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An Exploration on Indian Life Insurance Companies' Position in the Backdrop of Global Financial Crisis

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Abstract

Life insurance companies play a significant role in channelizing small savings into productive investment channels resulting economic growth in the country. The study is an attempt to evaluate the level of efficiency of Indian life insurance companies operating during the post-recession era (from 2008-09 to 2016-17) based on input-oriented DEA model under the assumption of CRS. OTE scores of the competing companies have been estimated in each year under the study period. The LICI, the only public sector life insurer and a long-time market leader maintained its efficiency in most of the years during this period. However, some other old as well new private life insurers, such as ICICI Prudential, SBI Life, IndiaFirst have also made their mark. However, Edelweiss Tokio, Future Generali could not perform with satisfactory efficiency level.

Key words: Life Insurance; Data Envelopment Analysis; Overall Technical Efficiency.

1. Introduction

Life insurance companies being one of the financial intermediaries and constituent of financial system play an important role in channelizing small savings into productive investment channels resulting in infrastructural development and economic growth. Hence, their efficient operation is a vital factor for economic growth. In 2007-08, the world economy was tremendously affected by a global financial crisis that emanated from a sub-prime mortgage crisis in the United States of America (USA) in the late 2004-05. Financial problems in the USA were quickly spread across the world. It resulted in an economic recession in India. Reduction in Government supervision, downgrading by rating agencies, lack of investment opportunities, pulling out of foreign investment as a result severely impacted life insurance business in the country (Saha, 2021). Furthermore, domestic investors too became sceptic towards their operation which has put life insurance business into jeopardy (Marcovic, et. al., 2010). Researchers all over the world have contributed their thoughtful studies on prudential sector performance in an economy. According to Carson & Ingves (2000) accuracy, timeliness, and comparability of the microeconomic and macroeconomic information would ensure better surveillance of the prudential sector. Eling and Luhnen (2008) in one of their studies observed that insurance companies in the developed economies were more efficient as compared to those from emerging economies. Bikker and Leuvensteijn (2008) made a study on Dutch insurers and pointed out that the efficiency of small and large companies was more than that of the medium sized companies. Chen, et al. (2009) while analysing the structural changes in Chinese insurance market and revealed that foreign participation in the market increased the potential for increasing the market efficiency. In one of the recent studies, Hsiao, et al. (2011) identified a few environmental factors, such as operating profit margin, total asset turnover, fixed asset turnover and benefit paid as a ratio of net premium having significant influence on life insurance sector efficiency. Sinha & Chatterjee (2011) used window analysis, one of the stochastic frontier techniques to evaluate the efficiency of Indian life insurers and observed that that the gap between the Life Insurance Corporation of India (LICI) and other private players in terms of efficiency in decreasing gradually. Das (2012) looked into performance of LICI and other private life insurers in north-eastern region of the country and opined that with the growth in private participation, the market share of LICI had decreased significantly not only in that region, but also in the whole country. Saha & Roy (2018) in a recent study used Data Envelopment Technique (DEA) to measure the effect of managerial performance and scale of operation on the efficiencies of all life insurance companies currently operating in India. All these studies had taken an investigative outlook towards efficiency of life insurance companies across the world and identified DEA as one of the prominent techniques for measuring technical efficiency of the companies. Despite having a wide spectrum of research made in India and abroad, recent studies focussing on efficiency of life insurance companies in India in the aftermath of global economic crisis is really rare. With a view to addressing this gap, the study is an attempt to identify the efficient and inefficient life insurance companies in each year following global economic recession and rank them based on their level of efficiency.

2. Objectives of the Study

The main objective of the current study is to explore the efficient and the inefficient life insurers in each year during the study period since economic global recession and to examine the rank of the companies based on their relative efficiency.

3. Research Methods

In the current study, life insurance companies operating in India from 2008-09 to 2016-17 are identified and their efficiencies are evaluated. Currently there are 24 life insurance companies operating in India. In 2008-09 there were 22 companies in the Indian insurance market. In 2009-10, after the entry of IndiaFirst, the total number becomes 23 until 2011-12 when again Edelweiss Tokio entered the market. Since then, the total number of players in Indian life insurance industry is 24.

Table 1: Life Insurance Companies in India

No.	Life Insurance Companies	No.	Life Insurance Companies
1	Aegon Life Insurance (Aegon)	13	IDBI Life Insurance Company Ltd. (IDBI Federal)
2	Aviva Life Insurance (Aviva)	14	IndiaFirst Life Insurance Company (IndiaFirst) *(entered the industry in 2009-10)*
3	Bajaj Allianz Life Insurance (Bajaj Allianz)	15	Kotak Life Insurance (Kotak Mahindra)
4	Bharti AXA Life Insurance (Bharti AXA)	16	Life Insurance Corporation of India Ltd. (LICI)
5	Aditya Birla Sunlife Insurance (Birla Sunlife)	17	Max Life Insurance (Max Life)
6	Canara HSBC OBC Life Insurance (Canara HSBC)	18	PNB Metlife
7	DHFL Pramerica	19	Reliance Nippon Life (Reliance Nippon)
8	Edelweiss Tokio Life Insurance (Edelweiss Tokio) *(entered the industry in 2011-12)*	20	Sahara India Life Insurance Corporation Ltd. (Sahara India)
9	Exide Life Insurance (Exide Life)	21	SBI Life Insurance Company (SBI Life)
10	Future Generali India LIC Ltd. (Future Generali)	22	Shriram Life (Shriram)
11	HDFC Life Insurance (HDFC Standard)	23	Star Union Dai-ichi Life Insurance (Star Union Dai-ichi)
12	ICICI Prudential Life Insurance (ICICI Prudential)	24	Tata AIA Life Insurance Company (TATA AIA)

Source: IRDA Handbook on Indian Insurance Statistics 2016-17

In the present study, the efficient and inefficient companies have been identified using Data Envelopment Analysis (DEA), which is basically a linear programming technique based on select input and output variables. According to Cooper, et. al. (2007), the product of the number of input and output should never exceed number of DMUs. It can be expressed mathematically as $n >= (p \times q)$, where, n = number of units, p = number of inputs, q = number of outputs. The minimum number of DMUs in a year during the study period is 22.

Hence, a two input - two output situation is considered here, so that the product of the number of input and output always remain below the number of DMUs. Commission (Diacon, Starkey and O'Brien, 2002) and Operating Expense (Ennsfellner et al., 2004) are considered as input variables for the study, while Net Premium (Abidin & Cabanda, 2011) and Benefits Paid (Cummins et. al., 1999) are considered as output variables. The relevant data for the study period 2008-09 to 2016-17 has been collected from Handbook on Indian Insurance Statistics published by the Insurance Regulatory and Development Authority of India (IRDA) (IRDA, 2017).

The study uses an input-oriented DEA under the assumption of constant returns to scale (Charnes et al., 1978) to calculate the efficiency scores of the life insurance companies [also known as decision making units (DMUs)]. In input-oriented DEA, the main objective is equi-proportionate reduction in inputs to produce standard industry output (Sinha, 2012). The underlying scale of production is assumed as Constant Returns to Scale (CRS). The efficiency of the DMUs in this technique is known as Overall Technical Efficiency (OTE). If OTE for a DMU is equal to 1, the DMU is efficient and if it is less than 1 then it is inefficient. The OTE score (below 1) dictates the level of efficiency of the respective DMU. DEA Solver, an MS Excel based analytical package is used estimate the efficiencies of life insurance companies in the individual years during the study period. The package is also used to rank the competing life insurance companies based on their OTE scores.

4. Analysis and Discussion

In this section, the current study explores the efficient and the inefficient life insurers in each year during the study period since economic global recession and examines the rank of the companies based on their relative efficiency.

Just in the following year of the economic recession (i.e., year 2008-09), there were 22 companies in the life insurance sector. Out of them, only three companies (LICI, ICICI Prudential, and DHFL Pramerica) achieved efficient status. LICI and ICICI Prudential were market leaders and were operating for quite several years. Hence, their efficiency is justifiable. But, for DHFL Pramerica that started its operation in 2008-09, it was a significant achievement for them.

Table 2: Efficient and Inefficient Life Insurance Companies in 2008-2009

Details of Efficient Companies				Details of Inefficient Companies			
No.	**Companies**	**OTE Score**	**Rank**	**No.**	**Companies**	**OTE Score**	**Rank**
1	DHFL Pramerica	1	1	1	IDBI Federal	0.935617	4
2	ICICI Prudential	1	1	2	SBI Life	0.930735	5
3	LICI	1	1	3	Exide Life	0.593643	6
				4	Aviva	0.59325	7
				5	HDFC Standard	0.593249	8
				6	Bajaj Allianz	0.576609	9
				7	Aegon	0.574443	10
				8	Kotak Mahindra	0.52861	11
				9	TATA AIA	0.520617	12
				10	Sahara India	0.496963	13
				11	Birla Sunlife	0.48949	14
				12	Shriram	0.477325	15
				13	Max Life	0.445515	16
				14	Bharti AXA	0.415961	17
				15	Reliance Nippon	0.40264	18
				16	Star Union Dai-ichi	0.349553	19
				17	PNB Metlife	0.322669	20
				18	Future Generali	0.302116	21

				19	Canara HSBC	0.16773	22

Source: Compilation of Secondary Data using DEA Solver

Apart from these three, all other companies were inefficient in 2008-09. Among them, IDBI Federal, SBI Life and Exide Life were marginally inefficient. However, PNB Metlife, Future Generali and Canara HSBC were the worst performers in that year (Table 2).

Table 3: Efficient and Inefficient Life Insurance Companies in 2009-2010

Details of Efficient Companies				Details of Inefficient Companies			
No.	**Companies**	**OTE Score**	**Rank**	**No.**	**Companies**	**OTE Score**	**Rank**
1	ICICI Prudential	1	1	1	SBI Life	0.957944	3
2	LICI	1	1	2	Star Union Dai-ichi	0.755851	4
				3	Kotak Mahindra	0.70077	5
				4	Bajaj Allianz	0.642762	6
				5	Sahara India	0.608436	7
				6	HDFC Standard	0.595997	8
				7	Aviva	0.545988	9
				8	IDBI Federal	0.536328	10
				9	Exide Life	0.524232	11
				10	IndiaFirst	0.506731	12
				11	Birla Sunlife	0.498142	13
				12	Shriram	0.496368	14
				13	Reliance Nippon	0.494188	15
				14	TATA AIA	0.494064	16
				15	Aegon	0.487934	17
				16	Max Life	0.459841	18
				17	PNB Metlife	0.423742	19
				18	Bharti AXA	0.386128	20
				19	DHFL Pramerica	0.327584	21
				20	Canara HSBC	0.287507	22
				21	Future Generali	0.179444	23

Source: Compilation of Secondary Data using DEA Solver

In 2009-10, IndiaFirst joined the market. DHFL Pramerica not only lost its efficient status but became one of the worst performers of 2009-10. Among the other 21 inefficient companies, Star Union Dai-Chi and Kotak Mahindra improved their performance (Table 3).

Table 4: Efficient and Inefficient Life Insurance Companies in 2010-2011

Details of Efficient Companies				Details of Inefficient Companies			
No.	**Companies**	**OTE Score**	**Rank**	**No.**	**Companies**	**OTE Score**	**Rank**

1	ICICI Prudential	1	1	1	IndiaFirst	0.932617	4
2	LICI	1	1	2	Star Union Dai-ichi	0.908171	5
3	SBI Life	1	1	3	PNB Metlife	0.889472	6
				4	Aviva	0.724653	7
				5	Kotak Mahindra	0.710995	8
				6	Shriram	0.702613	9
				7	HDFC Standard	0.669536	10
				8	Bajaj Allianz	0.634587	11
				9	Bharti AXA	0.628348	12
				10	Aegon	0.553053	13
				11	Sahara India	0.549471	14
				12	Birla Sunlife	0.521681	15
				13	TATA AIA	0.514698	16
				14	Canara HSBC	0.475552	17
				15	Reliance Nippon	0.461484	18
				16	IDBI Federal	0.430363	19
				17	Exide Life	0.418339	20
				18	Max Life	0.412261	21
				19	DHFL Pramerica	0.306596	22
				20	Future Generali	0.235249	23

Source*:* Compilation of Secondary Data using DEA Solver

In 2010-11, SBI Life found its place in the efficient league along with LICI and ICICI Prudential. Among the inefficient companies, IndiaFirst being a comparatively new company improved their performance to a great extent. PNB Metlife also became marginally inefficient this year. Worst performance of DHFL Pramerica continued. This time, MAX Life also reported a high inefficiency (Table 4).

Table 5: Efficient and Inefficient Life Insurance Companies in 2011-2012

Details of Efficient Companies				**Details of Inefficient Companies**			
No.	**Companies**	**OTE Score**	**Rank**	**No.**	**Companies**	**OTE Score**	**Rank**
1	Aviva	1	1	1	Kotak Mahindra	0.967564	7
2	Bajaj Allianz	1	1	2	Star Union Dai-ichi	0.830053	8
3	ICICI Prudential	1	1	3	TATA AIA	0.773685	9
4	IndiaFirst	1	1	4	Canara HSBC	0.761003	10
5	LICI	1	1	5	PNB Metlife	0.707421	11
6	SBI Life	1	1	6	Shriram	0.699291	12
				7	Bharti AXA	0.691711	13
				8	Birla Sunlife	0.677822	14
				9	HDFC Standard	0.66992	15
				10	Reliance Nippon	0.558721	16
				11	Exide Life	0.481518	17
				12	Sahara India	0.452203	18
				13	Max Life	0.413231	19
				14	Aegon	0.39018	20
				15	IDBI Federal	0.38677	21
				16	Future Generali	0.253298	22

				17	DHFL Pramerica	0.195122	23
				18	Edelweiss Tokio	0.142626	24

Source*:* Compilation of Secondary Data using DEA Solver

In 2011-12, Edelweiss Tokio became the newest member of the sector and with its entry life insurance industry in India comprised 24 members that continued till now. As expected, Edelweiss Tokio in its debutant year could not perform well. However, 2011-12 was a good year for Indian life insurance industry as six players achieved efficiency in this particular year. IndiaFirst achieved its efficient status along with Bajaj Allianz and Aviva. Among the 18 inefficient companies, Kotak Mahindra and TATA AIA improved their performance from previous years (Table 5).

Table 6: Efficient and Inefficient Life Insurance Companies in 2012-2013

Details of Efficient Companies				Details of Inefficient Companies			
No.	**Companies**	**OTE Score**	**Rank**	**No.**	**Companies**	**OTE Score**	**Rank**
1	Bajaj Allianz	1	1	1	Canara HSBC	0.897032	6
2	ICICI Prudential	1	1	2	HDFC Standard	0.837123	7
3	IndiaFirst	1	1	3	TATA AIA	0.822529	8
4	LICI	1	1	4	Kotak Mahindra	0.762067	9
5	SBI Life	1	1	5	Aviva	0.755003	10
				6	Reliance Nippon	0.711235	11
				7	Sahara India	0.691379	12
				8	Star Union Dai-ichi	0.678789	13
				9	Birla Sunlife	0.647801	14
				10	PNB Metlife	0.633664	15
				11	Shriram	0.594918	16
				12	Exide Life	0.54487	17
				13	Max Life	0.526708	18
				14	Aegon	0.525906	19
				15	Bharti AXA	0.5211	20
				16	IDBI Federal	0.419066	21
				17	Future Generali	0.316911	22
				18	DHFL Pramerica	0.140852	23
				19	Edelweiss Tokio	0.127605	24

Source*:* Compilation of Secondary Data using DEA Solver

In 2012-13, Aviva lost its efficient status. Among the 19 inefficient companies, Canara HSBC and HDFC Standard improved their efficiency (Table 6). However, efficiency of Star Union Dai-Chi took a downturn.

Table 7: Efficient and Inefficient Life Insurance Companies in 2013-2014

Details of Efficient Companies				Details of Inefficient Companies			
No.	**Companies**	**OTE Score**	**Rank**	**No.**	**Companies**	**OTE Score**	**Rank**
1	Bajaj Allianz	1	1	1	HDFC Standard	0.971497	6
2	ICICI Prudential	1	1	2	TATA AIA	0.92921	7
3	IndiaFirst	1	1	3	Canara HSBC	0.870217	8
4	LICI	1	1	4	Sahara India	0.835267	9
5	SBI Life	1	1	5	Aviva	0.769909	10
				6	Birla Sunlife	0.695267	11
				7	Kotak Mahindra	0.639995	12
				8	Max Life	0.610342	13
				9	Reliance Nippon	0.577473	14
				10	PNB Metlife	0.553979	15

				11	Shriram	0.490641	16
				12	Star Union Dai-ichi	0.469957	17
				13	Exide Life	0.464444	18
				14	IDBI Federal	0.461114	19
				15	Future Generali	0.362331	20
				16	Aegon	0.343362	21
				17	Bharti AXA	0.306599	22
				18	DHFL Pramerica	0.207452	23
				19	Edelweiss Tokio	9.40E-02	24

Source*:* Compilation of Secondary Data using DEA Solver

The five efficient companies of 2012-13 continued their efficiency even in 2013-14. Future Generali slightly improved their performance, while Bharti AXA came down to 22nd position (Table 7).

Table 8: Efficient and Inefficient Life Insurance Companies in 2014-2015

Details of Efficient Companies				Details of Inefficient Companies			
No.	**Companies**	**OTE Score**	**Rank**	**No.**	**Companies**	**OTE Score**	**Rank**
1	Bajaj Allianz	1	1	1	LICI	0.983649	5
2	ICICI Prudential	1	1	2	Canara HSBC	0.923799	6
3	IndiaFirst	1	1	3	HDFC Standard	0.921914	7
4	SBI Life	1	1	4	TATA AIA	0.92071	8
				5	Sahara India	0.734033	9
				6	Aviva	0.691263	10
				7	Birla Sunlife	0.608957	11
				8	Max Life	0.600356	12
				9	Reliance Nippon	0.5714	13
				10	Star Union Dai-ichi	0.489632	14
				11	DHFL Pramerica	0.488862	15
				12	IDBI Federal	0.484954	16
				13	PNB Metlife	0.439098	17
				14	Kotak Mahindra	0.421253	18
				15	Exide Life	0.411896	19
				16	Future Generali	0.389084	20
				17	Shriram	0.326222	21
				18	Aegon	0.277676	22
				19	Bharti AXA	0.269532	23
				20	Edelweiss Tokio	0.169427	24

Source*:* Compilation of Secondary Data using DEA Solver

In 2014-15, for the first time since economic recession, LICI lost its efficient status. However, it was marginally inefficient. Out of remaining 20 inefficient companies, Aegon became one of the worst performers with only 27.8% efficiency. However, DHFL Pramerica recovered from its previous position and went up the ladder (Table 8).

Table 9: Efficient and Inefficient Life Insurance Companies in 2015-2016

Details of Efficient Companies				Details of Inefficient Companies			
No.	**Companies**	**OTE Score**	**Rank**	**No.**	**Companies**	**OTE Score**	**Rank**
1	Aviva	1	1	1	SBI Life	0.968603	4
2	IndiaFirst	1	1	2	ICICI Prudential	0.956919	5
3	LICI	1	1	3	Canara HSBC	0.932475	6

				4	Bajaj Allianz	0.863247	7
				5	TATA AIA	0.855793	8
				6	HDFC Standard	0.807109	9
				7	DHFL Pramerica	0.741858	10
				8	Birla Sunlife	0.667565	11
				9	Max Life	0.627842	12
				10	Aegon	0.510392	13
				11	IDBI Federal	0.505789	14
				12	Sahara India	0.50307	15
				13	Reliance Nippon	0.484727	16
				14	Star Union Dai-ichi	0.476674	17
				15	Kotak Mahindra	0.467416	18
				16	Future Generali	0.462803	19
				17	PNB Metlife	0.357605	20
				18	Shriram	0.346572	21
				19	Exide Life	0.302495	22
				20	Bharti AXA	0.293669	23
				21	Edelweiss Tokio	0.232449	24

Source: Compilation of Secondary Data using DEA Solver

In 2015-16, LICI regained its efficient status along with Aviva. However, long time efficient ICICI Prudential, SBI Life and Bajaj Allianz lost their efficient positions, and they became marginally inefficient in that year. On the other hand, out of 21 inefficient companies, high inefficiency of Bharti AXA and Edelweiss Tokio continued. While Aegon improved their position from the previous year, Exide Life attained its low (Table 9).

Table 10: Efficient and Inefficient Life Insurance Companies in 2016-2017

Details of Efficient Companies				Details of Inefficient Companies			
No.	**Companies**	**OTE Score**	**Rank**	**No.**	**Companies**	**OTE Score**	**Rank**
1	Aegon	1	1	1	Canara HSBC	0.97321	7
2	Aviva	1	1	2	Birla Sunlife	0.951817	8
3	Bajaj Allianz	1	1	3	LICI	0.946823	9
4	ICICI Prudential	1	1	4	Sahara India	0.80637	10
5	IndiaFirst	1	1	5	HDFC Standard	0.794875	11
6	SBI Life	1	1	6	DHFL Pramerica	0.782318	12
				7	Star Union Dai-ichi	0.665984	13
				8	Reliance Nippon	0.651928	14
				9	IDBI Federal	0.545423	15
				10	TATA AIA	0.538124	16
				11	Max Life	0.529976	17
				12	Kotak Mahindra	0.519463	18
				13	PNB Metlife	0.510769	19
				14	Shriram	0.452408	20
				15	Future Generali	0.444833	21
				16	Exide Life	0.443598	22
				17	Bharti AXA	0.350182	23
				18	Edelweiss Tokio	0.32333	24

Source: Compilation of Secondary Data using DEA Solver

In the last year of the study period, Bajaj Allianz, ICICI Prudential and SBI Life regained their efficiency. Aegon is the new efficient life insurer of 2016-17. However, once again LICI lost its efficient status and became marginally inefficient. Among the 18 inefficient companies, Birla Sunlife improved their efficiency to a great extent (Table 10).

5. Conclusion

The study observes that out of 24 life insurance companies, a few, such as Future Generali, DHFL Pramerica remained highly inefficient throughout the study period. On the other hand, efficiency of Bharti AXA, Canara HSBC, Kotak Mahindra were highly volatile in post recession era. With sustained efforts, they might achieve their efficiency in near future. Year 2011-12 was a major turnaround year for Indian life insurance sector when around six companies achieved their efficient status. Truly speaking, Indian financial system received a huge blow following economic recession. During this phase, investors trusted their savings with life insurance, a comparatively secure investment option with tax benefits. Probably this is the reason behind satisfactory performances of life insurance industry even during the economic turmoil. Despite such shock, companies with large clientele, and innovative product ideas, such as LICI and ICICI Prudential maintained their efficiency.

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