

Growth and Market Structure in Post Reform Era : A Case of Indian General Insurance Sector

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Abstract

Present paper calculates growth and analyzes market structure of Indian General Insurance sector in post reform era starting from 2002-03 to 2014-15. It analyses market structure by calculating competition among general insurance companies through structural measures of competition which includes Concentration Ratios (CR_k) where $K= 4, 5 \text{ \& } 8$, Herfindahl-Hirschman Index (HHI) and Entropy Index (EI). The paper also assesses growth in terms of Physical, Structural, Business and Profitability growth. The result shows that Indian general insurance companies are operating in a monopolistic competitive market. Further the results also reveal that the private players are growing more than public players over the study period. Thus can be concluded that, though enactment of reform in Indian general insurance sector has significantly changed the market scenario but it still has to go a long way to become perfectly competitive market.

Keywords : *Growth, Market Structure, Herfindahl Hirschman Index, Entropy Index.*

Introduction

During the last two decades an enormous structural changes occurred in insurance markets around the world. All most all the developed as well as developing countries have opened up their insurance market. The Third Generation Insurance Directive in 1994 has remarkably changed the market environment of insurance in the European Union and enactment of financial system deregulation in 1996 has also changed the scenario of Japanese insurance market. In case of US Gramm-Leach-Bliley Financial Services Modernization Act of 1999 and many other deregulatory act in different countries have changed the insurance market all over the world (Weiss & Choi, 2008). In case of India also the General Insurance sector has grown up step by step and experience a 360-degree journey over a period of more than a hundred years. It started as an open competitive market with the establishment of Triton Insurance Company Ltd. by the British in the year 1850 in Calcutta and gets nationalized in the year 1972. By nationalizing the sector the government amalgamated 107 insurance companies and made four subsidiaries with a holding company.

Thus monopoly started in general insurance sector under the single shade of General Insurance Corporation with four subsidiaries i.e. National Insurance Company Ltd., New India Insurance Company Ltd., Oriental Insurance Company Ltd. and United India Company Ltd. (Sinha, 2005). In the year 1999 again the sector was opened up for private companies with the enactment of Insurance Regulation Act, 1999. The enactment of the Insurance Regulatory and Development Authority Act: 1999 brought greater freedom to the private sector and increased the number of domestic and foreign private companies by paralyzing the monopoly state of the sector. As a result after 2000, several changes have been seen in business environment, managing strategies, service quality and advance technology in the Sector (Sing & Kumar, 2009). In the year 2007 & 2008 the Detarification Act was enacted which has given Indian general insurance companies more freedom to charge their own premium and design their own product and also significantly impacted the premium rates and growth for commercial lines and health insurance. Finally the most waited Foreign Direct Investment bill (FDI) is amended by the government in the year 2015 and enhanced FDI to 49% from 26%. The aim of all this reform process was to create a competitive environment so that the players in the insurance sector can use their resources judiciously in order to enhance their growth, financial stability, customer satisfaction, fulfilling social needs, improving product offerings, transfer knowledge, advance technology, develop service quality as well as decreasing prices. So today, it became very significant to understand that after all these reforms whether Indian general insurance sector could achieve all those object of reform process and if achieved to what extent for the wellbeing of the sector as well as the country at large. In this backdrop, the purpose of present study is to find out the answer of a very pertinent question: what is the growth and degree of competition in Indian general insurance sector in post reform era? The research issue is relevant because the empirical evidence in this regard is very scanty in case of Indian general insurance sector. Further the research will also help the government or the authority to take necessary steps for further improvement of the sector. The remaining part of the paper is organized as follows:

Section 2 focuses on the review of existing literature related to the topic. Section 3 describes data and methodology. Section 4 provides growth of general insurance sector. Section 5 is devoted for analyzing market structure of the sector followed by concluding remarks in section 6.

Literature review

Research studies across various economies have indicated a positive relationship between development of insurance sector and economic growth (Holsboer, 1999, Ward & Zurberg, 2000, Arena, 2008, Han, Li, Moshirian & Tian, 2010). Outreville (1990) established a link between an economy's financial development and insurance market development in case of developing economies of the world. Webb, Grace & Skipper (2002) carried out

another study with an aim to investigate the effects of insurance and banking sector on economic growth. They found that both the insurance and the banking sector affect economic growth of a country. Chau, Khin & Teng (2013), studied the short term and long term relationship between life and general insurance consumption with economic development measured by gross domestic product (GDP) in case of Malaysian. They concluded that total employment and life insurance premium had a positive impact and significant relationship in short term economic development, while lag of GDP, capital stock, total employment, and general insurance premium exhibit a positive and significant relationship in long term economic development in the Malaysian insurance market. Michael (2012), examined the short and long run relationships between GDP and insurance sector growth of Nigeria and found that insurance sector growth positively and significantly affects GDP. The long run relationship between the insurance growth and GDP was also confirmed. Hou & Lee (2012) investigated the impact of financial institutions and GDP in 12 Euro-countries. They found that, the life insurance and banking development are significant predictors of GDP. Horng (2012), studied the relationship among the insurance demand, financial development and GDP of Taiwan. The study established that there is an equilibrium relationship between the insurance demand, financial development and GDP. The study also reveals that in short run, GDP is Granger cause of insurance demand and financial development is Granger cause of GDP. They finally concluded that financial development promotes GDP and GDP further promotes the insurance demand. Akins & Apanisile (2014), examined the relationship between insurance and economic growth in sub-Saharan Africa over the period 1986-2011. They employed pooled OLS, fixed effect model and generalized method of moment panel model in the estimation and concluded that insurance has positive and significance impact on economic growth in sub-Saharan Africa.

Thus growth of insurance sector is crucial for the development of a countries economy. Further due to completion of reform process all over the world market structure of insurance industry has become pertinent topic among the researchers. Market structure was primarily analyzed by using structural approach only. Structural measure inferred the nature of competition in an industry from its structural characteristics, such as the number of firms in the market and their size distribution, concentration, market share etc. (White, 1982). The main approaches of structural measure includes the method like structure-conduct-performance (SCP) hypothesis (Bain, 1951), efficient structure (ES) hypothesis (Demsetz, 1973), Concentration ratio, Herfindahl Hirschman Index, Entropy Index, Hall Tideman Index, Comprehensive Industrial Concentration Index, Rosenbluthe Index etc. (Bikker & Haaf, 2002).

Analysis of market structure was mostly carried out in case of banking sector both in abroad as well as in India by using different approaches of measuring competition (Bikker & Haaf, 2002, Rozas, 2007; shafar & Laura, 2009; Mensi & Jouari, 2011; Pawlowska, 2012; Ansari, 2013). Some of the studies used SCP and ES hypotheses but they found a

diverse result and could not indicate the superiority of one hypothesis than the other (Heggstad & Mingo, 1977, Brozen, 1982, Smirlock 1985, Jackson, 1992, Berger, 1999 and Evanoff & Fortier, 1998). In case of India, Sathye & Sathye (2004) conducted a study by using SCP approach for Indian banking sector. They used multiple regression model and calculated efficiency by applying non parametric method of DEA for time series cross-sectional data over a period from 1997 to 1998 with 2,700 unit of State Banks operating in seven-state. The result suggested that Indian banking market is competitive and efficient.

In case of insurance sector also some studies on market structure was done outside India. Mainly in United State they used SCP and ES hypothesis for analyzing market structure and found different results for different insurance lines (Carrol, 1993, Chidambaram, Pugel & Saunders, 1997, Bejtelsmit & Bouzouita, 1998, Choi & Weiss, 2005, Weiss & Choi, 2008).

There are a few studies in insurance sector where HHI, EI, Concentration ratio are used for measuring the degree of competition at different countries. Nissan (1996) analyzed the degree of concentration amongst the largest 200 property liability insurance company of US by using Theil's Entropy Index over a period between 1985 and 1993. The result revealed that the concentration in US property liability insurance is increased in accordance with substantial number of merger and acquisition. Again in the year 2000, Nissan and Caveny examined the concentration of US property liability insurance industry in terms of lines of insurance by using Herfindahl Hirschman Index between 1989 and 1995. They found a increasing trend in concentration for all most all the lines of insurance during the study period though the line of homeowners was found most concentrated line followed by private passenger auto physical damage and the line of commercial auto physical damage as least concentrated line. Sukpaiboonwat, Piputsitee, & Punyasavatsut, (2014) studied the market structure of life insurance and non-life insurance industry in Thailand by using Concentration Ratio and Herfindahl-Hirschman Index for measuring the degree of market concentration over a period 2006-2011. The paper also analyzed various data from all type of insurance premium, balance sheet and income statement to measure the concentration and competition trend. The results stated that the life insurance industry is more concentrated than the non-life insurance industry. In both segments of the insurance market, as well as in the overall insurance sector, they also observed a downward trend in market concentration.

Shukla (2010), analyzed the structure of Indian insurance industry in post liberalization period. The author carried out econometric analysis to select the best measure of concentration from a set of eight concentration ratios of the largest firms and HHI index. The study witnesses the domination of the public entities even after five years of liberalization. Further the finding has also shown that entry of large number of private players has changed the structure of the industry with a declining in concentration and increased in competition in the life insurance industry. Parekh and Banerjee (2010) also

found that in India insurance sector has significant impact on economic development. This sector is gradually increasing and its contribution in GDP is also increasing. Sastry (2012) used various concentration and inequality measures like HHI, CR_k , EI, Hall-Tideman Index, Bajo-Sales indices for over all insurance sector and found that concentration is slowly decreasing.

From the review of existing literature it is found that research studies across various economies even in India also indicates a positive relationship between development of insurance sector and economic growth. Most of the studies in analyzing market structure have been done in abroad in case of both banking as well as insurance sector. The structural approach has been extensively used in banking sector as well as life insurance sector but scanty applied in general insurance sector, and most of them are from abroad. Under structural approach they have mainly used SCP, ES, Concentration ratio, HHI and EI.

3. Data and Methodology

3.1 Data and Study Period

The present study is based on secondary data collected from the individual annual reports of the general insurance companies, IRDA and Hand Book of Insurance Statics of India for a period of 13 years from 2002-03 to 2014-15.

3.2 Population and Sample

The population of the study is all the general insurance companies operating in India. As on 31-03-2015 there are 28 general Insurance companies doing business in India out of which six public sector and 22 private sector companies. Among the private sector 5 are exclusively doing health business and among public sector four are doing multi line operations and two are specialized insurance companies. The sample size of present study is 12, four public and eight are private general insurance companies. The sample companies are selected on the basis of date of establishment and lines of insurance dealings with i.e. all the companies dealing with multi line general insurance business and established before 1st April 2003 are included in the sample.

3.3 Measures of Growth and market structure

To analyze the Growth of general insurance sector in post reform era trend analysis of the data has been done for identifying the appropriate growth rate for the variables. For that first we have plotted the actual data and compared with the figures of different growth rates. On comparison, we find that exponential growth rate is appropriate for all the variables. Hence, we have computed the exponential growth rate of various pertinent variables i.e. Total asset, Fixed asset, cash and bank balance, investment, capital, current liabilities, Net premium income, investment income, commission and management

expenses, net claim incurred and Profit after tax etc. by dividing into four segment, Physical growth, Structural growth, Business growth and Profitability growth. Further, growth has been calculated as individual Company wise and sector wise i.e. for public sector as well as private sector. For analyzing market structure of Indian general insurance sector in post reform era mainly the structural approach is used for measuring competition. From structural approach the present paper has used CR_K ratios where $K=4, 5 \text{ \& } 8$, Herfindahl-Hirschman Index (HHI) and Entropy Index (EI) as most of the previous studies has used ((Nissan, 1996, Nissan and Caveny, 2001, Subir & Madheswaran (2006), Sneha(2010), Shastry (2012), Sharma & Bal, 2012; Sukpaiboonwat et al. 2014 & Mirzaei & Moore, 2014). The details of all the measures are explained below.

Concentration Ratio : The concentration ratio is the measure of the percentage of market share of k numbers of companies in an industry held by the largest firms within that industry. The concentration ratio is measured by :

$$CR_K = \sum_{i=1}^K S_i \quad \text{where } K=4, 5 \text{ \& } 8 \text{ and } S_i \text{ is the market share of } i^{\text{th}} \text{ company.}$$

Concentration ratios range from 0 to 100 percent. While 0 indicates perfect competition or at the very least monopolistic competition 100 implies an extremely concentrated oligopoly or monopoly market.

HHI : Herfindalh Hirachman Index (HHI) is computed by applying the following formula -

$$HHI = \sum_{i=1}^n S_i^2 \quad \text{where } S_i \text{ is the market share of firm } i.$$

The HHI ranges between $1/n$ and 1, it reaches its lowest value (the reciprocal of the number of firms) when all the firms in a market are of equal size i.e. the market is purely competitive and reaches unity if the market is monopoly. So a decrease in the HHI indicates an increase in competition.

Entropy Index : The EI Index is similar to HHI index and it is defined as follows:

$$E = - \sum S_i \log S_i \quad \text{where } S_i \text{ is the market share of } i^{\text{th}} \text{ company.}$$

The value of the entropy varies inversely to the degree of concentration. It approaches zero if the underlying market is monopoly and reaches its highest value when the market shares of all the firms are equal and market concentration is lowest i.e. competitive market environment.

4. Growth of General Insurance Sector

Due to liberalization, privatization and globalization Indian insurance sector has grown enormously during a period of more than a decade. Since 2000 the market scenario

of Indian general insurance sector has changed drastically and becomes difficult for both public and private sector to maintaining their growth and market share. The detail growth analysis has been discussed below.

4.1 Physical Growth of Indian General Insurance sector

The potential of the insurance sector is universally assessed with reference to the two parameters, viz., insurance penetration and insurance density. These two are often used to determine the level of development i.e. the growth of the insurance sector in a country. Insurance density is the percentage of premium to total population while Insurance penetration is defined as the ratio of premium underwritten in a given year to the Gross Domestic Product (GDP). Therefore under physical growth along with penetration and density three more pertinent variable's growth i.e. Number of companies, Number of policy issued and Gross direct premium with in India has been presented in table -1.

Table 1
Physical Growth

Year	Penetration (percentage)	Density (in US Dollar)	No of Companies (Numbers)	No of policy Issued (millions)	Gross Direct Premium (millions)
2002-03	0.67	3	14	43.6	138982.6
2003-04	0.62	3.5	15	41.7	155948.1
2004-05	0.64	4	15	49.8	174806
2005-06	0.61	4.4	15	51.1	203597.2
2006-07	0.6	5.2	16	46.7	249054.9
2007-08	0.6	6.2	18	57.3	278237.4
2008-09	0.6	6.2	21	67.1	303518.3
2009-10	0.6	6.7	23	67.5	346204.5
2010-11	0.7	8.7	24	79.3	425764.5
2011-12	0.7	10	24	85.7	528757.7
2012-13	0.78	10.5	27	1,07.02	629726.5
2013-14	0.80	11	28	1,02.45	706100.2
2014-15	0.7	11	28	118.28	776395.4

Source : Hand book of Insurance Statistic and Annual reports of IRDA

Table -1 illustrate that in the year 2002-03 density of general insurance sector was 3 and in the year 2014-15 it became 11 which is more than three times, can visualized the fact that overall performance of insurance sector has improved a lot after liberalization. In case of penetration in the year 2002-03 it was 0.67% and in 2014-15 it became 0.7%, indicates very less growth of penetration and during the period from 2006-07 to 2009-10 it was constant. Which further specify that spread of general insurance business in India is very poor and a large section of insurable populations are still inaccessible of insurance coverage. The phenomenon clearly reveals that there is a huge prospective of untouched market in general insurance sector of India. Out of one billion people only two million people were covered thus one can see the growth prospect of general insurance sector of India. Number of companies also increases during the study period of more than a decade, from 14 numbers in the financial year 2002-03 to 28 by the end of 31st march 2015. In case of number of policy issued and gross direct premium as shown in figure-1 and figure -2 the sector is growing but in case of number of policy issued the growth is not steady and in case of gross direct premium the sector is growing sharply. Thus overall physical growth indicates that the general insurance sector of India is growing well and there is a huge potential for future growth.

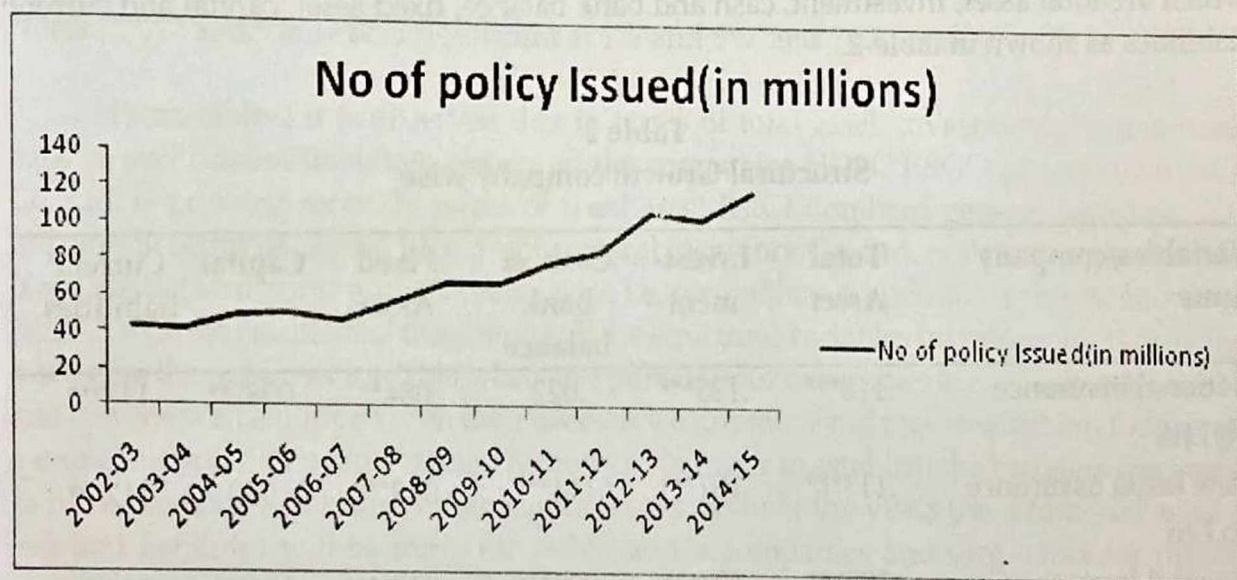


Figure 1 : Trend of number of policy issued

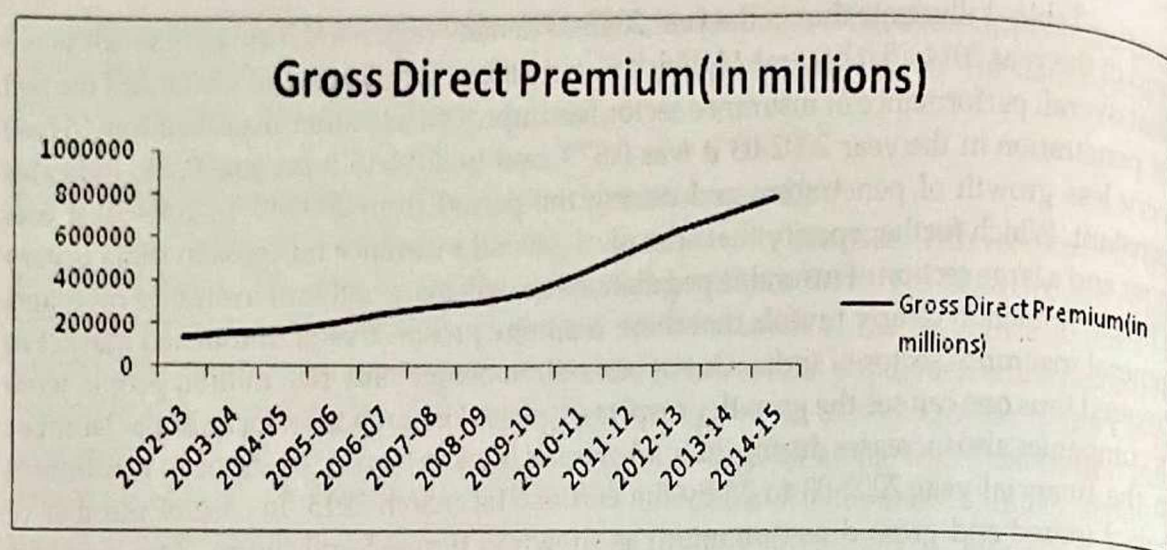


Figure 2 : Trend of gross direct premium income

4.2 Structural Growth of Indian General Insurance sector

Under structural growth six major structural variable's growth has been calculated which are total asset, investment, cash and bank balance, fixed asset, capital and current liabilities as shown in table-2.

Table 2
Structural Growth company wise

Variables/company name	Total Asset	Investment	Cash & bank balance	Fixed Asset	Capital	Current liabilities
National insurance Co Ltd.	.110***	.125***	.022	.084**	.098***	.118***
New India assurance Co.Ltd	.113***	.107***	.144***	.049***	.050	.112***
Oriental Insurance Co.Ltd	.102***	.104***	.099***	.045***	.106***	.094***
United Insurance Co.Ltd	.098***	.105***	.079***	.051***	.091***	.093***
Bajaj Alliance general insurance Co. Ltd.	.277***	.277***	.304***	.249***	.240***	.322***

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Reliance general insurance Co. Ltd.	.316***	.314***	.192**	.248**	.273***	.403***
Royal sundaram general insurance Co. Ltd.	.231***	.246***	.052*	.069*	.139***	.283***
ICICI Lombard general insurance Co. Ltd.	.322***	.326***	.130**	.353***	.258***	.355***
TATA AIG general insurance Co. Ltd.	.234***	.248***	.144***	.143***	.168***	.274***
Cholamandalam general insurance Co. Ltd.	.285***	.277***	.129**	.205***	.151***	.394***
Iffco Tokio general insurance Co. Ltd.	.261***	.268***	.260***	.066***	790.168***	.320***
HDFC ERGO general insurance Co. Ltd.	.335***	.330	.370***	.307***	.227***	.456***

Notes: ***, ** and * indicates significant at 1% and 5% and 10% level.

From table-2 it is observed that in terms of total asset, investment, cash & bank balance and current liabilities among all the companies HDFC ERGO general insurance Co. Ltd. is growing more. In terms of fixed asset ICICI Lombard general insurance Co. Ltd. and in terms of capital Iffco Tokio general insurance Co. Ltd. is showing good result. If we see the structural growth sector wise i.e. for public and private sector as shown in table - 3 it can be established that among all the structural variables private sector is growing more than the public sector. This is because public sector companies are already established and they are well equipped with their necessary equipment and requirement but for private sector companies they have started recently so in order to establish the business they need to have adequate assets and other requirements. So over the years the additional asset is less and liabilities will be more for public sector companies and vice versa for private sector companies. Among the public players the National Insurance Co Ltd. is growing more and among private players HDFC ERGO general insurance Co. Ltd. is growing more than other companies.

Table 3
Structural Growth Sector Wise

Structural growth of Public and Private sector						
Variable	Total Asset	Investment	Cash & bank balance	Fixed Asset	Capital	Current liabilities
Public Sector	.107***	.110***	.108***	.058***	.090**	.105***
Private sector	.286***	.289***	.234***	.238***	.225***	.340***

Notes: *** and ** indicates significant at 1% and 5% level of confidence.

4.3 Business Growth of Indian General Insurance sector

Business growth of Indian general insurance sector has been shown by calculating exponential growth rate of five pertinent variables which include claim incurred, investment income, management & commission expenses and premium income. Due to negative values of variables for some of the company present study could not calculate the exponential growth rate and is shown as not available (NA) in the table. The business growth of all the companies is shown in table- 4 and business growth sector wise is presented in table-5.

Table 4
Business Growth Company Wise

Variables/company name	Claim incurred	Investment income	Management & Commission expenses	Premium Income
National insurance Co Ltd.	.126***	.134***	.12***	.135***
New India assurance Co.Ltd	.151***	.119***	.096***	.117***
Oriental Insurance Co. Ltd.	.112***	.090***	.113***	.111***
United Insurance Co. Ltd.	.129***	.070***	.123***	.142***
Bajaj Alliance general insurance Co. Ltd.	.274***	.315***	.250***	.059***
Reliance general insurance Co. Ltd.	.417***	.398***	NA	.392***
Royal sundaram general insurance Co. Ltd.Co. Ltd.	.302***	.290***	.210***	.218***
ICICI Lombard general insurance Co. Ltd.	.402***	.418***	NA	.343***

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TATA AIG general insurance Co. Ltd.	.258***	.282***	.200***	.221***
Cholamandalam general insurance Co. Ltd.	NA	.448***	.356***	.405***
Iffco Tokio general insurance Co. Ltd.	NA	.371***	.279***	.267***
HDFC ERGO general insurance Co. Ltd.	.311***	.508***	.266***	.381***

Notes: ***, ** and * indicates significant at 1% and 5% and 10% level of confidence.

Table 5
Business Growth Sector Wise

Variable	Claim incurred	Investment income	Management & Commission expenses	Premium Income
Public Sector	.131***	.107***	.111***	.126***
Private sector	.338***	.354***	.279***	.178***

Notes: *** indicates significant at 1% level of confidence.

Table 4 and table 5 portrays the business growth of the sample companies as well as public and private sector. Among the companies, Cholamandalam General Insurance Co. Ltd. is growing more in terms of all the variables and sector wise private sector is growing more than the public sector. Private sector is growing more may be due the reason that after liberalization the private players enters into the market and they started taking the market share of public players. So it becomes difficult for the public players to maintain their share in terms of all the variables may it investment income or net premium income and became more difficult to increase it. May be the value increases but the rate of growth is decreasing. But for private players they are starting from the base hence there is a probability to grow more and thus the rate of growth is increasing.

4.4 Profitability growth of Indian General Insurance Sector

In order to see the profitability growth of general insurance sector present paper tries to calculate growth rate of two important variables i.e. Return On Equity (ROE) and Return On Asset (ROA). But from the analysis of over the year data for each company it is observe that the value of the variables are fluctuating and consists of both positive and negative values hence no growth rate is appropriate for these variables rather the movement

of this variable through line diagram is more appropriate, shown in figure-3 and figure- 4. A look into the figures 3 and 4, it is evident that there is no any steady movement of ROE and ROA over the years for overall sector as well as public and private sectors. The fluctuating movements of both ROE and ROA clearly demonstrate the instability of the earnings (in relative terms) of the Indian general insurance sector. During 2010-12, the profitability ratios were negative for both overall sector and private sector. However, since 2012 an increasing trend is noticed for both the sectors. In this respect, the average performance of public sector is relatively stable over the years, although the percentages of profit are less as compared to the private sectors during 2002-03 and 2014-15. Further, the figures also show three distinct stages for the overall sector: stage 1(2003-07) when the profitability is growing; stage 2 (2007-2012) when profitability is declining and stage 3 (2012-15) when profitability is again increasing. The sudden fall after 2007 is may be due to the regulatory change i.e. enactment of detariffing act. It further fallen because of the changes in business environment by global economic crisis in the year 2008 which started impacting from 2009 onwards. But the economy settle down worldwide and Indian economy also is growing well therefore from 2012 again a sudden rise can be seen in both the variables.

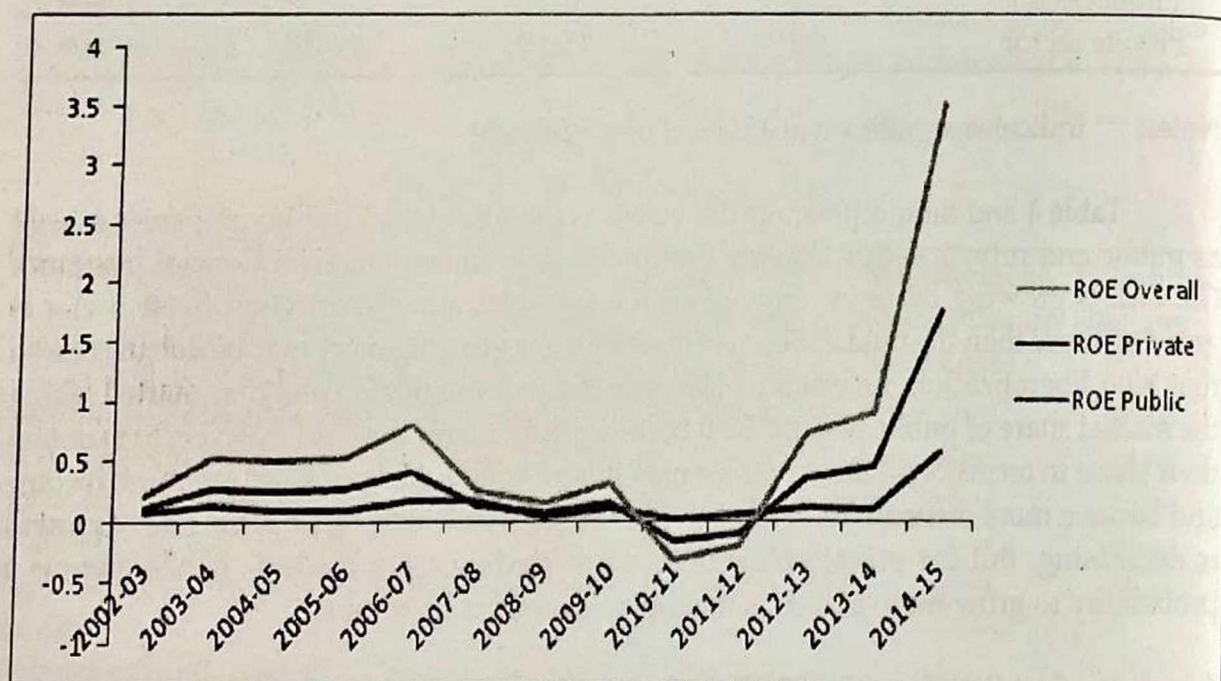


Figure 3 : Trend of ROE of Indian general insurance sector

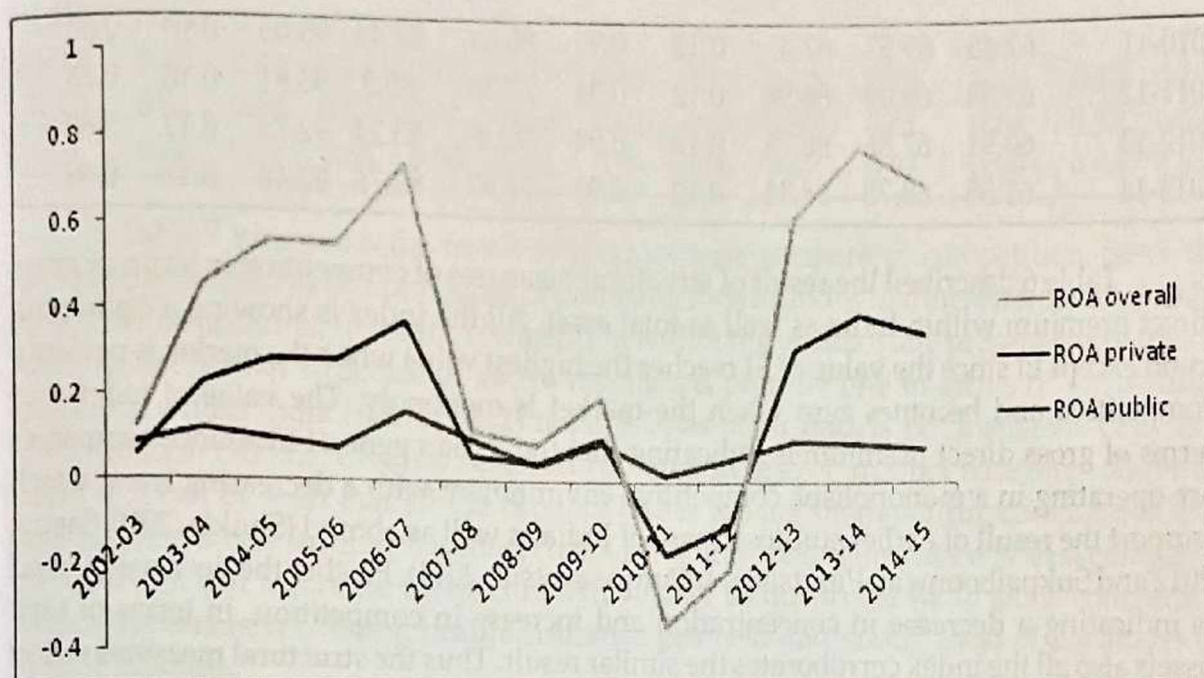


Figure 4 : Trend of ROA of Indian general insurance sector

5.1. Analysis of Market Structure of Indian General Insurance Sector

Market structure of Indian general insurance sector is analyzed on the basis of overall sector and product wise. Since all the sample companies are dealing with multiline insurance business so to see the competition within the product line, present study further calculates the competition of each product line.

Table 6
Structural Measures of Overall Sector

Index Year	Gross direct premium					Total asset				
	CR4	CR5	CR8	HHI	EI	CR4	CR5	CR8	HHI	EI
2002-03	90.34	92.48	97.16	0.21	0.76	95.28	96.12	98.17	0.25	0.68
2003-04	85.52	88.58	95.97	0.19	0.82	94.86	96.01	98.21	0.25	0.69
2004-05	79.93	84.81	95.21	0.17	0.86	93.83	95.26	98.16	0.24	0.7
2005-06	73.66	79.91	94.88	0.15	0.9	92.82	95.06	98.37	0.24	0.71
2006-07	65.28	72.45	91.9	0.13	0.94	89.31	93.18	97.54	0.23	0.75
2007-08	60.44	68.98	87.85	0.12	0.97	87.23	91.41	97.38	0.22	0.77
2008-09	60.12	68.85	87.52	0.12	0.97	81.03	87.77	96.25	0.19	0.82
2009-10	61.93	69.38	86.19	0.12	0.96	82.52	88.68	96.18	0.2	0.81

2010-11	62.45	69.57	87.47	0.12	0.95	80.61	87.44	95.05	0.19	0.83
2011-12	62.38	69.09	86.98	0.12	0.94	77.38	85.3	93.81	0.18	0.86
2012-13	60.91	67.86	86.71	0.12	0.94	75.4	83.21	92.72	0.17	0.88
2013-14	61.55	68.75	88.11	0.12	0.93	74.93	82.76	92.48	0.17	0.88

Table 6 described the result of structural measures of competition in terms of gross direct premium within India as well as total asset. All the Index is showing a decreasing trend except EI since the value of EI reaches the highest value when the market is perfectly competitive and becomes zero when the market is monopoly. The value of indexes in terms of gross direct premium is indicating that the Indian general insurance companies are operating in a monopolistic competitive environment with a decreasing trend which support the result of earlier studies in case of India as well as abroad (Shukla, 2010, Sastry, 2012 and Sukpaiboonwat, Piputsitee, & Punyasavatsut, 2014). Further the decreasing trend is indicating a decrease in concentration and increase in competition. In terms of total assets also all the index corroborates the similar result. Thus the structural measures reflect a monopolistic competition and less concentration in Indian general insurance market.

Table 7
Product Wise Structural Measures of General Insurance Sector in Terms of Gross Direct Premium Income Within India

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Index	-03	-04	-5	-6	-7	-8	-9	-10	-11	-12	-13	-14
Marine Insurance												
HHI	0.23	0.20	0.17	0.17	0.15	0.15	0.14	0.15	0.15	0.15	0.15	0.17
CR4	0.93	0.86	0.80	0.78	0.70	0.70	0.68	0.73	0.73	0.72	0.72	0.76
EI	0.71	0.79	0.85	0.86	0.90	0.90	0.92	0.90	0.90	0.92	0.91	0.85
Fire insurance												
HHI	0.19	0.16	0.15	0.14	0.13	0.13	0.13	0.14	0.14	0.14	0.14	0.14
CR4	0.85	0.77	0.72	0.66	0.62	0.61	0.64	0.68	0.70	0.70	0.69	0.68
EI	0.80	0.87	0.90	0.93	0.95	0.95	0.96	0.94	0.93	0.93	0.95	0.92
Motor insurance												
HHI	-	-	-	0.16	0.13	0.12	0.11	0.11	0.11	0.11	0.11	0.12
CR4	-	-	-	0.76	0.65	0.57	0.55	0.54	0.54	0.55	0.54	0.56
EI	-	-	-	0.88	0.94	0.97	0.99	1.00	1.01	1.02	1.02	0.99
Health insurance												
HHI	-	-	-	0.17	0.16	0.15	0.14	0.14	0.15	0.15	0.15	0.16
CR4	-	-	-	0.78	0.65	0.63	0.64	0.70	0.71	0.71	0.71	0.75
EI	-	-	-	0.84	0.88	0.91	0.92	0.92	0.90	0.90	0.91	0.86

Other insurance

HHI	0.21	0.20	0.18	0.15	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.13
CR4	0.92	0.88	0.82	0.71	0.66	0.62	0.63	0.63	0.61	0.61	0.57	0.58
EI	0.74	0.77	0.84	0.90	0.94	0.96	0.96	0.97	0.97	0.96	0.98	0.94

Table 7 represents the result of product wise measure of competition. Since the sample companies has five categories of product which includes Marine, Fire, Motor, Health and other insurance so to see the competition within the product line present study tries to analyze the market structure of above mentioned product line in terms of gross direct premium within India from 2002-03 to 2013-14 as other data is not available. Only one concentration ratio i.e. CR4 has been incorporated in case of product wise analysis. From table -7 it can be seen that all the product line is having monopolistic competition and among them motor insurance is most competitive and Health insurance is least compared to others. Health insurance is less competitive may be due to the stand alone companies, which are exclusively doing health insurance business and taking most of the shares of health business.

6. Conclusion

Present paper analyze the growth and market structure of Indian general insurance sector in post reform era by calculating exponential growth rate of various pertinent variables under four categories which includes physical, structural, business and profitability growth over a period of 13 years from 2002-03 to 2014-15. For analyzing market structure present paper uses structural measures which includes CR_k where $K=4, 5 \& 8$, HHI & EI. The results of the study found that private sector is growing more in all the four categories than public sector but in case of profitability public sector's growth is more stable than private sector. This is may be because private sector companies have started from the base and public sector companies are well established as a result growth rate of private sector become more than public sector. In case of profitability public sector has already captured the market and private sector is new born baby in the market and since private sector just started doing business so they incurred more expenses in terms of fixed asset than public sector during the study period. Therefore profitability of public sector is more stable than private sector. Further the result also illustrate that there is a monopolistic competition with decreasing trend in general insurance sector which supports the findings of earlier studies(Sukla, 2010 and Sastry, 2012) and among the product lines motor insurance is more competitive and health insurance is least competitive than other product lines. A similar result is also found in case of other developing countries like Turkey and Bulgaria (Kassman & turglut, 2008, and Todorove, 2016). Thus structural index indicates the success of competition promoting processes i.e the reform processes, which allows a greater and better choice for customers as well as insurer. It also ascertains strong evidence of change

in market structure in Indian general insurance market and can be concluded that during a period of more than a decade of opening up of this sector and enactment of all other reforms, has significantly changed the market scenario of the sector and as a result the sector has entered into monopolistic competitive phase by ending monopoly state. Since the structural measures show decreasing trend both in case of overall sector as well as product lines, more competition can be expected in future. Thus the government or the authority can take necessary steps to enhance the competition in the sector. The study also suggests that further research can be undertaken considering some other variables in more details and using non structural measures of competition to assess the growth and market structure of Indian general insurance sector.

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