005-06 using DEA. Among the public insurers, New India is the only company which turned out to be technically efficient on both CRS and VRS for all the years under reference. HDFC Chubb managed to retain 100% efficiency for the years included in the study on both VRS and CRS. The average efficiency results indicate that though private insurers lag behind public insurers, they are fast catching up and the efficiency scores of public and private insurers seem to converge.

Sinha and Chatterjee (2009) presented a paper on cost efficiency of the Life insurance companies in India for the period from 2002-03 to 2006-07, using the new cost efficiency approach suggested by Tone (2002). The study follows the value added approach and consider two output proxies, benefits paid to the customers and net premium mobilized, and two inputs, operating expenses and commission expenses. The results suggest an upward trend in cost efficiency of the observed life insurers between 2002-03 and 2004-05. However, the trend was reversed for the next two years i.e. 2005-06 and 2006-07. This may be due to the fact that during

the initial years of observation mean cost efficiency of the private life insurers was rising but the trend was reversed in 2005-06 and 2006-07.

Sinha (2010), compared efficiency of 15 life insurance companies operating in India for 2005-06 to 2008-09 using the old and new revenue maximizing approach. The difference between the two approaches lies in the specification of the production possibility set. In both the approaches, only the LIC was found to be efficient for the observed years followed very closely by Sahara life. However, since in the old approach, the technically inefficient firms are penalized very harshly, the grand mean technical efficiency score is less than 50% to that in the new approach. Further, *Dutta and Sengupta (2011),* employed a panel dataset of 14 life insurance companies for the period 2004–09, to evaluate their efficiency scores by using Data Envelopment Analysis and calculating the scale efficiency. The results render light on policy design and implementations for future development of the life insurance industry in India.

Khan and Mitra (2012), used the window analysis developed by Klopp (1985) to compare the performance of the major life insurance companies operating in India using a two output two input framework. The window approach evaluates firms on the basis of a panel of observations and thus is different from the conventional DEA. In the conventional DEA, technical efficiency for any particular decision-making unit (DMU) is measured by evaluating the DMU in the light of all the DMUs under observation for the time period. The study encompasses 18 life insurance companies for the period 2007-08 to 2012-13. The results suggest that there still exists a huge gap between LIC of India and other life insurance companies in terms of technical efficiency. However, the gap is expected to come down in future as the industry matures with increase in insurance penetration and density levels in India.

Chakraborty and Sengupta (2012), attempted a comparison of performance and efficiency in respect of catch-up efficiency scores, frontier-shift efficiency scores and Malmquist Total Factor Productivity growth index for a 7-year period ranging from 2003-04 to 2009-10. LICI exhibited a relative catch-up efficiency of 1 and the private life insurers such as Kotak and ING Vysya score of more than 1 over the period. Further, a comparison of the relative frontier-shift efficiency scores of the life insurers for the 7-year period from 2003-04 to 2009-10 reflected that the public-sector life insurer is marginally ahead of its private sector counterparts with respect to efficiency in frontier technology over the years. Moreover, LICI exhibited a consistent relative

Total Factor Productivity change index score of more than 1 over the 7-year time-period thereby indicating a relative progress in total factor productivity growth.

Noronh and Shinde (2012), evaluated the cost efficiency of all the life insurance companies operating in India for the period 2000-01 to 2009-10. The study involved calculation of cost efficiency score of life insurance sector in India with the DEA. Life Insurance Corporation of India has consistently secured a cost efficiency score of 1 in all the years from 2000-01 to 2009-10 and scored the highest rank for all the years under study. Thus Life Insurance Corporation of India has consistently been a cost efficient organization. While in the case of the private life insurance companies, the cost efficiency score has been inconsistent

Chakraborty, Dutta and Sengupta (2012), investigated the technical efficiency and productivity growth in Indian life insurance industry in the era of deregulation. The study used DEA method and Malmquist productivity index to measure and decompose technical efficiency and productivity growth, respectively. The results suggest that the growth in overall productivity is mainly attributed to improvement in efficiency. Higher pure technical efficiency and lower scale efficiency indicate the insurance firms have generally, moved away from the optimal scale over the study period. The truncated regression exploring the main drivers of efficiency in the long run found claims ratio, distribution ratio, and firm-size influence technical efficiency positively. The study also found firms that had both life and non-life businesses are more efficient than firms that has only life insurance business.

Parida and Acharya (2013) compared the performance and efficiency in terms of total factor productivity (TFP) growth of 13 Indian life insurance companies (12 private sector and 1 public sector) in respect of Catch-up efficiency and Frontier-shift efficiency for the years ranging from 2005-06 to 2010-11 using Data Envelopment Analysis (DEA). The results found that LIC exhibited a relative catch-up efficiency of 1 indicating no significant changes in performance over the years. In comparison, the private life insurers such as Max New York Life Insurance, Kotak Mahindra Life and ING Vysya exhibited a mean relative catch-up efficiency score of more than 1 over the said period. Further, a comparison of the relative frontier-shift efficiency scores of the life insurers reflected that the public-sector life insurer is marginally ahead of its private sector counterparts with respect to efficiency in frontier technology over the years. Moreover, LIC exhibited a consistent relative Total Factor Productivity change index score of

more than 1 over the six year time period thereby indicating a relative progress in total factor productivity growth from period t to period t+1. However, all the private life insurers exhibited a mean positive total factor productivity growth during the said period.

Dutta and Sengupta (2014), analysed the revenue efficiencies of Indian non-life insurance companies in the post-liberalised regime using the new cost-based DEA model proposed by Tone (2002) for both scale assumptions of constant and variable returns to scale. The study used three inputs and two outputs model for an analysis of 12 Indian non-life insurance companies over the period of 2005-2006 to 2009-2010. The overall revenue efficiency for the life insurance sector is 86% and 96.4 % under CRS and VRS assumptions, respectively. This implies that there is a scope of 14% and 3.6 % improvement of revenue under both the assumptions, respectively.

In another study *Rao and Venkateswarlu (2014),* measure the relative efficiency of non-life insurance companies in India from 2008 to 2013 by using Stochastic Frontier Analysis. It is found that Bharati AXA is at rank one and it has a relative efficiency score higher than all other companies. It is also found that the mean of efficiency score of non-life insurance companies is increasing from year to year.

Nandi (2014), measured the relative performance efficiency of 13 life insurance companies of India (1 public sector and 12 private sector) covering a period of 10 years from 2002-03 to 2011-12. The study used DEA technique to measure efficiency individually, year wise, sector wise and as a whole. The study utilized two inputs and two outputs, namely, commission paid and operating expenses as well as premium and net benefit respectively. Since this study attempted to maximise output, so output oriented DEA was used. The results of the study shows that overall life insurers carrying life insurance business at an average technical efficiency of 82.6%, pure technical efficiency of 87.5% and scale efficiency of 94.7%. On the other hand, in individual and sector wise performance analysis, LIC performs better as compared to others.

The table 4.1 presents a synoptic view of the literature on efficiency measurement of insurance companies around the world. Overall, the empirical evidence is quite consistent in finding that efficiency in developed Countries is on an average higher than that in emerging markets and that technical progress has increased productivity and efficiency around the world.

Table 4.1: Past Efficiency Studies in Indian & World									
Authors	**Country**	**Sample Period**	**Lines of Business**	**Method**	**Inputs**	**Outputs**	**Output Approach**	**Type of Efficiency**	**Findings**
Badunenko et al. (2006)	Ukraine	2003-05	Life, Non-life	DEA	Fixed assets, current assets, liabilities, equity	Premiums	Value Added	Technical, Scale	Increased capitalization requirements have positively influenced Ukrainian insurance market and helped improve both technical and scale efficiency
Barros and Obijiaku (2007)	Nigeria	2001-05	Life, Non-life	DEA	Capital, operative costs, number of employees, total investments	Profits, net premiums, claims, outstanding claims, investment income	Value Added	Technical, pure technical, scale	Most companies are VRS efficient
Barros et al. (2005)	Portugal	1995-01	Life, Non-life	DEA	Wages, capital, total investment income, premiums issued	Claims paid, profits	Value Added	Technical, pure technical, scale	Improvement of technical efficiency over time, but deterioration in terms of technological change
Berger et al. (1997)	US	1981-90	Property Liability	DFA	Labour, business services, debt capital, equity capital	Total real invested assets, present value of losses incurred	Value Added	Cost, profit	Independent agents less cost efficient but equally profit efficient as direct writers
Berger et al. (2000)	US	1988-92	Life, Property Liability	TFA, SFA	Labour, business services, re-serves, financial equity capital	Invested assets, present value of real losses incurred (P/L), incurred benefits (Life)	Value Added	Cost, revenue, profit	Conglomeration hypothesis holds for some types while strategic focus hypo-thesis dominates for others
Bernstein (1999)	Canada	1979-89	Life	Cost Function	Labour, buildings capital, machinery capital, materials	Number of policies	Physical	n/a	Average annual productivity growth of 1% for period 1979-1989
Brockett et al. (2005)	US	1989	Property Liability	DEA	Surplus previous year, change in capital and surplus, underwriting and investment expense, policy-holder-supplied debt capital	ROI, liquid assets to liability, solvency scores	Financial intermediary	n/a	Stock firms with higher inefficiency in the input dimension while mutual with higher shortfalls in all areas of output; direct systems with more inefficiencies than agency
Carr et al. (1999)	US	n/a	Life	DEA	Labour (admin., agents), business services, financial capital	Incurred benefits, additions to reserves	Value Added	Cost, revenue	Exclusive dealing insurers less efficient than nonexclusive dealing or direct writers; nonexclusive dealing insurers should focus on fewer product lines; firms adopting one of Porter's 3 generic strategies are more efficient than rivals

Table 4.1: Past Efficiency Studies in Indian & World									
Authors	**Country**	**Sample Period**	**Lines of Business**	**Method**	**Inputs**	**Outputs**	**Output Approach**	**Type of Efficiency**	**Findings**
Cummins (1999)	US	1988-95	Life	DEA	Labour (admin., agents), business services, financial capital	Incurred benefits, additions to reserves	Value Added	Pure technical, scale, allocative, cost, revenue	Efficiency scores in insurance relatively low compared to other financial services industries; also widely dispersed; small insurers operate with IRS; big insurers with DRS; brokerage system most efficient
Cummins and Rubio-Misas (2006)	Spain	1989-98	Life, Non-life	DEA	Labour, business services, debt capital, equity capital	Non-life losses incurred, life losses incurred, reinsurance reserves, non-reinsurance reserves, invested assets	Value Added	Cost, pure technical, allocative, scale	Consolidation leads to growth in TFP and increases number of firms operating with decreasing returns to scale
Cummins and Xie (2008)	US	1994-03	Property Liability	DEA	Labour (admin., agent), materials and business services, financial equity capital	Present value of losses incurred, real invested assets	Value Added	Cost, technical, allocative, pure technical, scale, revenue	M&As in property-liability insurance are value enhancing; acquiring firms achieved more revenue efficiency gains than non-acquiring firms, and target firms experienced greater cost and allocative efficiency growth than no targets
Cummins and Zi (1998)	US	1988-92	Life	DEA, DFA, FDH, SFA	Labour, financial capital, materials	Benefit payments, additions to reserves	Value Added	Cost, technical, allocative	Choice of estimation method can have a significant effect on the conclusions of an efficiency study; efficiency rankings are well preserved among the econometric methods; but the rankings are less consistent between the econometric and mathematical programming methods
Cummins et al. (1996)	Italy	1985-93	Life, Non-life	DEA	Labour (acquisition, admin.), fixed capital expense, equity capital	Life insurance: sum of life insurance benefits, changes in reserves, invested assets Non-life insurance: Losses incurred, invested assets	Value Added	Technical	Stable efficiency over time (70%–78% for the industry) with sharp decline (25% cumulative) in productivity due to technological regress

Table 4.1: Past Efficiency Studies in Indian & World									
Authors	**Country**	**Sample Period**	**Lines of Business**	**Method**	**Inputs**	**Outputs**	**Output Approach**	**Type of Efficiency**	**Findings**
Cummins et al. (2007)	US	1993-1997	Life (incl. health), Property liability	DEA	Labour (office, agent), materials and business service, financial equity capital	Life/health: Real value of incurred benefits, additions to reserves; P/L: Present value of real losses incurred, real invested assets	Value Added	Technical, cost, revenue	Weak evidence for existence of economies of scope; although diversified firms dominate specialists in the production of diversified firm output vectors in terms of revenue efficiency for both life-health and property-liability insurance, specialist firms dominate diversified firms for the production of specialist output vectors in revenue efficiency and also dominate diversified firms in cost efficiency for property-liability output vectors
Davutyan and Klumpes (2008)	7 European Countries	1996-02	Life, Non-life	DEA	Labour, business services, equity capital	Present value of losses incurred, premiums, invested assets	Value Added	Technical, pure technical, scale	In life insurance, after mergers, business inputs replace labour for both targets and acquirers, but these effects do not apply to non-life targets; mergers do not significantly impact acquirer behaviour
Diacon (2001)	6 European Countries	1999	General insurance	DEA	Total operating expenses, total capital, total technical reserves, total borrowings from creditors	Net earned premiums, total investment income	Value Added	Technical	Average efficiencies: UK (77%), France (67%), Germany (70%), Italy (56%), Netherlands (69%), Switzerland (66%)
Diboky and Ubl (2007)	Germany	2002-05	Life	DEA	Labour, business services, financial debt capital, equity capital	Gross premium, net income	Value Added	Technical, cost and allocative efficiency	Stock ownership is superior to mutual and public structure
Ennsfellner et al. (2004)	Austria	1994-99	Life/ health, Nonlife	SFA	Net operating expenses, equity capital, technical provisions	Health/life: Incurred benefits, changes in reserves, total invested assets Non-life: Losses incurred, total invested assets	Value Added	Technical	Deregulation had positive effects on production efficiency

Table 4.1: Past Efficiency Studies in Indian & World									
Authors	**Country**	**Sample Period**	**Lines of Business**	**Method**	**Inputs**	**Outputs**	**Output Approach**	**Type of Efficiency**	**Findings**
Erhemjamts and Leverty (2007)	US	1995-04	Life	DEA	Labour, business services, equity capital, policyholder-supplied debt capital	Incurred benefits, additions to reserves	Value Added	Technical	Stock production technology dominates mutual technology; mutual that are further away from mutual efficient frontier more likely to demutualization; access to capital important reason for demutualization
Fecher et al. (1991)	France	1984-89	Life, Non-life	DEA, SFA	Labour cost, other outlays	Gross premiums	Value Added	Cost	Increasing returns to scale
Fenn et al. (2008)	14 European countries	1995-01	Life, non-life, composite	SFA	Capital, technical provisions, labour, debt capital	Net incurred claims (= gross claims paid – claims received from reinsurers + increase in loss reserves + bonuses and rebates)	Value Added	Cost	Most European insurers operating under IRS; size and domestic market share lead to higher levels of cost inefficiency
Greene and Segal (2004)	US	1995-98	Life	SFA	Labour, capital, materials	Premiums, investments	Value Added	Cost	Inefficiency negatively associated with profitability; stock companies as efficient and profitable as mutual companies
Hao (2007)	Taiwan	1981-03	Life	DFA	Labour, physical capital, claims	Premiums, investments	Value Added	Cost	Firms with large market share tend to be cost efficient
Hardwick et al. (2004)	UK	1994-01	Life	DEA	Labour, capital	Incurred benefits, additions to reserves	Value Added	Cost technical, allocative	Cost efficiency positively related to size of corporate board of directors
Huang (2007)	China	1999-04	Life, property-liability	SFA	Labour, capital, business services	Premiums earned, incurred benefits and additions to reserves, total invested assets	Value Added	Cost, profit	Non-state-owned companies and foreign companies are superior in terms of cost efficiency to the property insurance industry, state-owned companies, and domestic companies

Table 4.1: Past Efficiency Studies in Indian & World									
Authors	**Country**	**Sample Period**	**Lines of Business**	**Method**	**Inputs**	**Outputs**	**Output Approach**	**Type of Efficiency**	**Findings**
Hwang and Gao (2005)	Ireland	1991-00	Life	DFA	Labour (admin., agent), financial capital	Insurance benefits, investable funds	Value Added	Cost	Increasing returns to scale; magnitude of cost economies varies with firm size
Hwang and Kao (2008)	Taiwan	1999-02	Non-life	DEA	Business and administrative expenses, commissions and acquisition expenses	1st stage: Direct written premiums, reinsurance premiums 2nd stage: underwriting income, investment income	2-stage production process	n/a	Two-stage DEA reveals significance of operating performance effectively; each company can realize its strengths and weaknesses in different production stages
Kessner (2001)	Germany and UK	1994-99	Life	DEA	New business cost, administration cost, cost for capital management, reinsurance contributions	Gross and net written premiums, interest on capital	Value Added	Technical	British insurers more efficient than Ger-man insurers; increasing efficiency in both markets
Kessner (2001)	Germany	1989-94	Life	DEA	New business cost, administration cost, cost for capital management, reinsurance contributions	Sum insured (new and existing business), net returns on capital investments	Value Added	Technical, scale	Small companies with increasing returns to scale; big companies with decreasing returns to scale
Klumpes (2007)	7 European countries	1997-01	Life, General Insurance	DEA	Labour, business services, debt capital, equity capital	Premiums, investment income	Value added	Cost, technical, allocative, pure technical, scale, revenue	Acquiring firms achieve greater efficiency gains than either target firms or firms not involved in mergers; no beneficial effect of mergers on target firms; M&A driven mostly by solvency objectives
Mansor and Radam (2000)	Malaysia	1987-97	Life	DEA	Claims, commission, salaries, expenses, other cost	New policy issued, premium, policy in force	Value added	Technical	Productivity growth; but low compared to real growth of economy
Noulas et al. (2001)	Greece	1991-96	non-life	DEA	Salaries and expenses (1 input) and payment to insurers and expenses incurred in the production of services (1 input)	Premium income, revenue from investment activities	Value added	Technical	Industry highly inefficient, with notable differences between different companies

Table 4.1: Past Efficiency Studies in Indian & World									
Authors	**Country**	**Sample Period**	**Lines of Business**	**Method**	**Inputs**	**Outputs**	**Output Approach**	**Type of Efficiency**	**Findings**
Qiu and Chen (2006)	China	2000-03	Life	DEA	Labour, equity capital, other	Benefit payments, additions to reserve, yield of investment	Value added	Technical, pure technical, scale	Average technical efficiency declining over time; increasing returns to scale
Ryan and Schellhorn (2000)	US	1990-95	Life	DEA	Labour, financial capital, materials	Benefit payments, additions to reserves	Value added	Cost	Unchanged efficiency levels after RBC became effective
Ward (2002)	UK	1990-97	Life	SFA	Labour, capital	Claims, additions to reserves	Value added	Cost, revenue, profit	Cost benefits for firms focusing on one mode of distribution
Wende at al. (2008)	Germany	1988-05	Property Liability	DEA	Operating expenses, equity capital, debt capital	Claims incurred, total invested assets	Value added	Technical, allocative, cost	Regulation influences comparative advantages of different organizational forms in terms of efficiency
Xie (2008)	US	1993-04	Property Liability	DEA	Labour, (admin, agent), business service and materials, financial equity capital	Present value of losses incurred, real invested assets	Value added	Cost, revenue	IPO firms perform no worse than private firms in terms of cost and revenue efficiency changes
Yao et al. (2007)	China	1999-04	Life, non-life	DEA	Labour, capital, payment and benefits	Premiums, investment income	Value added	Technical	Average efficiency of 0.77 for non-life and 0.70 for life companies
Zanghieri (2008)	14 Euro-pean countries	1997-06	Life, non-life	SFA	Labour, debt capital, equity capital	Claims paid, additions to reserves	Value added	Cost, profit	Country-specific factors do not seem to influence the efficiency of life insurers, but do have a strong effect on the efficiency of non-life insurers
Tone and Sahoo (2005)	India	1982-2001	Life	DEA	Labour, business services, debt capital, equity capital	Present value of real losses incurred, ratio of liquid assets to liabilities	Value added	Technical, allocative, cost, scale	Increasing allocative inefficiencies after 1994; increase in cost efficiency in 2000

Table 4.1: Past Efficiency Studies in Indian & World									
Authors	**Country**	**Sample Period**	**Lines of Business**	**Method**	**Inputs**	**Outputs**	**Output Approach**	**Type of Efficiency**	**Findings**
Sinha and Chatterjee (2009)	India	2002-03 to 2006-07,	Life	DEA	Operating Expenses and Commission Expenses	Benefits paid to the customers and Net premium mobilized	Value added	Cost efficiency	The results suggest an upward trend in cost efficiency of the observed life insurers between 2002-03 and 2004-05. However, the trend was reversed for the next two years i.e. 2005-06 and 2006-07
Khan and Mitra (2012)	India	2007-08 to 2012-13	Life	Window Analysis	Operating expenses, Commissions	Operating income, Net premium income	Value added	Technical Efficiency	The results suggest that there still exists a huge gap between LIC of India and other life insurance companies in terms of technical efficiency.
Chakraborty and Sengupta (2012)	India	2003-04 to 2009-10	Life	DEA	Operating Expenses and Commission Expenses	Net Premium Income, Number of products	Value added	Technical, MPI	Total Factor Productivity change index score of more than 1 over the 7-year time-period thereby indicating a relative progress in total factor productivity growth.
Parida and Acharya (2013)	India	2005-06 to 2010-11	Life	DEA	Operating Expenses and Commission Paid	Total Premium Income and Profits	Value added	Technical, Scale and MPI	All the private life insurers exhibited a mean positive total factor productivity growth during the said period.

4.5 Data Description & Methodology

4.5.1 Data

All the data used are annual in nature and are collected from various publications of IRDA, resembling Annual Report, Monthly Journal and Yearly Handbook of Indian Insurance Statistics (various issues). However, for specific company wise data, the figures were collected from the annual reports and quarterly results of the companies. The data set collected from IRDA, consists of the important indicators of life insurance like premium, commission, claims etc, for the period 2001-02 to 2012-13 (12-years). However, for the homogeneity of the sample, the study includes 13-life insurance companies, which are having operations in all the sample period 2002-03 to 2012-13 (11-year). All the life insurance indicators in the study are being deflated (whenever required) by using the Wholesale Price Index (WPI) of base 2004-05.

4.5.2 Methodology

This study has used DEA and MPI to assess the efficiency and change in productivity of life insurance companies in India for the period from 2002-03 to 2012-13. The DEA approach is used mainly for two reasons: (i) it provides a particularly convenient method for decomposing cost efficiency into its components - technical and allocative efficiency - as well as for decomposing technical to pure technical efficiency (PTE) and scale efficiency (SE); and (ii) the Malmquist approach, which is the standard technique for measuring the evolution of productivity and efficiency over time, is DEA-based. Thus, the use of DEA permits us to use the same methodology consistently throughout the chapter. To estimate the results, the study employs *DEA-Solver Software Pro-8.0 version* to measure the TE, SE, and Malmquist Productivity (TFP) growth index as well the Catch-up & Frontier-shift of the 13 life insurers in the study period.

4.5.2.1 Efficiency Measurement

In literature, there is not a single view about the approaches, parametric and non-parametric, to estimate the efficiency of the firms. The alternative to DEA is the econometric techniques. The main advantages of econometric/parametric approaches (SFA, DFA, and TFA) is that it allow firms to be off the frontier due to random error as well as inefficiency and consequently, do not count purely random error as inefficiency. But, it requires specification of functional form such as translog to estimate the frontier and as well, distributional assumptions in order to recover the efficiency estimates. However, the non-parametric

approach (DEA, FDH) avoids the specification error because it is not necessary to specify a functional form or distributional assumptions. However, in most applications of methodology, any departure from the frontier is measured as inefficiency, i.e. random error or bad luck is not separated out. DEA, a non-parametric approach that computes 'best practice' efficient frontiers based on convex combination of firms in the industry. The method can be used to estimate production, cost, and revenue frontiers and provides a particularly convenient way for decomposing efficiency into its components like cost efficiency, profit efficiency. Both the approaches have advocates and neither has emerged as dominant. This study considered DEA to be an appropriate methodology for measuring efficiency in the life insurance industry in India.

The research design calls for the assessment of the relative technical efficiency (TE) of each firm considered in the sample, and the identification of the main sources of inefficiency. The TE can be further decomposed into two efficiency indices to determine the sources of overall technical inefficiency. The TE can be further decomposed into two efficiency indices to determine the sources of overall technical efficiency. The first one is the pure technical efficiency (PTE) index, which determines the insurers' efficiency relative to a frontier that exhibits constant as well as variable returns to scale (VRS). The other index, the SE index, measures whether or not the insurance companies operates at constant returns to scale (CRS) or at increasing or decreasing returns to scale. Decomposing TE scores into PTE and SE designates, respectively, what can be apprehended in the short-term and in the long-term.

In practice, the TE scores are obtained by running the original DEA model under the CRS assumption, known as the CRR model (Charnes *et al.1978*). The PTE scores are obtained by running the DEA model under assumption of variable returns to scale (VRS), known as BCC model (Banker *et al. 1984).* Any significant difference between the TE and PTE scores indicates the existence of scale inefficiency, a deviation from operating at the appropriate scale. The SE scores can be computed by means of the ratio of the overall TE to that of PTE, as explained in Coelli *et al.*

4.5.2.2 Productivity Change

TFP growth is measured as the change in total outputs net of the change in total input usage. Internationally, there are a number of papers explore the issue of total factor productivity (TFP) growth in the insurance industry. It is also important to measure the effects of changes in management practices and the introduction of new technologies.

In this study, the Malmquist Productivity Index (MPI) introduced by *Caves, Christensen and Diewert (*1982*)* is used, which is a normative measure that constructs a production frontier representing the technology and uses the corresponding distance functions evaluated at different input-output combinations for productivity comparisons that is by comparing the proportion of output to input over two periods of time. MPI decomposed into two components, namely a *catch-up index and a frontier-shift index*. In practice, as reported in Cooper *et al.* (2007), the MPI is defined as the product of a catch-up and frontier-shift terms. It evaluates the productivity change of a decision making units (DMUs), the insurance firm in our case, between two time periods. The catch-up (recovery) term relates to the degree to which a DMU improves or worsens its efficiency, while the frontier-shift (or innovation) term reflects the change in efficiency frontiers between the two time periods and hence measures the change in the technology in the sector formed by the DMUs considered in the sample, the life insurance industry in India in the case of this study.

MPI = (Catch-up) x (Frontier-shift)

The interpretation of the indices obtained from the decomposition of the MPI is:

- **Catch-up > 1;** indicates progress in relative efficiency from period t to t+1. While (catch-up) = 1 and (catch-up) <1; indicate no change and regress in efficiency, respectively.
- **Frontier-shift > 1;** indicates progress in the frontier technology around the corresponding DMU from the period t to t+1. While (frontier-shift) =1 and (frontier-shift) <1; indicate the status quo and regress in the frontier technology, respectively.
- **MPI>1** implies that total factor productivity progress has occurred, while MPI values of less than 1 (MPI<1) and equal to 1 (MPI=1) indicates deterioration in total factor productivity and no productivity change respectively.

4.5.2.3 Selection of Inputs and Outputs

An important step in the efficiency analysis is the selection of input and output. Indeed the result can be misleading or meaningless if those quantities are poorly defined. This problem is especially acute in the service sector such as insurance, banking etc, where many outputs are intangible and many prices are implicit and, therefore, difficult to measure. The pragmatic approach is, therefore, to identify the services provided by such firms and find measurable proxies that are highly correlated with those services. There has been considerable disagreement over the appropriate proxies to use as the output for the insurance services. A

variety of sets of variables are considered in the existing literature to analyze the efficiency of insurance firms.

a) Choice of Inputs

Insurance inputs can be classified into three main groups: (i) *Labour, (ii) Business Service & Materials, and (iii) Capital.*

- ***Labour*** is the most important input in the financial service industry. In insurance companies, no raw material is required, and cost of labour is the major component of cost. It is defined as the number of employees and agents in the insurance company or in any other firm. In this study, *'individual agents (IA)'* used as labour inputs as company wise employee numbers are not available.

- ***Business service and materials*** consists of all operating expenses other than labour and capital expenses. Most of these expenses are related directly to selling and servicing policies. The t*otal commission (TC)* is used as the input for business services and materials in this study.

- ***Capital*** comprises two components: *financial capital*, defined as book value of equity plus the asset valuation reserve (AVR); and *physical capital*, defined as the sum of capital expenses - rent, rental of equipment, and depreciation. In literature, many studies include equity capital as an input. The rationale for the use of equity capital is that insurers must maintain equity capital to back the promise to pay claims even if losses are higher than expected and to satisfy regulatory requirements. The rationale for the use of *debt capital (DC)* is similar to that for the use of deposits as an input in banking, i.e., that insurers raise debt capital by issuing insurance and annuity policies and invest the capital as part of the intermediation function. However, debt capital is not always used as an input in banking or insurance studies because reserves for insurers and deposits for banks have some characteristics of both inputs and outputs. In addition, to the extent that the definition of insurance output and output price accounts for the time value of money, it is probably not necessary to include debt capital as an input. In this study we employ two inputs, *equity share capital as equity capital (EC) and total liabilities as debt capital (DC).*

b) Choice of Outputs

In efficiency literature, there are mainly three principal approaches to measuring outputs in the insurance industry: *(i) the asset or intermediation approach, (ii) the user-cost approach, and (iii) the value-added approach*.

(i) The ***intermediation (Asset) approach***, which is also called flow approach, views the insurance company as a financial intermediary that manages a reservoir of assets, borrowing funds from policyholders, investing them on capital markets, and paying out claims, taxes, and other costs. This approach is only explains the intermediation services provided by life insurance firms are taken into account without any regard to the risk-pooling and risk-bearing services rendered by the insurers.

(ii) The ***user-cost method*** differentiates between inputs and outputs based on the net contribution to revenues. If a financial product yields a return that exceeds the opportunity cost of funds or if the financial costs of a liability are less than the opportunity costs, it is deemed a financial input; otherwise, it is considered a financial output (Cummins and Weiss, 2000). This method may require precise information on product revenues and opportunity costs which is a tedious task to obtain for the Indian life insurers.

(iii) The ***value-added approach*** counts outputs as important if they contribute a significant added value based on operating cost allocations (see Berger et al., 2000). This approach differs from the other two approaches (asset approach and the user-cost approach) as it considers all asset and liability categories to have some output characteristics. Those categories which have substantial value added are then used as the important outputs. The remaining categories are treated as intermediate products, or inputs. An important advantage compared to the user-cost approach consists in the fact that the value-added approach uses operating cost data rather than determining the costs implicitly or using opportunity costs. The value added approach is considered to be the most appropriate method to measuring output of financial firms and is widely used in recent insurance studies.

This study employs the *value-added approach* to measuring outputs, due to its importance to frontier efficiency measurement in insurance. The approach assumes that the insurer provides three main services, for which volume output proxies must be defined: through the *first* service, risk-pooling and risk-bearing, insurers create value added by operating a risk pool, collecting premiums from policyholders, and re-distributing most of them to customers who

have incurred losses. They also reduce their customers' risks by holding capital to absorb unexpected losses. The *second* service, 'real' financial services relating to insured losses, means that insurers create value added for their policyholders by providing real services such as financial planning (life) or the design of coverage programs (property-liability). The *third* service is intermediation, where insurers create value added by acting as financial intermediaries that invest assets, which policyholders provide by way of their premiums (Cummins et al. 1999).

To proxy the risk-pooling/risk-bearing function, either premiums or incurred benefits (life) and present value of losses (property-liability) have been used. However, there is an intense debate as to whether premiums are an appropriate proxy because they represent price-times quantity of output and not output (see, Cummins and Weiss, 2000). Additions to reserves or invested assets are normally used to proxy the intermediation function (see, Cummins et al., 1999b). Both incurred benefits/present value of losses, as well as additions to reserves/invested assets, are correlated with the third function, real financial services of the insurer. Usually, several types of outputs are defined, representing the single lines of business under review.

The table 4.2 gives an overview of the inputs and outputs used in this study and table 4.3 contains the summary statistics on the variables employed. For a comparative purpose, all the inputs and outputs numbers are expressed in real terms, deflated by using the Wholesale Price Index (WPI) with base of 2004-05.

Table 4.2: Choice of Input and Output Variables

Inputs	**Outputs**
a) IA: Number of Individual Agents b) TC: Total Commission c) EC: Equity Share Capital d) DC: Total Liabilities	a) NBPC: Benefits Paid to Customers (net) b) LAL: Liquid Assets to Liabilities

Table: 4.3: Descriptive Statistics of Inputs & Outputs (I/O)												
I/O	**2002-03**				**2003-04**				**2004-05**			
	Min	**Max**	**Mean**	**SD**	**Min**	**Max**	**Mean**	**SD**	**Min**	**Max**	**Mean**	**SD**
Benefits Paid	0.04	12308	947	3414	0	13601	1049	3771	2.6	28440	2212	7881
Liquid Assets to Liabilities	5.6	21.9	13.2	4.9	4.6	26.3	11.6	5.7	4.8	35.4	11.1	7.8
Agents	1454	988358	82188	272335	2181	1098910	97322	301190	2080	1041737	93283	285408
Total Commissions	1.0	2997	238	829	3.1	3260	269	899	7.9	6245	546	1713
Equity Capital	3.0	255	103	58	2.8	384	135	89	5.0	925	323	213
Debt Capital	58	166163	12962	46031	103	196715	15497	54450	314	416910	33432	115227
I/O (Rs Crore)	**2005-06**				**2006-07**				**2007-08**			
Benefits Paid	5.7	32476	2593	8980	19	47855	3849	13224	30	48489	4068	13354
Liquid Assets to Liabilities	3.7	13.7	8.8	3.1	4.2	11.8	7.7	2.0	2.8	11.5	6.6	2.5
Agents	5046	1052283	108800	285012	18019	1103047	150424	295308	22360	1193744	187781	315129
Total Commissions	13.7	6792	635	1852	72	8234	845	2231	91	8204	963	2198
Equity Capital	4.8	1134	413	272	4.5	1179	531	290	4.3	1201	738	365
Debt Capital	499	508670	41195	140477	1098	562153	46859	154873	2331	666156	57764	182919
I/O (Rs Crore)	**2008-09**				**2009-10**				**2010-11**			
Benefits Paid	60.9	41644	3561	11451	132	60490	5613	16551	333	77615	7608	21120
Liquid Assets to Liabilities	2.0	8.3	5.3	2.0	1.0	5.6	3.3	1.2	0.9	4.8	2.9	1.1
Agents	30838	1344856	214434	348082	23753	1402807	213083	364415	23219	1337064	189614	351037
Total Commissions	87.6	7962	929	2122	92.3	9257	1026	2480	61	9286	953	2508
Equity Capital	4.0	1491	935	492	3.8	1506	978	539	3.5	1399	937	507
Debt Capital	2934	667589	59271	182910	4439	854185	79124	233158	4907	894560	83963	243869
I/O (Rs Crore)	**2011-12**				**2012-13**				**Note:**			
Benefits Paid	486	75238	7476	20409	712	80470	8712	21669	▪ Benefits Paid: in Rs crore			
Liquid Assets to Liabilities	1.3	7.2	3.7	1.7	1.8	9.4	4.5	2.1	▪ Liquid Assets to Liabilities Ratio in %			
Agents	19126	1278234	168678	337869	17470	1172983	156895	309054	▪ Agents: in Number			
Total Commissions	59.9	8990	889	2437	61.8	8811	861	2392	▪ Total Commissions: in Rs crore			
Equity Capital	64.0	1284	871	460	59.7	1201	814	431	▪ Equity Capital: in Rs crore			
Debt Capital	4780	883935	83020	240938	4728	908663	84869	247795	▪ Debt Capital: in Rs crore			

4.6 Results & Discussion

4.6.1 Technical Efficiency (TE) and its Decomposition

The analysis of efficiency in DEA is based on the input oriented vs. output oriented. Here, the DEA results are based on the output maximization model, known as output-oriented approach. In this approach, the maximum output is determined while holding inputs constant. The DEA model was run twice, once under the constant returns to scale (CRS) assumption and then under the variable returns to scale (VRS) assumption. CRS assumes that there is no significant relationship between the scale of operations and efficiency, thus small insurance firms can be as efficient as large insurers in converting the specified inputs into the specified outputs. DEA under VRS assumption is run to check for scale inefficiency. The scale inefficiency should be understood as disproportional change in output compared with any change in inputs.

The CRS efficiency score of each insurers measure its TE, which indicate the inefficiencies due to the input/output (I/O) configuration and the size of operations. On the other hand, VRS efficiency score represents pure technical efficiency (PTE) that is the measure of efficiency, after eliminating the scale inefficiency. Therefore, SE score is calculated by dividing the TE score by the PTE score (SE = TE/PTE). By using the DEA methodology and data for the 13 insurance firms, TE, PTE and SE annual scores are calculated for the period starting from 2002-03 to 2012-13 and reported in table 4.5, a summary of that is presented in table 4.4. The summary table 4.4 indicates that the averages the efficiency scores per year as well as for the whole study period for the sample of insurance firms included.

The average TE of all 13-life insurance companies in India for FY03 is 69.82% with a minimum score of 32.90% efficiency. However, in FY04 the average declined to 67.66%, with a minimum score of 7.9% with standard deviation of 31.78%. However, in FY05, the average TE was back to 73.63% and minimum efficiency score is 33.47% and standard deviation is 27.31%. After FY05, the average TE scores trended upward and reached the highest level of 91.35% in FY13, with a minimum SD of 14.54% and a minimum score of 60.69%, which is highest in the sample period. This indicates that the technical efficiency of the firms has improved due to the new regulations and the increasing competition made by the gradual liberalization of the sector. However, from the table 4.4, it is also clear that the average TE score for FY03 to FY13 is 81.94%, suggests that the life insurance business in India is moderately efficient and hence there is a large room for improvement.

Table 4.4: Summery Statistics of Annual Averages of Technical Efficiency Scores						
Year	Efficiency Measure	Mean (%)	SD (%)	Minimum (%)	Maximum (%)	No of fully Efficient Firms
FY13	**TE**	**91.35**	**14.54**	**60.69**	**100.00**	**8**
	PTE	92.92	13.22	65.09	100.00	9
	SE	98.06	2.66	93.24	100.00	8
FY12	**TE**	**91.38**	**13.88**	**59.06**	**100.00**	**8**
	PTE	95.81	8.61	76.26	100.00	9
	SE	94.95	8.37	75.54	100.00	8
FY11	**TE**	**89.14**	**16.76**	**48.47**	**100.00**	**8**
	PTE	94.01	11.10	67.18	100.00	9
	SE	94.09	9.56	72.15	100.00	8
FY10	**TE**	**85.07**	**20.19**	**50.14**	**100.00**	**8**
	PTE	90.04	14.51	63.65	100.00	8
	SE	93.58	10.67	66.31	100.00	8
FY09	**TE**	**85.93**	**17.10**	**55.28**	**100.00**	**5**
	PTE	92.13	10.13	77.40	100.00	7
	SE	92.49	10.49	70.70	100.00	5
FY08	**TE**	**86.80**	**15.25**	**55.53**	**100.00**	**6**
	PTE	92.62	11.23	64.17	100.00	8
	SE	93.33	8.59	77.01	100.00	6
FY07	**TE**	**84.67**	**24.43**	**33.15**	**100.00**	**7**
	PTE	90.40	18.15	48.72	100.00	8
	SE	92.41	15.22	55.20	100.00	7
FY06	**TE**	**75.89**	**25.47**	**26.98**	**100.00**	**5**
	PTE	83.98	24.06	29.55	100.00	7
	SE	90.48	13.58	55.62	100.00	5
FY05	**TE**	**73.63**	**27.31**	**33.47**	**100.00**	**4**
	PTE	80.22	28.99	33.86	100.00	8
	SE	92.69	10.40	64.18	100.00	4
FY04	**TE**	**67.66**	**31.78**	**7.90**	**100.00**	**4**
	PTE	73.91	31.91	17.38	100.00	6
	SE	88.58	15.37	45.43	100.00	4
FY03	**TE**	**69.82**	**32.90**	**8.24**	**100.00**	**6**
	PTE	76.80	26.51	25.40	100.00	6
	SE	85.51	20.40	32.43	100.00	6
Average (FY03-FY13)	**TE**	**81.94**	**21.78**	**39.90**	**100.00**	**6**
	PTE	**87.53**	**18.04**	**51.70**	**100.00**	**8**
	SE	**92.38**	**11.39**	**64.35**	**100.00**	**6**
Note: TE- Technical Efficiency, PTE: Pure TE & SE- Scale Efficiency						

Table 4.5: Technical Efficiency Scores (TE, PTE and SE) of Sample Indian Life Insurers															
INSURER	**FY13**			**FY12**			**FY11**			**FY10**			**FY09**		
	TE	**PTE**	**SE**	**TE**	**PTE**	**SE**	**TE**	**PTE**	**SE**	**TE**	**PTE**	**SE**	**TE**	**PTE**	**SE**
Aviva	1	1	1	1	1	1	1	1	1	1	1	1	0.8543	1	0.8543
Bajaj Allianz	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Birla Sun Life	0.6069	0.6509	0.9324	0.7964	0.9991	0.7972	0.7104	0.8516	0.8342	0.7091	0.7675	0.9239	1	1	1
HDFC Standard	0.6442	0.6779	0.9503	0.5906	0.7818	0.7554	0.7566	0.9471	0.7988	0.6658	0.7506	0.8870	0.9867	1	0.9867
ICICI Prudential	1	1	1	1	1	1	1	1	1	1	1	1	0.9693	0.9762	0.9929
ING Life	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Kotak Mahindra	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MaxLife	0.9319	0.9708	0.9599	0.9322	1	0.9322	1	1	1	1	1	1	0.7389	0.8367	0.8831
PNB MetLife	0.7515	0.7802	0.9632	1	1	1	0.9066	1	0.9066	0.5842	0.6365	0.9179	0.8100	0.8242	0.9828
Reliance	1	1	1	0.8737	0.9117	0.9584	0.7293	0.7514	0.9706	0.5981	0.9021	0.6631	0.5694	0.7740	0.7356
SBI Life	1	1	1	1	1	1	1	1	1	1	1	1	0.6900	0.7834	0.8808
TATA AIA	0.9415	1	0.9415	0.6866	0.7626	0.9004	0.4847	0.6718	0.7215	0.5014	0.6481	0.7736	0.5528	0.7819	0.7070
LIC	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Memo:															
Average	0.91353	0.92922	0.98055	0.91381	0.95809	0.9495	0.89136	0.94014	0.94091	0.85066	0.90037	0.9358	0.85935	0.92126	0.92487
SD	0.14543	0.13218	0.02664	0.13883	0.08609	0.08371	0.16762	0.11097	0.09561	0.20195	0.14513	0.10666	0.17101	0.10129	0.10488
Number of fully efficient firms	8	9	8	8	9	8	8	9	8	8	8	8	5	7	5
Minimum	0.60687	0.6509	0.93236	0.59056	0.76259	0.75536	0.48474	0.67182	0.72154	0.50138	0.63647	0.66306	0.55278	0.77401	0.70698
Maximum	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Note: TE: Technical Efficiency, PTE: Pure Technical Efficiency and SE: Scale Efficiency (Continued)															

Table 4.5: Technical Efficiency Scores (TE, PTE and SE) of Sample Indian Life Insurers (Continued)

INSURER	FY08			FY07			FY06			FY05			FY04			FY03		
	TE	PTE	SE	TE	PTE	SE	TE	PTE	SE	TE	PTE	SE	TE	PTE	SE	TE	PTE	SE
Aviva	1	1	1	0.9401	1	0.9401	0.6657	0.7537	0.8832	0.9370	1	0.9370	0.4414	0.5132	0.8600	0.4783	0.5214	0.9172
Bajaj Allianz	1	1	1	1	1	1	1	1	1	0.6418	1	0.6418	0.7427	0.9997	0.7429	0.7404	0.8462	0.8749
Birla Sun Life	0.7138	0.8004	0.8918	0.3315	0.5313	0.6239	0.4050	0.4070	0.9952	0.4445	0.4984	0.8918	0.2621	0.3105	0.8440	0.3821	0.5239	0.7293
HDFC Standard	0.6741	0.8699	0.7749	0.4908	0.8893	0.5520	0.5232	0.9407	0.5562	0.3537	0.3619	0.9774	0.4891	0.5102	0.9586	0.4093	0.6796	0.6022
ICICI Prudential	0.8649	0.8772	0.9860	0.4838	0.4872	0.9931	0.2698	0.2955	0.9133	0.3609	0.3658	0.9867	0.0790	0.1738	0.4543	0.0824	0.2540	0.3243
ING Life	1	1	1	0.9722	0.9855	0.9865	0.8344	1	0.8344	1	1	1	1	1	1	1	1	1
Kotak Mahindra	1	1	1	1	1	1	0.7211	0.7353	0.9807	0.8952	1	0.8952	0.8800	1	0.8800	1	1	1
MaxLife	0.8017	0.8517	0.9413	1	1	1	0.8806	1	0.8806	0.3347	0.3386	0.9884	0.3574	0.3665	0.9754	0.3265	0.4203	0.7769
PNB MetLife	1	1	1	1	1	1	1	1	1	0.8044	1	0.8044	1	1	1	1	1	1
Reliance	0.9037	1	0.9037	1	1	1	1	1	1	1	1	1	0.8351	1	0.8351	1	1	1
SBI Life	0.7701	1	0.7701	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TATA AIA	0.5553	0.6417	0.8653	0.7883	0.8589	0.9178	0.5652	0.7857	0.7193	0.8000	0.8634	0.9266	0.7091	0.7346	0.9653	0.6582	0.7380	0.8918
LIC	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Memo:																		
Average	0.868	0.9262	0.9333	0.8467	0.904	0.9241	0.7589	0.8398	0.9048	0.7363	0.8022	0.9269	0.6766	0.7391	0.8858	0.6982	0.768	0.8551
SD	0.1525	0.1123	0.0859	0.2443	0.1815	0.1522	0.2547	0.2406	0.1358	0.2731	0.2899	0.104	0.3178	0.3191	0.1537	0.329	0.2651	0.204
No of fully efficient firms	6	8	6	7	8	7	5	7	5	4	8	4	4	6	4	6	6	6
Minimum	0.5553	0.6417	0.7701	0.3315	0.4872	0.552	0.2698	0.2955	0.5562	0.3347	0.3386	0.6418	0.079	0.1738	0.4543	0.0824	0.254	0.3243
Maximum	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Note: TE: Technical Efficiency, PTE: Pure Technical Efficiency and SE: Scale Efficiency

Individual Insurer's Mean Efficiency Score

The insurer-wise mean efficiency scores and rank are outlined in table 4.6, for the period FY03 to FY13. The results indicate that LIC is operating with an efficiency score of 1, and ranked at top, followed by ING life and Kotak Mahindra. However, Birla Sun Life, HDFC Life and ICICI Prudential are placed at bottom with ranks of 13, 12 and 11 respectively.

Table 4.6: Individual Insurer's Mean Efficiency (FY03 to FY13)

Insurers	Scores			Rank		
	TE	PTE	SE	TE	PTE	SE
Aviva	0.847	0.890	0.945	8	8	6
Bajaj Allianz	0.920	0.986	0.933	5	3	8
Birla Sun Life	0.578	0.667	0.860	13	13	11
HDFC Standard	0.599	0.764	0.800	12	11	13
ICICI Prudential	0.646	0.675	0.877	11	12	10
ING Life	**0.982**	**0.999**	**0.984**	**2**	**2**	**2**
Kotak Mahindra	0.954	0.976	0.978	3	5	3
MaxLife	0.755	0.799	0.940	9	9	7
PNB MetLife	0.896	0.931	0.961	6	7	5
Reliance	0.864	0.940	0.915	7	6	9
SBI Life	0.951	0.980	0.968	4	4	4
TATA AIA	0.658	0.772	0.848	10	10	12
LIC	**1.000**	**1.000**	**1.000**	**1**	**1**	**1**

4.6.2 MPI Results & Its Decomposition

To measure productivity change, we employ output-oriented MPI approach, to analyse changes in efficiency and productivity over time. While working with Malmquist indices, it is important to adopt an assumption with respect to the returns to scale of the underlying technology, with the choices generally being CRS and VRS. However, *Ray and Desli (1997)* show that the underlying assumption does not affect the overall Malmquist productivity index, which is correctly measured by the ratio of CRS distance functions even when the underlying technology exhibits VRS. However, the return to scale benchmark does affect the decomposition of the index, which can be decomposed into indices representing pure efficiency change, technical change, and scale change.

In order to measure Malmquist Productivity Index (MPI) and the Catch-up & Frontier-shift efficiency measures, specification of outputs and inputs is essential; however, we used the same inputs and outputs (refer table 4.2) used in the DEA firm efficiency. To estimate the MPI index and its components for the 13 sample insurance firms for the period 2002-03 to 2012-13, the study employs Malmquist-Radial Program in the DEA Solver-Pro-8.0 and

adopted an output-orientation with VRS, which is in consistent with our approach in the DEA analysis of firm efficiency. The estimated results of MPI and its components are outlined in the tables 4.7, 4.8 and 4.9 and insurer-wise mean scores are given in the table 4.10 below.

- **Catch-up Efficiency Scores:** The catch-up component of the MPI scores in table 4.7 indicates that out of the 13-insurers, LIC has scored consistently 1 over the years, indicating that no change in relative efficiency. However, Bajaj Allianz which has scored 1.1814 in FY03-04, indicating an 18.14% improvement in relative efficiency from FY03 to FY04, remains steady at 1 after that, showing no change in internal efficiency of the insurers. The rest of 11 private insurer scores showed mixed results but remained steady at 1 in recent years. However, the yearly average score of all 13-insurers indicates that there is consistent improvement in relative efficiency as the score is 1.0072 in FY08-09 from 0.9278 in FY03-04. However, there is a decline in relative efficiency to 0.9831 in FY09-10, but thereafter the insurance companies has managed to breed efficiency and the score rose to 1.0267 in FY11-12. Further, the catch-up score decline to 0.9752 in FY12-13, indicating a deterioration of internal efficiency by 2.5% from the year FY12 to FY13. While, average score place ICICI prudential at the top followed by Max New Work, and Aviva Life in generating internal efficiency but the public sector giant (LIC: rank 12) and MetLife (rank 13) placed at the bottom of the efficiency scale.
- **Frontier Shift Efficiency Scores:** The score of frontier-shift component of the MPI is presented in table 4.8, which indicates that LIC has consistently scored 1.0 up to the year FY11. This means there is no relative improvement in technology. However, afterwards the scores results a consistent upward movement in technical efficiency by 22.68% and 2.07% from the year FY11 to FY12 and FY12 to FY13 respectively. The private life insurer attained frontier-efficiency scores above 1 only in patches but not on a consistent basis over the years. However, in the initial periods of operations, the private insurers have garbed more efficiency due to technological innovations. However, the year-wise mean relative frontier-shift scores shows that there is a continuous improvement in the technology, which scores at 0.8953 in FY03-04, touch the highest point of 1.3118 in FY12-13. While, the insurer-wise mean efficiency indicate that ICICI Prudential enjoyed the highest mean relative frontier efficiency score of 1.1618 followed by LIC with a score of 1.0247 across the study period.

Table 4.7: Insurer-wise Catch-up Efficiency Scores												
Insurers	**FY03-04**	**FY04-05**	**FY05-06**	**FY06-07**	**FY07-08**	**FY08-09**	**FY09-10**	**FY10-11**	**FY11-12**	**FY12-13**	**Average**	**Rank**
Aviva	0.9843	1.9484	0.7537	1.3268	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	**1.1013**	3
Bajaj Allianz	1.1814	1.0003	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	**1.0182**	7
Birla Sun Life	0.5927	1.6050	0.8166	1.3054	1.5065	1.2493	0.7675	1.1096	1.1731	0.6515	**1.0777**	5
HDFC Standard	0.7508	0.7093	2.5991	0.9454	0.9783	1.1495	0.7506	1.2617	0.8255	0.8670	**1.0837**	4
ICICI Prudential	0.6844	2.1043	0.8078	1.6488	1.8006	1.1128	1.0244	1.0000	1.0000	1.0000	**1.2183**	1
ING Vysya	1.0000	1.0000	1.0000	0.9855	1.0147	1.0000	1.0000	1.0000	1.0000	1.0000	**1.0000**	11
Kotak Mahindra	1.0000	1.0000	0.7353	1.3599	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	**1.0095**	8
Max New York	0.8720	0.9240	2.9532	1.0000	0.8517	0.9824	1.1951	1.0000	1.0000	0.9708	**1.1749**	2
MetLife	1.0000	1.0000	1.0000	1.0000	1.0000	0.8242	0.7723	1.5712	1.0000	0.7802	**0.9948**	13
Reliance	1.0000	1.0000	1.0000	1.0000	1.0000	0.7740	1.1655	0.8329	1.2133	1.0969	**1.0083**	9
SBI Life	1.0000	1.0000	1.0000	1.0000	1.0000	0.7834	1.2765	1.0000	1.0000	1.0000	**1.0060**	10
TATA AIG	0.9953	1.1754	0.9100	1.0931	0.7471	1.2185	0.8289	1.0365	1.1351	1.3113	**1.0451**	6
LIC	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	**1.0000**	12
Average	**0.9278**	**1.1898**	**1.1981**	**1.1281**	**1.0691**	**1.0072**	**0.9831**	**1.0625**	**1.0267**	**0.9752**	**1.0568**	-
Max	**1.1814**	**2.1043**	**2.9532**	**1.6488**	**1.8006**	**1.2493**	**1.2765**	**1.5712**	**1.2133**	**1.3113**	**1.2183**	-
Min	**0.5927**	**0.7093**	**0.7353**	**0.9454**	**0.7471**	**0.7740**	**0.7506**	**0.8329**	**0.8255**	**0.6515**	**0.9948**	-
SD	**0.1605**	**0.4221**	**0.7113**	**0.2139**	**0.2772**	**0.1510**	**0.1674**	**0.1792**	**0.0979**	**0.1545**	**0.0720**	-

Table 4.8: Insurer-wise Frontier-shift Efficiency Scores												
Insurers	**FY03-04**	**FY04-05**	**FY05-06**	**FY06-07**	**FY07-08**	**FY08-09**	**FY09-10**	**FY10-11**	**FY11-12**	**FY12-13**	**Average**	**Rank**
Aviva	0.6857	0.6090	0.7063	0.7289	0.9640	1.0000	1.7037	1.0277	1.0643	1.0000	**0.9490**	8
Bajaj Allianz	0.5884	0.6340	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0314	1.2791	**0.9533**	6
Birla Sun Life	1.0138	0.6372	0.7194	0.5610	0.7962	0.8336	1.1114	1.0028	1.0666	1.6622	**0.9404**	9
HDFC Standard	1.1554	0.7252	0.4027	0.7380	0.8299	0.8556	0.9604	0.9867	1.1444	1.3382	**0.9136**	11
ICICI Prudential	1.2000	1.1191	0.9566	0.9051	0.8425	0.8424	2.0846	1.4391	0.8418	1.3872	**1.1618**	1
ING Vysya	1.0956	1.1589	0.4332	0.7902	0.8962	1.0000	1.0000	1.0000	0.9856	1.2390	**0.9599**	5
Kotak Mahindra	0.8077	0.8511	0.9201	0.9076	0.9505	0.8924	1.0000	1.0000	1.0000	1.0000	**0.9329**	10
Max New York	0.7956	0.6147	0.6623	0.8136	0.9143	0.8488	0.6925	1.0247	1.1106	1.2621	**0.8739**	12
MetLife	0.7835	0.7804	0.9638	0.7346	0.9185	0.8531	0.7486	0.9563	1.1582	1.5969	**0.9494**	7
Reliance	0.6498	0.7714	1.1478	0.9323	0.9898	0.7423	0.6405	1.0392	1.0353	1.9152	**0.9864**	4
SBI Life	1.0876	1.0000	0.9984	0.7443	0.9746	0.7534	0.9988	1.5111	1.1817	0.7713	**1.0021**	3
TATA AIG	0.7756	0.7022	0.7108	0.6376	0.8515	0.7701	0.6295	0.9600	1.1177	1.5812	**0.8736**	13
LIC	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.2268	1.0207	**1.0247**	2
Average	**0.8953**	**0.8156**	**0.8170**	**0.8072**	**0.9175**	**0.8763**	**1.0438**	**1.0729**	**1.0742**	**1.3118**	**0.9632**	-
Max	**1.2000**	**1.1589**	**1.1478**	**1.0000**	**1.0000**	**1.0000**	**2.0846**	**1.5111**	**1.2268**	**1.9152**	**1.1618**	-
Min	**0.5884**	**0.6090**	**0.4027**	**0.5610**	**0.7962**	**0.7423**	**0.6295**	**0.9563**	**0.8418**	**0.7713**	**0.8736**	-
SD	**0.2052**	**0.1939**	**0.2304**	**0.1353**	**0.0696**	**0.0960**	**0.4168**	**0.1806**	**0.1004**	**0.3198**	**0.0740**	-

Table 4.9: Insurer-wise Malmquist Index Scores over the Period FY03 to FY13												
Insurers	**FY03-04**	**FY04-05**	**FY05-06**	**FY06-07**	**FY07-08**	**FY08-09**	**FY09-10**	**FY10-11**	**FY11-12**	**FY12-13**	**Average**	**Rank**
Aviva	0.6749	1.1865	0.5323	0.9671	0.9640	1.0000	1.7037	1.0277	1.0643	1.0000	**1.0121**	4
Bajaj Allianz	0.6951	0.6342	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0314	1.2791	**0.9640**	7
Birla Sun Life	0.6009	1.0227	0.5874	0.7324	1.1996	1.0414	0.8530	1.1127	1.2513	1.0829	**0.9484**	9
HDFC Standard	0.8674	0.5144	1.0466	0.6977	0.8119	0.9836	0.7209	1.2449	0.9447	1.1602	**0.8992**	13
ICICI Prudential	0.8213	2.3550	0.7728	1.4923	1.5170	0.9374	2.1354	1.4391	0.8418	1.3872	**1.3699**	1
ING Vysya	1.0956	1.1589	0.4332	0.7787	0.9093	1.0000	1.0000	1.0000	0.9856	1.2390	**0.9600**	8
Kotak Mahindra	0.8077	0.8511	0.6766	1.2343	0.9505	0.8924	1.0000	1.0000	1.0000	1.0000	**0.9412**	10
Max New York	0.6937	0.5679	1.9559	0.8136	0.7787	0.8338	0.8276	1.0247	1.1106	1.2253	**0.9832**	6
MetLife	0.7835	0.7804	0.9638	0.7346	0.9185	0.7031	0.5781	1.5025	1.1582	1.2460	**0.9369**	12
Reliance	0.6498	0.7714	1.1478	0.9323	0.9898	0.5745	0.7465	0.8656	1.2562	2.1008	**1.0035**	5
SBI Life	1.0876	1.0000	0.9984	0.7443	0.9746	0.5902	1.2749	1.5111	1.1817	0.7713	**1.0134**	3
TATA AIG	0.7719	0.8254	0.6469	0.6969	0.6361	0.9384	0.5218	0.9951	1.2687	2.0735	**0.9375**	11
LIC	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.2268	1.0207	**1.0247**	2
Average	**0.8115**	**0.9745**	**0.9047**	**0.9095**	**0.9731**	**0.8842**	**1.0278**	**1.1326**	**1.1016**	**1.2759**	**0.9995**	-
Max	**1.0956**	**2.3550**	**1.9559**	**1.4923**	**1.5170**	**1.0414**	**2.1354**	**1.5111**	**1.2687**	**2.1008**	**1.3699**	-
Min	**0.6009**	**0.5144**	**0.4332**	**0.6969**	**0.6361**	**0.5745**	**0.5218**	**0.8656**	**0.8418**	**0.7713**	**0.8992**	-
SD	**0.1619**	**0.4652**	**0.3886**	**0.2365**	**0.2109**	**0.1612**	**0.4518**	**0.2180**	**0.1360**	**0.3933**	**0.1173**	-

⌖ Malmquist Productivity Index

The Malmquist Total Factor Productivity (TFP) Index indicates that the productivity change of the production point (X_{t+1}, Y_{t+1}) relative to the production point (Xt, Yt). The change in Malmquist total factor productivity index is the product of catch-up and frontier-shift effects. So, in table 4.9 the year-wise and insurer wise relative Malmquist total factor productivity index scores are given. The insurer-wise MPI, indicates that LIC has consistently score 1 till the year FY10-11, indicating that no change in productivity. However, the change in LIC's productivity between year FY11 & FY12 and FY12 & FY13, is due to change in TE components by 22.68% and 2.07% respectively. The MP index for the private insurers indicates a mixed result except for Bajaj Allianz, which has been showing continuous improvement in productivity change over the years. The productivity change in Bajaj Allianz life insurance is due to better performance in both the sub-components; catch-up and frontier shift indices.

The individual insurer's mean MPI score for the period 2002-03 to 2012-13 indicates that ICICI Prudential is placed at the top followed by LIC, SBI Life and Aviva Life but, HDFC Life and MetLife ranked at the bottom of the scale (refer table 4.10).

Table 4.10: Malmquist Productivity Indices & Decomposition: Average Scores^ & Ranking

Insurers	Catch-up		Frontier-shift		Malmquist Index	
	Average Scores^	Rank	Average Scores^	Rank	Average Scores^	Rank
Aviva	1.1013	3	0.9490	8	1.0121	4
Bajaj Allianz	1.0182	7	0.9533	6	0.9640	7
Birla Sun Life	1.0777	5	0.9404	9	0.9484	9
HDFC Standard	1.0837	4	0.9136	11	0.8992	13
ICICI Prudential	**1.2183**	**1**	**1.1618**	**1**	**1.3699**	**1**
ING Vysya	1.0000	11	0.9599	5	0.9600	8
Kotak Mahindra	1.0095	8	0.9329	10	0.9412	10
Max New York	1.1749	2	0.8739	12	0.9832	6
MetLife	0.9948	13	0.9494	7	0.9369	12
Reliance	1.0083	9	0.9864	4	1.0035	5
SBI Life	1.0060	10	1.0021	3	1.0134	3
TATA AIG	1.0451	6	0.8736	13	0.9375	11
LIC	1.0000	12	1.0247	2	1.0247	2

Note: ^ average scores of the period FY03 to FY13

The table 4.11 shows the productivity changes between two years, which indicates that there is TFP growth in all periods after FY08/09. However, this growth varies between different periods, from 2.7% in FY09/10 to 27.5% in FY12/13. Further, on the sources of TFP growth, it is remarkable that in only 3 of the 10 period's efficiency and technical change were in the same direction (either positive or negative): FY03/04, FY10/11 and FY11/12. For all other periods, positive change in one measure is partly offset by negative change in the other, resulting in small or even negative TFP change. Considering the yearly average score of all the 13-insurers reads that there is consistent improvement in total productivity change over the years, as the score reached 1.2759 in FY12-13 from 0.8115 in FY03-04.

Table 4.11: Malmquist Index of Total Factor Productivity (Average)

Insurers	Catch-up	Frontier-shift	Malmquist Index
FY03-FY04	**0.9278**	**0.8953**	0.8115
FY04-FY05	1.1898	0.8156	0.9745
FY05-FY06	1.1981	0.8170	0.9047
FY06-FY07	1.1281	0.8072	0.9095
FY07-FY08	1.0691	0.9175	0.9731
FY08-FY09	1.0072	0.8763	0.8842
FY09-FY10	0.9831	1.0438	**1.0278**
FY10-FY11	**1.0625**	**1.0729**	**1.1326**
FY11-FY12	**1.0267**	**1.0742**	**1.1016**
FY12-FY13	0.9752	1.3118	**1.2759**
FY03-FY13	**1.0568**	**0.9632**	**0.9995**

Interestingly, the last line of table 4.11 indicates that total factor productivity (TFP) change during the entire period of the (FY03-FY13) is negative at -0.05%. This is mainly due to improvement in technical change (catch-up) of 5.6%, but there is a decline in technical efficiency change (frontier-shift) by 3.6%. This result is surprising, as a significantly higher increase in TFP and efficiency over time was expected due to deregulation and the consequent intensification of competition in the Indian life insurance market, as discussed in the objective 1. It seems that deregulatory efforts have had only marginal effect on productivity and efficiency in the Indian Life Insurance market up to the year 2012-13.

This result is surprising, as we expected a significantly higher increase in TFP and efficiency over time due to deregulation and the consequent intensification of competition in the Indian life insurance market, as discussed in the Chapter 3. It seems that deregulatory efforts have

had only a small effect on productivity and efficiency in the Indian Life Insurance market up to the year 2012-13.

4.6.3 Efficiency and Productivity Change

In order to compare the technical efficiency score and productivity change, we summarize the values of both TE and its components and MPI and its components in table 4.12. Interestingly, the table indicates that LIC ranks at number one in efficiency change and rank 12 in catch-up efficiency improvement. However, ICICI prudential ranks number one in productivity change but is placed at 11th position in efficiency change.

Table 4.12: Insurer-wise Annual Average (FY03 to FY13) of Efficiency & Productivity Score

Insurers	Efficiency Change						Productivity Change					
	TE		PTE		SE		Catch-up		Frontier-shift		Malmquist Index	
	Score	Rank	Score	Rank	Score	Rank	Scores	Rank	Score	Rank	Score	Rank
Aviva	0.8470	8	0.8899	8	0.9447	6	1.1013	3	0.9490	8	1.0121	4
Bajaj Allianz	0.9204	5	0.9860	3	0.9327	8	1.0182	7	0.9533	6	0.9640	7
Birla Sun Life	0.5783	13	0.6673	13	0.8603	11	1.0777	5	0.9404	9	0.9484	9
HDFC Standard	0.5986	12	0.7644	11	0.8000	13	1.0837	4	0.9136	11	0.8992	13
ICICI Prudential	0.6464	11	0.6754	12	0.8773	10	1.2183	1	1.1618	1	1.3699	1
ING Life	0.9824	2	0.9987	2	0.9837	2	1.0000	11	0.9599	5	0.9600	8
Kotak Mahindra	0.9542	3	0.9759	5	0.9778	3	1.0095	8	0.9329	10	0.9412	10
MaxLife	0.7549	9	0.7986	9	0.9398	7	1.1749	2	0.8739	12	0.9832	6
PNB MetLife	0.8961	6	0.9310	7	0.9614	5	0.9948	13	0.9494	7	0.9369	12
Reliance	0.8645	7	0.9399	6	0.9151	9	1.0083	9	0.9864	4	1.0035	5
SBI Life	0.9509	4	0.9803	4	0.9683	4	1.0060	10	1.0021	3	1.0134	3
TATA AIA	0.6584	10	0.7715	10	0.8482	12	1.0451	6	0.8736	13	0.9375	11
LIC	1.0000	1	1.0000	1	1.0000	1	1.0000	12	1.0247	2	1.0247	2

Note: TE: Technical Efficiency, PTE: Pure Technical Efficiency and SE: Scale Efficiency

4.7 Concluding Remarks

This chapter starts with the theoretical background underlying measurements of efficiency and productivity change. Efficiency measures deviation in performance from the predicted performance of the 'best practice' firms on the efficient frontier, facing a number of exogenous market factors. Economic efficiency refers to the ability of a firm to select the input and/or output levels and mixes to optimize the economic goals such as cost minimization or profit maximization of the firms. Thus, efficiency can be decomposed into pure technical efficiency (PTE), allocative efficiency (AE) and scale efficiency (SE). Pure technical efficiency occurs, when a firm maximizes the output from a given level of input, while allocative efficiency (AE) measures the extent to which a firm is able to use inputs and outputs optimally with the given prices and production technology. A firm has scale

efficiency when it operates in the range of constant returns to scale. Scope efficiency occurs when a firm operates in different diversified locations. The economic (cost) efficiency analysis provides an overall numerical efficiency value and ranking of insurers. In literature, however, we have not come across a single study that employs DEA and MPI analysis of TE of the life insurance companies operating in India. *Tone and Sahoo (2005)* were the first to study efficiency of the life insurance sector as they applied new cost efficiency model to examine the performance of LIC of India only using time series data.

To estimate the life insurer's efficiency, we used the data envelopment analysis (DEA) techniques to calculate the technical efficiency (TE), pure technical efficiency (PTE) and scale efficiency (SE) of the sample of 13 insurance companies for the period 2002-03 to 2012-13. The DEA score of 1 (0) indicates that the firm is efficient (inefficient). In the second part, to see the productivity change over a period of time, the Malmquist productivity index (MPI) is calculated. The MPI allows for changes in productivity to be broken down into changes in efficiency (catch-up index) and technological changes (frontier-shift index). If MPI > 1, it indicates a favourable development, i.e., a positive growth in total factor productivity between two periods; MPI < 1 is a negative development, i.e., a decline in total factor productivity between two periods and if MPI equals to one, productivity remains unchanged.

To calculate the insurers' efficiency score in DEA, we used four inputs (namely, number of individual agents, total commission paid, equity capital and debt capital) and two outputs (namely, net benefits paid to customers and liquid assets to liabilities). However, premiums seems to be the best proxy to measure of output volume in the insurance industry, but, in the literature, it has been argued that premium is price times of quantity, whereas output volumes should represent only quantity. So, we have not included premium as an output variable.

The estimated results of technical efficiency indicate that the average TE of all the 13-life insurance companies in India for FY03 was 69.82% with a minimum score of 32.90% efficiency. However, this average decreased in FY04 to only 67.66% with a minimum score of 7.9% with the standard deviation to 31.78%. However, in FY05, the average TE was again back to 73.63% and the minimum efficiency score was 33.47%, which was the best minimum score in the three years period. Therefore, the standard deviation was 27.31%, much less than the previous year. After FY05, the average TE scores trended upward and reached the highest level of 91.35% in FY13, with a minimum SD of 14.54% and a minimum score of 60.69%, which is the highest in the sample period. This indicates that the technical efficiency of the

firms has improved due to the new regulations and the increasing competition made by the gradual liberalization of the sector. However, the average TE score of 81.94% for FY03 to FY13, suggests that the life insurance business in India is moderately efficient and hence there is a large room for improvement. The results also show that the insurance sector was experiencing high growth, and this growth was accompanied by continuous improvement in the TE for the periods from 2004-05 to 2012-13.

The MPI index indicates that LIC exhibited a relative catch-up efficiency of 1 over the years, indicating no change in relative efficiency. However, Bajaj Allianz which scored 1.1814 in FY03-04, indicating an 18.14% improvement in relative efficiency from FY03 to FY04, remained steady at 1 afterwards, showing no change in internal efficiency of the insurers. The rest 11 private insurers' scores showed mixed results but remained steady at 1 in recent years. Considering the yearly average score of the entire 13-insurers one infers that there is consistent improvement in relative efficiency as the score reached 1.0072 in FY08-09 from 0.9278 in FY03-04. However, there is a decline in relative efficiency to 0.9831 in FY09-10, which may be due to the global financial crisis 2008 but thereafter the insurance companies has managed to breed efficiency and reached 1.0267 in FY11-12. Further, the catch-up score declined to 0.9752 in FY12-13, indicating a deterioration of internal efficiency by 2.5% from the year FY12 to FY13. On the other hand, by considering the average score of the entire years, ICICI prudential is placed at the top followed by Max New Work, and Aviva Life in generating internal efficiency but the public sector giant (LIC: rank 12) and MetLife (rank 13) are placed at the bottom of the efficiency scale.

Further, a comparison of the relative frontier-shift efficiency scores of the life insurers for the 11-year period from 2002-03 to 2012-13 reflected that LIC consistently scored 1.0 up to the year FY11, indicating that there is no relative improvement in technology. However, the scores showed a consistent upward movement in technical efficiency by 22.68% and 2.07% from the year FY11 to FY12 and FY12 to FY13 respectively. The private life insurers attained frontier-efficiency scores above 1 only in patches but not on a consistent basis over the years. However, in the initial periods of operations, the private insurers have shown more efficiency due to technological innovations. The year-wise mean relative frontier-shift scores shows that there is a continuous improvement in the technology, which has scored 0.8953 in FY03-04, reached the highest point of 1.3118 in FY12-13. By considering the insurer-wise mean efficiency over the years, ICICI Prudential seems to have enjoyed the highest mean

relative frontier efficiency score of 1.1618 followed by LIC with a score of 1.0247 across the study period.

Moreover, analysis of the MPI, computed as a product of two components, indicates that LIC has consistently scored 1 for the period FY03-04 to FY10-11, showing no change in productivity change. However, the change in LIC's productivity between year FY11 & FY12 and FY12 & FY13, is due to change in TE components by 22.68% and 2.07% respectively. The MP index for the private insurers shows mixed results except Bajaj Allianz, which indicates continuous improvement in productivity change over the years. This productivity change in Bajaj Allianz life insurers is due to a better performance in both the components; catch-up and frontier shift indices.

Looking at the year-on-year changes in TFP one finds TFP growth in all periods after FY08/09. However, this growth varies significantly between different periods, from 2.7% in FY09/10 to 27.5% in FY12/13. As regards the sources of TFP growth, it is remarkable that in only 3 of the 10 periods did efficiency and technical change point into the same direction (either positive or negative): FY03/04, FY10/11 and FY11/12. For all other periods, positive change in one measure is partly offset by negative change in the other, resulting in small or even negative TFP change. Considering the yearly average score of all the 13-insurers consistent improvement in total productivity change over the years is observed, as the score reached 1.2759 in FY12-13 from 0.8115 in FY03-04.

Interestingly, the total factor productivity (TFP) change over the entire period (FY03-FY13) is negative at -0.05%. This is contributed by an improvement in technical change (catch-up) of 5.6%, but there is a decline in technical efficiency change (frontier-shift) by 3.6%. This result is surprising, as a significantly higher increase in TFP and efficiency over time was expected due to deregulation and the consequent intensification of competition in the Indian life insurance market, as discussed in objective 1 (Chapter 3). Therefore, it can be concluded that deregulatory efforts have had only marginal effect on productivity and efficiency in the Indian Life Insurance market up to the year 2012-13.

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Chapter V

Profitability of Life Insurance in India: An Examination

5.1 Introduction

Profitability is one of the most prominent objectives of a company to accomplish the goal of maximizing shareholder's wealth. However, profitability relies on the performance of the company in managing both the internal and external factors. The internal factors, which put the company in difficulty to meet the desired goals of profitability in a firm may include: low productivity, lack of skills, use of obsolete technology, agency problem and trade unions etc. The external factors, which are beyond the control of management include: uncertain macro-economic environment, regulatory uncertainty, political instability, specific situations such as terrorism, natural disasters etc. In case of insurance companies, profit not only improves upon insurers' solvency but it also plays an essential role in persuading policyholders and shareholders to supply funds to insurance firms. Thus, one of the objectives of management of insurance companies is to attain profit as an underlying requirement for conducting any insurance business. Without profits no insurer can sustain in the business in this changing and competitive globalized environment.

Since, life insurance is a capital intensive business; global experience of the insurance markets indicate that companies in life insurance sector take 7 to 10 years to break-even[1]. However, it has been observed that the Indian life insurers are still facing difficulty in managing their profitability, due to a number of factors. A study by KPMG (2013) stated that the Indian insurance industry has faced structural challenges that have adversely affected both aspects of operations and overall profitability consequently. First, demand was created for a product that transferred the investment risk, along with its return, to the customer. Secondly, in an economy that is undergoing a slowdown, investments have provided limited returns. A number of studies have reported that the Indian life insurance industry is the least profitable market for its shareholders among all Asian countries, due to fall in new business premium. In 2013-14, out of the 24 life insurers, 18 life insurance companies, reported an aggregate loss of Rs 1,024 crore. Further, the life insurance companies have incurred an aggregate loss of Rs 11,476 crore during the period 2000-01 to 2013-14. This may be due to economic slowdown and sudden policy changes by the regulator to protect the customer and to avoid mis-selling of the ULIP product. So, it is true that the life insurance industry in India is at a

[1] IRDA Annual Report 2012-13, Page no 27.

critical stage and there is a need to discuss the factors affecting the profitability of the Indian life insurance industry.

To assess the profitability, an attempt is made to find out the important factors determining the profitability of life insurance companies in India. Panel data models are employed to examine the relationship underlying the structure, efficiency and performance of the life insurance industry, which enables a better identification and measurement of phenomenon that are not captured in either cross-section or time series models. The study adds to the existing literature in several ways; first, use of new data series with base year 2004-05 are considered for the economic variables like GDP, WPI etc; second, a longer sample series has been included; third, the scope has been expanded by moving from firm specific factors to industry features like efficiency & market structure; and finally, Inflation and GDP growth are also controlled to account for the effect of the macroeconomic environment of insurer's profitability.

This chapter is organized as follows; section 2 summarizes the major past empirical studies on profitability of the life insurers. Data sources and methodology to estimate the model is discussed in section 3. Section 4 presents variable descriptions and results are discussed in the section 5. Factors of profitability are discussed in section 6. Finally, section 7 discusses the relationship between competition, efficiency and profitability of the life insurance companies in India, in the post reform period.

5.2 Review of Literature

In earlier literature, studies concerning determinants of profitability, mainly focused on the banking sector and very few studies are on the insurance sector. The available literature on insurance are mostly on the developed markets. *Greene and Segal (2004)* explore the relationship between cost inefficiency and profitability in the U.S. life insurance industry. They derive cost efficiency using the stochastic frontier (SF) method allowing the mean inefficiency to vary with organizational form and the outputs. The results suggest that cost inefficiency in the life insurance industry is substantially relative to earnings, and that inefficiency is negatively associated with profitability measures such as the return on equity. The analysis of inefficiency and organizational form suggest that stock (shareholder-owned) companies are as efficient and profitable as mutual (policy holder-owned) companies.

Al-Shami and Ahmed (2008) examined the determinants of profitability on a panel of 25 insurance companies over the period of 2006-2007 listed on UAE stock market, with

variables including age of the firm, leverage, volume of capital, risk or loss ratio and firm size. The results concluded that firm size had a direct and significant relationship with profitability, volume of capital had a direct but insignificant relationship with profitability, age of the firm did not have any relationship with profitability while last two variables of leverage and loss ratio had inverse and significant relationship with profitability.

Ahmed et al. (2011) investigated the determinants of performance in life insurance sector of Pakistan by using panel data of five insurance companies from 2001-2007. They explored the relationship between firm level attributes (leverage, growth, size, age, liquidity, risk and tangibility) and performance of insurance firms, and observed that leverage, size of the firm and risk were significant determinants of performance. On the other hand growth, tangibility, age of the firm and liquidity did not have any significant association with performance of life insurance firms. Further, *Javaria, Khan and Amjad (2013),* examined the determinants of profitability in insurance sector of Pakistan with a panel data set of 31 insurance firms (both life & non-life) for the period 2006-2011. They concluded that leverage, size, earnings volatility and age of the firm were significant determinants of profitability while growth opportunities and liquidity were not significant determinants of profitability.

To examine the determinants of profitability of Life insurers in Ghana, *Akotey et al* (2013) employed a panel of 10 life insurers over a 10 year period to identify gross premium written, insurer's size, reinsurance, claims, management expenses and interest rate as the significant determinants of life insurer's profitability in Ghana. The results found that gross written premiums had a positive relationship with insurers' sales profitability and its relationship with investment income was negative. Also, the results showed that life insurers had been incurring large underwriting losses due to overtrading and price undercutting. The results further revealed a setting-off rather than a complementary relationship between underwriting profit and investment income towards the enhancement of the overall profitability of life insurers.

A study by *Alhassan and Addison (2013),* examined the market structure, efficiency and profitability of the insurance companies in Ghana, using a sample of 14 life and 22 non-life insurers from 2007 to 2011. They employed the panel corrected standard errors (PCSE) model of Beck and Katz (1995) with return on assets (ROA) as the dependent variable whereas HHI and concentration ratio (4-firm CR) were used as proxies for market structure. Insurers Efficiency was computed using DEA technique. Insurer's size, underwriting risk, leverage, GDP growth rate and inflation rate were controlled. The results provide ample

evidence in support for efficient structure hypothesis for both life and non-life insurance markets. While conflicting results was found for SCP hypothesis in the non-life insurance market, it was rejected in the Life insurance market. The findings also pointed to an increasing level of competition in both life and non-life insurance industry in Ghana though they still remained concentrated with the life insurance sector compared to the non-life sector.

However, to the best of our knowledge, there is only a single study available on Indian insurance industry, which studies the determinants of profitability of the life insurers *(Charumathi, 2012)* for the period 2008-09 to 2010-11. The author conclude that profitability of life insurers is positively influenced by the size (as explained by logarithm of net premium) and liquidity. The leverage, premium growth and logarithm of equity capital have negatively and significantly influenced the profitability of Indian life insurers. The study has not found any evidence for the relationship between underwriting risk and profitability.

5.3 Data and Methodology

5.3.1 Data

The data set consists of a balanced panel of 13-life insurance companies over the period of 2002-03 to 2012-13 (i.e., 11-years). The 13 life insurers are selected on the basis of their year of operations to have uniformity with the previous chapters in the thesis. All the data are of annual frequency and are secondary in nature. The data on insurance indicators are collected from different publications of IRDA like Annual Reports and Handbook of Indian Insurance Statistics. Data on macro-economic variables, like inflation and GDP, are collected from RBI and MOSPI. However, some of the financial indicators of the individual life insurers are collected from the balance sheet of the respective insurers.

5.3.2 Methodology

The study employs panel data models to examine the relationship of the structure, efficiency and performance of the life insurance industry, which enables a better identification and measurement of phenomena that are not captured in either cross-section or time series models.

5.3.2.1 Measures of Market Structure

In literature, there are several measures of market structure of an industry, which are highlighted in chapter 3 of table 3.1. Some of these measures are namely, Herfindahl Hirschman Index (HHI), Concentration Ratios (CR_n) and GRS index etc. In this study, HHI

and CR5 are used, as a proxy of the structure of Indian life insurance industry, due to their simplicity and limited data requirements. As discussed in the chapter 3 (equation 3.2), CRn and HHI are defined as:

- CRn is defined as the sum of market shares of *n* largest insurer in the market and it takes the form:$CRk = \sum_{i=1}^{k} Si$, where, *Si* is the market share of insurer *i* and *k* is the number of insurance companies in concern. (*i = 1 2…k*).
- HHI is defined as the sum of the squares of the relative sizes (expressed as proportions of the total size of the market) of the firms/companies in the market. The formula takes the form: $HHI = \sum_{i=1}^{n} s_i^2$, where *Si* stands for the market share of the i^{th} company in the industry.

The values of HHI and CR5 are calculated in chapter 2, taking into account the 'total premium' of the life insurance companies, which are given in table 5.1 below. The HHI and CR5 indices indicate that the life insurance sector in India is concentrated, though the index is declining considerably due to increasing number of players in the sector.

Table 5.1: Indicators of Market Structure & Efficiency (Sample Insurers Average) of Life Insurance Industry in India

Year	Market Structure		Market Efficiency	
	HHI	CR5	TE	PTE
2002-03	0.9603	0.9944	0.6982	0.7680
2003-04	0.9089	0.9844	0.6766	0.7391
2004-05	0.8235	0.9667	0.7363	0.8022
2005-06	0.7385	0.9541	0.7589	0.8398
2006-07	0.6756	0.9410	0.8467	0.9040
2007-08	0.5627	0.9116	0.8680	0.9262
2008-09	0.5134	0.8839	0.8593	0.9213
2009-10	0.5012	0.8707	0.8507	0.9004
2010-11	0.4964	0.8672	0.8914	0.9401
2011-12	0.5078	0.8630	0.9138	0.9581
2012-13	0.5358	0.8740	0.9135	0.9292
Average	**0.6567**	**0.9192**	**0.8194**	**0.8753**

5.3.2.2 Measuring Efficiency

To compute the efficiency of the life insurance companies, data envelopment analysis (DEA) technique is employed. The efficiency score of the individual life insurer is calculated in chapter 4, by using a set of inputs and outputs (see table 4.2 of chapter 4). To measure the efficiency of the life insurer's, two efficiency scores, i.e., technical efficiency (TE) and pure

technical efficiency (PTE) are calculated. The efficiency scores estimated under the assumption of CRS is termed as TE (Charnes et al, 1978), which denotes the ability of the firms to employ technology to maximize output. While, the input(s) changes, results in disproportional changes in the output variable under VRS, it's described as PTE (Banker et al., 1984). The calculated average efficiency scores of the 13-panel life insurers, using DEA, are given in the table 5.2, which indicate that efficiency (TE and PTE) of the life insurance market has improved over the years.

Table 5.2: Individual Life Insurer's Annual Average (FY03 to FY13) of Efficiency Scores

Insurers	TE	PTE
Aviva	0.8470	0.8899
Bajaj Allianz	0.9204	0.9860
Birla Sun Life	0.5783	0.6673
HDFC Standard	0.5986	0.7644
ICICI Prudential	0.6464	0.6754
ING Life	0.9824	0.9987
Kotak Mahindra	0.9542	0.9759
MaxLife	0.7549	0.7986
PNB MetLife	0.8961	0.9310
Reliance	0.8645	0.9399
SBI Life	0.9509	0.9803
TATA AIA	0.6584	0.7715
LIC	1.0000	1.0000

The individual life insurer's annual average efficiency score for the 11-years (FY03 to FY13) are given in table 5.2. The values above 0.60 indicate that efficiency of life insurance companies which has improved over the years. Further, it is observed that the efficiency score of the individual life insurers varies from 0.08 to 1 in TE and 0.17 to 1 in PTE, indicating that there is significant variation in efficiency among the individual life insurance companies.

5.3.2.3 Panel Regression Analysis

The basic linear panel model takes the following form[2]:

$$Y_{it} = \alpha + \beta X_{it} + \mu_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5.1)$$

In general, simple linear panel data models can be estimated by using three different methods: (a) pooled OLS method (with a common constant term), (b) fixed effects (FE) method (constant is treated as group/section specific) and (c) random effects (RE) method (constant for each group/section is random).

[2] Asteriou and Hall; 2007

(a) Pooled OLS method: This method takes the form of equation 5.1 and estimates a common constant *'α'* for all cross sections (common constant for all companies). This is useful under the hypothesis that the data set is *a priori* homogeneous (e.g. sample of EU Countries). However, this case is quite restrictive and cases of more interest involve in inclusion of fixed and random effects in the method of estimation.

(b) Fixed Effects (FE) Method: Traditionally, the fixed effects model is a very useful model. In FE method the constant is treated as group (section) specific, which means that the method allows for different constants for each group (section). The fixed effects estimator is also known as the least-squares dummy variables (LSDV) estimator because in order to allow for different constants for each group, This model takes the form:

$$Y_{it} = \alpha_i + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \ldots..+ \beta_k X_{kit} + \mu_{it} \ldots\ldots\ldots (5.2)$$

(c) Random Effects (RE) Method: The other method is the random effects model, where the constant is not fixed, rather a random parameter. The main difference between the FE & RE method is that RE handles the constants for each section not as fixed, but as random parameters. Hence, the variability of the constant for each section comes from the fact that:

$$\alpha_i = \alpha + v_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots (5.3)$$

Here, v_i is a zero mean standard random variable. The random effects model therefore takes the following form:

$$Y_{it} = (\alpha + v_i) + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \ldots..+ \beta_k X_{kit} + \mu_{it} \ldots\ldots\ldots (5.4)$$

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \ldots..+ \beta_k X_{kit} + (v_i + \mu_{it}) \ldots\ldots\ldots (5.5)$$

By comparing, equations 5.2 and 5.5, it is understood that the difference between the FE and RE methods of testing panel data models is: FE model assumes that each company/country differs in its intercept term, whereas RE model assumes that each company/country differs in its error term. Usually, if the panel is balanced (contains all existing cross-section data), one might expect that the fixed effects model will work the best. In other cases, when the panel is unbalanced (contains limited observations of the cross sections), the random effect model might be suitable. The Hausman (1978) test is used to choose the appropriate model between the fixed and random effects for estimations. The Hausman test statistics test the null (H_0) hypothesis that RE model is suitable, with the alternative (H_1) hypothesis, i.e., FE model is

suitable. So, if in the Hausman test, *'P'* value is significant then one has to reject H_0 and accept H_1. Otherwise, the random effects model is suitable for estimation.

5.3.2.4 Panel Cointegration

To do the cointegration analysis for the panel data, one follows three steps: first, to avoid any spurious correlation, stationarity of the variables are checked, i.e., whether the variable has a unit root. If the variables are non-stationary, then the second step is to test the long-run relationship between the variable, which is termed as cointegration test. Finally, if the cointegration results confirm the existence of long-run relationship between the variables, then FMOLS is employed.

a) Panel Unit Root

In the literature, the classical methods are designed to reject the null hypothesis only when the evidence against the null is sufficiently overwhelming. However, because unit-root tests typically are not very powerful against alternative hypothesis of somewhat persistent but stationary processes, reversing roles and testing the null hypothesis of stationarity against the alternative of a unit root is appealing. For pure time series, the *KPSS test* of Kwiatkowski *et al.* (1992) is one such test.

The *Hadri (2000)* LM test uses panel data to test the null hypothesis that the data are stationary versus the alternative that at least one panel contains a unit root. The test is designed for cases with large T and moderate N. The Hadri test is a generalization of the KPSS fluctuations test (Kwiatkowski, Phillips, Schmidt, and Shin, 1992) for a single time series and is based on OLS residuals obtained from regressing Y_{it} on a constant (or a constant plus trend). The null hypothesis is that there is no unit root in any series (stationarity). The alternative hypothesis is that the panel has a unit root.

$$Y_{it} = r_{it} + €_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5.6)$$

$$r_{it} = r_{i,\,t-1} + \mu_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5.7)$$

$$H_0 = \sigma^2_{\mu} = 0 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5.8)$$

If variance u_{it} is zero, then r_{it} becomes a constant and thus Y_{it} is stationary. The Hadri test allows for heteroskedasticity adjustments. Its empirical size is close to its nominal size if N and T are large.

b) Panel Cointegration

Once the panel unit root test confirms that the variables are non-stationary, i.e., they are integrated of order one, then the next step is to apply cointegration analysis to examine whether a long run cointegration relationship exists among the variables. In this study, two methods of panel cointegration, i.e., *Pedroni (1999) & Kao (1999)* test is used, as our data set consists of a long time series (T: 11 years & N: 13 companies).

- Pedroni's cointegration equation may be given as:

$$Y_{it} = \alpha_i + \delta_i t + \beta_i X_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(5.9)}$$

Where, t = 1 2…T, i = 1, 2…N. T refers the number of observations over time and N refers to the number of individual companies in the panel. The Pedroni test employs four panel statistics and three group panel statistics to test the null hypothesis of no cointegration against the alternative hypothesis of cointegration. Out of the seven statistics, four are panel statistics, namely, (i) Panel variance, (ii) Panel *rho*, (iii) Panel PP and (iv) Panel ADF,that tests the hypothesis for cointegration for the panel as a whole. The rest three statistics are group statistics, namely Group *rho*, group PP and group ADF, that test cointegration across the cross sections. Hence, rejection of the null of no cointegration using a group statistic implies evidence of cointegration for at least one cross-section. As we are interested in average relationship across insurers, panel statistics are more relevant for our case.

- *Kao (1999)* used both DF and ADF to test for cointegration in the panel. The Kao test uses the panel regression model:

$$Y_{it} = ß_{it} X_{it} + \gamma_0 Zit + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(5.10)}$$

Where, Y and X are assumed to be non-stationary.

$$\hat{e}_{it} = \rho\, \hat{e}_{it} + \upsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(5.11)}$$

Where, $\hat{e}_{it}$ = (Y_{it} – $ß^{\wedge}_{it}$ X_{it} - $\gamma^{\wedge}$ Z_{it}) are residuals. To test the null hypothesis, H_0: ρ=1, against the alternative that Y and X are conitegrated (i e., H_1: $\rho < 1$). Kao (1999) developed both DF-Type test statistics and ADF test statistics were used to test cointegration in panel.

c) FMOLS Panel Estimates

After the cointegration test confirms that the model is cointegrated, fully modified OLS (FMOLS) is applied to the panel model. The FMOLS model was developed by *Phillips and Hansen (1990)*, to provide optimal estimates of cointegrating regressions. Cointegrating links between non-stationary series lead to endogeneities in the regressors that cannot be avoided by using vector auto-regressions (VAR'S) as they are simply reduced forms. The method modifies least squares to account for serial correlation effects and for the endogeneity in the regressors that result from the existence of a cointegrating relationship (Acharya et. al. 2009). By considering, the following cointegrated system for a panel of i=1, 2… N insurers over time t = 1, 2… T:

$$Y_{it} = \alpha_i + \beta X_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5.12)$$

Where, $X_{it} = X_{it-1} + \varepsilon_{it}$ and the estimates α_{it} and β are found through FMOLS methodology.

5.4 Specification of the Empirical Model

The regression model used in this study is:

$$Y_{it} = \alpha_i + \beta_1 MS_t + \beta_2 ES_{it} + \sum_{i=1}^{N} \beta_i X_{it} + \sum_{c=1}^{c} \phi_c M_t + \mu_{it} \ldots\ldots\ldots (5.13)$$

Where, Y_{it} denotes profitability of the insurance company *i* in a year *t*, X_{it} represents a vector of variables of an insurer *i* in year *t*, and M_t is a vector of variables representing the macro-economic variables in a year *t*. μ_{it} is the error term.

In the model, return on assets (ROA) is used as a proxy for profitability, which is measured as the ratio of profit after tax to total assets. The market structure (MS) indicators are measured by HHI and CR5, while the efficiency scores (ES) are estimated under DEA technique, are TE and PTE. The insurer's specific variable, namely 'size', 'leverage' & 'risk' and two macro-economic factors like 'GDP & Inflation' are used as independent variable in the model. So, the equation 5.8 can be reformulated as:

$$RoA_t = \alpha_i + \beta_1 MP_t + \beta_2 ES_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 RISK_{it} + \beta_6 GDP_t + \beta_7 WPI_t + \mu_{it} \quad (5.14)$$

A brief description of these variables and their expected relationships are provided in the following:

- **Market Structure (MS) and Efficiency (E):** The relationship between 'market structures (MS)' and 'profitability' is expected to be unambiguous, as competition may affect the profitability in both the ways. If competition increases and efficiency is also increased, then profitability of the life insurers will increase, showing a positive relationship. However, if efficiency does not increase, profitability may reduce due to higher competition in the market.
- **Size:** The size of insurance companies is calculated by taking natural logarithm of total assets. It is expected that relationship between size and profitability is ambiguous. A positive relationship indicates the benefits of economies of scale, while a negative relationship indicates diseconomies of scale.
- **Leverage:** The leverage of life insurance companies is calculated by ratio of the total premium to total assets in a year. The relationship is expected to have a mixed result with profitability.
- **Risk:** Insurer's risk is captured by the ratio of benefits paid in a year to total premium collections in that year. This measures the viability of insurance companies in a year. It is hypothesized that the insurers with high underwriting risk would be less profitable; hence, a negative relationship with profitability is expected.
- **GDP Growth:** In any financial system, the financial entities like banks, insurance companies etc, are directly linked with the growth of the economy. Increasing growth stimulates demand for services, which in turn increases the sales of insurance policies and leads profitability. It is expected that GDP growth would have a positive relationship with profitability through growth in premium collections.
- **Inflation:** In every financial activity, inflation works like a tax on return or interest rate. If inflation increases, RBI would raise the interest rate to keep inflation under control, while the return on investment will increase, due to tight interest rate environment. Hence, it is expected that inflation would have a positive effect on the insurer's profitability. However, a negative relationship can be experienced, if incurred losses exceed gain in investment returns. Additionally, the increase in inflation would reduce the real income, which may put pressure on the sale of policies by insurance companies. So, inflation is expected to have a mixed relationship with profitability.

Table 5.3: Choice of Variables and Hypothesized Signs		
Dependent Variable		
Return on Assets (RoA)	Profit after Tax to Total Asset Ratio	
Independent Variables		
Market Structure (MS)	HHI/CR5	+/-
Efficiency (ES)	TE/PTE	+
Size	Ln (total Assets)	+/-
Leverage (LEV)	Total Premium to Total Asset Ratio	+/-
Risk	Benefits paid to Total Premium ratio	-
GDP	GDP Growth (YoY %)	+
Inflation (WPI)	WPI Inflation Rate (YoY %)	-

By including the variables in table 5.3, the model in equation 5.14, can be expanded into four separate models, which needed to find out the determinants of life insurance Company's profitability in India.

The models are as the following variants equation 5.15

$$\begin{cases} \textbf{(1)}\ RoA_t = \alpha_i + \beta_1 HHIt + \beta_2 TEit + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 RISK_{it} + \beta_6 GDP_t + \beta_7 WPI_t + \mu_{it} \\ \textbf{(2)}\ RoA_t = \alpha_i + \beta_1 HHIt + \beta_2 PTEit + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 RISK_{it} + \beta_6 GDP_t + \beta_7 WPI_t + \mu_{it} \\ \textbf{(3)}\ RoA_t = \alpha_i + \beta_1 CR5t + \beta_2 PTEit + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 RISK_{it} + \beta_6 GDP_t + \beta_7 WPI_t + \mu_{it} \\ \textbf{(4)}\ RoA_t = \alpha_i + \beta_1 CR5t + \beta_2\ TEit + \beta 3 SIZEit + \beta_4 LEV_{it} + \beta_5 RISK_{it} + \beta_6 GDP_t + \beta_7 WPI_t + \mu_{it} \end{cases}$$

5.5 Empirical Results & Discussions

5.5.1 Descriptive Statistics

The summary statistics of the variables are presented in table 5.4 below. The insurer's profitability, which is a proxy as ROA, indicates on an average a negative value of 4%. While the macro-economic variables like GDP growth averaged a high growth of 7.61% and inflation rate at 6.26%.

Table 5.4: Descriptive Statistics					
Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	143	-0.04	0.07	-0.43	0.06
HHI	143	0.66	0.17	0.50	0.96
CR5	143	0.92	0.05	0.86	0.99
TE	143	0.82	0.23	0.08	1.00
PTE	143	0.88	0.20	0.17	1.00
SIZE	143	8.71	2.10	4.57	14.24
LEV	143	0.37	0.17	0.04	0.95
RISK	143	0.22	0.26	0.00	1.43
GDP	143	7.61	1.76	3.90	9.60
WPI	143	6.26	2.00	3.40	9.60

5.5.2 Correlation Matrix

To examine the possibility of high correlation among the independent variables, the Pearson's correlation coefficient was estimated and the results are given in table 5.5 below. The results confirm that there is no multi-collinearty in the models as the values of correlation do not exceed from cut point of 0.5. However, there is a higher correlation between macro-economic variable with the market structure indicators.

Table 5.5: Correlation Matrix

	ROA	HHI	CR5	TE	PTE	SIZE	LEV	RISK	GDP	WPI
ROA	1									
HHI	-0.477	1.000								
CR5	-0.504	0.974	1.000							
TE	0.229	-0.334	-0.328	1.000						
PTE	0.187	-0.339	-0.324	0.931	1.000					
SIZE	0.526	-0.657	-0.561	0.280	0.248	1.000				
LEV	-0.226	0.015	0.157	-0.203	-0.165	-0.267	1.000			
RISK	0.441	-0.479	-0.570	0.366	0.302	0.505	-0.471	1.000		
GDP	0.292	-0.545	-0.518	0.242	0.273	0.374	0.303	0.065	1.000	
WPI	0.285	-0.537	-0.587	0.210	0.205	0.399	-0.131	0.444	0.488	1

5.5.3 Panel Regression Results

The stated four models in equation 5.15, are estimated by using the fixed and random effect models of the panel regression and the results are presented in table 5.6.

- **Results of Fixed Effects Model:** Under FE model, there are four variables, i.e. 'size', 'leverage', 'GDP' and 'WPI', which are significant in all the estimated four models. As expected both 'size and GDP' coefficients are positive and 'leverage and WPI' coefficients are negative. However, the market structure variables (CR5/HHI) and efficiency variables (TE/PTE) are not significant in the estimated four FE models. The coefficients of the HHI and CR5 are positive, indicating that competition leads to insurer's profitability. However, the TE and PTE coefficients exhibit insignificant mixed results, which do not provide strong evidence for SCP hypothesis in the life insurance industry in India. The within R^2 in all the four FE model is around 40%, between R^2 is around 25% while overall R^2 is 26%. Within R^2 implies that independent variables explain 40% variations in the profitability in this panel from year to year i.e. 2003 to 2013. Between R^2 implies that independent variables explain about 25% variations in profitability from firm to firm. Finally overall R^2 shows that independent variables

explain 26% variations in the whole panel. All the estimated four FE models exhibit good fit as evident in the significant F.

- **Random Effects Model Results:** The results of the four random effects (RE) models are presented in table 5.6. In all the four RE models, the variables 'size, risk, leverage and GDP' are significant, while 'CR5/HHI, TE/PTE and WPI' are insignificant. The coefficients of the significant variables 'size, leverage and GDP' are positive, as hypothesized. However, 'risk' was expected to have a negative relationship with profitability but the results shows a positive relationship, though the coefficient is very small. The coefficient of WPI is negative, as expected but the variable is insignificant in all the estimated four RE models. The market structure variable (CR5 & HHI) coefficients are negative. Against the expected positive relationship of efficiency (TE & PTE) variable, the estimated results imply a negative relationship with profitability. The models are also significant as its Wald Chi^2 is higher and also significant at 1% level. The R^2 of fixed effects models are higher compared to random effects models.

To choose the appropriate model, the Hausman (1978) specification test is employed and the results (see table 5.6) prefer fixed effects (FE) to random effects.

Thus, the fixed effects model in all the estimated four models, has four significant variables, 'size, leverage, GDP and WPI', while the other three variables 'HHI/CR5, TE/PTE and risk' are insignificant. Insurer size is significant and an important determinant of profitability and positive relationship is found between size and profitability. This implies that bigger life insurance companies are profitable compared to smaller ones, which may be due to better distribution channels, public trust, economies of scale etc. It is well known that a better economic environment is conducive for the insurance companies for business operation. So, in the estimated models, GDP growth is positively related to profitability. On the other hand, higher inflation leads higher interest rate environment, which affects the insurance business due to low sales, and thus affects profit of the life insurers. The model expected the efficiency (TE/PTE) of the insurers to lead to better profitability but the estimated values showed mixed results and insignificant. On the other hand, though the market structure variables (CR5/HHI) are insignificant but are positively related to profitability of the life insurance companies in India.

Table 5.6: The Panel OLS Results : Fixed Effects (FE) Vs Random Effects Models								
Dependent Variable-ROA								
Regressor	**Fixed Effects (FE) Model Results**				**Random Effects Model Results**			
	Model-1	**Model-2**	**Model-3**	**Model-4**	**Model-1**	**Model-2**	**Model-3**	**Model-4**
C	-0.44** (-2.35)	-0.41** (-2.17)	-0.33 (-0.78)	-0.38 (-0.90)	-0.11 (-1.21)	-0.09 (-1.03)	0.13 (0.59)	0.10 (0.51)
HHI	0.14 (1.29)	0.13 (1.16)	-	-	-0.05 (-0.93)	-0.06 (-0.97)	-	-
CR5	-	-	0.11 (0.32)	0.15 (0.42)	-	-	-0.27 (-1.44)	-0.26 (-1.41)
TE	0.03 (0.11)	-	-	-0.01 (-0.10)	-0.01 (-0.26)	-	-	-0.01 (-0.28)
PTE	-	-0.02 (-0.55)	-0.03 (-0.73)	-	-	-0.22 (-0.74)	-0.02 (-0.77)	-
SIZE	0.04** (2.60)	0.03** (2.51)	0.02*** (1.81)	0.03*** (1.87)	0.01*** (1.95)	0.01*** (1.91)	0.01*** (1.73)	0.01*** (1.78)
RISK	0.04 (1.22)	0.04 (1.42)	0.05 (1.59)	0.04 (1.43)	0.05*** (1.85)	0.06** (1.96)	0.05*** (1.85)	0.05*** (1.74)
LEV	-0.09** (-2.34)	-0.09** (-2.37)	-0.09** (-2.43)	-0.09** (2.41)	-0.08** (-2.05)	-0.08** (-2.11)	-0.07** (1.85)	-0.07 (-0.28)
GDP	0.01** (2.45)	0.02** (2.54)	0.01** (2.26)	0.01** (2.11)	0.01*** (1.88)	0.01** (1.99)	0.01** (2.23)	0.01** (2.10)
WPI	-0.05*** (-1.70)	-0.01*** (-1.73)	-0.01 (-1.52)	-0.04 (-1.46)	-0.01 (-1.15)	-0.01 (-1.20)	-0.01 (-1.42)	-0.01 (-1.36)
R^2	Within: 0.4011 Between: 0.2634 Overall: 0.2572	Within: 0.4025 Between: 0.2577 Overall: 0.2629	Within: 0.3965 Between: 0.2398 Overall: 0.3008	Within: 0.3939 Between: 0.2463 Overall: 0.2959	Within: 0.3838 Between: 0.2054 Overall: 0.3381	Within: 0.3869 Between: 0.1990 Overall: 0.3392	Within: 0.3895 Between: 0.1942 Overall: 0.3467	Within: 0.3861 Between: 0.2015 Overall: 0.3457
F Test/ Wald Chi^2	11.77	11.84	11.54	11.42	77.19	78.19	79.89	78.85
Prob>F/ Chi^2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hausman Test Statistic :- H0: Random Effects Model is Appropriate, H1: Fixed Effects Model is Appropriate								
Chi^2	31.21	64.67	10.18	14.46				
Prob. >Chi^2	0.0000	0.0000	0.0170	0.0249				
Note: Figures in (#) implies t-statistics for FE and z-statistics for RE model, Wald Chi^2 for RE model; * Significant at 1% level, ** at 5% level, *** at 10% level								

5.5.4 Panel Cointegration Analysis

The estimated panel regression results indicate that some variables are not significant in the model, which may be due to the variables are correlated in the long run.

a) Panel Unit Root Tests

To test for unit roots in series, Hadri's (2000) panel unit root methodology is being used. Hadri's test holds the null hypothesis (H_0) that the variable is stationary. The test results presented in table 5.7 indicate that all the variables are non-stationary, both in trend and intercept at 1% or 10% significance level. However, after differentiating a number of variables become stationary. So, Hadri's unit root test confirms that the variables are non-stationary.

Table 5.7: Hadri Panel Unit Root Test Results

H0: Variable is Stationary ; H1: Variable Contains Unit Root

Variables	Z-Statistics (Without Trend)				Z-Statistics (With Trend)			
	Level	P-Value	1st Difference	P-Value	Level	P-Value	1st Difference	P-Value
RoA	7.6572*	0.0000	-1.3994	0.9192	-0.3580	0.6398	-0.8386	0.7991
HHI	18.0937*	0.0000	12.0295*	0.0000	12.9169*	0.0000	5.4947*	0.0000
CR5	19.8010*	0.0000	4.8011*	0.0000	7.0916*	0.0000	8.3315*	0.0000
TE	11.5873*	0.0000	-1.6016	0.9454	3.4012*	0.0003	-1.2726	0.8984
PTE	11.4843*	0.0000	-1.8292	0.9663	2.9658*	0.0015	-1.1594	0.8769
SIZE	19.4824*	0.0000	8.1501*	0.0000	10.7862*	0.0000	0.6784	0.2488
RISK	12.6600*	0.0000	7.5178 *	0.0000	9.2544*	0.0000	4.6347*	0.0000
LEV	4.8582*	0.0000	3.3659*	0.0004	10.2681*	0.0000	0.0342	0.4864
GDP	3.7747*	0.0001	-1.0878	0.8617	6.1222*	0.0000	-2.8500	0.9978
WPI	5.7751 *	0.0000	-3.1161	0.9991	-3.0787	0.9990	-3.2266	0.9994

Note: * Reject H0 at 1% level, ** at 5% level, *** at 10% level

b) Panel Cointegration Results

The next step is to conduct cointegration analysis to examine whether a long-run cointegration relationship exists among the variables. To determine the existence of cointegration relationship in the model, two tests Pedroni (1999), Kao (1999) are used. The results of both the tests are given in table 5.8, indicate that in all the four models, the null hypothesis of no cointegration is rejected by the Pedroni test statistics given by four test statistics at 1% level of significance. The Kao test statistics, also confirms cointegration in all the four models, ensuring a long-run cointegration between the variables in the panel.

Table 5.8: Panel Cointegration - Pedroni & KAO Test								
Test Statistic	Model-1		Model-2		Model-3		Model-4	
	Intercept	Intercept & Trend	Intercept	Intercept & Trend	Intercept	Intercept & Trend	Intercept	Intercept & Trend
(A) Pedroni Results: Ho: No Cointegration, H1: Cointegration								
Panel v-Statistic	-2.631046	-1.832797	-2.535225	-1.451761	-2.819027	-1.953901	-2.188704	-0.395809
Panel rho-Statistic	3.701155	4.647094	3.696775	4.787518	3.573934	5.339328	3.676116	4.865087
Panel PP-Statistic	-8.242631*	-16.43874*	-7.054028*	-11.58591*	-7.230174*	-9.266443*	-7.431622*	-14.00821*
Panel ADF-Statistic	-5.713066*	-7.084211*	-5.299091*	-5.638601*	-5.779207*	-3.036636*	-5.564901*	-5.722480*
Group rho-Statistic	5.789956	6.406168	6.057692	6.659972	5.968545	6.863718	5.743455	6.405904
Group PP-Statistic	-17.80128*	-22.01105*	-15.13921*	-19.16248*	-12.80402*	-13.78988*	-13.84684*	-20.77476*
Group ADF-Statistic	-4.673408*	-5.703566*	-2.988320*	-3.664543*	-2.776462*	-2.547503*	-4.251431*	-5.788073*
(B) KAO Results: Ho: No Cointegration, H1: Cointegration								
ADF	-7.727824*	-	-7.765276*	-	-7.196252*	-	-7.162102*	-
Note: Figures in (#) implies t-statistics ; * Significant at 1% level, ** Significant at 5% level, *** Significant at 10% level								

Note:

Model 1: ROA HHI TE SIZE RISK LEV GDP WPI; **Model 2:** ROA HHI PTE SIZE RISK LEV GDP WPI
Model 3: ROA CR5 PTE SIZE RISK LEV GDP WPI; **Model 4:** ROA CR5 TE SIZE RISK LEV GDP WPI

5.5.6 FMOLS Results

The cointegration results confirm existence of cointegration between the variables. FMOLS is estimated and the results presented in table 5.9. The following FMOLS model is used.

$$ROA_{it} = \alpha+\beta_1 (HHI_t/CR5_t) +\beta_2 (TE_{it}/PTE_{it}) + \beta_3 SIZE_{it}+ \beta_4 RISK_{it}+\beta_5 LEV_{it}+\beta_6 GDP_t +\beta_7 WPI_t + \mu_{it} \quad \ldots\ldots. (5.16)$$

In models 1 and 4, the market structure variables (HHI/CR5) are significant and positive, which implies that decline in market concentration increases profit of the life insurers. However, the efficiency (TE) variable shows a significant negative relationship with profitability in model 4 and insignificant relationship in model 1. Among the other firm specific variables of - size, risk, leverage, 'risk' alone shows a positive insignificant relationship with profitability (except in model 4), against the expectation of a negative relationship. In case of the other two firm specific variables, 'size and leverage' results are significant with positive coefficients. However, the macro-economic variables are significant in all the models and also the coefficients bear signs as expected.

Table 5.9: The FMOLS Estimates

Dependent Variable-ROA				
Regressor	**Model-1**	**Model-2**	**Model-3**	**Model-4**
HHI	0.52*** (1.58)	0.62*** (1.74)	-	-
CR5	-	-	0.05 (0.07)	1.65*** (1.74)
TE	-0.04 (-0.99)	-	-	-0.18* (-2.43)
PTE	-	-0.19 (-0.10)	-0.52 (-0.25)	-
SIZE	0.75*** (1.64)	0.86*** (1.70)	0.02 (0.87)	0.46** (2.04)
RISK	0.05 (0.51)	0.05 (0.20)	0.06 (1.30)	0.10** (2.25)
LEV	-0.22** (-1.95)	-0.16 (-1.27)	-0.17** (-2.26)	-0.28** (-2.42)
GDP	0.03* (4.17)	0.03* (5.90)	0.02* (4.19)	0.03* (3.26)
WPI	-0.01* (-3.47)	-0.02* (-5.02)	-0.01* (-3.19)	-0.01* (-2.99)

Note: Figures in (#) implies t-statistics; * Significant at 1% level, ** at 5% level, *** at 10% level

5.6 Concluding Remarks

To assess profitability, an attempt is made in this chapter to find out the important factors determining profitability of life insurance companies in India. Panel data models are employed to examine the relationship among structure, efficiency and performance of the life insurance industry.

The model employs ROA as the dependent variable, which is proxy for profitability of the life insurers and a set of independent variables, including two-industry specific factors like HHI/CR5 & PE/PTE, three-firm specific variables like 'size', 'leverage' & 'risk' and two macro-economic factors like 'GDP & Inflation'. The data set includes a panel of 13 life insurance companies for the period 2002-03 to 2012-13 (11 years).

To estimate equations, initially the linear panel models like fixed effects and random effects models are estimated. Further, to check the long run relationship between the variables, panel cointegration tests are used. The panel cointegration analysis follows three steps: first, to avoid any spurious correlation, stationarity of the variables are checked, i.e., whether the variable has a unit root. If the variables are non-stationary, in the second step the long-run relationship between the variables is tested, which is termed as cointegration test. Finally, if cointegration is confirmed then coefficients are estimated through FMOLS regressions.

Hadri's (2000) panel unit root methodology is used to test panel variables and Pedroni (1999) & Kao (1999) tests are employed to examine whether a long-run cointegrating relationship exists among the variables. As, the cointegration results confirm the existence of cointegration between the variables, FMOLS is used to estimate coefficients.

The panel regression is estimated by both the fixed effects and random effects models to investigate the determinants of profitability. However, Hausman's (1978) specification test recommended that fixed effects model is the appropriate model. The results of fixed effects model suggest that leverage, size, of the firm and two macro variables, GDP and inflation, are significant determinants of profitability while 'underwriting risk', market structure (HHI/CR5) and efficiency (TE/PTE) are not significant determinants of profitability.

The estimated panel regression results indicate that some variables are not significant, which may be due to the variables being correlated in the long run. So, the panel cointegration technique is used. The FMOLS results yield mixed results across the four estimated models. The market structure variables (HHI/CR5) are significant and positive with the TE variable in the model. However, the efficiency (TE) variable shows a significant negative relationship

with profitability in CR5 and insignificant in HHI. Risk shows a positive insignificant relationship with profitability, against the expectation for a negative relationship. The other two firm specific variables, 'size and leverage' results are significant with positive coefficients. However, the macro-economic variables are significant in all the models and also the coefficients bear signs as expected.

To conclude, profitability of the life insurers is positively influenced by the insurer's size (as explained by logarithm of total assets) and leverage (liabilities to assets ratio). Further, the industry specific factors like market structure (HHI/CR5) also affects the life insurer's profitability with a positive relationship; i.e. competition in the industry increases profitability of the life insurers. This study does not find any evidence on the relationship between 'underwriting risk' and 'profitability'. Additionally, macro-economic variables, GDP and inflation, have significant positive and negative relationship with profitability of the life insurers in India respectively.

5.7 Competition, Efficiency and Profitability

The Competition, Efficiency and Profitability of life insurance companies in India has been discussed in detail chapters III, IV, and V respectively. Now, the question arises that whether competition really results in efficiency and then profitability for the insurers. In economic theory, competition is considered as a positive force to increase efficiency and enhance consumer's welfare. However, the existence of a link between market structure and efficiency, was first proposed by Hicks (1935), who argues that monopoly power allows managers a quiet life free from competition and therefore increased concentration should bring about a decrease in efficiency. Leibenstein (1966) claims that inefficiencies are reduced by increasing competition as managers respond to the challenge. Berger and Hannan (1998) relate the impact of market structure on efficiency to several related reasons: (i) high levels of market concentration may allow firms to charge prices in excess of competitive levels and allow manages to benefit from higher prices not necessarily as higher profits but as 'quiet life' (i.e. managers don't need to work hard to keep costs under control); (ii) market power may allow managers to pursue objectives other than firm profits; (iii) management may use resources to obtain and maintain market power; and (iv) the higher prices charged when exploiting market power allow inefficient managers to persist. Berger and Hannan (1998) conclude that market power may allow for managerial incompetence to persist and therefore negatively impact cost efficiency.

In the traditional industrial economics literature, the SCP hypothesis is based on the assumption that concentration weakens competition by fostering collusive behaviour among firms. Increased market concentration was found to be associated with higher prices and greater than normal profits (Bain, 1951). However, a number of banking studies suggest that concentration does not substantially increase bank profitability (Berger, 1995) as predicted by the SCP hypothesis. To explain these contradictory findings, Berger and Hannan (1997) argue that banks in more concentrated markets may take advantage of market power in pricing not for earning higher profits but to allow costs to rise as a consequence of slack management. Increased concentration, therefore, has a negative impact on bank efficiency. However, this explanation also implies a lack of market discipline created by market concentration.

On the other hand, the efficient structure hypothesis, postulates a reverse causality between competition and efficiency. According to the efficient structure hypothesis, more efficient firms have lower costs, which in turn lead to higher profits. Therefore, the most efficient firms are able to increase their market share, resulting in higher concentration. Firms may be exploiting greater x-efficiency or greater scale efficiency. If higher market concentration lowers competition, according to the efficiency hypothesis there should be an inverse relationship between competition and efficiency, thus reversing the causality running from efficiency to competition in the SCP paradigm. Berger (1995) finds some evidence that the efficiency hypothesis holds in US banking. In Europe, on the other hand, structural factors appear to be more important and the SCP hypothesis seems to hold (Goddard et al., 2001). However, the debate on "collusion" versus "efficiency" has not yet been satisfactorily resolved (Goddard et al., 2007).

In the post reform period, the study found that the level of concentration in Indian life insurance industry has declined, though the speed of reduction is noticeably slow. In other words, competition in the Indian life insurance industry has increased but at a slower pace. The post 2012-13 results indicate a rise in concentration, due to LIC's gain in market share. Further, efficiency of the life insurers has improved but the average TE score (81.94%) in the post reform period suggests that life insurance business in India is moderately efficient. Interestingly, the total factor productivity (TFP) change, measured by MPI, in the said period is negative -0.05%, which is contributed by an improvement in technical change (catch-up) by 5.6% and a decline in technical efficiency change (frontier-shift) by 3.6%. This result is surprising, as expected a higher TFP, due to deregulation, reduced concentration and

moderate efficiency of the Indian life insurance sector in the post reform period. Further, profitability of the life insurers in India is positively influenced by the insurer's size (as explained by logarithm of total assets) and leverage (liabilities to assets ratio). The market structure, measured by the concentration indices HHI/CR5, is having a significant and positive relationship with profitability. That means an increase in competition implies an increases in profit of the life insurers. While, the efficiency, measured by TE and PTE, have a negative relationship with profitability, the results are insignificant.

Thus, in the post reform period, deregulation of the Indian life insurance sector has intensified competition among the insurers, which has had a positive impact on the insurers' profitability and efficiency. However, there is an inconclusive relationship between the efficiency and profitability of the life insurers. Finally, it seems that deregulatory efforts have had a small effect on productivity change for the life insurance companies in India. It is also seen that in recent period the monopoly power of LIC is increasing, which may other life insurers into difficulty as far as their profitability is concerned. Hence, there is a large room for the regulator and Government to increase competition and efficiency to see it that sector stays profitable in long-run.

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Chapter VI

Insurance Regulation in India: Progress Made and the Way Forward

6.1 Introduction

Insurance business is fundamentally based on trust, wherein policyholders buy insurance contracts to avoid the associated risk to their life (own and family members') and properties. So, insurance companies pull a huge amount of funds by selling insurance contracts, which needs to be safeguarded for the interest of the policyholders. To uphold policy holders' interest, insurance companies around the world are regulated by the state in some form or the other with the objective that the business is carried out fairly and conducted by competent people, so that it does not result in undue losses to the insurers themselves resulting in their insolvency and protects the legitimate interests of the insuring public. However, there is no straight jacket available for regulation of the insurance companies around the world and the regulatory structure of insurance companies differs from each other. Each country has its own laws and regulatory arrangements depending upon its experience, current needs, administrative capabilities existing political system and economic ideology. The degree of regulations varies from country to country, starting from the very tight control to liberal supervision. All the regulatory systems aim at finding out the financial conditions of the insurers and their practices with a view to take timely and corrective remedial actions wherever necessary to ensure safety of the policyholder's funds.

In India, insurance regulation is an age old; however, the first major milestone in this journey which was passage of the Insurance Regulatory and development Authority (IRDA) Bill in the Parliament and opening of the sector for private players in 2000. The objective of deregulation was to expand the coverage and spread awareness about insurance, in a view that the interest of the policy holder's would be better served. It was also felt that the country has a vast potential market to be tapped, which can be done only when the competition in the industry will intensify and the companies will spread their wings across the country by offering a variety of products catering to the demands of the people. It was also recognised that competition would generate a healthy attitude towards redressal of consumer grievances and improve the quality of service. So, the sector has passed over a decade of experiencing of public and private sector operating together and the industry has achieved phenomenal growth in almost all areas. However, certain regulatory actions as well as external events in the past few years have questioned the future performance of the industry. So, in this Chapter,

an attempt is made to list out the important regulatory changes that have transpired and its impact on the life insurer's business indicators.

The rest of the Chapter is structured as: Section 2 that discusses the need for insurance regulation and Section 3 briefly summarize the regulatory framework around the world. Section 4 portrays a brief evolution and progress of insurance regulations/laws in India. The impact of FDI limit hike in the insurance companies is discussed in section 5. In section 6, role of regulatory bodies and other associations/councils that are influencing policies in India are tinted. A brief review of assessment of the sector by IMF, World Bank and RBI is discussed in section 7. The recent regulatory changes by IRDA are summarised in section 8 and its impact on the business operations of life insurers in India are analysed in section 9. Finally, before concluding, in section 10, some suggestions are recommended for the revival of the Indian life insurance industry based on our and outside industry analysis.

6.2 Need for Insurance Regulation

Regulation is needed for any industry to safeguard the interest of the stakeholder or participants for a smooth functioning of firms operating in the industry. However, insurance regulation is a special one, as asymmetric information flow cannot be eradicated entirely. So, there are primarily two reasons for insurance regulation: *first*, the nature of insurance as a contingent claim for which the insured pays in advance creates the need to instil some guarantee of insurer's performance. It may be noted that this in itself is an insufficient reason since it is true of any inter-temporal contract. However, the 'long tail' of some insurance contracts, such as personal liability claims, obviously creates special problems which may provide a justification for regulation. *Secondly,* parties to insurance contracts typically have different bargaining positions and levels of knowledge with respect to the range of exposures. Insurers have access to actuarial data that policyholders do not have. This information asymmetry leads to complex insurance contracts. This is the standard 'consumer protection' argument for regulation. Hence, insurance regulatory responsibilities are divided into two major categories; *solvency regulation and market regulation.* Solvency regulation aims to protect the interest of the policy holders against the risk of those insurance companies that will not be able to meet their obligations. However, market regulation ensures fair insurance prices, products and trade practices. Although both the objectives are interlinked, solvency regulation is concerned with the rights of existing policy holders, whereas market regulation is more oriented towards prospective customers.

Thus, regulations define the requirements of an insurer, provide consumer protection through the supervision of insurers to safeguard their solvency and thus shield the customer from buying insurance from an unsuitable company. More specifically, insurance regulation helps to protect customers from misleading sellers and unfair claims practices; protect the financial viability of insurance companies; define the general features of insurance, duties and responsibilities, conditions for the entry and exit of players in the market and guarantee a level playing field in the market. So, there is a need to make the regulatory framework robust, introduce risk-based prudent regulation, remove non-prudent barriers to entry and investment, nurture a vibrant insurance culture, implement international standards and practices (including documentation), improve the human capital of both local market participants and regulators, and promote efficient and transparent markets.

6.3 Regulatory Framework: A Cross Country Analysis

Regulations either promote insurance provisions or hinder insurance businesses. So, a conducive regulatory framework is essential to achieve sustainability and at the same time needed for expanding insurance coverage to all the people in a country. To have a clear insight of the regulatory practises around the world, a cross country comparison of the regulatory framework of major countries on various parameters is listed below:

Table 6.1: Cross Country Comparison of Regulatory Framework in Insurance Regulation					
Parameters	**US**	**UK**	**Singapore**	**Germany**	**India**
Regulatory Authority	National Association of Insurance Commission (NAIC)	Financial Services Authority	The Monetary Authority of Singapore	Ministry of Finance	Insurance Regulatory and Development Authority (IRDA)
Supervisory Authority			Insurance Supervision Department		
Financing	-	By the state budget & insurance industry	By the Central Bank only	By the state budget & insurance industry	By the Central Government
Separation of Life and Non-life Business	Separated	Separated	Composite	Separated	Separated
Licensing Requirements	Legal form of company limited by shares and public limited company				Any organization should be incorporated under the Companies Act, 1956 and possess the certificate of the memorandum of association and articles of association to be able to apply for an insurance license
Business Plan	Required	Required	For the first five years	Required	Not required
Shareholder Information	Approval of shareholders and identification		No provision	Approval of shareholders and identification	Information is required: Due diligence is conducted
Financial Requirements	Require that insurance companies possess a certain minimum capital as a condition for authorization				1) Applicant should have Rs 1 billion or more paid up equity share capital for the life insurance or general insurance business; 2) Applicant should have Rs 2 billion or more paid up equity share capital for the re-insurance
Specific Requirements for Branches & Subsidiaries	17 states have no mechanism for licensing the initial entry of a non-US insurance company	The system of the single authorization (European passport) permits any insurance company, to offer in the other EU members	Application of the "market need test"	-	Joint Venture with Indian Company with investment Cap of 49%
Reporting	To submit a financial report at least once a year (annual report) usually holding the annual accounts (balance sheet, profit and loss accounts, additional notes), an annual statement of the solvency margin, and statements concerning premium income due, losses, reserves, assets, etc.				
Premium Rates	Detariffication				
On-Site Inspection	1) Once every five years 2) On-site inspection of foreign branches allowed				1) Once every year
Solvency Supervision	In the US, another method employing risk based capital (RBC), is used	The method of assessing solvency rests on the principle of a solvency margin			The method of assessing solvency rests on the principle of a solvency margin, which is 150%. IRDA plans to implement Solvency III norms

Table 6.1: Cross Country Comparison of Regulatory Framework in Insurance Regulation					
Parameters	**US**	**UK**	**Singapore**	**Germany**	**India**
Technical Provisions	Life: mathematical reserves; Non-life: unearned premiums, claims outstanding and claims incurred	Life: mathematical reserves; Non-life: equalization reserve	Life: mathematical reserves; Non-life: unearned premium reserves, unexpired risks reserve & claims reserves	Life: "mathematical reserves" Non-life: equalization reserve	No provisions
Investments Ceilings & Floors	Prudent person management Approach		A set of maximum limits associated with the solvency assessment	Quantitative restrictions	Exposure and prudential norms for various instruments
Foreign Investments	No restrictions	No restrictions	No restrictions	Between 5-20% based on the foreign assets	No restrictions
Investment Valuation	Valued at market price		Lower of historical cost or market value	Life: Lower of historical cost or market value Non-life: Valued at historical cost	Independent by the Actuaries
Reinsurance Arrangements	Approval required				
Actuaries	Independent of insurance company	Only life insurance companies, an age requirement (at least 30) has to be met	Only life insurance companies	Evidence of competence and reputability is required	Independent of insurance company
Compulsory Insurance	Compulsory motor third party liability insurance		Compulsory motor third party liability and Accident insurance		Compulsory motor third party liability insurance
Insurance Distribution	Brokers need to be licensed and agents need to be registered	Brokers also have to establish financial guarantees in order to practise	Regulation exists for brokers and agents both, brokers also have to establish financial guarantees for practise	No regulations	Brokers need to be licensed and agents need to be registered
Taxation	Tax exemption for benefits paid		Tax incentives on purchase of life insurance		Tax exemption for benefits paid
Liquidation	The insurance company may file for bankruptcy		Report the existence of preferential status for policyholders in the liquidation procedure	Only the supervisory authority may file a petition in bankruptcy	The insurance company may file for bankruptcy

6.4 Review of Insurance Regulations/Laws in India

In the initial years, insurance business in India was conducted without any specific regulation but the companies were subject to the *Indian Companies Act 1866*. However, with the advent of 20th century, a large number of insurance companies, mostly Indian, were floated. This uncontrolled growth of the number of insurers pushed some of the companies into financially unsound and went insolvent. Hence, the need for regulation of the insurance business was felt by the Government. A brief highlights of the evolution and growth of insurance laws in India is given below:

6.4.1 Insurance Legislation 1912

The first legislation was passed by the then British Government in India, i.e. the Life Insurance Companies Act 1912, which includes two sets of regulations: (*i) the Indian Life Insurance Companies Act and (ii) the Provident Insurance Societies Act.* The Act of 1912 brought in a measure of control over Indian life insurance offices by necessitating the certification of rate tables and periodical valuation by an actuary. There are several striking features of these legislations; *first,* this was the first legislation in India that particularly targeted the insurance sector. *Secondly,* the legislation left the general insurance business out, as the Government did not feel the necessity to regulate it. *Thirdly,* they restricted activities of the *Indian insurers* but not the *foreign insurers* even though the model used was the British Act of 1909. Thus, it creates discrimination between foreign and Indian insurance companies putting Indian Insurance Companies at a disadvantage. It created resentment among the Indian insurers and they took up the matter with the Government for corrective action. All in all, the ***Insurance Act 1912*** provided the first legislation aimed at regulating the insurance companies.

The only significant legislative changes before the insurance Act 1938 was **Act XX of 1928**. It enabled the Government of India to collect information regarding *(i)* Indian Insurance Companies operating in India, *(ii)* Foreign Insurance Companies operating in India and *(iii)* Indian Insurance Companies operating in foreign countries. The last two points were missing in the Insurance Act 1912. Thus, the collected information allows comparison of the average size face value of Indian Insurance Companies against their foreign counterparts.

6.4.2 The Insurance Act, 1938

In 1937, the Government of India set up a consultative committee under the Chairmanship of Mr. Shusil C. Sen. Finally, the **Insurance Act, 1938** was passed to bring about order in the

industry; it also brought other fundamental changes, including the creation of an insurance wing in the Ministry of Finance. This piece of legislation was the first comprehensive one in India; it also covered both life and general insurance companies. The important legislations include deposits for life insurance business, supervision of insurance companies, investments, commission of agents and directors appointed by the policy holders, among other. The main features of the Act are:

- Constitution of a Department of insurance under a superintendent vested with wide powers of supervision and control over life as well as non-life insurance companies. It also provided for compulsory registration of insurance companies and for filing of returns of investment and financial conditions.
- Provision for deposits to prevent insurers of inadequate financial resources and also to check them from speculative activities. Additionally, it also recommended that 55% of the net life fund of an Indian or non-Indian insurers should be invested in Indian Government and other approved securities with at least 25% in Indian Government Rupee securities. The foreign companies must invest 100% of their Indian liabilities in Indian Government and approved securities with at least 33.3% in Indian Government securities.
- Prohibition of rebating, restriction of commission, licensing of agents. Maximum rates of commission for life business are fixed at 40% of the first year's premium and 5% of the renewal premium.
- The Insurance Act permitted appointment of' Principal agents' who received commission for non-life insurance at the rate of 15% in case of marine and 20% for other business, including commission to their agents.
- Periodical valuation of Indian business of the foreign companies and the business of the Indian companies. Provision for policyholder’s representative as director on the board of the Insurance Companies.
- Standardisation of policy conditions required all companies to file standard forms and tables of *premia* approved by an actuary. Under this provision, the initial deposit for life insurance business was raised from Rs 25,000 to Rs 50,000 in Government securities to be raised to Rs 2 lakh within a specified time limit.

The Act 1938 when put in operation revealed many shortcomings. So, in the subsequent years, amendments to the Act were effected in 1939, 1940, 1944 and 1945 covering the issue of the regulation of the insurance business and the shortcomings of the Act 1938 were

considerably removed. The Act provided a strict control over the insurance companies' and their operations but could not check the malpractices of some of the insurer's which developed in the 1940's. These are mainly of two types: (i) Malpractices that had crept into the management of the insurance companies, especially during the forties, such as acquisition of insurance companies by financiers and use of life insurance funds to serve other enterprises in which the financier had commercial interest or for speculation, payment of large emoluments to nominee of the controlling interests and at times interlocking the funds between banks and insurance companies; and (ii) Malpractices also developed relating to excessive costs, unchecked rebating and inefficient management in some of the companies. Several representations were made to the Government to take remedial actions. The Government appointed a committee to study all the malpractices brought to its notice by various interest groups and promised to bring out legislation on the basis of the report of the committee.

6.4.3 The Insurance Act 1950

The Government enacted the Insurance Act 1950 to check the malpractice in insurance business and also to exercise more strict control over the operation of the Insurance Companies. The main provisions of the Act 1950 are as follows:

- Comprehensive and stringent control over the insurance companies by Government was provided. The superintendent of insurance was redesigned as the controller of Insurance and was widely empowered to exercise effective control over the insurers.
- The Life Insurance Council and General Insurance Council are accorded statutory recognition and empowerment to guide the insurance companies.
- The provision empowered the Government to appoint administrator, as its nominee to manage the business of financially weak insurance companies. Interlocking of interest between insurance companies and banks was totally stopped.
- The controller of insurance was empowered to supervise the operation of the insurance companies more strictly and inspect their books of accounts.
- The Act defined the "Approved Investment" on certain criteria and the investment share of the insurance fund in the approved investment fixed to ensure safety of the fund. This provision provided investment of 50% of the insurance fund in Government and other approved securities and guidelines are laid down for the investment of the remaining 50% of the fund of insurers.

The Act 1950 brought effective control of the Government over the entire insurance industry. It was widely commended by the policyholders as well as the insurers. However, some unscrupulous insurers still resorted to the malpractices and public opinion was built in favour of total Government control, which was possible only after nationalisation of the insurance industry.

6.4.4 Post-Nationalisation Regulation

The Insurance Act 1938 and 1950 has created a strong & powerful supervisory and regulatory authority in the controller of Insurance. During the period 1938 to 1955, the controller of insurance exercises the powers effectively to control the operation of the insurance business in India. The powers of the controller are very comprehensive and include powers to direct, advise, caution, prohibit, investigate, inspect, prosecute, search, seize, fine, amalgamate, authorise, register and liquidate insurance companies.

In 1956, Life Insurance Corporation (LIC) of India was formed by an Act of Parliament (LIC Act 1956) in the way of consolidation of 245 Indian and foreign insurers and provident societies, with a capital contribution of Rs 5 crore from the Government of India. Further, the General insurance business in India, also nationalised through, General Insurance Business (Nationalisation) Act 1972, with effect from 1st January 1973. There are 107 general insurers amalgamated and grouped into 4 companies, namely National Insurance Company Limited, New India Assurance Company Limited, Oriental Insurance Company Ltd and United India Insurance Company Ltd. The General Insurance Corporation of India (GIC) is incorporated as a company. The nationalisation happened in the belief that the nationalised industry did not require any supervision and that it's accountability to Government through the insurance division of Finance Ministry would be adequate. This control could be exercised as the Heads of LIC and GIC are Government appointees and were responsible to the Ministry of the Finance. Further the LIC and GIC have Government officer generally secretary (Insurance) on their Board as Director and hence all major decisions of these two insurance companies are thoroughly scrutinized by the Government. The LIC and GIC are also subject to the Parliamentary control and Annual Reports incorporating all the statutory statements are to be submitted to the Government and Parliament for information and framing guidelines by the Government. Government also issued exhaustive guidelines for investment of the 'Insurance Fund' from time to time.

Hence in the post-nationalisation era, most of the regulatory functions were taken away from the controller and vested in LIC and GIC. In law, the controller of the insurance was still the supervisory and regulatory authority for the insurance industry. However, in practice, it was with the insurance division of Finance Ministry, which has emerged as the controller of the insurance companies. The joint secretary of the insurance division is designated as the controller of insurance and worked under the secretary (Insurance) of Finance Ministry, Government of India.

6.4.5 Insurance Sector Reforms: 'Malhotra Committee Recommendations'

With the advent of Economic Reforms in India in 1991, the Government of India formed a committee under the Chairmanship of former RBI Governor R.N. Malhotra (known as ***Malhotra Committee***), to evaluate the Indian insurance industry and to recommend its future direction. The committee was set up with the objective of complementing the reforms initiated in the financial sector. The reforms were aimed at creating a more efficient and competitive financial system suitable for the requirements of the economy keeping in mind the structural changes currently underway and recognising that insurance is an important part of the overall financial system where it was necessary to address the need for similar reforms. In 1994, the committee submitted its report. Some of the key recommendations are detailed below:

- **Structure:** Government's stake in the insurance Companies to be brought down to 50%. Government should take over the holdings of GIC and its subsidiaries so that these subsidiaries can act as independent corporations. All the insurance companies should be given greater freedom to operate.
- **Competition**: Private companies with a minimum paid up capital of Rs 100 crore should be allowed to enter the sector and no company should deal in both Life and General Insurance through a single entity. Foreign companies may be allowed to enter the industry in collaboration with the domestic companies. Postal Life Insurance should be allowed to operate in the rural market. Only one State Level Life Insurance company should be allowed to operate in each state.
- **Regulatory Body:** The Insurance Act should be amended and an Insurance Regulatory body should be set up. Controller of Insurance - a part of the Finance Ministry - should be made an independent regulator, like SEBI.

- **Investments:** Mandatory Investments of LIC Life Fund in Government securities to be reduced from 75% to 50%. GIC and its subsidiaries are not to hold more than 5% in any company (their current holdings to be brought down to this level over a period of time).
- **Customer Service:** LIC should pay interest on delays in payments beyond 30 days. Insurance companies must be encouraged to set up unit linked pension plans. Computerisation of operations and updating of technology to be carried out in the insurance industry.

The Committee emphasised that in order to improve the customer services and increase the coverage of insurance policies, industry should open up to competition. But, at the same time, the committee felt the need to exercise caution as any failure on the part of new players could ruin public confidence in the industry. Hence, it is decided to allow competition in a limited way by stipulating the minimum capital requirement of Rs 100 crores. The committee felt the need to provide greater autonomy to insurance companies in order to improve their performance and enable them to act as independent companies with economic motives. For this purpose, it is proposed to setup an independent regulatory body - The Insurance Regulatory and Development Authority (IRDA).

6.4.6 IRA Bill in Parliament (1st Phase of Insurance Reform)

To promote competition and efficiency in Indian insurance industry, the Insurance Regulatory Authority (IRA) Bill is introduced in Parliament in December 1996 by the then finance minister, Mr. P. Chidambaram. The Bill came up for discussions in Parliament in its monsoon session in August 1997 but was withdrawn due to the lack of support from the Congress MPs as most of them were away in Calcutta to attend the convention of the Congress Party. The BJP and left parties were also opposing the Bill. However, the United Front Government promised to introduce the Bill in the winter session in December 1997. Meanwhile, in November 1997, the Congress Party withdrew support and the Government at the Centre fell and mid-term poll was announced.

The BJP-Led Government was installed at the centre after the general election in mid-March 1998. The Government was in favour of opening the insurance sector to private Indian Companies but the *Swadeshi lobby* of the BJP party did not want to open the insurance sector to the foreign insurers. In the first budget of the BJP-led Government presented to the Parliament on 01 June 1998 by the Finance Minister Mr. Yashwant Sinha, the Indian insurance market, hitherto, a monopoly of the central Government was proposed to be opened

to private Indian companies. The operative portion of the Finance Bill relating to insurance reform is reproduced below:

The BJP-Led Government has introduced the Insurance Regulatory Authority (IRA) Bill in the Parliament in December 1998. This is a Comprehensive Legislation intended to amend LIC Act 1956, GIC Act 1972, and Insurance Act 1938 and also to grant statutory status to the IRA. The IRA Bill, after introduction in Parliament, has been referred to the standing Committee of the Parliament for scrutiny, thereafter the IRA bill, will be taken for consideration and approval in the Budget session of the Parliament Commencing in February 1999. The IRA bill is accepted and approved in the Parliament in its ensuing budget session. Thereafter the deck fully cleared for entry of the Private insurers to the Indian Market. The IRA bill has Proposed 26% equity ownership of the foreign investment allowed by NRI and foreign financial institutional investors in the Indian Insurance Company.

Finally, Government of India liberalised the insurance sector in March 2000 with the passage of the Insurance Regulatory and Development Authority (IRDA) Bill, 1999 lifting all entry restrictions for private players and allowing foreign players to enter the market with a 26% cap on equity participation. The IRDA since its incorporation as a statutory body in April 2000 has fastidiously stuck to its schedule of framing regulations and registering the private sector insurance companies. Since being set up as an independent statutory body the IRDA has put in a framework of globally compatible regulations. The other decision taken simultaneously to provide the supporting systems to the insurance sector and in particular the life insurance companies was the launch of the IRDA's online service for issue and renewal of licenses to agents. The approval of institutions for imparting training to agents has also ensured that the insurance companies would have a trained workforce of insurance agents in place to sell their products. With the privatization/deregulation of the sector in late 20th century, the Insurance Act 1938 has turned out as the backbone of the current legislation of insurance companies, as Insurance Regulatory and Development Authority Act of 1999 was superimposed on the Insurance Act 1938.

6.4.7 Insurance Laws (Amendment) Bill (2nd Phase of Insurance Reform)

With a view to amend the Insurance Act 1938, the General Insurance Business (Nationalization) Act, 1972 and the Insurance Regulatory and Development Authority Act, 1999, the Insurance Laws (Amendment) Bill, 2008, was introduced in the Rajya Sabha on 22nd December, 2008. The Bill redefines certain types of insurance and allows for foreign

investors to hold up to 49% of the capital in an insurance company. It provides for nationalized general insurance companies to raise funds from capital markets with the permission of the central Government. The Bill changes norms governing the rights of policyholders and insurers with respect to insurance policies. It enhances penalties for a range of offences and prescribes a procedure for appeals against decisions by IRDA. The Bill requires life and general insurers to have a minimum capital of Rs 100 crore and health insurers are required to have a minimum capital of Rs 50 crore.

The Bill was introduced in the Parliament but referred to the Standing Committee on Finance (under the Chairmanship of Shri Anant Kumar) for examination and suggestions. The Standing Committee submitted its report to Parliament on 13th December 2011. There are a total of 111 clauses in the Insurance Laws (Amendment) Bill, 2008. However, the Union Cabinet on 11 May 2012 deferred a decision on modifications to the insurance amendment bill as it did not see great hurry in moving changes to the law if it could not increase the foreign direct investment in the sector. After the Modi led NDA Government assumed charge, the finance Minister Mr. Arun Jaitly, announced in his first Union Budget 2014-15 speech on July 10, 2014, an increase in the FDI limit up to 49% from 26% with full Indian management and control through the Foreign Investment Promotion Board (FIPB) route.

In the winter session of the parliament in December 2014, the Cabinet cleared the parliamentary (Select) committee's recommendations for a composite cap of 49% on foreign investment in insurance, which includes both foreign direct investment and foreign portfolio investments. The select committee had in its report recommended 110 amendments to the Bill. In order to win Congress support, it had adopted 88 amendments proposed by the Congress earlier. However, the bill was stuck in the Rajya Sabha where the NDA is in minority.

On 26 December 2014, Government has passed the Insurance Laws (Amendment) Ordinance 2014, which is virtually the entire Insurance Bill as amended by the Select Committee. The main changes to the existing law include the following: (i) raising foreign investment cap to 49%, with management 'controlled'[1] by Indians; (ii) allowing foreign companies to open branches to undertake reinsurance business in India; (iii) permitting Lloyd's to access the Indian market as the branch of a foreign Reinsurer; (iv) the Securities Appellate Tribunal (SAT) hearing appeals against the orders or decisions of the IRDA and (v) imposing fines for

[1] The definition of "control" is borrowed from the Companies Act 2013, and is defined as the right to appoint a majority of the directors, to control management, and to control policy decisions

carrying on insurance business without registration. Fines for other breaches of the statutory and regulatory framework have also been significantly increased. Finally, on 12 March 2015 the Insurance Laws (Amendment) Bill 2014 was passed in the Parliament.

Summary of Insurance Regulation in India

The table 6.2 and figure 6.1 briefly summarise all the legislative changes happen in the Indian insurance industry during the period from 1912 to 2015.

Figure 6.1: The Indian Insurance Industry: Path to Liberalisation

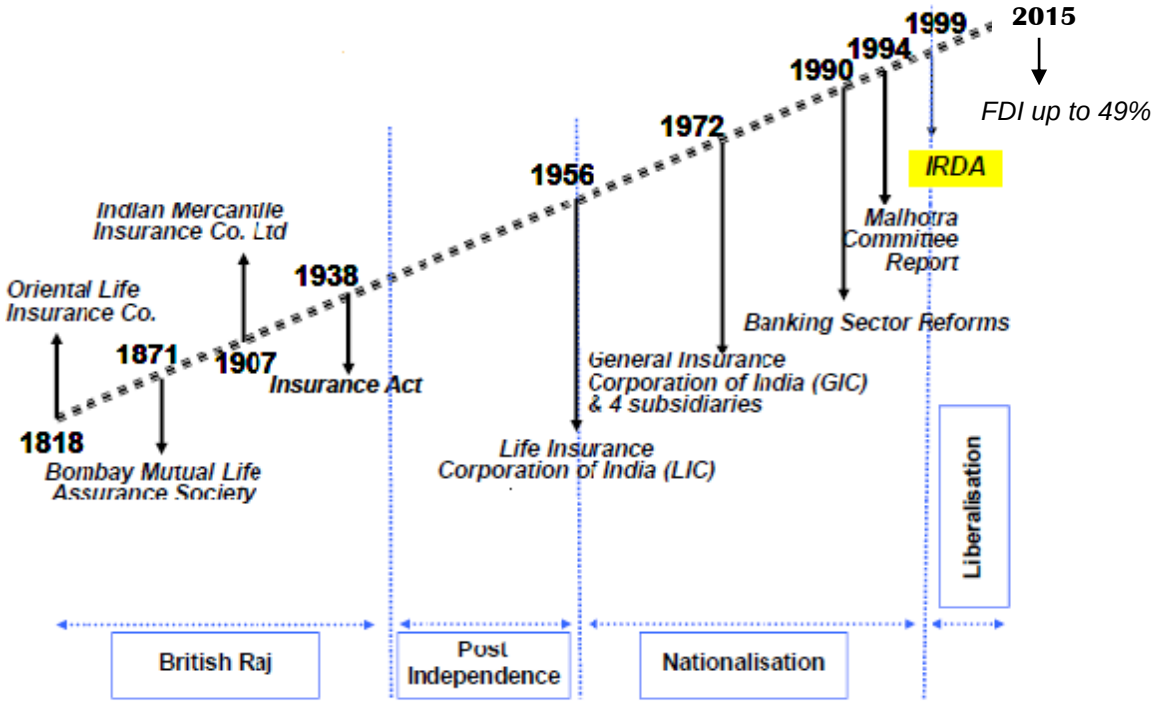


Table 6.2: Milestones of Insurance Regulations in India

Year	Significant Regulatory Event
1912	▪ The Indian Life insurance Company Act
1928	▪ Indian Insurance Companies Act
1938	▪ The Insurance Act: Comprehensive Act to regulate insurance business in India
1956	▪ Nationalization of Life Insurance Business in India with a monopoly awarded to the life insurance corporation of India
1972	▪ Nationalization of General Insurance Business in India with the formation of a holding company General Insurance Corporation
1993	▪ Setting Up of Malhotra Committee
1994	▪ Recommendations of Malhotra Committee Published
1995	▪ Setting up of Mukherjee Committee
1996	▪ Setting up of (interim) Insurance Regulatory Authority (IRA) Recommendations of the IRA
1997	▪ Mukherjee Committee report submitted but not made public
1997	▪ The Government gives greater autonomy to LIC, GIC and its subsidiaries with regard to the restructuring of the boards and flexibility in investment norms aided at channeling funds to the infrastructure sector.
1998	▪ The Cabinet decides to allow 40% foreign equity in private insurance companies; 26% to foreign companies and 14% to Non-resident Indians and foreign institutional investors
1999	▪ The Standing Committee headed by Mr Murali Deora decides that foreign equity in private insurance should be limited to 26%. The IRA Bill is renamed the Insurance Regulatory and Development Authority Bill
1999	▪ Cabinet Clears Insurance Regulatory and Development Authority Bill
2000	▪ President Gives Assent to the IRDA Bill
2005	▪ De-tarrification of marine hull
2007	▪ De-tarrification of all general insurance products except of the auto third-party liability segment
2008	▪ Insurance Laws (Amendment) Bill, 2008 introduced
2011	▪ Standing Committee submitted its report to Parliament
2014	▪ Union Budget 2014-15 proposed to increase the foreign direct investment (FDI) limit in the insurance sector, up to 49% from 26% with full Indian management and control under FIPB route
2015	▪ Government on 12 March 2015 passed the Insurance Laws (Amendment) Bill 2014 in the parliament, which would become an act

6.5 FDI Limit Hike and its Impact on the Insurers

The insurance industry in the last 14 years has attracted over Rs 33,749 crore of capital and over the next five to ten years the industry requires as much, if not more in terms of fresh capital to be able to fund its growth and expansion. With financial inclusion proceeding in full force, the timing of FDI limit hike up to 49% is a blessing, as coverage for insurance contracts can increase many folds, resulting in better pricing and lowering distribution costs. The FDI cap hike would help the insurance industry in two ways; *(i)* may help the insurer to access capital more easily, and (ii) could act as a trigger for the listing of insurance players. However, it is not clear about how FIPB will consider the proposal for approval of the extra 23% (49% minus 26%) investment in the company.

Table 6.3: Estimated Additional Capital Flows to the Sector due to FDI Limit Hike

Private Insurers	Equity Capital (` crore)		
	FY14	Scenario II	Scenario I
Life	25,839	11,627	6,537
Non-Life	6,226	2,802	1,718
Specialised Health	1,684	758	472
Total Equity Capital	**33,749**	**15,187 ($2.5 bn*)**	**8,727**

Source: IRDA; * assuming $1= Rs 62

This may happen in two scenarios: *first,* dis-investment of the Indian promoter's stake to 51% from 74%; or *Second,* by keeping the Indian promoter's stake at present level (in amount), but by increasing the foreign investments, so that the new ratio of domestic and foreign insurer's stake would be at 51:49. It is ideal that Government should favour the second scenario, i.e., to issue fresh shares for extra foreign investments, rather than sale of shares by domestic promoters. In this scenario, the estimates suggest that insurance companies may receive around Rs 15,187 crore ($2.5 billion, assuming $1 is Rs 62) of additional foreign investment in the way of hike in FDI limit. But, if Government will allow the domestic promoters to divest their stake (first scenario) in the insurance companies, a maximum of Rs 8,727 crore additional investments may flow to the industry, through foreign investments. However, the objective of hike in FDI limit may not be achieved, as the capital base will remain same and the insurers will not be able to expand their foot print to achieve the national agenda of financial inclusion.

It is estimated that the industry is expected to attract capital inflows of about Rs 40,000 crore to Rs 60,000 crore over the next 5 years and immediate inflows of around Rs 20,000 crore. If these projected levels of capital inflows materialize, the industry is likely to expand at a CAGR of about 15% over the next 10 years (Parida T K; 2015).

The impacts of these changes to different stake holders are outlined below:

- First, the insurance industry not only protects human life but also is a key resource for raising funds for the country's infrastructure. According to the 12th Plan, India needs to spend about $1.2 trillion on infrastructure build-up and expansion, and there's almost a $300 billion gap in funding. The increase in FDI limit in insurance is one way of meeting this requirement.
- Second, insurers need capital to maintain a healthy base, offer a wider bouquet of products, and protect consumer interests against insolvency. So, the increase in capital inflow will enable the insurers to offer products that are capital-guzzling, but work in the customer's interest without taking a toll on their bottom lines. It will also give domestic players, access to the state of art technology to upgrade their distribution systems towards deeper product expertise and better underwriting skills. The increased capital inflow is also likely to give a fillip to relatively new private life insurance companies that have seen a decline in new business premium over last two years.
- Third, the FDI limits hike also opens up doors for two non-life insurers (namely L&T General Insurance and Reliance General Insurance), one health insurer (namely Religare health insurance) and three life insurers (namely Exide life, Sahara India Life and Shriram Life) to sell their stakes to overseas companies, which is owned 100% by the Indian promoters. Further, this will also incentivise insurance intermediaries such as brokers and web aggregators through higher commissions.
- Fourth, the insurance bill may help the banking fraternity in two ways; (i) the big banks like SBI, ICICI Bank, may reap higher revenues (non-interest income) due to their wide distribution network, as international companies may pay a premium to exploit their franchise. (ii) If the first scenario of disinvestment is considered, then public sector banks (PSBs) may be benefited to sell their stake in insurance business to meet the capital requirement under Basel III. However, it is not advisable to PSBs to sell their stake in insurance, as banking business in the current scenario is under stress, with higher non-performing assets and low interest income.

6.6 Regulatory Bodies and Other Associations/Councils influencing policies in India

In India, IRDA regulates and supervises the different functions of the insurance companies in India.

6.6.1 Insurance Regulatory and Development Authority (IRDA)

IRDA was established under an Act of Parliament in the year 2000, with an objective to regulate and for the development of the insurance sector in India. In addition, it safeguards the interest of the policy holders. Some of IRDA's functions includes: (i) to regulate and promote the systematic growth of the insurance business in India; (ii) to recommend regulations for the investment of funds; (iii) to supervise for the maintenance of solvency margins; (iv) to resolve disputes between insurers and other stake holders; and finally (v) to supervise the functions of TAC.

6.6.2 Insurance Association and Insurance Councils

In addition to the regulator (IRDA) and Government of India, there are a number of supporting organisations and associations facilitating in the working of the Indian insurance industry smoothly. Some of them are brief outlined below:

6.6.2.1 Insurance Association of India

All insurance companies in India are members of the Insurance Association of India. However, it includes two councils: (i) The Life Insurance Council; & (ii) The General Insurance Council.

(a) Life Insurance Council

Life Insurance Council is a body set up under section 64C of the Insurance Act 1938, with an objective to convert the life insurance industry to a lively, trustworthy and profitable business, which will help the people towards prosperity in their journey. All the life insurers are members of the council and IRDA nominates two members from the Authority, one of whom is the Chairman of the Council. The Life Insurance Council functions through several sub-committees and includes all life insurance companies in India. In addition, as and when needed, specific areas of work are taken up at the meetings of ‘working groups’ constituted to discuss emerging issues. The committee based approach ensures participation and valuable contribution from senior executives of the industry. In short, it is the face of the Life Insurance industry.

(b) General Insurance Council

The other one is the General Insurance Council, which was formed under the section 64C of the Insurance Act, 1938. All the non-life insurers are members of the Council and are presented by their Chairman & Managing Director. The Council discuss the issues of common interest; participate in discussions related to policy development and act as an advocate for better customer service. The Council brought a number of initiatives by bringing together experts from non-life insurance companies, GIC Re and IRDA in a common platform for debating on different issues from time to time and helps them to resolve in a wise manner.

6.6.2.2 Insurance Information Bureau (IIB)

Data is the integral part of decision making process as all the management decisions in insurance industry are based on data. So, greater the availability and quality of data leads to more efficient decision making for the businesses and policymakers in the industry. In this context, IIB has been created to flip the data need of the whole insurance industry, which would empower the stakeholders in the way of provision of accurate, timely, reliable insurance data and analysis. The Bureau was setup by the executive order of IRDA on October, 2009 and has registered as a Society with Registrar of Societies, Government of Andhra Pradesh on 21st November 2012. The Society is administered by a Governing Council with 20 members from different fields like insurance, information technology and distinguished academicians and ex-officio members from the insurance councils and members of the Authority.

6.6.2.3 Insurance Advisory Committee (IAC)

Insurance Advisory Committee (IAC) was setup under the Section 25 of the IRDA Act 1999, to give advice to the Authority on matters regarding formation of regulations and on other such other matters as may be recommended. The Committee includes twenty-five members excluding ex-officio members from different areas like commerce, industry, transport, agriculture, consumer fora, surveyors, agents, intermediaries, organisations engaged in safety and loss prevention, research bodies and employees' associations in the insurance sector. The Chairperson and the members of IRDA is deemed to be the ex-officio Chairperson and ex-officio members of the Committee.

6.6.2.4 Ombudsmen

The insurance ombudsmen play a critical role for the smooth functioning of the insurance companies in India. The main objective of the ombudsmen is to address the complaints relating to claim settlements. In the year 2013-14, the 12 Ombudsmen centres across India received a total of 26,315 complaints, out of which 17,512 complaints (66.5%) relates to life insurance and the rest 8803 (33.5%) connect to the non-life insurers.

6.6.2.5 Tariff Advisory Committee (TAC)

The main task of TAC is to regulate and control the rates, benefits, terms and conditions that are to be offered by the insurance companies with connection to fire, marine, motor, engineering products. However, after the de-tariffing of non-life insurance business with effect from 1st January 2007, the regulatory and administrative role of the TAC is no longer in existence.

6.7 Review of Studies on Insurance Regulation

In literature, there is a few number of paper are available, that studies the regulatory aspect of insurance industry. As per McShane *et al* (2010), regulatory separation theory indicates that a system with multiple regulators leads to less forbearance and limits producer's gains. Fragmented regulations of the US life insurance industry provide an especially rich environment for testing the effects of regulatory competition. The paper finds positive relation between regulatory competition and profitability measures of this industry. The results have practical implications for the debate over federal versus state regulation of insurance and financial services in US. Regulations pertaining to capital adequacy, policy forms and rates, market conduct, and agent licensing are often not uniform. Further, regulatory compliance requirements and action can vary across state regulatory systems. The regulatory competition across the states in US leads to higher profitability for regulated insurers, which suggests greater forbearance by state regulators and a 'competition in laxity'. The test results for capital adequacy measures are also consistent with profitability.

Ranade and Ahuja (1999) presented an overview of the evolution of insurance sector in India for the pre liberalization era wherein they discussed emerging strategic issues that need to be addressed in the wake of liberalization. These included demographic trends (article referred to modern trends in Indian context that had positive effect on insurance business significantly i.e., emerging trend of nuclear families and increase in elderly population to defend themselves.), higher demand for pension plans/ schemes to be provided by insurance

companies (in India, apart from organized sector employees, there is hardly any social security for old age), competition with other saving assets, selling of life insurance through postal networks and issues of pricing. It was also mentioned that information and technology could play critical role in the life insurance business as it requires profiling of huge customer data.

Ahuja (2004) in his paper pointed out four areas where regulators are required to do the necessary which includes pension and health (health insurance premium is growing at an impressive rate, total health premium is still small given the fact that health is de-tariffed segment and recent issues with respect to third party administrators - TPA) insurance, phasing off tariffs, strengthening of self-regulation and reviewing capital requirement. As opined by the author, the success ultimately would depend on the efficiency of implementation of regulations.

After liberalization of the sector, *Ministry of Finance* jointly with the Reserve Bank of India (RBI) reviewed the sector in 2009 and reported that the life insurance business indicators are in accordance with standard capital adequacy requirements. The committee raised a concern about the solvency ratio of LIC, which was at the stipulated minimum regulatory norms by IRDA. There were no concerns about the asset quality, profitability and liquidity of the insurance companies.

In 2013, the *IMF and World Bank* assessed the sector and reflected on improved levels of compliance and significant progress made in the compliance post the self-assessment in 2009. The Detailed Assessment Report (DAR) has commended for relatively well developed insurance regulation and supervisory architecture in India particularly in the areas of licensing, consumer protection, market oversight and transparency. The report mentioned that IRDA's on-going supervision of insurance companies and market is tight and displayed a strong level of control and that the insurance industry in India has relatively large footprint as compared to other forms of financial intermediation given India's income levels, in comparison with other developing countries. This is particularly apparent when measured in terms of the total assets under management (AUM). The life AUM to GDP figure of 16.8% puts India in the same general range as a number of developed countries, although underlying drivers vary. India is a clear outperformer in terms of expected life insurance penetration, and is broadly in line with expectations in the non-life sector. While the pre-conditions of effective supervision are broadly met, it has been further commented that the IRDA is taking steps to address different issues raised in the assessment report.

In a press release on 29 August 2013, IRDA welcome the assessment carried out by the IMF-World Bank team. IRDA also said that there is complete oversight on the LIC with regard to both market conduct and prudential regulations and that the Indian Third Party Motor Pool has been dismantled from the year 2012. However, the issues relating to valuation of non-life liabilities were being addressed by strengthening the stipulations for provisioning, incurred but not reported (IBNR) and Incurred but not Enough Reported (IBNER) liabilities. One of the recommendations of the DAR is putting in place a modern risk based early warning system, IRDA said that this does not envisage the need for a ladder approach to the intervention levels, as it already has a high level of solvency at 150% required to be maintained by insurers at all times. However, in a view to enabling a risk based oversight, IRDA has in place the early warning signals (EWS) for the systemically important insurance groups, and is closely working with other financial sector regulators in the country. Moving towards the risk based capital approach to solvency, IRDA is presently examining various issues related to the same and would take a view on adopting a standardized framework after discussions with all stakeholders. As a first step an exposure draft has been released laying down the framework to assign risk weights to financial assets supporting insurance liabilities. While acknowledging that fraud is a challenge to be met squarely, IRDA has laid down the regulatory framework on detection, classification, monitoring, reporting and mitigation of frauds.

In a report by, *Milliman-India (2013),* a global consulting firm, has surveyed 11 CEOs of the 24 life insurance companies and 200 life insurance officers across the life insurance industry to gauge their views on the current state of the life insurance sector and the outlook for the future. The main results of the 200 insurance officers of the survey indicate that the regulatory changes will benefit both the customer and the insurance industry in the long run. This perhaps reflects the perception that the regulations issued by IRDA to improve the value proposition for customers will eventually benefit the industry as a whole. Regarding the future outlook, more than 90% of the respondents foresee a period of moderate to high growth for the life insurance industry in the next 10 year, which indicates that the long-term prospects of the life insurance industry are still strong, despite the impact of the regulatory changes in the recent years. However, around 33% of the respondents feels that creating innovative products will be the greatest upcoming challenge for the life insurance industry. With the increasing internet penetration in the country, the study also concludes that the online channel will emerge as a key distribution channel in the coming years and term

insurance will add value to the insurance business. This indicates a structural shift in the buyer's motive from traditional channels to emerging distribution channels and importance of protection-oriented business. However, about the future of ULIP policy 40% of the respondents believe that the current regulations on unit-linked insurance products (ULIPs) would lead to low sales of ULIP policy.

The CEO survey suggests that going forward, to be successful in India, companies need to address the fundamental issues faced by the industry, i.e., (i) to improve the productivity level of the agency channel; (ii) to Improve the level of training and professionalism amongst intermediaries; (iii) to keep the market conduct of the distributor under control to avoid mis-selling; and (iv) to improve the quality of business by controlling the high policy lapse rates; and refrain from entering into expensive third party distribution arrangements and enhancing the overall cost efficiency of the businesses. However, the CEO's also accepted that such changes are not easy to implement, mainly due to business practices/models adopted by the industry that are now over a decade old and there needs to be a behavioural/ mind-set change across all levels in the organisations. Such a change will happen only gradually, especially in the current uncertain environment. Also, despite the experience over the past decade, new business volumes/market share are still seen by many shareholders to be the most important performance parameter.

6.8 Important Regulatory Changes in the Life Insurance in India

Supervision and regulation of insurance is relatively new for the Indian regulator IRDA. The Regulator needs to ensure that the insurance companies have sufficient resources to meet the liabilities at any point of time. At the time of liberalisation of the sector, Government has to deal with the issues relating to ensure solvency of the companies and fair treatment to the policy holders. The solvency is addressed by stipulating a high level of capital requirement for entry into the field and rigorous enforcement of the solvency requirements, while the issue of fair treatment is covered by the regulations put in place for protection of policyholder's interests. Since the establishment of IRDA in 2000, the Authority has been continuously in a mode to develop and regulate the industry. However, since July 2006, the IRDA has issued a number of guidelines (the most recent ones coming into effect from September 2010), to impose restrictions on the design and pricing of ULIP. which are mainly focused on new customer-centric practices in order to: (i) Enhance value for money to ULIP policyholders, (ii) Protect ULIP policyholders from the high surrender charges imposed by insurers in the early years of a policy, to cover the high up-front distributor commission, (iii)

Curb perceived mis-selling of ULIPs and improve persistency; (iv) Indirectly influence insurers to lower their overall expense ratios and to improve the productivity of the distribution channels. In the following, we summarise certain regulatory actions by IRDA, which has prompted many to raise several questions about the future performance of the industry.

6.8.1. Regulatory Guidelines in 2010

IRDA issued guidelines in September 2010 restricting the design and pricing of unit linked insurance plans (ULIPs) with the introduction of caps on charges (including surrender penalties). This was the start of a series of measures that have been introduced by the IRDA in the last decade. Some of the important changes in regulations are:

- Standardization of the ULIP terminology, the unit-pricing (NAV calculation) approach, imposition of minimum death benefit cover in ULIPs, requirement of issuance of annual account statements to the policyholders, etc.
- Imposition of caps on the charges on ULIPs through a maximum permissible difference between gross investment return and net maturity yield to policyholders, broadly set at 3.0% (for policy tenors of 10 years or less) and 2.25% (for policy tenors beyond 10 years).
- Imposition of an explicit cap on the fund management charges (as part of the overall cap on reduction in yield to policyholder), at 1.35% per annum.
- Imposition of caps on the surrender charges during the first four policy years and requirements of NIL surrender charges thereafter.
- Imposition of caps on surrender charges on ULIPs through a maximum permissible difference between gross investment return and net yield to surrendering policyholders, broadly set varying between 4% and 2.25% (for durations between 5 years and beyond 15 years).
- Requirement for a policy lock-in period of five years within which surrender proceeds cannot be paid out.
- Requirement of a minimum guaranteed return (currently pegged at 4.5% pa) at maturity for unit-linked pension plans.
- Requirement to disclose distributor compensation in point-of-sale benefit illustrations.

Further, IRDA issued similar guidelines (effective November 23, 2010) on VIP products, which amongst other things: (i) imposed a cap on the maximum commission and expense components of the premium and (ii) imposed a restriction on the surrender charges and implicitly disallowed the imposition of a market value adjustment (MVA) on such products. These guidelines essentially made launching universal life products unattractive due to the requirement of a minimum guaranteed interest rate throughout the policy term and caps on surrender penalties.

6.8.2. Regulatory Guidelines Issued in 2011

- In February 2011, IRDA issued guidelines on Outsourcing Activities, which made it mandatory for insurance companies to retain 'core' functions within the companies and resulted in lost opportunities to achieve potential cost savings through outsourcing.
- The Agent Persistency and Productivity Requirements guidelines introduced with a minimum performance requirements for agents.
- In July 2011, the Authority issued guidelines on Fund Approval and NAV Calculations in ULIPs. These guidelines required companies to modify their unit pricing methodology and standardised the approval process for launching new funds under ULIPs.
- To increase the attractiveness of 'pension' products to insurance companies, in November 2011, IRDA amended the Guidelines on Pension Products through amendments in the nature of investment guarantees required to be provided in the products, but failed to do so.
- Further, in December 2011, the Authority issued guidelines on Regulations in IPOs of Life Insurance Companies. These regulations made it possible for insurance companies that meet certain criteria to raise capital on the stock market, but no company has planned to do so yet, given that the prevailing business environment and the lack of a growth story in particular, make it difficult for them to attract good valuations.

6.8.3. Regulatory Guidelines Issued in 2012

- In January 2012, IRDA has issued guidelines on 'ALM and Stress Testing' and made it mandatory for companies to submit the results of their ALM and stress testing analysis to the IRDA on a regular basis.

6.8.4. Regulatory Guidelines Issued in 2013

In 2013, IRDA introduced a slew of regulations, which appear to be an attempt by IRDA to improve the level of transparency and value for money for policyholders of non-linked life insurance products. It was made mandatory for the life insurers to ensure compliance with these regulations before 30 June 2013 for group products and before 30 September 2013 for individual products both in linked and non-linked insurance businesses.

a) **Regulations on Non-Linked Insurance Products:** The regulations cover various aspects of non-linked insurance products:

- Minimum floors on sum assured introduced for single and regular premium products depending on the age of the policy holder. The minimum policy term with a minimum premium term for individual products fixed at five years.
- Maximum commission (or remuneration to distributors in any form) limits have been introduced for all non-linked insurance products. The key changes include:
  - The first year commission (FYC) limits for non-pension regular premium products with premium terms lower than 12 years reduced. The limits on maximum commission has increased with premium term, although the highest limit is the same as currently permitted.
  - The maximum distributor remuneration is fixed at 2% of premium for group products.
  - No commission payment would be made on business procured through the direct marketing channel.
- Minimum guaranteed surrender values have been introduced for a different policy period. Companies are also required to pay ‘special surrender values' based on asset shares underlying the policies.
- The variable insurance products, as defined as non-linked products for which benefits depend upon regular interest rate credits, are now subject to the same regulations as those applicable to ULIPs.
- Benefit illustrations are now required to be presented assuming gross investment returns of 4% p.a. and 8% p.a. The regulations also require illustrations to be provided based on the rates specified by IRDA or the Life Insurance Council (which are currently at 6% p.a. and 10% p.a.)

- A number of regulations has introduced around the management of participating business, covering the need to set up an asset share framework; a governance mechanism involving a 'with-profits committee' which would include an independent director of the Board, the CEO, Appointed Actuary and an independent actuary; and the granting of power to the IRDA to prescribe methodology to allocate expenses between different funds.

b) Regulations on Linked Insurance Products

These regulations are largely in line with the earlier unit-linked guidelines released by the IRDA in September 2010. They split linked insurance products into unit-linked products and variable-linked products and provide regulations for each of them separately. The key changes in these regulations as compared with the previously released unit-linked guidelines include the following:

- Maximum commission (or remuneration to distributors in any form) limits have been introduced in line with those now applicable under the new non-linked product regulations.
- Companies are now not allowed to offer the so-called 'highest NAV guaranteed' products and any closed ended funds. However, companies can provide guaranty at a product level (as opposed to a fund level) even at maturity.
- Now, the companies need to provide comprehensive information to IRDA in regard to the guarantee charges levied on the products offering investment guarantees. In addition, the investment benefits are offered, using investment returns of 4% pa and 8% pa.
- There are no changes to the maximum reduction in yield to policyholder at maturity as prescribed by the IRDA in earlier guidelines. However, insurance companies are required to demonstrate compliance with these requirements using six different gross investment return assumptions at the time of filing of the product.

c) Regulations on Reinsurance of Life Insurance Business: These regulations attempt to standardize the reinsurance treaties between life insurers and their reinsurers. The key highlights of these regulations include:

- Life insurance companies are required to reinsure a percentage (as may be specified by the IRDA, but not exceeding 30%) of their sum assured with the Indian reinsurers. If any amount of business is to be reinsured with a foreign reinsurance, the reinsurer should

have maintained a credit rating of BBB (Standard and Poor's) or equivalent over the past five years.

- Each life insurer is required to file a board approved program of reinsurance with the IRDA at least 45 days prior to the commencement of each financial year. In addition, all reinsurance arrangements need to be filed with the IRDA within 30 days of the commencement of each financial year.
- The new regulations stipulate a minimum holding limits that vary from Rs 500,000 to Rs 2 million for pure protection products, and Rs 1 million to Rs 3 million for savings-oriented products, based on the age of the life insurer.

d) Regulations on Appointed Actuaries: In order to be eligible to act as an Actuary for an insurance company, an individual should have a minimum of 10 years of relevant work experience, out of which 2 years should have been in the respective field (in the specialised area). Further, he/she should be a Fellow or Affiliate member of the Institute of Actuaries of India, with specialisation (as evidenced by qualification and/or work experience) in the relevant area (life, general or health). Aged less than 65 years (after 1 January 2014).

e) Regulations on Investments: The main change in the investment regulations is that insurance companies with large investment assets, are allowed to acquire a higher percentage (10% to 15%, depending on the size of the insurer's investment assets) of the equity and debt of the 'investee' company.

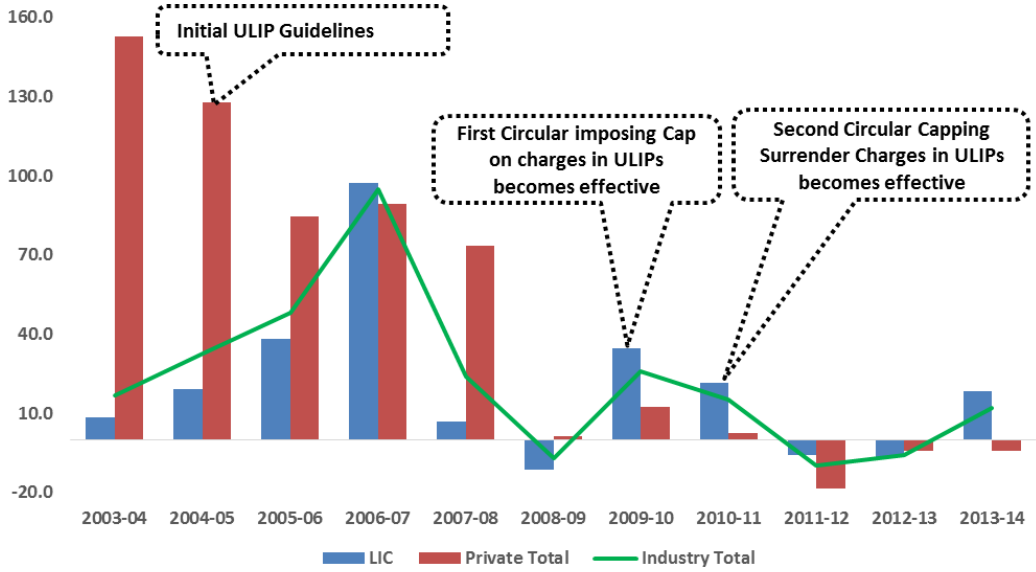
6.9 Impact of New Regulations/Guidelines on the Life Insurers

The regulatory changes in India is regarded as one of the most stringent regulatory regimes in the Asia Pacific region. The industry has been struggling to react to the fast paced changing regulations. In the following, we highlight the major impact on the life insurers due to regulatory changes, specifically after 2010.

6.9.1 Decline in New Business Volumes: There has been significant fall in new business volumes since 2010. Tight caps on ULIP charges have led to a significant reduction in the level of commission payments. ULIPs have become less attractive for distributors (especially tied agents) with the sale of ULIPs waning considerably as a consequence. The adverse media coverage about the high level of charges on ULIPs in the past and the negative stock market conditions have also continued to the problems. However, in recent times, there has

been seen some uptake in new business, due to favourable economic environment and better than expected stock market.

Figure 6.2: Decline in New Business Premium Growth (YoY %)



Source: IRDA

6.9.2 Changing Product Mix: The new ULIP regulations have led to a dramatic switch in product mix for many insurance companies. Prior to the regulatory changes, linked business was contributed around 85-90% of the top line for most of the private life insurers in new business but now it declined to 29% in 2013-14. In case of LIC also, the linked business has declined to 0.05% in 2013-14 from 39.3% in 2009-10. However, LIC has maintained its profitability due to its traditional focus on the non-linked business, which now stands at around 100% of the first year premium.

Table 6.4: Life Insurers Business mix in First Year Premium (% Share)

Year	LIC		Pvt Life Insurers		**Industry Total**	
	Linked	Non-Linked	Linked	Non-Linked	**Linked**	**Non-Linked**
2008-09	28.4	71.6	86.5	13.5	**51.1**	**48.9**
2009-10	39.3	60.7	83.0	17.0	**54.5**	**45.5**
2010-11	30.5	69.5	68.7	31.3	**42.4**	**57.6**
2011-12	5.0	95.0	41.4	58.6	**15.3**	**84.7**
2012-13	0.3	99.7	34.7	65.3	**10.1**	**89.9**
2013-14	0.05	99.95	29.0	71.0	**7.2**	**92.8**
Source: IRDA						

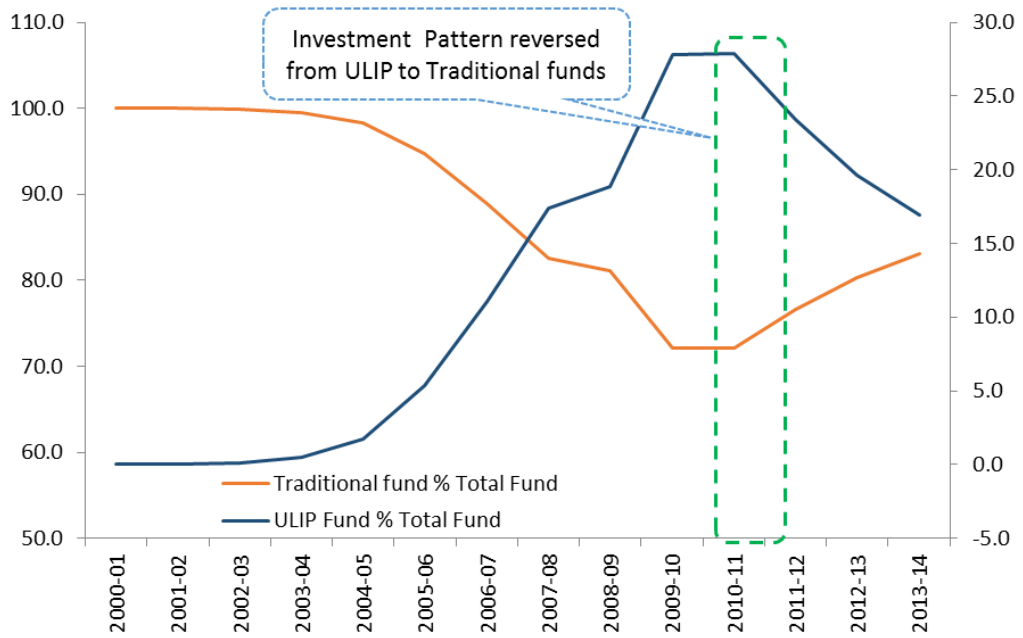
The insurers are now selling a significant proportion of traditional products (which still allow a higher level of distributor compensation than ULIPs), with some having managed to increase the proportion of new traditional business sales from 10%-20% to nearly 40%-50% or more. Examples of the changing new business product mix can be observed from the table below both in first year premium and total premium collection of the life insurers.

Table 6.5: Life Insurers Business mix in Total Premium (% Share)

Year	LIC		Pvt Life Insurers		Industry Total	
	Linked	Non-Linked	Linked	Non-Linked	Linked	Non-Linked
2008-09	22.1	77.9	86.7	13.3	**40.9**	**59.1**
2009-10	25.4	74.6	86.0	14.0	**43.5**	**56.5**
2010-11	19.3	80.7	79.2	20.8	**37.4**	**62.6**
2011-12	7.3	92.7	65.0	35.0	**24.3**	**75.7**
2012-13	3.1	96.9	54.0	46.0	**17.0**	**83.0**
2013-14	1.15	98.85	45.0	55.0	**11.9**	**88.1**
Source: IRDA						

6.9.3 Decline in Investments: The share of ULIP funds in investment is exhibiting a downward trend from 2009-10 and reached 16.9% in 2013-14 from the peak of 27.9% in 2010-11. On the contrary, the traditional fund[2] indicates a reverse trend during the same period.

Figure 6.3: Fund-wise Investment of Life Insurers

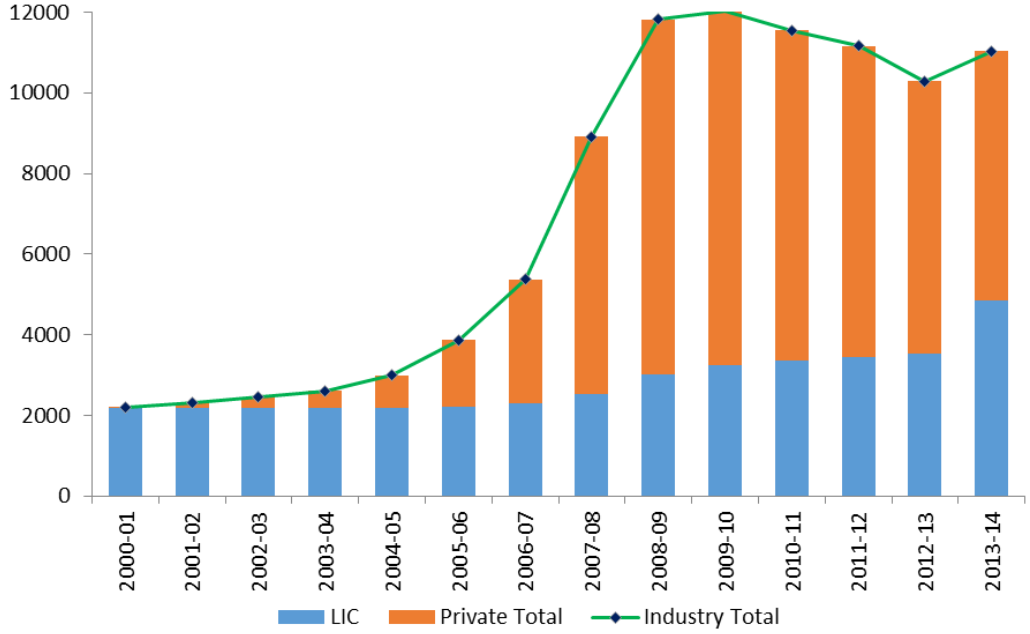


Source: IRDA

[2] Includes both 'life fund' and Pension & General Annuity & Group Fund'

6.9.4 Declining Life Insurance Offices: In the period 2008-09 to 2012-13, the decreasing trend in the number of life insurance offices in India can be seen. However, in 2013-14, the trend is reversed as LIC added 1313 new offices to its network.

Figure 6.4: Number of Life Insurance Offices



Source: IRDA

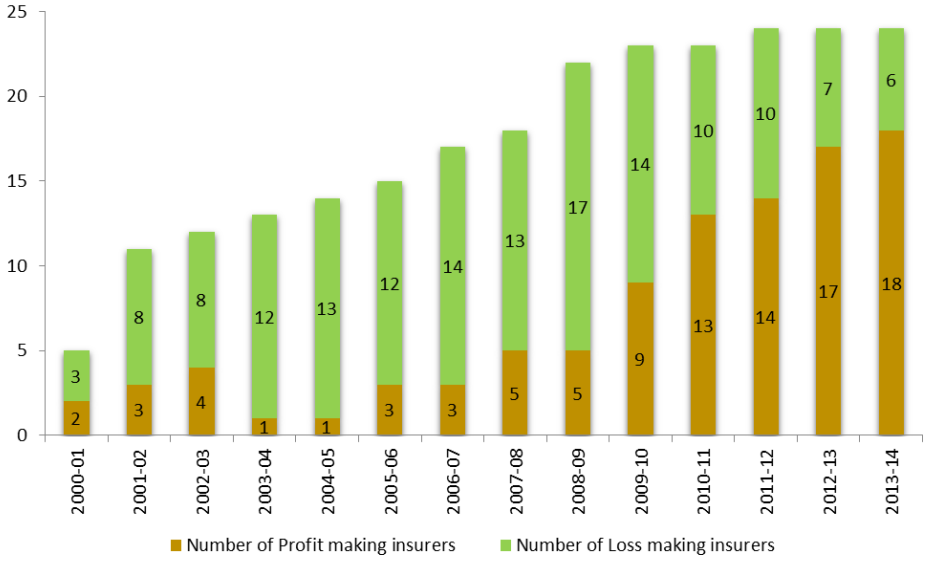
Interestingly, starting from 2008-09 to 2013-14, the private insurers have closed 2592 offices, however, LIC has added 1809 offices in the same period; therefore there was a net reduction of 783 offices. Among the private insurers, Aviva (92), Bajaj Allianz (172), Bharti AXA (73), HDFC STD (159), ICICI Prudential (1545), Max Life (417) and TATA AIA (274) have been leading the game. This is mainly due to lower profitability of the life insurers. ICICI has reduced its number of branches to 557 in 2012-13 from 2102 branches in 2007-08 and which has contributed greatly in its profits turning positive in subsequent years.

6.9.5 Distribution Channel Mix: The reduction in ULIP sales has been most noticeable for the tied agency channel. The bancassurance distribution channel and broker channel is relatively less affected due to the reduced commission level on ULIPs, given the relative attractiveness of the sale of ULIPs vs. mutual funds (on which no commission is now payable) and also given the channel's lower infrastructure costs in general. However, it can be observed from the table shown below that the 'direct selling' channel is indicating an upward movement in distribution in the recent period and all other modes continues to declining.

Table 6.6: Channel Wise Life Insurance Business (Individual) (% to total New Business)								
Channels	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Individual Agents	90.46	83.75	79.57	79.61	78.95	78.69	77.53	78.4
Corporate Agents-Banks	**5.57**	**7.97**	**9.69**	**10.6**	**13.3**	**14.96**	**16.18**	**15.62**
Corporate Agents- Others	3.02	4.36	4.86	4.28	3.56	2.7	2.07	1.33
Brokers	**0.55**	**0.6**	**1.11**	**1.38**	**1.77**	**1.75**	**1.66**	**1.56**
Direct Selling	0.39	3.33	4.76	4.13	2.42	1.89	2.55	3.09
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Referrals	2.04	2.95	3.9	3.13	1.01	0.05	0.03	0.03
Source: IRDA								

6.9.6 Lower Profitability: Life insurance is a capital intensive business and insurers are required to infuse capital at a regular intervals to fund both the new business strain and to expand their infrastructure base including expenses on initial operations, development of the distribution channels, creating niche markets and achieving reasonable levels of persistency. The experience of the insurance markets globally indicate that, companies in the life sector take seven to ten years to break-even[3]. In Indian case also, it is seen that the new private insurance companies are now starting to make profits from their operations. In 2012-13, out of 24 life insurers, 17 companies have declared profit. The following graph indicates the profitability of the life insurance sector from 2000.

Figure 6.5: Profitability of the Life Insurers



Source: IRDA

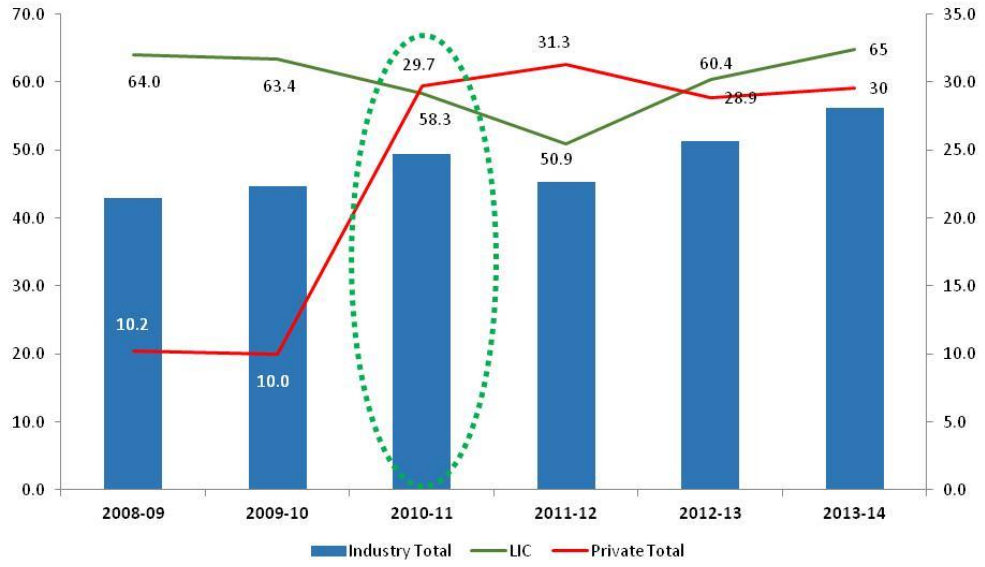
[3] IRDA Annual Report 2012-13

It is also noticed that the profit margin of the insurer has declined significantly due to regulatory changes in linked business, especially in ULIP, which has put considerable pressure on new business profit margins. It is widely believed that profit margins on ULIPs have approximately halved from their previous levels. A shift in product mix towards traditional non-participating plans (that typically provide higher profit margins) has helped some insurers absorb some of the impact due to the reduced profitability on ULIPs. However, the proportion of traditional non-participating business is still small, leading to limited impact on the overall profit margins.

6.9.7 Single Premiums Business as a tactical move: As a consequence of the new charge in caps on ULIPs, first year commission rates now do not differ significantly between single and regular premium plans. Many distributors now find single premium plans more attractive than regular premium plans due to their higher average sizes. As a result, there has been an increase in the proportion of single premium business from H2FY10-11. This is true mainly for the private insurers, as the share of single premium in total first year premium reached to 30% in 2013-14 from 10% in 2008-09. Other reasons for a higher proportion of single premium business include:

- Companies see single premium policies as carrying less persistency risk (as under the new guidelines, policyholders cannot surrender their policies for five years); and
- Single premium business is seen to be providing top-line support in the immediate short term, until companies fully adapt their strategies to the new regulatory environment.

Figure 6.6: Single Premium % Share in Total First Year Premium



Source: IRDA

6.10 Policy Recommendations for the Revival of the Insurance Industry in India

In the last 4 to 5 years, IRDA has taken a number of regulatory and legislative measures to help the industry to get back to the sustainable growth path. Though, many of the regulations are in the right direction and have been issued in the right spirit and with the right focus (i.e. customer protection), the industry has suffered due to sudden regulatory changes. In our view, there are a number of changes that are still possible and necessary for a customer centric growth of the industry. Some of the changes suggested in this section are required to be carried out by Government/IRDA and the insurers. It may not be easy / straightforward to bring about the various changes listed below. Some of the suggestions may also seem rather essential. However, the changes recommended are believed to be in the best interest of the potential customers / policyholders and consequently the life insurance industry as a whole.

6.10.1 Macro-Economic Factors

The macro-economic factors are the important indicators to move the insurance industry to a sustainable growth path. So, there is an essential need that the macro-economic factors to start looking positive. In particular, the following changes may be necessary in the macro-economic environment:

a) **Revival of the Positive Sentiments:** The investment level in the economy needs to be paced up. Further, the GDP needs to grow at 8%-9% as seen in the last decade, which may ensure positive sentiment in the economy, as well as among the retail investors.

b) **Stable Equity Market:** For a success in the unit linked products, a stable equity market is required, which will motivate the retail investors to invest in to unit-linked investment policies. Thus, despite having one of the best financial products in the market (especially after the September 2013 regulations by the IRDA), the ULIPs has failed to attract the potential investors. So, a stable equity market performance may win the investor's confidence and help ULIPs to back on the new business performance Figures of life insurers.

c) **Softer Interest Rate Regime:** The steps taken by the RBI in the past several years to curb high inflation have resulted into high interest rate environment. This has also pushed up the interest rates on fixed deposits offered by the banks (8%-9%). In pricing the traditional products, life insurers typically adopt a long term view on interest rates. Additionally, IRDA limits the maximum illustration interest rate to 4% and 8% gross. Due to these factors, the traditional life insurance products offer rather unattractive

returns to the customers, in comparison to the other financial products available. So, a lower interest rate regime would boost the demand for life insurance policies.

d) **Depth in Corporate Debt Market:** A well-developed corporate bond market enhances economic welfare as it complements other financial instruments and provides a full spectrum of investment vehicles whose payoffs across contingencies or states of nature cannot be easily replicated by other securities in the market (for instance, the pension funds and insurance companies may hold low risk debt instruments with a stable return, which is not provided by the equity market). So, this may broaden product offerings for customers, for example, variable annuities.

6.10.2 Business Practices Adopted by the Insurers

It is important for the life insurance companies themselves to change the way they have been carrying out their businesses in the past. It may no longer be possible for the insurance companies to focus only on top-line performance, and ignore all other parameters that can measure their overall performance in productive efficiency, customer satisfaction and the quality of business sold. Going forward, the insurers need to take steps to rearrange their business model and to adopt practices that would foster a sustainable growth. A few measures for the insurers in India are recommended below:

a) **Involve Promoters:** A lot of the behaviour in the industry in the past may be attributed to the directions received right from the top, i.e. from the promoter's level. So, it is crucial to ensure that the promoters should have a good understanding of how the life insurance business works. If possible, a hands on conference for the promoters/Board members is required to educate the nuances of the life insurance business would be a good first step.

b) **Align Interests of Stakeholders:** The main motive of each and every life insurer should be protection of the policyholder's interest. The other stakeholders' interest should be aligned to the policyholder's interest. Going forward, the insurance industry needs to focus in achieving this, which can be attained through various measures such as by promoters/shareholders carrying out a review of their individual interests and whether they are aligned to those of the policyholders; by insurance companies offering compensation to distributors that is better aligned to the interests of the policyholders; by employees being offered remuneration / incentives that are linked to fulfilling the quantitative as well as qualitative aspects of customer satisfaction etc.

c) **Align Cost Structures with Productivity & Efficiency**: Though, the insurers are in business since 2000 but the profitability of the sector is at a critical stage. This may be due to initial establishment cost, training and recruitment etc. However, to be in business, the insurer needs to go for a drastic measure to re-align the cost structures in the industry, which may include for instance acerbic the salary levels for top management, increase the performance linked incentives in the salary structures, offer variable pay to the frontline sales executives, restructure the branch locations, and back up the operations executives etc.

d) **Use of Technology**: At present the use of technology in insurance industry in India is lagging behind, as compared to other financial sectors like banking, asset management etc. So, the usage of the technology shouldn't be confined only to the sales but it needs to be automated starting from 'sales' to 'after sales' to 'customer servicing' to 'accounting' to 'investment management' to 'MIS reporting' to 'claims'. By using technology, it will help to reduce the cost and also lower the human intervention and thereby will increase transparency, improve the quality of the business and the level of customer satisfaction.

e) **Revamp the Sales Process:** A number of problems faced by the industry today are due to the mis-selling practices involved by the distributors. The insurers needs to 'clean up' the sales process and build confidence among the policy holders. The insurer needs to find out the right distributor with proper level of training to offer him the right kind of IT tools to aid in the sales process; to monitoring his sales activities through periodic checks and audits; to taking prompt action against erring distributors. This would help the industry to go a long way in ensuring good quality business.

f) **Segmentation of the Opportunity:** In order to understand the potential market in depth, the insurance companies may need to carry out a detailed exercise to analyse the needs, saving patterns, family circumstances etc of their potential market. They may then need to allow only the 'right' distribution channel to reach out to a given target customer segment. Insurance companies shouldn't allow the distributors to sell all types of products to any customer. A proper mapping of 'customer needs-distribution channel-suitable sales process-products' is the desired for a sustained business.

g) **Arrange Customer Centric Programmes:** A lot needs to be done to improve the level of customer experience in the life insurance industry. Several steps need to undertake to educate the customers through customer awareness programmes/seminars, road shows,

offering regular health check-up facilities etc. Further, the insurers may think about customer loyalty programmes along the lines of those offered by credit card companies; arranging 'family days' of fun and entertainment for customers and their families etc.

h) **Enhancing the Level of Public Relations:** After ULIPs fails due to mis-selling, the life insurance industry has suffered hugely by negative media coverage. So, it is important for the industry to take steps to reduce the negative perceptions among the customers. This can be archived through a massive public relations (PR) engagement initiative at all levels of the industry, including IRDA, insurance companies, the Life Insurance Council and also among the employees. The industry may highlight their achievement in real life examples such as the large number of claims processed, timely insurance payments have helped needy families; how a systematic saving/investment in insurance policies has helped families achieve their goals etc.

i) **Go Rural:** As India's insurance penetration is at a very low level, so there is a huge potential market in the rural areas. So, the insurers should not confine to the metro, urban or semi-urban areas. They need to explore the business opportunities at every corners of the country. In doing so, the insurance companies should not look at this just as a regulatory requirement to be fulfilled. Instead, it should be looked at as an investment into creation of future business opportunities. The insurers should take initiatives like 'adopting' villages and giving basic facilities like drinking water, arranging free medical check-ups etc, will help to develop goodwill and a market for the insurance industry in these areas.

6.10.3 Regulatory Changes Required

In addition to the insurers, the regulator and Government needs to play an active role in enabling the journey of the insurance industry through the troublesome insurers to have sustained profitable business model. In fact, it would be better, if the regulator prepares a short-term (3-5 year) and a long term (more than 10 years) road map for the industry and share it with the insurers, which will benefit the insurers in preparing their business plan for the years ahead.

a) **Flexibility in Distributor Compensation:** In a recent speech[4] by T.S. Vijayan, Chairman, IRDA that the insurance industry needs to incentivize its distributors so that they can become more efficient and able to serve the industry for a long period, which in

[4] 16th Annual Insurance Conference organized by FICCI at Mumbai

turn would ensure superior persistency ratios and a lesser lapses. Agents need to be treated and incentivized properly, as they are required to serve the customers through the entire term of the policy sold. He also added that IRDA has proposed to remove the cap on first year commissions on life insurance policies, however, is planning to impose certain regulatory limits on the expenses allowed for an insurer. In this context, we are not suggesting to remove maximum caps on distributor compensation altogether, rather we expect IRDA should give flexibility to insurance companies to structure the distributor compensation within a company level maximum limit, as prescribed in the Insurance Rule 17D. For instance, to sale a policy, a highly productive distributor consistently writing high quality business may be allowed to be paid a compensation of say 100% of first year premium, while on the same policy, another distributor may be paid only 10%. This flexibility may also allow companies to offer compensation linked to other parameters such as persistency, value addition to shareholder, customer satisfaction etc. So, if there is full transparency on the level of distributor compensation offered, such flexibility may enable companies to reward the right behaviour and penalize wrong behaviour, yet maintaining the overall company level compensation within the stated limits.

b) **Mandatory to Buy Term Insurance Products:** A common criticism of the life insurance industry is that it 'pushes' the products that the consumers don't need. If we will make, it mandatory for the consumers to buy the products, then the consumers will 'demand' the product that they need, which may enhance the overall level of protection cover in India and fulfil an important social need of the country. To start, Government may make it compulsory to buy protection products upon certain lifestyle events such as marriage, child birth etc, where a financial dependency gets created. Additionally, at the time of loan sanctioning in the organising sector, this should be mandatory to buy an insurance product to hedge the risk associated with it. This will benefit both the policy holder and the organisation, at the time of any uncertainty.

c) **Offer Tax Incentives on Insurance Policies:** In India, most of the people demand insurance, mainly for their tax planning. So, there is a need for separate tax exemption on life insurance premiums under 80C on an exclusive basis, rather clubbing it with other financial products like PPF, NSC etc. Further, a need for exclusive tax incentives for certain type of products such as term insurance so as to enhance the level of protection business in the country, which will help to 'create a demand' for the life insurance

products. In our view, Government should consider a separate cap of Rs 50,000 for life and health insurance, under 80C deductions, which will help all the stakeholders (Parida; 2014).

d) **Ensure Appropriate Taxation Policies:** In the Union Budget 2013-14, Government has widened the service tax net to the insurance policy premiums paid. Though, the tax rate differs from product to product; traditional products that are not investment-oriented would be taxed at lower rates compared to investment-focused policies. The tax rate would be 12.36% on Unit-Linked Insurance Policies (only on charges, such as mortality & administration), 3.09% on traditional products as most of the premium goes into savings, and 12.36% on term plans. In our view, insurance should not be taxed in India, as it is an instrument that provides financial protection against risk. Further, in India the insurance penetration is low; the introduction of service tax in the realm of insurance may not represent the best step forward.

e) **Refine Outsourcing Guidelines**: In India, it is compulsory for insurance companies to have an in-house investment team. This requirement for in-house management for all funds raises the entry barriers for new companies and reduces competition. So, by promoting competition would bring innovative new products with premiums enhance customer base in the near term. The life insurance industry may be allowed to offer external funds (e.g. mutual funds) to manage their investment funds. This would result into the retail consumers benefitting from the distribution infrastructure established by the life insurers and the investment expertise of the mutual funds industry in a cost effective manner. If availed of this facility, the small life insurers would benefit through low cost investment management and would concentrate more on the protection business.

f) **Making Distributors more Accountable:** One of the existing provisions in the Insurance Act, 1938 requires distributor compensation to be structured on a 'writing distributor' basis against a 'servicing distributor' basis. So, it required a change in the Act in order to ensure that compensation to the distributor is paid only if the distributor continues to provide after sale service to his / her client.

g) **Demat Life Covers:** Although IRDA has introduced the facility of holding the insurance policies in an electronic form (similar to the Demat facility on equity) in September 2013 but life insurers have been slow to come on board (10 out of 24 life insurers joined). As a result, only about 1 lakh e-insurance accounts have been opened and the number of

policies that have been dematerialized are a few thousand. The regulator/Government should ensure mandatory policies in dematerialized form for life insurance companies. This may help both the insurers and customer in processing their claims in an easy way.

h) Simplify KYC: At the 16th Annual Insurance conference at Mumbai, IRDA Chairman commented that IRDA is working on a centralized KYC (know your client) registration process for customers for simplifying and reducing the burden of multiple registrations needed every time, a person intends to buy a policy. This move will definitely help both the customer and insurers in buying/selling insurance contracts. However, there is a need for simplifying the KYC norms and also a single demat account for all the financial products, which will benefit the insurance inclusion in the country (Parida T K; 2014).

i) Refine Investment Norms: In India, the insurers are barred from investing in a large variety of instruments and asset classes, including all overseas investments. So, by restricting insurance investment only to the domestic market leads investors' exposure to any cyclical downturns in the economy. For instance, if a crop insurance policy holder (a farmer) is claiming on a policy due to a poor monsoon, it is found that the insurer is in difficulty settling the claim, as the same monsoon has also depressed the value of assets across the board; including the investments the insurance company had bought to cover the claims. Diversifying a portion of the asset base beyond India's borders would allow insurers a degree of insulation against the volatility of domestic equity markets. Under the current restrictions on diversification ensures that the Indian insurers need to carry extra reserves, and pass the added cost of doing so to the policyholder. So, life insurance companies may also be allowed to invest into derivative instruments, so that they can hedge the investment risks offered in life insurance products. Further, the existing restrictions on investments of life insurance funds (i.e. the 'controlled funds') may also be relaxed to allow greater flexibility to invest into equity markets both in domestic as well as overseas.

6.11 Conclusion

To address the regulation aspect, this chapter analyses the best international regulatory practices in insurance industry and the role of IRDA in developing and grooming the Indian life insurance market. Also, an assessment is attempted to see the impact of regulatory changes on the life insurance companies' business indicators. The regulatory changes in September 2010 are regarded as one of the most stringent regulatory regimes in the Asia

Pacific region. Hence, the year 2010 is assumed to be the year of regulatory change. This year is used as a benchmark to compare the insurers' indicators (like premium underwriting, investment income etc) to examine the impact of regulation change on the life insurers.

The study finds that many of the regulations are in the right direction and have been issued in right spirit and with the right focus (i.e. customer protection). However, the life insurance industry has suffered due to sudden regulatory changes and the insurers are not able to adapt with the change immediately. Considering the experience of the industry in the past four years, it would appear that the impact of the guidelines may have fallen short of fulfilling these underlying objectives. In our views, IRDA may have introduced further areas of concerns for the life insurance industry:

- Rather than regulating through tighter oversight of distribution practices adopted by insurers, the IRDA has chosen to regulate the product charges instead. In our view the limits on ULIP charges are somewhat extreme and have resulted in insurers being unable to remunerate the distributors appropriately, resulting in severe reduction in number of agents and sluggish new business volumes across the industry.
- Companies are now selling more traditional participating and non-participating products, primarily due to the higher levels of commission. Further, traditional products also offer a low surrender value with companies booking surrender profits in the event of lapsation. Though, some people may prefer traditional products over ULIPs but the lack of transparency on such products may lead to lower overall returns to policyholders.
- The policy lapse/discontinuance rates in the industry continue to be high (at around 35%-40% in the first year). The charge caps on ULIPs do not appear to have addressed the unhealthy sales practices in the industry.
- Pensions business has suffered significantly, which is disappointing given the absence of a robust social security system in India.
- Significant pressure on cost management has led to many companies paying more attention on improving 'agent productivity'. However, there still does not seem to be sufficient investment in improving the training provided to the agents.

To conclude, there should not be an immediate call for wholesale de-regulation, however, any regulatory change must be handled carefully to avoid excess regulation to the system. Therefore, policymakers need to make sure that liberalization is not like a green light for wagering but they must set sensible rules for outsourcing fund management. The regulator would have to establish a strong and consistent oversight mechanism to make sure that the rules/guidelines are being followed, even though the insurance funds are invested in international markets. The only benchmark that matters for an insurer's portfolio is to match the future cash flows required to meet its liabilities. Though, it is a difficult task to foresee the future, however, the broader the portfolio there is a greater space for the managers to prepare for adverse events. Thus, there is a need for a cost effective and reliable insurance industry which strengthens India's economic growth, however, the tight and uncertain regulatory systems are limiting the sector's ability to realize its potential. Going forward, given the fact that though India's capital and equity markets are growing in depth and breadth, the insurers need to access the international markets to balance risk and return efficiently.

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Chapter VII

Summary & Conclusion

The thesis set four major objectives to examine mainly four aspects of the life insurance industry in India, i.e., competition, efficiency, profitability and regulation in the post-reform period (i.e., post 2000). The first three objectives are examined in the Chapters III, IV and V respectively. In particular, to address the question, 'whether competition really leads to efficiency and then profitability of the insurers?', the thesis examined the relationship between competition, efficiency and profitability of the life insurers in Chapter V. Finally, the regulatory changes and its impacts on the life insurance companies in their business operations after the year 2010 are discussed in Chapter VI. The major findings are summarized below and some concluding remarks are offered.

7.1 Major Findings

7.1.1 Competition

To assess the state of competition and market structure of the Indian life insurance industry, concentration indices are calculated using a set of 10 different market concentration indices. Here, the assumption is that a measure of market concentration is a function of the combined market share of all the firms in the industry (Mishra et al., 2011). So, the concentration indices are calculated on the basis of market share (total premium and 1-Yr premium) of the life insurers, both by including and excluding LIC in the industry. The study used the data for the period 2000-01 to 2013-14. Further, by following the criterion suggested by Ginevicius and Cirba (2009), an attempt is made to suggest the best concentration index to study the state of competition in Indian life insurance industry.

The concentration indices indicate that: first, there exists a uniform trend across various concentration measures, showing a fall in the concentration across all indices of the life insurers for both the samples including and excluding LIC in case of both the variables (total premium & first year premium). Secondly, though the reform reduced concentration in the life insurance sector, the speed of reduction is noticeably slow. Among all the concentration measures, HHI, HTI and GIN indices depict low market concentration of life insurance companies, compared to other indices. However, since 2012-13, the indices indicate a reverse in trend, as LIC has gained the market share around 5% in the said period. By following the Ginevicius and Cirba (2009) criterion,

GRS index is the most accurate index to measure concentration in the life insurance sector in India. The GRS index value indicates that though the concentration in the market has declined, but still it remains at a relatively higher level. So, there is adequate scope for the regulator to promote competition in the life insurance industry in India.

7.1.2 Efficiency

In Chapter IV of the thesis, the objective two, i.e., to measure the efficiency of the life insurance companies in India is addressed. Efficiency measures deviations in performance from the predicted performance of the "best practice" firms on the efficient frontier, facing a number of exogenous market factors. Economic efficiency refers to the ability of a firm to select the input and/or output levels and mixes to optimize the economic goals such as cost minimization or profit maximization of the firms. Thus, efficiency can be decomposed into pure technical efficiency (PTE), allocative efficiency (AE) and scale efficiency (SE). Pure technical efficiency occurs, when a firm maximizes the output from a given level of input, while allocative efficiency (AE) measures the extent up to which a firm is able to use inputs and outputs optimally with the given prices & production technology. A firm has scale efficiency when it operates in the range of constant returns to scale. Scope efficiency occurs when a firm operates in different diversified locations. The economic (cost) efficiency analysis provides an overall numerical efficiency value and ranking of insurers. In literature, however, we have not come across a single study that employs DEA and MPI analysis of TE of the life insurance companies operating in India. Tone and Sahoo (2005) were the first to study efficiency of the life insurance sector as they applied new cost efficiency model to examine the performance of LIC of India only using time series data.

To estimate the life insurer's efficiency, the data envelopment analysis (DEA) techniques is used to calculate the technical efficiency (TE), pure technical efficiency (PTE) and scale efficiency (SE) of the sample of 13 insurance companies for the period 2002-03 to 2012-13. The DEA score of 1 (0) indicates that the firm is efficient (inefficient). In the second part, to see the productivity change over a period of time, the Malmquist productivity index (MPI) is calculated. The MPI allows for changes in productivity to be broken down into changes in efficiency (catch-up index) and technological changes (frontier-shift index). If MPI > 1, it indicates a favourable development, i.e., a positive growth in total factor productivity between two periods; MPI < 1 is a negative

development, i.e., a decline in total factor productivity between two periods and if MPI equals to one, productivity remains unchanged.

To calculate the insurers' efficiency score in DEA, four inputs (namely, number of individual agents, total commission paid, equity capital and debt capital) and two outputs (namely, net benefits paid to customers and liquid assets to liabilities) are used. However, premiums seems to be the best proxy to measure of output volume in the insurance industry, but, in literature, it is argued that premium is price times of quantity, whereas output volumes should represent only quantity. So, premium is not included as an output variable.

The estimated results of technical efficiency indicate that the average TE of all the 13-life insurance companies in India for FY03 was 69.82% with a minimum score of 32.90% efficiency. However, this average decreased in FY04 to only 67.66% with a minimum score of 7.9% with the standard deviation to 31.78%. However, in FY05, the average TE was again back to 73.63% and the minimum efficiency score was 33.47%, which was the best minimum score in the three years period. Therefore, the standard deviation was 27.31%, much less than the previous year. After FY05, the average TE scores trended upward and reached the highest level of 91.35% in FY13, with a minimum SD of 14.54% and a minimum score of 60.69%, which is the highest in the sample period. This indicates that the technical efficiency of the firms has improved due to the new regulations and the increasing competition made by the gradual liberalization of the sector. However, the average TE score of 81.94% for FY03 to FY13, suggests that the life insurance business in India is moderately efficient and hence there is a large room for improvement. The results also showed that the insurance sector was experiencing high growth, and this growth was accompanied by continuous improvement in the TE for the periods from 2004-05 to 2012-13.

The MPI index indicates that LIC exhibited a relative catch-up efficiency of 1 over the years, indicating no change in relative efficiency. However, Bajaj Allianz which scored 1.1814 in FY03-04, indicating an 18.14% improvement in relative efficiency from FY03 to FY04, remained steady at 1 afterwards, showing no change in internal efficiency of the insurers. The rest 11 private insurers' scores showed mixed results but remained steady at efficiency score of 1 in recent years. Considering the yearly average score of the entire 13-insurers one infers that there is consistent improvement in relative efficiency as the score reached 1.0072 in FY08-09 from 0.9278 in FY03-04. However, there is a decline in relative efficiency to 0.9831 in FY09-10, which may be due to

the global financial crisis 2008 but thereafter the insurance companies has managed to breed efficiency and reached 1.0267 in FY11-12. Further, the catch-up score declined to 0.9752 in FY12-13, indicating a deterioration of internal efficiency by 2.5% from the year FY12 to FY13. On the other hand, by considering the average score of all the years, ICICI prudential is placed at the top followed by Max New York, and Aviva Life in generating internal efficiency but the public sector giant (LIC: rank 12) and MetLife (rank 13) are placed at the bottom of the efficiency parameter.

Further, a comparison of the relative frontier-shift efficiency scores of the life insurers for the 11-year period from 2002-03 to 2012-13 reflected that LIC consistently scored 1.0 up to the year FY11, indicating that there is no relative improvement in technology. However, the scores showed a consistent upward movement in technical efficiency by 22.68% and 2.07% from the year FY11 to FY12 and FY12 to FY13 respectively. The private life insurers' attained frontier-efficiency scores above 1 only in patches but not on a consistent basis over the years. However, in the initial periods of operations, the private insurers have shown more efficiency due to technological innovations. The year-wise mean relative frontier-shift scores shows that there is a continuous improvement in the technology, which has scored 0.8953 in FY03-04, reached the highest point of 1.3118 in FY12-13. By considering the insurer-wise mean efficiency over the years, ICICI Prudential seems to have enjoyed the highest mean relative frontier efficiency score of 1.1618 followed by LIC with a score of 1.0247 across the study period.

Analysis of the MPI, computed as a product of two components, indicates that LIC has consistently scored 1 for the period FY03-04 to FY10-11, showing no productivity change. However, the change in LIC's productivity between year FY11 & FY12 and FY12 & FY13, is due to change in TE components by 22.68% and 2.07% respectively. The MP index for the private insurers shows mixed results except Bajaj Allianz, which indicates continuous improvement in productivity change over the years. This productivity change in Bajaj Allianz life insurer is due to better performance in both the components; i.e., catch-up and frontier shift indices.

Looking at the year-on-year changes in TFP, one finds TFP growth in all periods after FY08/09. However, this growth varies significantly between different periods, from 2.7% in FY09/10 to 27.5% in FY12/13. As regards the sources of TFP growth, it is remarkable that in only 3 of the 10 periods did efficiency and technical change, point into the same direction (either positive or negative): FY03/04, FY10/11 and FY11/12. For all other periods, positive change in one measure

is partly offset by negative change in the other, resulting in small or even negative TFP change. Considering the yearly average score of all the 13-insurers, the study finds consistent improvement in total productivity change over the years, as the score rose to 1.2759 in FY12-13 from 0.8115 in FY03-04.

Interestingly, the total factor productivity (TFP) change over the entire period (FY03-FY13) is negative at -0.05%. It is contributed by an improvement in technical change (catch-up) of 5.6%, but there is a decline in technical efficiency change (frontier-shift) by 3.6%. This result is surprising, as a significantly higher increase in TFP and efficiency over time was expected due to deregulation and the consequent intensification of competition in the Indian life insurance market, as discussed in the Objective 1. It seems that deregulatory efforts have had only a marginal impact on productivity and efficiency in the Indian Life Insurance market up to the year 2012-13.

7.1.3 Profitability

To assess the *third objective* of profitability of the life insurers, an attempt is made to find out the important factors determining the profitability of life insurance companies in India. Panel data models are employed to examine the relationship underlying the structure, efficiency and performance of the life insurance industry, which enables a better identification and measurement of phenomenon that are not captured in either cross-section or time series models. The study adds to the existing literature in several ways; first, use of new data series with base year 2004-05 are considered for the economic variables like GDP, WPI etc; second, a longer sample series has been included; third, the scope has been expanded by moving from firm specific factors to industry features like efficiency & market structure; and finally, Inflation and GDP growth are also controlled to account for the effect of the macroeconomic environment of insurer's profitability.

The model employs ROA as the dependent variable, which is proxy for profitability of the life insurers and a set of independent variables, including two-industry specific factors like HHI/CR5 & PE/PTE, three-firm specific variables like 'size', 'leverage' & 'risk' and two macro-economic factors like 'GDP & Inflation'. The data set includes a panel of 13 life insurance companies for the period 2002-03 to 2012-13 (11 years).

To estimate equations, initially the linear panel models like fixed effects and random effects models are estimated. Further, to check the long run relationship between the variables, panel cointegration tests are used. The panel cointegration analysis follows three steps: first, to avoid

any spurious correlation, stationarity of the variables are checked, i.e., whether the variable has a unit root. If the variables are non-stationary, in the second step the long-run relationship between the variables is tested, which is termed as cointegration test. Finally, if cointegration is confirmed then coefficients are estimated through FMOLS regressions.

Hadri's (2000) panel unit root methodology is used to test panel variables and Pedroni (1999) & Kao (1999) test are employed to examine whether a long-run cointegration relationship exists among the variables. As the cointegration results confirm that the existence of cointegration between the variables FMOLS is employed to estimate coefficients.

The panel regression is estimated by both the fixed effects and random effects models to investigate the determinants of profitability. However, Hausman's (1978) specification test recommends that fixed effects model is the appropriate model. The results of fixed effects model suggest that leverage, size, of the firm and two macro variables, GDP and inflation, are significant determinants of profitability while 'underwriting risk', market structure (HHI/CR5) and efficiency (TE/PTE) are not significant determinants of profitability.

The estimated panel regression results indicate that some variables are not significant, which may be due to the variables being correlated in the long run despite short-term disagreements. So, the panel cointegration technique is used. The FMOLS results yield mixed results across the four estimated models. The market structure variables (HHI/CR5) are significant and positive with the TE variable in the model. However, the efficiency (TE) variable shows a significant negative relationship with profitability in CR5 and insignificant in HHI. Risk shows a positive but insignificant relationship with profitability, against the expectation for a negative relationship. The other two firm specific variables, 'size and leverage' results are significant with positive coefficients. However, the macro-economic variables are significant in all the models and also the coefficients bear signs as expected.

To conclude, profitability of the life insurers is positively influenced by the insurer's size (as explained by logarithm of total assets) and leverage (liabilities to assets ratio). Further, the industry specific factors like market structure (HHI/CR5) also affects the life insurer's profitability with a positive relationship; i.e. competition in the industry increases profitability of the life insurers. This study does not find any evidence on the relationship between 'underwriting risk' and

'profitability'. Additionally, the macro-economic variables, GDP and inflation, have significant positive and negative relationship with profitability of the life insurers in India respectively.

7.1.4 Regulation

To study the aspect of regulation, the Chapter VI focused on analyzing the best international regulatory practices in insurance industry and the role of IRDA in developing and grooming the Indian life insurance market. Also, an assessment of the impact of regulatory changes on the life insurance companies' business indicators is attempted in the same chapter. The regulatory changes in September 2010 is regarded as one of the most stringent regulatory regimes in the Asia Pacific region. Hence, the year 2010 is assumed to be the year of regulatory change. This year is used as a benchmark to compare the insurers' indicators (like premium underwriting, investment income etc) to examine the impact of regulation change on the life insurers.

The study found that many of the regulations are in the right direction and have been issued in the right spirit and with the right focus (i.e. customer protection). However, the life insurance industry has suffered due to sudden regulatory changes and the insurers are not able to adopt the change immediately. However, by considering the experience of the industry in the past four years, it would appear that the impact of the guidelines may have fallen short of fulfilling these underlying objectives.

7.2 Policy Implications

In light of the evidence generated in this study, IRDA may have introduced further areas of concerns for the life insurance industry:

- Rather than regulating through tighter oversight of distribution practices adopted by insurers, the IRDA has chosen to regulate the product charges instead. In our view the limits on ULIP charges are somewhat extreme and have resulted in insurers being unable to remunerate the distributors appropriately, resulting in severe reductions in number of agents and sluggish growth in new business volumes across the industry.
- Companies are now selling more traditional participating and non-participating products, primarily due to the higher levels of commissions. Further, traditional products also offer low surrender values with companies booking surrender profits in the event of lapsation. Though,

some people may prefer traditional products over ULIPs, lack of transparency on such products may lead to lower overall returns to policyholders.

- The policy lapse/discontinuance rates in the industry continue to be high (at around 35%-40% in the first year). The cap on charge on ULIPs do not appear to have addressed the unhealthy sales practices in the industry.
- Pensions business has suffered significantly, which is disappointing given the absence of a robust social security system in India. The new pension guidelines have not led to a healthy revival of the pensions business.
- Significant pressure on cost management has resulted in many companies paying more attention on improving 'agent productivity'. However, there still does not seem to be sufficient investment in improving the training provided to the agents.

7.3 Limitations of the Study and Scope for Future Research

To the best of our knowledge, this is the first study which has examined the four different aspects, i.e., competition, efficiency, profitability and regulation, of the life insurance companies in India. The study restricted to the post liberalization period, due to scarcity of data prior to 2000. The regulation aspect could be examined through an empirical analysis. Further, this study could not cover the distribution channels, products and investment norms etc, which can be studied in detail.

7.4 Concluding Remarks

India continues to be a country of savers though India has witnessed a decline in the household financial saving in the past couple of years. The problem lies in idle household saving or saving instruments that do not help savers achieve their life stage goals. Despite this, the future of the life insurance industry looks interesting, with several changes in regulatory framework which will lead to further change in the way the industry conducts its business and engages with its customers. The demographic factors such as growing middle class population, aspirant young generation and increasing awareness of the need for protection and retirement planning will also support the growth of Indian life insurance.

There is also a need for closer dialogue between the industry and the regulator to ensure a more effective and sustainable solution that is in the best interests of all parties; ranging from the rural farmer to the urban shareholder.

No doubt, IRDA regulations will bring fruits to the industry in future. However, it believe that there should not be an immediate call for wholesale de-regulation. Regulatory change must be handled carefully to avoid excess regulation of the system. The regulator would have to establish a strong and consistent oversight mechanism to make sure that the rules/guidelines are being followed, even though the insurance funds are invested in international markets. The only benchmark that matters for an insurer's portfolio is to match the future cash flows required to meet its liabilities. Though, it is a difficult task to foresee the future, the broader the portfolio the greater the space for the managers to prepare for adverse events. Thus, there is a need for a cost effective and reliable insurance industry which will strengthen India's economic growth. Both the Government and IRDA need to work together and take some urgent steps for the revival of the Indian life insurance industry. Going forward, IRDA would need to balance its responsibility for 'Development' as well as 'Regulation' of the industry to give the industry the stimulus that it desperately needs.

To conclude, in the post reform period, deregulation of the Indian life insurance sector has intensified competition among the insurers, which has had a positive impact on the insurers' profitability and efficiency. However, there is an inconclusive relationship between the efficiency and profitability of the life insurers. The results show that deregulatory efforts have had a small effect on productivity change for the life Insurance companies in India. It is also seen that in the recent period the monopoly power of LIC is increasing, which may affect the rest of the life insurers, regarding their profitability in short-term. So, there is a large room for the regulator and Government to increase competition and efficiency to make the sector sustainable in long-run. Additionally, though India's equity markets are growing in depth and breadth, the insurers need to access the international markets to balance risk and return efficiently.

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Life Insurance Industry in India

ORIGINALITY REPORT

0%	0%	0%	0%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

EXCLUDE QUOTES	ON	EXCLUDE MATCHES	< 25%
EXCLUDE BIBLIOGRAPHY	ON		