Market Concentration and Firm Performance : Evidences from the Indian Life Insurance Industry

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Abstract

In the pre-reform era, Life Insurance Corporation of India (LICI) dominated the Indian life insurance sector with a market share of close to 100%. But the situation drastically changed since the beginning of the year 2000. With the development of the Insurance Regulatory and Development Authority of India (IRDAI) Act in 1999, private players started entering into the Indian life insurance market. At the end of the FY 2014-15, the market share of LICI stood at 73.48% with the number of private players having risen to 23 in the country's life insurance sector. One of the reasons for such a decline in the market share of LICI during the post-reform period could be attributed to the increasing competition from the private players in the country's life insurance sector. The present study attempted to evaluate the extent of concentration and competition prevailing in the Indian life insurance market over the study-period from 2008-09 to 2014-15, against the backdrop of the global financial crisis. In addition, an attempt was made to ascertain any significant differences in the performances of the 18 life insurance companies in India, inclusive of LICI, in terms of life insurance premium underwritten during the period under review. The present study revealed the pre-existing dominance of LICI in the Indian life insurance market, both in terms of market concentration and premiums underwritten, even after 15 years since the privatization of the country's insurance sector.

Keywords: life insurance, IRDA, concentration, competition, financial performances, HHI, normalised HHI, k-concentration ratio, analysis of variance, pairwise comparisons

JEL Classification : F62, G22, L10

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The insurance sector in India was opened up for private participation since the year 2000. Till such time, the life insurance business continued to remain under the monopoly of the state-owned Life Insurance Corporation of India (LICI) since its inception in 1956. With the enactment of the IRDAI Act in 1999, the country's insurance market was opened up for private participation and many foreign insurers entered into joint ventures with domestic companies, or with domestic commercial banks having large branch network, to tap the vast potential of the country's insurance sector. As a result, the number of companies doing life insurance business in India moved up to 24 (inclusive of LICI) at the end of the FY 2014-15, with more companies being in the pipeline.

Since then, the Indian life insurance sector has been under a consistent process of transition from the extreme stages of 'monopoly' towards 'perfect competition'. Though LICI happened to be the largest company operating in the country's life insurance sector, the impact of competition has significantly brought down the market share of LICI from almost 100% to 73.48% at the end of FY 2014-15. The performances of the private life insurers have been commendable since the privatization of the country's insurance sector which is evident from a combined gain of 26.52% market share at the end of FY 2014-15, almost from scratch (IRDA Annual Reports).

The present study demonstrates the extent of concentration and competition prevailing in the country's life insurance sector during the period from 2008-09 to 2014-15. The first part of the study makes an attempt to explore

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the market structure, along with the level of concentration and competition prevailing in the country's life insurance sector during the post-deregulation study-period, since the outbreak of the global financial crisis. That is to say, whether the insurance market during the period under review is either operating in a monopoly market-structure or controlled by a small number of large firms, the number of companies who constitute such a group and the disparity in market shares between the LICI and the private players has been explored in the present study. The second part of the study further evaluates the extent of disparity in the performances of the 17 private life insurers, with an established player like LICI, in terms of life premiums underwritten (including renewal premiums) during the period under review.

Literature Review

Having reviewed the most pertinent past research papers, I have not found enough evidence of any such studies in India or in abroad that comprehensively dealt with the market concentration and firm performances of the Indian life insurance industry, against the backdrop of the global financial crisis. The present study intended to fill that research gap. Some of the literatures reviewed by me relating to the present area of research has been summarized as follows:-

   Bedi and Singh (2011) made an attempt to evaluate the performance of 18 life insurance players in India during the post-LPG era over the study-period from 2001-02 to 2007-08. The change in the investment strategy of LICI was further evaluated for the period from 1980 to 2009. The data was analyzed using the t-test and the two-way Anova approach. It was found that the total business of LICI was showing an increasing trend over the study-period. The collected and analyzed data proved that the LPG (Liberalization, Privatization & Globalization) was having a positive influence on LICI and its performances. Among the private players, ICICI prudential leads the race by taking over a lot of business of LICI due to its aggressive business strategies and flexible product range.

   Cummins, Denenberg, and Scheel (1972) made an attempt to measure the concentration in the US Life insurance industry. The study used the Herfindahl index to measure the concentration based on 20 firms covering 49 states and the District of Columbia in USA. The results showed that the life insurance industry in many states has attained relatively high levels of concentration both in group and in ordinary insurance businesses. Furthermore, the results also indicated an inverse relationship between concentration and competition.

   Chakraborty and Sengupta (2016) has made an attempt to evaluate the financial soundness and market concentration of the four leading life insurers in India namely the Life Insurance Corporation of India (LICI), ICICI Prudential Life Insurance Company Limited (ICICI PruLife), HDFC Standard Life Insurance Company Limited (HDFC Standard), and SBI Life Insurance Company Limited (SBI Life). The study was based on the secondary data sources and analysed the performances of the respective life insurers for the period from 2008-09 to 2012-13. The methodology used by them has been the ratio-based CARAMELS model (as published by IMF) to determine the financial performances of the life insurers, followed by the application of the widely-used k-concentration ratios, the Herfindahl-Hirschman Index (HHI) and the normalized HHI to evaluate the level of concentration and competition prevailing in the country's life insurance sector. The study has revealed the pre-existing dominance of LICI even after 15 years since the privatization of the country's life insurance sector, along with the existence of a fairly competitive market structure.

   Gulati and Jain (2011) have made an attempt to evaluate the comparative performances of all the Indian life insurers for the period from 2001-02 to 2008-09. The study was based on secondary data sources and analysed the impact of privatization on the performances of the 22 life insurers (inclusive of LICI) in terms of certain parameters such as agency-force, premium income, number of policies, the growth rates of premium and the growth rates of policies. The results of their study indicated the dominance of LICI in the country's life insurance segment despite of a significant drop in its market share since liberalization, with the rising presence of private players.

Kotgiri (2013) has made an attempt to compare the performances of public and private life insurance companies in India in terms of growth in insurance industry and trend of customers' investments in particular plans. The purpose of the study was to find out the investment habits, change in attitude of customer's investment, growth in investments and premiums underwritten between the public and private-sector life insurers in India. The study was based on secondary data sources and included all the life insurers who have been in operation till the end of the FY 2011-12. His study revealed the dominance of LICI in the Indian life insurance sector, but also pointed out the slow and steady rise in the market shares of the private life insurers.

Lapteacru (2012) discussed the shortcomings of the widely-used Herfindahl-Hirschman Index and the Entropy concentration indices in his study. It has been shown that these two indexes were biased and hence the construction of a new global concentration index was felt by the author. Two new forms of concentration, named alpha-concentration and beta concentration have been used to identify the determinants in the loan-portfolio concentration of the 35 Bulgarian Banks for the period from 2003-2006. Furthermore, the application of the normalized versions of Herfindahl-Hirschman and the Entropy concentration indices were suggested by the author to get rid of the 'weight-bias' that characterizes these concentration measures. Applying a dynamic-panel model, he has found that liquidity, loan portfolio level and the level of money in circulation influences the way in which the Bulgarian banks lend to different economic sectors. The results also suggested the need for the development of a global concentration index.

Nagaraja (2015) has made an attempt to vindicate the relationship between the performance of the insurance industry with the country's economic development, followed by a comparative analysis of the life and non-life insurance industry in India w.r.t. the pubic-sector and private-sector players. Four indicators - Premium incomes, Market Share, New Policies Issued and Claims Settlement Ratio - have been used to analyze the performances of Insurance industry. He has made an analytical study of the country's insurance industry based on secondary data-sources covering the period 2004-05 to 2013-14. The study concluded with the observation that the country's insurance penetration and density was very low compared to the developed countries. The results also showed the impressive performances of LICI over its private-sector counterparts in the life insurance segment. In the non-life segment, the performance of the public-sector players seemed to be stagnant compared to the fluctuating levels of performances among the private-sector general insurers over the study-period.

Sastry (2012) pointed out the extent of concentration and competition in the Indian insurance sector. For the purpose of the study, he used the various concentration measures such as the k-Concentration ratios, the Herfindahl index and the Theil's entropy index. The paper also adopted the methodology suggested by Bajos and Salas (2002) for decomposing the concentration measures. The period of study has been considered from 2003-04 to 2007-08 for determining the levels of concentration in both the life insurance and non-life insurance segments in India. The study concluded with an indication about an emerging competitive market structure in the Indian insurance sector due to a gradual decline in concentration over the study-period.

Sinha (2013) has analyzed the financial soundness of two leading private life insurance companies operating in India, namely Bajaj Allianz Life Insurance and ICICI Prudential Life Insurance, based on the CARAMELS framework, as jointly published by IMF and World Bank. The data set covered a period of 6 years from 2004-05 to 2009-10 and the life insurers were selected based on the purposive sampling method. Based on the ratios used, the results of both the players were found to be impressive over the period of study.

Stitch (1993) investigated the concentration structure in the Swedish and Finnish insurance market over the period from 1989 to 1993. It further explored the differences between the two countries over time and with respect to their life and non-life insurance segments. He has used several concentration indices, dominance measures, dynamic concentrationindices and mobility measures for the purpose of his study. The concentration indicators behaved differently with respect to life and non-life sectors between the two countries. It has been found that in Finland the concentration has decreased in the non-life insurance market, while inthe life market it has increased. In Sweden the reverse is true. Furthermore, in both the countriesthe concentration in the life sector was found to be

higher than in the non-life sector. Most importantly, both the countries showed signs of an oligopolistic market structure with references to their life and non-life insurance segments.

Conceptual Framework

(1) Market Concentration Analysis : Market concentration is an important characteristic in any industry, which is open to private participation. It is said to be inversely related to market competition, as the level of competitiveness decreases (concentration increases) or vice-versa, with the increase in the number of new entrants. The concentration measures are used when firms produce a homogeneous product across the industry. Insurance is a complex business and insurers supply more than one service to their customers. The products and services rendered by the institute may not be homogeneous across the life insurance companies. However, as insurers collect premiums and render services, premiums can be viewed as an output-bundle resulting from sale of various products (services), thereby making it homogeneous. As a result, the market structure of an industry can be assessed depending on the market concentration in the life insurance business. The use of concentration indices was mostly used in the manufacturing sector to study the market structure. The concentration indices measures how equal or unequal the output in an industry is distributed among the firms.

The importance of concentration ratios stems from their ability to capture structural features of a market arising out of market competitiveness in an industry on account of new entrants. The significance of concentration ratios have been felt in the financial sector as well; and few of the research studies has shown the utility of these indices in predicting the market structure and degree of competitiveness in the financial markets with reference to the banking sector. For instance, Sastry (2012) investigated the concentration in the Indian insurance market over the period from 2003-04 to 2007-08 using the k-Concentration ratios, the Herfindahl index and the Theil's entropy index.

Cummins, Denenberg, and Scheel (1972) studied the concentration in the US life insurance industry using the Herfindahl index to measure the concentration based on 20 firms covering 49 states and the District of Columbia in USA. Stitch (1993) investigated the concentration in the Swedish and Finnish insurance market over the period from 1989 - 1993 using the k-Concentration ratios and the Herfindahl index among the concentration indices. Chakraborty and Sengupta (2016) studied the market concentration and competition prevailing in the Indian life insurance sector during the period from 2008-09 to 2012-13 based on the application of the k-concentration ratios and the Herfindahl-Hirschman Index (HHI). The insurance regulatory body IRDA for the first time in its Annual Report for the FY 2012-13 demonstrated the impact of concentration and competition in the country's life insurance sector for the period 1999-00 to 2012-13, using the k-Concentration ratio (CR_k) and the Herfindahl-Hirschman Index (HHI). These two measures of concentration have been widely used by the researchers across the globe, against the others, because of their relative merits.

In congruence with the above studies, the present research work has made an attempt to figure out the market structure and the extent of concentration and competition prevailing in the country's life insurance sector in the post-deregulation phase during the FYs 2008-09 to 2014-15, using the k-Concentration ratios (CR_k) and the Herfindahl-Hirschman Index (HHI). The measures, k-Concentration ratios and the HHI have been computed against the business volumes (i.e. total life premiums underwritten) of the 18 life insurers for the period from 2008-09 to 2014-15. The total life insurance premium underwritten, which is the sum of first-year premium and renewal premium, has been used in the derivation of market shares of the respective life insurers under review.

(i) k-Concentration Ratios : The k-concentration ratio (CR_k) is obtained as the cumulative market share of the biggest *'k'* companies in the industry ($1 \leq k \leq N$). The k-Concentration ratio ranges from '0' (an extreme scenario indicating a state of perfect competition) to '1' (the other extreme scenario indicating a monopoly market structure), if the market shares are expressed in fractions rather than in percentages.

Let the industry have *'N'* number of companies with their respective volume of output (say, Premium Underwritten), denoted as *"P_i"*, where, $i = 1, 2, \ldots\ldots N$. The *k*-Concentration Ratio is expressed as follows, that is, $CR_k = \sum S_i$, ($i = 1$ to k), where S_i = Market shares of individual players in the industry.

The k-Concentration Ratio ranges from 0 to 100 thereby indicating the level of market concentration prevailing in the industry. A low k-Concentration Ratio indicates greater competition among the firms in the industry. On the contrary, a very high k-Concentration Ratio indicates a market situation ranging from 'Oligopoly' to 'Monopoly'.

(ii) Herfindahl-Hirschman Index : The Herfindahl-Hirschman Index (HHI), obtained as the sum of squares of market shares, is regarded as one of the most important concentration indicators used in the study of market structure. The HHI, in conjunction with the other indices, is considered as a yardstick in determining the extent of concentration and competition prevailing in an industry. Thus,

$HHI = \sum S_i^2$, ($i = 1$ to N), where S_i = Market shares of Individual players in the industry.

The HHI ranges from '0' (an extreme scenario indicating a state of perfect competition) to '10,000' (the other extreme scenario indicating a monopoly market structure), if the market shares are expressed in percentages rather than fractions. Usually, a value in the range of 0 - 1000 indicates non-concentration in the market, a value within 1000 – 2000 indicates that there are no adverse effects on competition, and a value of above 2000 is a concern and needs further investigation.

The normalized HHI (denoted as n-HHI), considered as an extension of the usual HHI, is widely used as an indicator in the banking sector to normalize the effects of any 'weight-bias' that characterizes the usual HHI. Lapteacru (2012) discussed the shortcomings of the widely-used Herfindahl-Hirschman indices in his study. Lapteacru (2012) in his study has pointed out that the HHI was biased and the use of the normalized Herfindahl-Hirschman would be appropriate to get rid of the 'weight-bias' that characterizes this concentration measure. To support his views, he has rightly pointed out that any concentration measure must not be influenced by the number of entities existing in the market, only the share they own should determine the market concentration. The presence of any 'weight-bias' in the determination of the usual HHI values could easily be corrected by the normalization of the HHI, as they take values between zero and one regardless of the number of firms on the market. The normalized HHI values also ranges between '0' and '1', similar to HHI, if the market shares are expressed in terms of fractions rather than percentages. In semblance with the above observations, the present study has used the application of the normalized HHI (n-HHI) besides the usual Herfindahl-Hirschman Index (HHI) in determining the extent of concentration in the country's life insurance sector during the period under review. Though the measure is widely used in the banking industry, the same can also be applied in the context of a service-oriented sector such as insurance. It can be expressed as follows :-

$n\text{-}HHI = [HHI - (1/N)] / [1 - (1/N)]$, where HHI is the usual Herfindahl-Hirschman Index and N is the number of firms.

(2) Performance Analysis : The performance analysis of the life insurers' under review has been conducted in an attempt to investigate any disparity in the performances of the public-sector and the private-sector life insurers under review during the post-liberalization study-period from 2008-09 to 2014-15, since the outbreak of the global meltdown.

While deciding on the most suitable tool of analysis, I have found that extensive literature review reveals the application of the Analysis of Variance (Anova) technique as the appropriate model for studies related to performance analysis of insurance firms. Despite of its limitations, the Anova technique has found much significant applicability in the literatures relating to the performance assessment of firms. For instance,

Chakraborty and Sengupta (2016) have made an attempt to evaluate the extent of differences in the performances of the public-sector and private-sector life insurance firms for the period from 2008-09 to 2012-13, using the one-way Anova approach.

Bedi and Singh (2011) has used the two-way Anova approach to determine the existence of any significant differences between the performances of LICI with the private-sector life insurance companies over a period from 2001-02 to 2007-08. In resemblance with the above studies, the present study has made an attempt to explore any significant differences in the performances of the 18 life insurers' under review against a set of hypothesis framework through the application of the one-way Anova approach, using a single factor. The total life premiums underwritten by the life insurers, inclusive of the renewal premiums, have been considered as the sole factor for evaluating the performances of the life insurers' under review over the study-period.

In one-way Anova, the interest lies in testing the null hypothesis against an alternative hypothesis to measure the variation in the mean values of the dependent variable for different categories of the independent variable. Finally, the acceptance or rejection of the null hypothesis of equal category means leads to a conclusion about the nature of effects of the independent variable (or, categorical variable) on the dependent variable. Other salient issues relating to the application of Anova, such as examination of differences among specific means (popularly referred to as 'critical differences') can help in locating the unequal pair of means among the samples. This can be used in situations when all the samples are of equal sizes and the null hypothesis of equal category means is found to be rejected.

Based on the data-set of 18 life insurance firms classified w.r.t. a single factor i.e. total life premiums underwritten, the validity of the null hypothesis (denoted as H_0) has been tested against an alternative hypothesis (denoted as H_1) using the one-way Analysis of Variance (Anova) at a pre-determined significance level of 5 percent with appropriate degrees of freedom.

H_0: There are no significant differences in the performances of the public-sector and private-sector life insurance firms over the post-liberalization study-period from 2008-09 to 2014-15.
i.e., H_0: $\mu_1 = \mu_2 = \mu_3 = \ldots\ldots\ldots = \mu_{18}$ (or, Equality of Means)

Against an alternative hypothesis which is defined as follows:-

H_1: There are significant differences in the performances of the public-sector and private-sector life insurance firms over the post-liberalization study-period from 2008-09 to 2014-15.
i.e., H_1: $\mu_1 \neq \mu_2 \neq \mu_3 \neq \ldots\ldots\ldots \neq \mu_{18}$ (or, Non-Equality of Means)

The null hypothesis that the category means are equal in the population is tested by an *F*-statistic, for given degrees of freedom at desired levels of significance, which is the ratio of the mean square related to the independent variable to the mean square related to error. Hence, this ratio gives an indication that whether the differences among the several sample means is significant or is just a matter of sampling fluctuations.

The rejection of the null hypothesis of equal means may lead us to a conclusion that not all the group means are equal, but only some of the means may be statistically different. The differences among specific means may be examined through the application of posteriori contrasts, which can be conducted if the Anova test fails to accept the null hypothesis of equal sample means. A posteriori contrast, such as the multiple comparison tests, can be used to determine which of the means are statistically different by constructing generalized confidence intervals that can be used to make pair wise comparisons of all treatment means. The Least Square Differences (LSD) tests, considered as the most powerful among the multiple comparison tests, has been used in the present study to determine the extent of differences amongst the performances of the life insurers under review covering all the years of the study-period with respect to a specified confidence interval.

Objectives of the Study

The present study has three-fold objectives which are listed as follows:-

(i) To ascertain the level of market structure, market concentration and competition prevailing in the country's life insurance sector during the post-liberalization period under review.

(ii) To ascertain the differences in the performances of the public-sector and private-sector life insurance companies under review during the post-deregulation period study-period.

(iii) To assess the impact of the global financial meltdown on the country's life insurance sector during the period under review.

Research Methodology

(i) Sample Selection : The objective of the present study is confined only in the post-reform period after the liberalization of the country's insurance sector, which has started since the financial year 1999-2000. Majority of the private life insurers started their business operations from the financial year 2005-06 and henceforth. Moreover, the reporting structure and availability of data before the financial year 2005-06 was also an area of concern. Besides that, the performance of the private life insurers in their initial years of operation was not too impressive with majority of them reporting a negative profit. Hence, the selection of the financial years 2008-09 to 2014-15 as the time-frame for the present study is appropriate in the given context. The other reason for the selection of the time-period from 2008-09 to 2014-15 was also to judge the extent of the impact that the global financial crisis had upon the performances of the life insurance firms under review. The life insurers making entry during the years covering the study-period has not been considered, given their newness in the industry.

Hence, the purposive sampling approach has been employed in the selection of the sample that comprises of 17 private life insurers and 1 public-sector life insurer who has been consistently in operation over all the years of the study-period from 2008-09 to 2014-15. Like most of the studies in financial services, data availability for this study is also restricted to the information submitted by the life insurers in compliance with the regulatory authority, IRDAI.

(ii) Research Tools : While deciding on the most suitable tools of analysis, I have found that extensive literature review reveals the application of the Analysis of Variance (Anova) technique as the appropriate model for studies related to performance analysis of insurance firms. Besides this, the literature review has found the application of the k-concentration ratios and Herfindahl-Hirschman index as the most popular tool of analyzing the market concentration and market structure of the insurance industry. In view of the past research studies, the present study has employed the application of the aforesaid measures in determining the performances of the life insurance firms under review and the market structure of the country's life insurance sector in the post-financial crisis period.

(iii) Data Sources : The data for the present research work has been collected from the following secondary sources:-

(i) Annual Reports published by the IRDAI, 2008-09 to 2014-15.

(ii) Various Journals and magazines relating to the issues under study.

(iii) Newspapers and government reports relating to the issues under study.

(iv) Other secondary sources, such as the RBI Annual Reports, UGC-Inflibnet, etc.

Analysis and Results

(1) Results of Market Concentration Analysis : Table 1 given below presents the widely-used k-concentration ratios, i.e. CR_1 (i.e. single-firm concentration ratio) and CR_4, (i.e. four-firm concentration ratio) of the life insurance firms under review over the study-period. For this purpose, the market shares of the individual players have been determined with respect to their total premiums underwritten (i.e. aggregate of first-year premium and renewal premium) against the total premiums underwritten of the industry as a whole during the period under review. The concentration ratios has been shown in the context of the single largest player ($k = 1$) and the top-four players ($k = 4$) dominating the country's life insurance sector during the stated period.

Based on the results obtained from Table 1, I have found that the differences between CR_1 and CR_4 recorded a highest margin of almost 15% during the FY 2008-09 but gradually streamlined over the next few years within a level of 13 to 14%. The concentration-ratio of the single-largest firm LICI depicted maximum and minimum figures of 75.39% and 62.56%, respectively during the years 2013-14 and 2009-10, respectively. The concentration ratios of the four largest firms in the industry, inclusive of LICI, depicted the maximum and minimum figures of 86.61% and 76.90 % over the same set of years. The high concentration ratios were mostly on account of the continued dominance of LICI even after privatization of the country' life insurance sector, as reflected in the concentration indices. But it was interesting to find a significant decline in the market shares of LICI with rising number of private players in the country's life insurance sector. The concentration ratios depicted a sharp decline during the FY 2009-10 mainly on account of a fall in the premium collection of the life insurer sowing to the contagion effects of the global financial crisis. But the quick turnaround since the FY 2010-11 speaks volumes about the resilience shown by the life insurance companies in combating the after-effects of the global financial meltdown, as was evident from the Figure 1.

The four-firm concentration ratios registered a maximum of 86.61% and a minimum of 76.90 % during the FYs 2013-14 and 2009-10, respectively. The consistent growth of more than 80% in the four-firm concentration ratios over the study-period can be attributed to the inclusion of LICI, which almost enjoyed an average market share of 70% over the period under review (as shown in Annexure 1). But barring LICI, the combined market share of the remaining top-three companies recorded a nominal change of 13 to 14 % over all the years of the study-period. From the Annexure 1, I find that the three consistent best-performers among the private players in the country's life insurance sector since the FY 2011-12 were ICICI PruLife, HDFC Standard Life and SBI Life respectively. ICICI PruLife and SBI Life were the only two private players who consistently featured among the top-three private life insurers, immediately following LICI, in all the years of the study-period. During the years 2008-09 and 2009-10, it was Bajaj Life who featured among the top-three private players besides ICICI PruLife and SBI Life. It was interesting to find that the top-three private players, following LICI, enjoyed nominal market shares within the range of 3% to 7% among them covering all the years of the study-period, thereby reflecting upon a huge gap with the state-owned giant LICI. Hence, the current stage of competition in the Indian life insurance industry rightly fits into the stage of 'Monopolistic Competition' [1] type of market structure due to the presence of large number of

Table 1. *k* - Concentration Ratios   (In fractions)

Indicators	Period of Study						
	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
CR₁	0.7095	0.6256	0.6978	0.7067	0.7271	0.7539	0.7322
CR₄	0.8593	0.7690	0.8365	0.8368	0.8501	0.8661	0.8636

[1] Monopolistic competition represents a market structure containing a large number of relatively small firms, with relative freedom of entry and exit. (Source: AmosWEB Encyclonomic, http://www.amosweb.com)

Figure 1. Depiction of Trends in *k*- Concentration Ratios
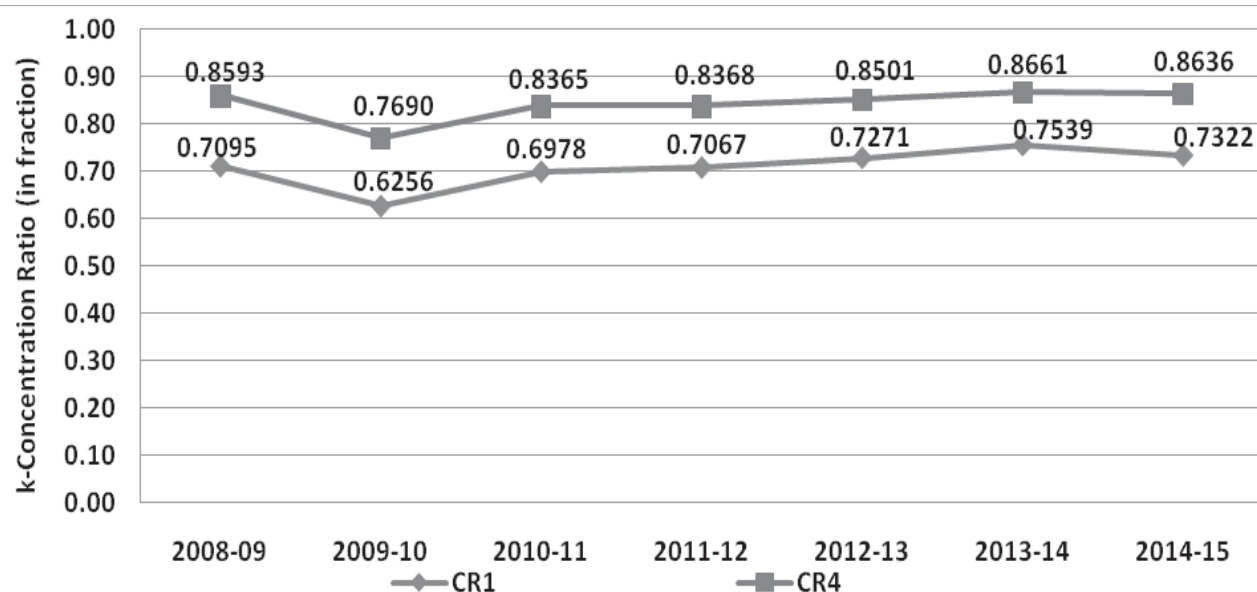
companies with relatively smaller market shares in contrast to LICI.

The results of my study are also indicative of the observations depicted for the first time in the IRDAI Annual Report 2012-13 about the dominance of a few group of private life insurers at the top with relatively smaller market shares, besides LICI, who were enjoying a substantial market share in the country's life insurance sector.

The Table 2 represents the HHI and the normalised-HHI values covering all the life insurers' under review over the period from 2008-09 to 2014-15. For this purpose, the sum of the squares of market shares of all the individual life insurers' under review has been the foundation for the determination of both the HHI and the normalized-HHI values over the study-period. The determination of the n-HHI indices was based upon the usual HHI values and the reciprocal of the number of firms considered for the period under review.

Based on the results obtained from Table 2, I have found that the 18-firms' HHI and n-HHI values lay within the minimum and maximum ranges of 0.3660 and 0.5741 respectively over the study-period. The HHI and n-HHI values of the life insurers' under review (inclusive of LICI) showed an increasing trend over the study-period, excepting the FYs 2009-10 and 2014-15. The fall in concentration indices during the FY 2009-10 was primarily on account of the setback suffered by the country's life insurance sector owing to the after-effects of the global financial crisis during 2007-08. It was further remarkable to witness some reversal in the fall of the concentration indices during the FY 2014-15. The reasons for the same could be due to the stabilization of operations of the insurers, and a cautious approach undertaken by them in the wake of changes in government policies. The decline in concentration indices during the FY 2014-15 also showed signs of an emerging competitive market structure in the country's life insurance sector. The higher values of HHI and the n-HHI indices over the study-period were largely attributed to the presence of the state-owned giant LICI. Barring LICI, the HHI values for the remaining 17 private life insurers' under review lay below the range of '1000' thereby indicating significant signs of market competition. This was indicative in the Figure 2.

From the Figure 2, it may be observed that the market concentration was increasing over time with a steep fall during the FY 2009-10. The decline eventually coincided with the after-effects of the global financial crisis that resulted into a setback in the Indian economy during the year 2008-09 and henceforth. Moreover, the

Table 2. HHI & *n*- HHI Concentration Indices   (In fractions)

Indicators	Period of Study						
	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
HHI	0.5139	0.4012	0.4965	0.5076	0.5358	0.5741	0.5436
n-HHI	0.4853	0.3660	0.4669	0.4786	0.5085	0.5491	0.5168

Figures 1 and 2 further confirms an almost similar pattern of market concentration in the life insurance business. The decline in concentration index during the FY 2014-15, as depicted in Figure 2 pointed towards an increase in competition in the country's life insurance sector, which was further expected to rise with the FDI hike from 26 % to 49% in the country's insurance sector during the year 2015. The presence of large number of companies with relatively smaller amount of market shares, in contrast to LICI, provides enough evidence to draw conclusions about the existence of a 'Monopolistic Competition' type of market structure in the country's life insurance sector during the period under review.

The findings were in line with the observations put forth in Sastry (2012) and Chakraborty and Sengupta (2016), both of which has pointed out the existence of a fairly competitive market structure in the country's insurance sector owing to a decline in the concentration indices. The IRDAI in its Annual Report 2012-13 has further confirmed a similar pattern in the market concentration of life insurance business in India along with the presence of a monopolistic-competition type of market structure since the privatization of the country's insurance sector.

(2) Results of Performance Analysis : The performance analysis of the life insurance firms were conducted using the one-way Anova approach at a 5% level of significance. The total life premiums underwritten by the life insurers during the period under review were taken as a proxy for their performances.

The Table 3 shows the descriptive statistics of the individual life insurers over the study-period, followed by the findings of the one-way Anova approach (containing the ratios of sample variances i.e. *F*-values) covering all the life insurers' under review, as depicted in the Table 4, respectively.

Based on the results obtained from Table 4, I have found that the calculated value of *F*-statistic, at given degrees

Figure 2. Depiction of Trends in HHI and *n*-HHI Concentration Indices
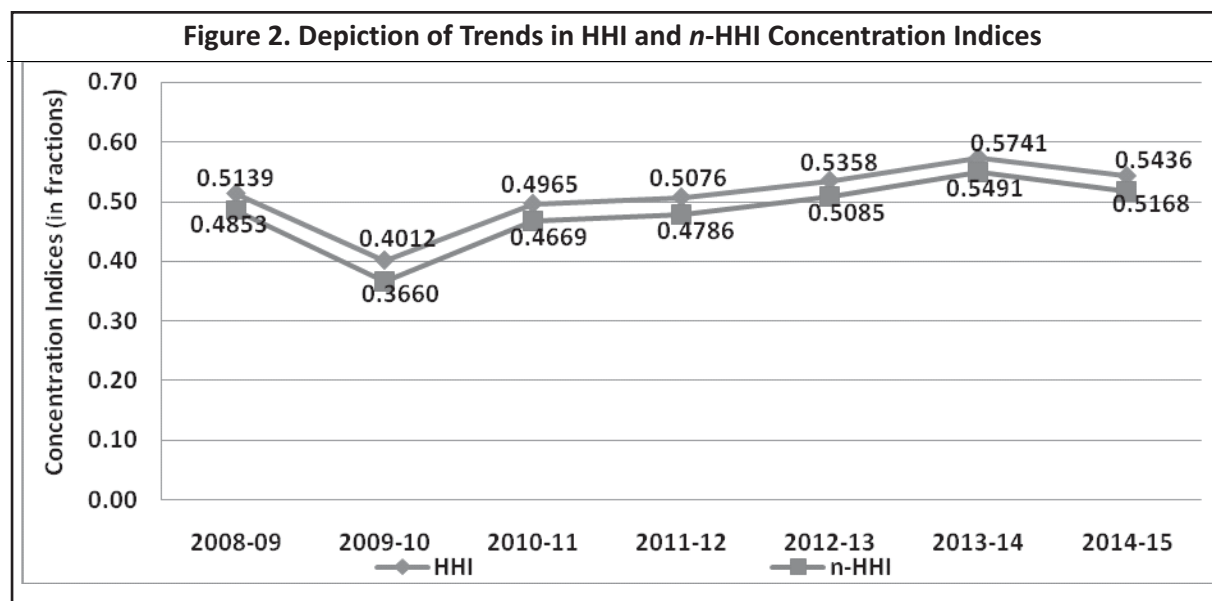
of freedom, to be statistically significant since the p-value (i.e. 0.000) was found to be less than the desired significance level (i.e. 0.05 or 5 percent). Hence, the above result does not support the null hypothesis of no-differences in sample means. It may, therefore, be concluded that the differences in the performances of the public-sector and private-sector life insurers' under review was found to be significant covering all the years of the study-period and hence have arisen due to sampling fluctuations i.e. fluctuations in the performances of the life insurers in terms of total premiums underwritten. Thus, the acceptance of the alternative hypothesis (or, rejection of null hypothesis) finally justifies the disparity in performances among the public-sector and private-sector life insurers in line with the findings derived under the one-way Anova framework during the period under review.

As a result of the rejection of the null hypothesis of equal means, the critical differences were determined based on the 'least square differences' (LSD) that were performed between LICI and the private life insurers under review at a 99% confidence interval covering all the years of the study-period. The results were summarized in the following Table 5.

The test of LSD provides a notion about the nature and extent of inequality that is existing in the performances of the life insurers' under review in terms of their total premiums underwritten (inclusive of renewal premiums) during the period under review. Based on the results obtained from Table 5, I have found the existence of differences [as denoted in asterisk (*)] in the performances of LICI with all the private life insurers' under review over the combined years of the study-period from 2008-09 to 2014-15. This was further confirmed by the evidences of p-values (i.e. 0.000) being lower than the applied significance level of 0.01 (or, 1%). The reasons for the same could be attributed mainly to the vast premium-base that has been brought forward by LICI from the pre-reforms period because of the first-mover advantages enjoyed by LICI in the country's life insurance sector. The

Table 3. Descriptive Statistics

Life Insurers	Sample Size	Means	Std. Deviation	Std. Error	95% Confidence Interval for Means		Minimum	Maximum
					Lower Bound	Upper Bound		
LICI	7	20488628.29	2848437.631	1076608.228	17854262.85	23122993.72	15718656	23948277
ICICI PruLife	7	1491462.14	188136.578	71108.942	1317464.83	1665459.46	1228265	1781698
HDFC Std. Life	7	993880.86	312505.919	118116.135	704861.09	1282900.63	551837	1476245
SBI Life	7	1100835.00	211274.319	79854.187	905438.84	1296231.16	720239	1308084
Bajaj Life	7	822280.57	228174.774	86241.958	611254.10	1033307.04	577532	1139136
MNYL	7	608060.00	144608.655	54656.934	474319.30	741800.70	381903	810515
Birla Sun Life	7	513527.86	49025.074	18529.736	468187.23	558868.49	441427	574777
Reliance Life	7	519793.29	104574.564	39525.470	423077.94	616508.63	401532	658834
TATA-AIA Life	7	299580.71	70344.747	26587.815	234522.67	364638.75	210559	397287
Kotak-M Life	7	276314.14	23188.616	8764.473	254868.25	297760.04	230774	297559
Exide Life	7	171814.00	17709.695	6693.635	155435.26	188192.74	143470	201421
PNB METLIFE	7	235627.00	21737.043	8215.830	215523.59	255730.41	197827	262533
AVIVA Life	7	200803.29	46314.557	17505.257	157969.46	243637.11	107305	238969
Sahara Life	7	20573.71	4848.242	1832.463	16089.84	25057.59	10435	25052
Shriram Life	7	63560.57	12034.184	4548.494	52430.81	74690.34	43568	82105
Bharati-AXA Life	7	74554.86	20672.704	7813.547	55435.80	93673.92	35948	103803
Future Generali Life	7	57507.14	20366.956	7697.986	38670.85	76343.44	14797	76547
IDBI Federal Life	7	72880.29	23192.705	8766.019	51430.61	94329.96	31854	106071
Total	**126**	**1556204.65**	**4671502.608**	**416170.530**	**732551.52**	**2379857.78**	**10435**	**23948277**

Table 4. Results of One-way Anova

Sources of Variation	Sum of Squares	DF	Mean Squares	F	Sig. (p-values)
Between Groups	2677541659936653.000	17	157502450584509.000	338.005	.000
Within Groups	50325416716661.140	108	465976080709.825		
Total	**2727867076653314.000**	**125**			

Table 5. Pairwise Comparisons (LSD) Between LICI and Private Life Insurers

Life Insurers (I)	Life Insurers (J)	Mean Difference (I-J)	Std. Error	Sig. (p-values)	99% Confidence Interval	
					Lower Bound	Upper Bound
LICI	ICICI PruLife	18997166.143*	364878.093	.000	18040411.97	19953920.31
	HDFC Std. Life	19494747.429*	364878.093	.000	18537993.26	20451501.60
	SBI Life	19387793.286*	364878.093	.000	18431039.12	20344547.45
	Bajaj Life	19666347.714*	364878.093	.000	18709593.55	20623101.88
	MNYL	19880568.286*	364878.093	.000	18923814.12	20837322.45
	Birla Sun Life	19975100.429*	364878.093	.000	19018346.26	20931854.60
	Reliance Life	19968835.000*	364878.093	.000	19012080.83	20925589.17
	TATA-AIA Life	20189047.571*	364878.093	.000	19232293.40	21145801.74
	Kotak Life	20212314.143*	364878.093	.000	19255559.97	21169068.31
	Exide Life	20316814.286*	364878.093	.000	19360060.12	21273568.45
	PNB METLIFE	20253001.286*	364878.093	.000	19296247.12	21209755.45
	AVIVA Life	20287825.000*	364878.093	.000	19331070.83	21244579.17
	Sahara Life	20468054.571*	364878.093	.000	19511300.40	21424808.74
	Shriram Life	20425067.714*	364878.093	.000	19468313.55	21381821.88
	Bharati-AXA Life	20414073.429*	364878.093	.000	19457319.26	21370827.60
	Future Life	20431121.143*	364878.093	.000	19474366.97	21387875.31
	IDBI Federal Life	20415748.000*	364878.093	.000	19458993.83	21372502.17

* The mean differences are significant at the 0.01 level.

existence of significant differences in premiums underwritten by the public and private-sector life insurers was also evident from the previous studies by Bedi and Singh (2011) and Chakraborty and Sengupta (2016). Chakraborty and Sengupta (2016) pointed out significant disparity in the performances of the private life insurers (considering the top three private life insurers) with LICI during the period from 2008-09 to 2012-13, using the one-way Anova approach.

Annexure 2 further confirms the gap in performances of the private life insurers among themselves as well as with the state-owned giant LICI. In each of the cases, the performances of the established and the new private life insurers were found to be statistically different with the public-sector player LICI over all the combined years of the study-period. In addition, the performances of the established players significantly varied with the performances of the relatively newer ones in the industry, as was also evident from the corresponding Annexure - 2. As expected, there were differences in the performances of the established players with the newly-inducted ones such as Sahara Life, Shriram Life, Future Generali Life, IDBI Federal Life, etc. The reasons for the same could be attributed to the newness of the private players in the industry, inexperience and differences in firm-

sizes. But at the same time, some of the relatively newer players such as Kotak-M Life and Exide Life have been able to significantly reduce the gap in their performances with the established ones. Despite of moving late in the country's insurance sector, the newer private-sector players seems to be fast catching up with the paces of the older ones in terms of premium collection through improved marketing strategies, customized products and technological inputs from their foreign partners. This eventually confirms the presence of a healthy competition among the players in the country's life insurance sector during the period under review.

Research Implications

The present study has made an attempt to evaluate the performances of the life insurance players during the post-financial crisis besides evaluating the extent of concentration and competition prevailing in the country's life insurance sector. The country's insurance sector experienced a sharp downturn following the U.S. financial crisis, the effects of which were felt in the performances of the insurance players. Excepting few, most of the insurance players had to bear a downfall in profits and investment returns post 2007-08. Hence, the present study has tried to give an insight into the performances of the Indian life insurance industry, following the global financial crisis. Moreover, the Indian life insurance sector has been experiencing a rise in the footfall of the private players since the year 2000.

With the rise in the number of private players to 23, the country's life insurance sector has been showing signs of competitiveness in recent times which was further expected to move up with the hike in FDI from 26% to 49% in the country's insurance sector by the government of India. The private players have been able to capture 26.52 % at the end of FY 2014-15, almost from scratch. As a result, the state-owned LICI, which enjoyed a monopoly control over the country's life insurance sector, has been experiencing severe threat from the private players that has eventually brought down its market share to 73.48% at the end of FY 2014-15, from almost 100%. As it is known, that the market structure of an industry is linked with the level of market competition/concentration prevailing in an industry. In view of this, the present study tried to evaluate the market structure and level of concentration in the country's life insurance sector during the period from 2008-09 to 2014-15. That is to say, whether the insurance market is either operating in a monopoly market-structure or controlled by a small number of large firms; and the number of companies who constitute such a group are the areas which have been explored in the present study. Since very limited studies have been taken up in the past covering these areas, hence the present study intended to fill that research gap.

Conclusion

In conclusion, it is found that the two measures of concentration used in the present study exhibited similar patterns over the period under review. The abrupt fall in concentration indicators during the FY 2014-15, though by a nominal margin, in contrast to the previous years showed emerging signs of a competitive market structure. The presence of a large number of relatively small firms with smaller market shares provides indications of a 'monopolistic competition' type of market structure prevalent in the country's life insurance segment over the given period, from a 'monopoly market-condition' during the pre-deregulation period. Considering the potential in the country's life insurance segment, there is a scope for rising competition in the future. Though the private life insurance companies lagged behind LICI by a huge margin in terms of market shares, yet the pursuer group was slowly making in-roads into the market. Among the pursuer groups, ICICI PruLife and SBI Life consistently featured as the best performers in the private - sector category over the study-period. The state-owned LICI had a dominating influence in the market concentration indicators, primarily because of its long-standing presence and first-mover advantages in the Indian life insurance sector. The sharp decline in the concentration indices during

the FY 2009-10 also provides evidences of an adverse market condition in the country's insurance sector, against the backdrop of the global meltdown.

The performance analysis of the life insurers' under review reflected the differences in the performances of the private-sector players with the state-owned giant LICI over the post-deregulation phase of the study-period from 2008-09 to 2014-15. The rejection of null hypothesis of equal means, based on Anova tests, corroborated the fact about the extent of disparity in the performances of public-sector and private-sector players in terms of premiums underwritten during the period under review. The least square differences (LSD) further acted as a testimony to the differences in performances of the private players with LICI during the period under review, as obtained under the hypothesized analysis of variance approach. This was mainly on account of a huge premium-base that has been carried over by LICI since its inception in 1956. Though the private life insurers lagged behind LICI in terms of premium collection, yet they are fast narrowing down the differences with LICI through the introduction of new customized products, innovative marketing strategies and infusion of fresh foreign capital.

The country's life insurance penetration stood at 3.1, below the global average of 3.5, at the end of FY 2013-14 that hinted at a hugely untapped customer-base and unexplored market-potential of our country. The private players would be in a better position than LICI to exploit the same on account of their technological know-how and improved marketing strategies derived from their foreign partners. In contrast, LICI has been largely banking upon their conventional products that have been carried over from the past years with no fresh infusion of capital observed during the post-deregulation period. It now remains a moot-point as to how the state-owned giant LICI shows its resistance to a further fall in its market shares against rising competition from the private life insurers in the years ahead.

Limitations of the Study and Scope for Future Research

The data collected for the present study has been derived from the published financial statements of the respective life insurers without any emphasis on primary data, and the same has not been adjusted for inflation. Hence, the study incorporates all the limitations that are inherent in the published financial statements. The study is also restricted only to a time span of 7 years focusing on the market concentration and performances of the 18 life insurance firms covering the post-recessionary phase of the reform period from 2008-09 to 2014-15, since the outbreak of the global financial crisis. Hence, the future studies of research in this area could take into account more number of players covering both the country's life insurance and general insurance sectors for an extended time-period.

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ANNEXURES

Annexure 1. Market Shares and Concentration Indices of the Life Insurers

Life Insurers	Market Shares (in Fractional values)						
	2008-09	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
LICI	0.7095*	0.6256*	0.6978*	0.7067*	0.7271*	0.7539*	0.7322*
ICICI PruLife	0.0693*	0.0623*	0.0614*	0.0488*	0.0472*	0.0396*	0.0468*
HDFC Standard	0.0251	0.0264	0.0309	0.0355*	0.0394*	0.0384*	0.0453*
SBI Life	0.0325*	0.0381*	0.0443*	0.0458*	0.0364*	0.0342*	0.0393*
BAJAJ Life	0.0480*	0.0430*	0.0330*	0.0261	0.0240	0.0186	0.0184
MNYL	0.0174	0.0183	0.0200	0.0223	0.0231	0.0232	0.0250
Birla SLI	0.0202	0.0208	0.0195	0.0205	0.0182	0.0154	0.0160
Reliance Life	0.0223	0.0249	0.0225	0.0192	0.0141	0.0136	0.0142
TATA-AIA Life	0.0124	0.0132	0.0137	0.0127	0.0096	0.0074	0.0065
Kotak-M Life	0.0106	0.0108	0.0102	0.0102	0.0097	0.0086	0.0093
Exide Life	0.0065	0.0062	0.0059	0.0058	0.0061	0.0058	0.0062
PNB METLIFE	0.0091	0.0095	0.0090	0.0093	0.0084	0.0071	0.0075
AVIVA Life	0.0090	0.0090	0.0081	0.0084	0.0074	0.0060	0.0033
SAHARA Life	0.0009	0.0009	0.0008	0.0008	0.0007	0.0007	0.0003
SHRIRAM Life	0.0020	0.0023	0.0028	0.0022	0.0021	0.0019	0.0022
BHARTI-AXA	0.0016	0.0025	0.0027	0.0027	0.0026	0.0028	0.0032
FUTURE Life	0.0007	0.0020	0.0025	0.0027	0.0023	0.0021	0.0019
IDBI Federal	0.0014	0.0022	0.0028	0.0026	0.0028	0.0026	0.0033
CR_k (k = 4)	**0.8593**	**0.7690**	**0.8365**	**0.8368**	**0.8501**	**0.8661**	**0.8636**
HHI	**0.5139**	**0.4012**	**0.4965**	**0.5076**	**0.5358**	**0.5741**	**0.5436**
n-HHI	**0.4853**	**0.3660**	**0.4669**	**0.4786**	**0.5085**	**0.5491**	**0.5168**
HHI (excl. LICI)	**0.0105**	**0.0098**	**0.0096**	**0.0082**	**0.0071**	**0.0057**	**0.0075**

* Market shares of top-4 companies in the Life Insurance Industry

Annexure 2. Pairwise Comparisons (LSD) Among the Indian Life Insurers

Life Insurers (I)	Life Insurers (J)	Mean Difference (I-J)	Std. Error	Sig.	99% Confidence Interval	
					Lower Bound	Upper Bound
	LICI	-18997166.143*	364878.093	.000	-19953920.31	-18040411.97
	HDFC Std. Life	497581.286	364878.093	.176	-459172.88	1454335.45
	SBI Life	390627.143	364878.093	.287	-566127.03	1347381.31
	Bajaj Life	669181.571	364878.093	.069	-287572.60	1625935.74
ICICI PruLife	MNYL	883402.143	364878.093	.017	-73352.03	1840156.31
	Birla SunLife	977934.286*	364878.093	.009	21180.12	1934688.45
	Reliance Life	971668.857*	364878.093	.009	14914.69	1928423.03
	TATA-AIA Life	1191881.429*	364878.093	.001	235127.26	2148635.60
	Kotak Life	1215148.000*	364878.093	.001	258393.83	2171902.17
	Exide Life	1319648.143*	364878.093	.000	362893.97	2276402.31
	METLIFE	1255835.143*	364878.093	.001	299080.97	2212589.31
	AVIVA Life	1290658.857*	364878.093	.001	333904.69	2247413.03
	Sahara Life	1470888.429*	364878.093	.000	514134.26	2427642.60
	Shriram Life	1427901.571*	364878.093	.000	471147.40	2384655.74
	Bharti-AXA Life	1416907.286*	364878.093	.000	460153.12	2373661.45
	Future Life	1433955.000*	364878.093	.000	477200.83	2390709.17
	IDBI Life	1418581.857*	364878.093	.000	461827.69	2375336.03
HDFC Std. Life	LICI	-19494747.429*	364878.093	.000	-20451501.60	-18537993.26
	ICICI PruLife	-497581.286	364878.093	.176	-1454335.45	459172.88
	SBI Life	-106954.143	364878.093	.770	-1063708.31	849800.03
	Bajaj Life	171600.286	364878.093	.639	-785153.88	1128354.45
	MNYL	385820.857	364878.093	.293	-570933.31	1342575.03
	Birla SunLife	480353.000	364878.093	.191	-476401.17	1437107.17
	Reliance Life	474087.571	364878.093	.197	-482666.60	1430841.74
	TATA-AIA Life	694300.143	364878.093	.060	-262454.03	1651054.31
	Kotak Life	717566.714	364878.093	.052	-239187.45	1674320.88
	Exide Life	822066.857	364878.093	.026	-134687.31	1778821.03
	METLIFE	758253.857	364878.093	.040	-198500.31	1715008.03
	AVIVA Life	793077.571	364878.093	.032	-163676.60	1749831.74
	Sahara Life	973307.143*	364878.093	.009	16552.97	1930061.31
	Shriram Life	930320.286	364878.093	.012	-26433.88	1887074.45
	Bharti-AXA Life	919326.000	364878.093	.013	-37428.17	1876080.17
	Future Life	936373.714	364878.093	.012	-20380.45	1893127.88
	IDBI Life	921000.571	364878.093	.013	-35753.60	1877754.74
SBI Life	LICI	-19387793.286*	364878.093	.000	-20344547.45	-18431039.12
	ICICI PruLife	-390627.143	364878.093	.287	-1347381.31	566127.03
	HDFC Std. Life	106954.143	364878.093	.770	-849800.03	1063708.31
	Bajaj Life	278554.429	364878.093	.447	-678199.74	1235308.60
	MNYL	492775.000	364878.093	.180	-463979.17	1449529.17

	Birla SunLife	587307.143	364878.093	.110	-369447.03	1544061.31
	Reliance Life	581041.714	364878.093	.114	-375712.45	1537795.88
	TATA-AIA Life	801254.286	364878.093	.030	-155499.88	1758008.45
	Kotak Life	824520.857	364878.093	.026	-132233.31	1781275.03
	Exide Life	929021.000	364878.093	.012	-27733.17	1885775.17
	METLIFE	865208.000	364878.093	.020	-91546.17	1821962.17
	AVIVA Life	900031.714	364878.093	.015	-56722.45	1856785.88
	Sahara Life	1080261.286*	364878.093	.004	123507.12	2037015.45
	Shriram Life	1037274.429*	364878.093	.005	80520.26	1994028.60
	Bharti-AXA Life	1026280.143*	364878.093	.006	69525.97	1983034.31
	Future Life	1043327.857*	364878.093	.005	86573.69	2000082.03
	IDBI Life	1027954.714*	364878.093	.006	71200.55	1984708.88
Bajaj Life	LICI	-19666347.714*	364878.093	.000	-20623101.88	-18709593.55
	ICICI PruLife	-669181.571	364878.093	.069	-1625935.74	287572.60
	HDFC Std. Life	-171600.286	364878.093	.639	-1128354.45	785153.88
	SBI Life	-278554.429	364878.093	.447	-1235308.60	678199.74
	MNYL	214220.571	364878.093	.558	-742533.60	1170974.74
	Birla SunLife	308752.714	364878.093	.399	-648001.45	1265506.88
	Reliance Life	302487.286	364878.093	.409	-654266.88	1259241.45
	TATA-AIA Life	522699.857	364878.093	.155	-434054.31	1479454.03
	Kotak Life	545966.429	364878.093	.137	-410787.74	1502720.60
	Exide Life	650466.571	364878.093	.077	-306287.60	1607220.74
	METLIFE	586653.571	364878.093	.111	-370100.60	1543407.74
	AVIVA Life	621477.286	364878.093	.091	-335276.88	1578231.45
	Sahara Life	801706.857	364878.093	.030	-155047.31	1758461.03
	Shriram Life	758720.000	364878.093	.040	-198034.17	1715474.17
	Bharti-AXA Life	747725.714	364878.093	.043	-209028.45	1704479.88
	Future Life	764773.429	364878.093	.038	-191980.74	1721527.60
	IDBI Life	749400.286	364878.093	.042	-207353.88	1706154.45
MNYL	LICI	-19880568.286*	364878.093	.000	-20837322.45	-18923814.12
	ICICI PruLife	-883402.143	364878.093	.017	-1840156.31	73352.03
	HDFC Std. Life	-385820.857	364878.093	.293	-1342575.03	570933.31
	SBI Life	-492775.000	364878.093	.180	-1449529.17	463979.17
	Bajaj Life	-214220.571	364878.093	.558	-1170974.74	742533.60
	Birla SunLife	94532.143	364878.093	.796	-862222.03	1051286.31
	Reliance Life	88266.714	364878.093	.809	-868487.45	1045020.88
	TATA-AIA Life	308479.286	364878.093	.400	-648274.88	1265233.45
	Kotak Life	331745.857	364878.093	.365	-625008.31	1288500.03
	Exide Life	436246.000	364878.093	.234	-520508.17	1393000.17
	METLIFE	372433.000	364878.093	.310	-584321.17	1329187.17
	AVIVA Life	407256.714	364878.093	.267	-549497.45	1364010.88
	Sahara Life	587486.286	364878.093	.110	-369267.88	1544240.45

	Shriram Life	544499.429	364878.093	.139	-412254.74	1501253.60
	Bharti-AXA Life	533505.143	364878.093	.147	-423249.03	1490259.31
	Future Life	550552.857	364878.093	.134	-406201.31	1507307.03
	IDBI Life	535179.714	364878.093	.145	-421574.45	1491933.88
Birla SunLife	LICI	-19975100.429*	364878.093	.000	-20931854.60	-19018346.26
	ICICI PruLife	-977934.286*	364878.093	.009	-1934688.45	-21180.12
	HDFC Std. Life	-480353.000	364878.093	.191	-1437107.17	476401.17
	SBI Life	-587307.143	364878.093	.110	-1544061.31	369447.03
	Bajaj Life	-308752.714	364878.093	.399	-1265506.88	648001.45
	MNYL	-94532.143	364878.093	.796	-1051286.31	862222.03
	Reliance Life	-6265.429	364878.093	.986	-963019.60	950488.74
	TATA-AIA Life	213947.143	364878.093	.559	-742807.03	1170701.31
	Kotak Life	237213.714	364878.093	.517	-719540.45	1193967.88
	Exide Life	341713.857	364878.093	.351	-615040.31	1298468.03
	METLIFE	277900.857	364878.093	.448	-678853.31	1234655.03
	AVIVA Life	312724.571	364878.093	.393	-644029.60	1269478.74
	Sahara Life	492954.143	364878.093	.180	-463800.03	1449708.31
	Shriram Life	449967.286	364878.093	.220	-506786.88	1406721.45
	Bharti-AXA Life	438973.000	364878.093	.232	-517781.17	1395727.17
	Future Life	456020.714	364878.093	.214	-500733.45	1412774.88
	IDBI Life	440647.571	364878.093	.230	-516106.60	1397401.74
Reliance Life	LICI	-19968835.000*	364878.093	.000	-20925589.17	-19012080.83
	ICICI PruLife	-971668.857*	364878.093	.009	-1928423.03	-14914.69
	HDFC Std. Life	-474087.571	364878.093	.197	-1430841.74	482666.60
	SBI Life	-581041.714	364878.093	.114	-1537795.88	375712.45
	Bajaj Life	-302487.286	364878.093	.409	-1259241.45	654266.88
	MNYL	-88266.714	364878.093	.809	-1045020.88	868487.45
	Birla SunLife	6265.429	364878.093	.986	-950488.74	963019.60
	TATA-AIA Life	220212.571	364878.093	.547	-736541.60	1176966.74
	Kotak Life	243479.143	364878.093	.506	-713275.03	1200233.31
	Exide Life	347979.286	364878.093	.342	-608774.88	1304733.45
	METLIFE	284166.286	364878.093	.438	-672587.88	1240920.45
	AVIVA Life	318990.000	364878.093	.384	-637764.17	1275744.17
	Sahara Life	499219.571	364878.093	.174	-457534.60	1455973.74
	Shriram Life	456232.714	364878.093	.214	-500521.45	1412986.88
	Bharti-AXA Life	445238.429	364878.093	.225	-511515.74	1401992.60
	Future Life	462286.143	364878.093	.208	-494468.03	1419040.31
	IDBI Life	446913.000	364878.093	.223	-509841.17	1403667.17
TATA-AIA Life	LICI	-20189047.571*	364878.093	.000	-21145801.74	-19232293.40
	ICICI PruLife	-1191881.429*	364878.093	.001	-2148635.60	-235127.26
	HDFC Std. Life	-694300.143	364878.093	.060	-1651054.31	262454.03
	SBI Life	-801254.286	364878.093	.030	-1758008.45	155499.88

	Bajaj Life	-522699.857	364878.093	.155	-1479454.03	434054.31
	MNYL	-308479.286	364878.093	.400	-1265233.45	648274.88
	Birla SunLife	-213947.143	364878.093	.559	-1170701.31	742807.03
	Reliance Life	-220212.571	364878.093	.547	-1176966.74	736541.60
	Kotak Life	23266.571	364878.093	.949	-933487.60	980020.74
	Exide Life	127766.714	364878.093	.727	-828987.45	1084520.88
	METLIFE	63953.714	364878.093	.861	-892800.45	1020707.88
	AVIVA Life	98777.429	364878.093	.787	-857976.74	1055531.60
	Sahara Life	279007.000	364878.093	.446	-677747.17	1235761.17
	Shriram Life	236020.143	364878.093	.519	-720734.03	1192774.31
	Bharti-AXA Life	225025.857	364878.093	.539	-731728.31	1181780.03
	Future Life	242073.571	364878.093	.508	-714680.60	1198827.74
	IDBI Life	226700.429	364878.093	.536	-730053.74	1183454.60
Kotak-M Life	LICI	-20212314.143*	364878.093	.000	-21169068.31	-19255559.97
	ICICI PruLife	-1215148.000*	364878.093	.001	-2171902.17	-258393.83
	HDFC Std. Life	-717566.714	364878.093	.052	-1674320.88	239187.45
	SBI Life	-824520.857	364878.093	.026	-1781275.03	132233.31
	Bajaj Life	-545966.429	364878.093	.137	-1502720.60	410787.74
	MNYL	-331745.857	364878.093	.365	-1288500.03	625008.31
	Birla SunLife	-237213.714	364878.093	.517	-1193967.88	719540.45
	Reliance Life	-243479.143	364878.093	.506	-1200233.31	713275.03
	TATA-AIA Life	-23266.571	364878.093	.949	-980020.74	933487.60
	Exide Life	104500.143	364878.093	.775	-852254.03	1061254.31
	METLIFE	40687.143	364878.093	.911	-916067.03	997441.31
	AVIVA Life	75510.857	364878.093	.836	-881243.31	1032265.03
	Sahara Life	255740.429	364878.093	.485	-701013.74	1212494.60
	Shriram Life	212753.571	364878.093	.561	-744000.60	1169507.74
	Bharti-AXA Life	201759.286	364878.093	.581	-754994.88	1158513.45
	Future Life	218807.000	364878.093	.550	-737947.17	1175561.17
	IDBI Life	203433.857	364878.093	.578	-753320.31	1160188.03
Exide Life	LICI	-20316814.286*	364878.093	.000	-21273568.45	-19360060.12
	ICICI PruLife	-1319648.143*	364878.093	.000	-2276402.31	-362893.97
	HDFC Std. Life	-822066.857	364878.093	.026	-1778821.03	134687.31
	SBI Life	-929021.000	364878.093	.012	-1885775.17	27733.17
	Bajaj Life	-650466.571	364878.093	.077	-1607220.74	306287.60
	MNYL	-436246.000	364878.093	.234	-1393000.17	520508.17
	Birla SunLife	-341713.857	364878.093	.351	-1298468.03	615040.31
	Reliance Life	-347979.286	364878.093	.342	-1304733.45	608774.88
	TATA-AIA Life	-127766.714	364878.093	.727	-1084520.88	828987.45
	Kotak Life	-104500.143	364878.093	.775	-1061254.31	852254.03
	METLIFE	-63813.000	364878.093	.861	-1020567.17	892941.17
	AVIVA Life	-28989.286	364878.093	.937	-985743.45	927764.88

	Sahara Life	151240.286	364878.093	.679	-805513.88	1107994.45
	Shriram Life	108253.429	364878.093	.767	-848500.74	1065007.60
	Bharti-AXA Life	97259.143	364878.093	.790	-859495.03	1054013.31
	Future Life	114306.857	364878.093	.755	-842447.31	1071061.03
	IDBI Life	98933.714	364878.093	.787	-857820.45	1055687.88
PNB METLIFE	LICI	-20253001.286*	364878.093	.000	-21209755.45	-19296247.12
	ICICI PruLife	-1255835.143*	364878.093	.001	-2212589.31	-299080.97
	HDFC Std. Life	-758253.857	364878.093	.040	-1715008.03	198500.31
	SBI Life	-865208.000	364878.093	.020	-1821962.17	91546.17
	Bajaj Life	-586653.571	364878.093	.111	-1543407.74	370100.60
	MNYL	-372433.000	364878.093	.310	-1329187.17	584321.17
	Birla SunLife	-277900.857	364878.093	.448	-1234655.03	678853.31
	Reliance Life	-284166.286	364878.093	.438	-1240920.45	672587.88
	TATA-AIA Life	-63953.714	364878.093	.861	-1020707.88	892800.45
	Kotak Life	-40687.143	364878.093	.911	-997441.31	916067.03
	Exide Life	63813.000	364878.093	.861	-892941.17	1020567.17
	AVIVA Life	34823.714	364878.093	.924	-921930.45	991577.88
	Sahara Life	215053.286	364878.093	.557	-741700.88	1171807.45
	Shriram Life	172066.429	364878.093	.638	-784687.74	1128820.60
	Bharti-AXA Life	161072.143	364878.093	.660	-795682.03	1117826.31
	Future Life	178119.857	364878.093	.626	-778634.31	1134874.03
	IDBI Life	162746.714	364878.093	.656	-794007.45	1119500.88
AVIVA Life	LICI	-20287825.000*	364878.093	.000	-21244579.17	-19331070.83
	ICICI PruLife	-1290658.857*	364878.093	.001	-2247413.03	-333904.69
	HDFC Std. Life	-793077.571	364878.093	.032	-1749831.74	163676.60
	SBI Life	-900031.714	364878.093	.015	-1856785.88	56722.45
	Bajaj Life	-621477.286	364878.093	.091	-1578231.45	335276.88
	MNYL	-407256.714	364878.093	.267	-1364010.88	549497.45
	Birla SunLife	-312724.571	364878.093	.393	-1269478.74	644029.60
	Reliance Life	-318990.000	364878.093	.384	-1275744.17	637764.17
	TATA-AIA Life	-98777.429	364878.093	.787	-1055531.60	857976.74
	Kotak Life	-75510.857	364878.093	.836	-1032265.03	881243.31
	Exide Life	28989.286	364878.093	.937	-927764.88	985743.45
	METLIFE	-34823.714	364878.093	.924	-991577.88	921930.45
	Sahara Life	180229.571	364878.093	.622	-776524.60	1136983.74
	Shriram Life	137242.714	364878.093	.708	-819511.45	1093996.88
	Bharti-AXA Life	126248.429	364878.093	.730	-830505.74	1083002.60
	Future Life	143296.143	364878.093	.695	-813458.03	1100050.31
	IDBI Life	127923.000	364878.093	.727	-828831.17	1084677.17
Sahara Life	LICI	-20468054.571*	364878.093	.000	-21424808.74	-19511300.40
	ICICI PruLife	-1470888.429*	364878.093	.000	-2427642.60	-514134.26
	HDFC Std. Life	-973307.143*	364878.093	.009	-1930061.31	-16552.97

	SBI Life	-1080261.286*	364878.093	.004	-2037015.45	-123507.12
	Bajaj Life	-801706.857	364878.093	.030	-1758461.03	155047.31
	MNYL	-587486.286	364878.093	.110	-1544240.45	369267.88
	Birla SunLife	-492954.143	364878.093	.180	-1449708.31	463800.03
	Reliance Life	-499219.571	364878.093	.174	-1455973.74	457534.60
	TATA-AIA Life	-279007.000	364878.093	.446	-1235761.17	677747.17
	Kotak Life	-255740.429	364878.093	.485	-1212494.60	701013.74
	Exide Life	-151240.286	364878.093	.679	-1107994.45	805513.88
	METLIFE	-215053.286	364878.093	.557	-1171807.45	741700.88
	AVIVA Life	-180229.571	364878.093	.622	-1136983.74	776524.60
	Shriram Life	-42986.857	364878.093	.906	-999741.03	913767.31
	Bharti-AXA Life	-53981.143	364878.093	.883	-1010735.31	902773.03
	Future Life	-36933.429	364878.093	.920	-993687.60	919820.74
	IDBI Life	-52306.571	364878.093	.886	-1009060.74	904447.60
Shriram Life	LICI	-20425067.714*	364878.093	.000	-21381821.88	-19468313.55
	ICICI PruLife	-1427901.571*	364878.093	.000	-2384655.74	-471147.40
	HDFC Std. Life	-930320.286	364878.093	.012	-1887074.45	26433.88
	SBI Life	-1037274.429*	364878.093	.005	-1994028.60	-80520.26
	Bajaj Life	-758720.000	364878.093	.040	-1715474.17	198034.17
	MNYL	-544499.429	364878.093	.139	-1501253.60	412254.74
	Birla SunLife	-449967.286	364878.093	.220	-1406721.45	506786.88
	Reliance Life	-456232.714	364878.093	.214	-1412986.88	500521.45
	TATA-AIA Life	-236020.143	364878.093	.519	-1192774.31	720734.03
	Kotak Life	-212753.571	364878.093	.561	-1169507.74	744000.60
	Exide Life	-108253.429	364878.093	.767	-1065007.60	848500.74
	METLIFE	-172066.429	364878.093	.638	-1128820.60	784687.74
	AVIVA Life	-137242.714	364878.093	.708	-1093996.88	819511.45
	Sahara Life	42986.857	364878.093	.906	-913767.31	999741.03
	Bharti-AXA Life	-10994.286	364878.093	.976	-967748.45	945759.88
	Future Life	6053.429	364878.093	.987	-950700.74	962807.60
	IDBI Life	-9319.714	364878.093	.980	-966073.88	947434.45
Bharti-AXA Life	LICI	-20414073.429*	364878.093	.000	-21370827.60	-19457319.26
	ICICI PruLife	-1416907.286*	364878.093	.000	-2373661.45	-460153.12
	HDFC Std. Life	-919326.000	364878.093	.013	-1876080.17	37428.17
	SBI Life	-1026280.143*	364878.093	.006	-1983034.31	-69525.97
	Bajaj Life	-747725.714	364878.093	.043	-1704479.88	209028.45
	MNYL	-533505.143	364878.093	.147	-1490259.31	423249.03
	Birla SunLife	-438973.000	364878.093	.232	-1395727.17	517781.17
	Reliance Life	-445238.429	364878.093	.225	-1401992.60	511515.74
	TATA-AIA Life	-225025.857	364878.093	.539	-1181780.03	731728.31
	Kotak Life	-201759.286	364878.093	.581	-1158513.45	754994.88
	Exide Life	-97259.143	364878.093	.790	-1054013.31	859495.03

	METLIFE	-161072.143	364878.093	.660	-1117826.31	795682.03
	AVIVA Life	-126248.429	364878.093	.730	-1083002.60	830505.74
	Sahara Life	53981.143	364878.093	.883	-902773.03	1010735.31
	Shriram Life	10994.286	364878.093	.976	-945759.88	967748.45
	Future Life	17047.714	364878.093	.963	-939706.45	973801.88
	IDBI Life	1674.571	364878.093	.996	-955079.60	958428.74
Future Life	LICI	-20431121.143*	364878.093	.000	-21387875.31	-19474366.97
	ICICI PruLife	-1433955.000*	364878.093	.000	-2390709.17	-477200.83
	HDFC Std. Life	-936373.714	364878.093	.012	-1893127.88	20380.45
	SBI Life	-1043327.857*	364878.093	.005	-2000082.03	-86573.69
	Bajaj Life	-764773.429	364878.093	.038	-1721527.60	191980.74
	MNYL	-550552.857	364878.093	.134	-1507307.03	406201.31
	Birla SunLife	-456020.714	364878.093	.214	-1412774.88	500733.45
	Reliance Life	-462286.143	364878.093	.208	-1419040.31	494468.03
	TATA-AIA Life	-242073.571	364878.093	.508	-1198827.74	714680.60
	Kotak Life	-218807.000	364878.093	.550	-1175561.17	737947.17
	Exide Life	-114306.857	364878.093	.755	-1071061.03	842447.31
	METLIFE	-178119.857	364878.093	.626	-1134874.03	778634.31
	AVIVA Life	-143296.143	364878.093	.695	-1100050.31	813458.03
	Sahara Life	36933.429	364878.093	.920	-919820.74	993687.60
	Shriram Life	-6053.429	364878.093	.987	-962807.60	950700.74
	Bharti-AXA Life	-17047.714	364878.093	.963	-973801.88	939706.45
	IDBI Life	-15373.143	364878.093	.966	-972127.31	941381.03
IDBI Life	LICI	-20415748.000*	364878.093	.000	-21372502.17	-19458993.83
	ICICI PruLife	-1418581.857*	364878.093	.000	-2375336.03	-461827.69
	HDFC Std. Life	-921000.571	364878.093	.013	-1877754.74	35753.60
	SBI Life	-1027954.714*	364878.093	.006	-1984708.88	-71200.55
	Bajaj Life	-749400.286	364878.093	.042	-1706154.45	207353.88
	MNYL	-535179.714	364878.093	.145	-1491933.88	421574.45
	Birla SunLife	-440647.571	364878.093	.230	-1397401.74	516106.60
	Reliance Life	-446913.000	364878.093	.223	-1403667.17	509841.17
	TATA-AIA Life	-226700.429	364878.093	.536	-1183454.60	730053.74
	Kotak Life	-203433.857	364878.093	.578	-1160188.03	753320.31
	Exide Life	-98933.714	364878.093	.787	-1055687.88	857820.45
	METLIFE	-162746.714	364878.093	.656	-1119500.88	794007.45
	AVIVA Life	-127923.000	364878.093	.727	-1084677.17	828831.17
	Sahara Life	52306.571	364878.093	.886	-904447.60	1009060.74
	Shriram Life	9319.714	364878.093	.980	-947434.45	966073.88
	Bharti-AXA Life	-1674.571	364878.093	.996	-958428.74	955079.60
	Future Life	15373.143	364878.093	.966	-941381.03	972127.31

*The mean difference is significant at the 0.01 level.