A Comparative Study of **Cost Efficiency of Life Insurance** Companies in India

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The insurance sector in India has come a full circle from being an open competitive market to nationalization and back to a liberalized market again. The objectives of the study are to compare international life insurance density and penetration and to evaluate the cost efficiency of life insurance companies operating in India for the period 2000-01 to 2009-10.Secondary data is used for this research. All private and public sector life insurance companies in India from 2000-01 to 2009-10 were selected for the study. The present study involves calculation of cost efficiency score of life insurance sector in India with the used of Data Envelopment Analysis (DEA). Life Insurance Corporation of India has consistently secured a cost efficiency score of 1 in all the years from 2000-01 to 2009-10 and scored the highest rank for all the years under study. Thus Life Insurance Corporation of India has consistently been a cost efficient organization. While in the case of the private life insurance companies, the cost efficiency score has been inconsistent.

Keywords: DEA, Cost Efficiency, Density, Penetration

Introduction:

The Life Insurance Sector in India

Life insurance in the modern form was first set up in India through a British company called the Oriental Life Insurance Company in 1818 followed by the Bombay Assurance Company in 1823 and the Madras Equitable Life Insurance Society in 1829. All these companies operated in India but did not insure the lives of Indians. They insured the lives of Europeans living in India. Some of the companies that started later did provide insurance for Indians, as they were treated as "substandard". Substandard in insurance parlance refers to lives with physical disability. Pioneering efforts of reformers and social workers like Raja Rammohan Ray, Dwarakanath Tagore, Ramatam Lahiri, Rustomji Cowasji and others led to entry of Indians in insurance business. The first Indian insurance company under the name 'Bombay Life Insurance Society' started its operation in 1870, and started covering Indian lives at standard rates. Later 'Oriental Government Security Life Insurance Company', was established in 1874, with Sir Phirozshah Mehta as one of its founder directors. Insurance in India can be traced back to the Vedas. For instance, yogakshema, the name of Life Insurance Corporation of India's corporate headquarters, is derived from the Rig Veda. The term suggests that a form of 'community insurance' was prevalent around 1000 BC and practiced by the Aryans.

Insurance business was conducted in India without any specific regulation for the insurance business. They were subject to Indian Companies Act 1866. After the start of the 'Be Indian Buy Indian Movement' (called Swadeshi Movement) in 1905, indigenous enterprises sprang up in many industries. It was during the swadeshi movement in the early 20th century that insurance witnessed a big boom in India with several more companies being set up. Not surprisingly, the Movement also touched the insurance industry leading to the formation of dozens of life insurance companies along with provident fund companies (provident fund companies are pension funds). In 1912, two sets of legislation were passed: the Indian Life Assurance Companies Act and the Provident Insurance Societies Act. There are several striking features of these legislations. They were the first legislations in India that particularly targeted the insurance sector. They did not include general insurance business. The government did not feel the necessity to regulate general insurance. They restricted activities of the Indian insurers. As these companies grew, the government began to exercise control on them. The Insurance Act was passed in 1912, followed by a detailed and amended Insurance Act of 1938 that looked into investments, expenditure and management of these companies' funds.

The nation under the leadership of Pandit Jawaharlal Nehru was moving towards socialistic pattern of society with the main aim of spreading life insurance to rural areas and to channelize huge funds accumulated by life insurance companies to nation building activities. The Government of India nationalized the life insurance industry in January 1956 by merging about 245 life insurance companies and forming Life Insurance Corporation of India (LIC), which started functioning from 01.09.1956. After completing the arduous task of integration of about 245 life insurance companies, LIC of India gave an exemplary performance in achieving various objectives of nationalization. The non-life insurance business continued to thrive with the private sector till 1972. Their operations were restricted to organized trade and industry in large cities. The general insurance industry was nationalized in 1972. With this, nearly 107 insurers were amalgamated and grouped into four companies- National Insurance Company, New India Assurance Company, Oriental Insurance Company and United India Insurance Company. These were subsidiaries of the General Insurance Company (GIC). For years thereafter, insurance remained a monopoly of the public sector. It was only after seven years of deliberation and debate that R. N. Malhotra Committee report of 1994 became the first serious document calling for the re-opening up of the insurance sector to private players. The sector was finally opened up to private players in 2001.The Insurance Regulatory and Development Authority, an autonomous insurance regulator set up in 2000, has extensive powers to oversee the insurance business and regulate in a manner that will safeguard the interests of the insured. Insurance is a federal subject in India. There are two legislations that govern the sector- The Insurance Act- 1938 and the IRDA Act- 1999. The insurance sector in India has come a full circle from being an open competitive market to nationalization and back to a liberalized market again. Tracing the developments in the Indian insurance sector reveals the 360 degree turn witnessed over a period of almost two centuries.

Literature Review:

The initial studies on the efficiency of U.S. life insurers, Grace and Timme (1992) Yuengert (1993) and Gardner and Grace (1993) mostly focused on scale economies. These studies tend to find evidence of significant scale economies in the industry, although larger firms generally are found to exhibit decreasing returns to scale.

Rai (1996) studied cost efficiency by Stochastic Frontier Approach method during 1988 to 1992 covering 11 OECD countries- Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Sweden, Switzerland, U.K. and US. He concluded that the cost efficiency of Finland and France was greater than U.K. where as small firms were more cost efficient than large firms.

Cummis, Tennyson, and Weiss (1999) used the Data Envelopment Analysis to examine the relationship among mergers and acquisitions, efficiency, and economies of scale in the US life insurance industry over the period 1988 to 1995.They found that acquired firms achieve greater efficiency gains than firms that have not been involved in mergers or acquisitions.

Davutyan,Klumpes (2008) studied technical efficiency, pure technical efficiency and scale efficiency using Data Envelopment Analysis method. The study covered 472 insurers of 7 European countries: France Germany, Italy, Netherlands, Spain, Switzerland and U.K. during 1996 to 2002.They included both life and non-life insurers in their study. The inputs used in their model were labor, business service and equity capital. On the output side, the factors included present value of losses incurred premiums and invested asset. The study analyzed that the efficiency score was very low in seven European countries. In life insurance France was the best and Netherlands was the worst where as in non life insurers Switzerland was the best and Spain was the worst.

Berger et al. (2000) analyzed cost efficiency, revenue efficiency and profit efficiency of 684 insurers in US by using Thick Frontier Approach and Stochastic Frontier Approach method for the period 1988 to 1992.The result showed that conglomeration hypothesis holds for some types while strategic focus hypothesis dominates others.

Lin (2002) applied the Data Envelopment Analysis approach to measure efficiency scores and to examine whether life insurers in Taiwan have fully recognized the new market structure after deregulation. Results showed no change in overall efficiency, no pure technical efficiency change, and no scale efficiency change after deregulation.

Madhukar Palli (2004) assessed Life Insurance Potential in India. The report focused on risk security, the core product of life insurance. It provides estimates of the Life Insurance Gap to maintain dependents' living standards after the death of the primary wage earner. The primary drivers of demand for risk security are 'Age', 'Income', 'Affordability', 'Wealth' and finally the desire to protect income from Inflation. Though aggregate demand is driven by these factors, various researches have shown that there is little correlation between a specific family's need for security and its actual purchase of insurance. Many families, especially young ones, have either no risk security or inadequate security.

Tapen Sinha (2005) analyzed the evolution of insurance in India. He concluded that India is fast becoming a global economic power. India is among the important emerging insurance markets in the world. The fundamental regulatory changes in the insurance sector in 1999 will be critical for future growth. Despite the restriction of 26% on foreign ownership, large foreign insurers have entered the Indian market. State-owned insurance companies still have dominant market positions. But, this would probably change over the next decade.

Hussels,Ward (2006) analyzed the cost efficiency as well as technical efficiency of 31 life insurers of Germany and 47 life insurers of U.K. during 1991 to 2002.They concluded that the cost and technical efficiency of U.K. was greater than Germany. There was limited evidence of improvement in post deregulation efficiency as well as limited influence of deregulation on efficiency.

Sabera (2007) studied the opening of the insurance sector. He concluded that the entry of private players helped in spreading and keeping the operation in the Indian insurance sector which in turn results in restructuring and revitalizing of public sector.

No research has been undertaken to compare LIC of India vis a vis the new private life insurance companies in terms of cost efficiency in India. Even in this direction, the efforts are fragmented. The present research seeks to fill this gap.

Research Methodology:

Research Statement

The research statement studied is entitled, “A Comparative Study of Cost Efficiency of Life Insurance Companies in India”.

Objective of the study

The objective of the study is to compare the cost efficiency of life insurance companies in India.

Nature of data and sources of data

The data used for this research is secondary in nature. The relevant and required data has been collected from journals, dailies, annual reports, magazines, literature and websites of selected companies and through various search engines.

Sample selection

All private and public sector life insurance companies in India from 2000-01 to 2009-10 were selected for the study. The companies selected for the research work in public sector only i.e. Life Insurance Corporation of India. And in private sector there are twenty two companies i.e HDFC Standard Life Insurance Co. Ltd. ,Max New York Life Insurance Co. Ltd.,ICICI Prudential Life Insurance Co. Ltd.,Kotak Mahindra Life Insurance Co. Ltd.,Birla Sun Life Insurance Co. Ltd.,TATA AIG Life Insurance Co. Ltd.,SBI Life Insurance Co. Ltd.,ING Vysya Life Insurance Co. Ltd., Bajaj Allianz Life Insurance Co. Ltd., Met Life India Life Insurance Co. Ltd., Reliance Life Insurance Co. Ltd., Aviva Life Insurance Co. Ltd., Sahara India Life Insurance Co. Ltd., Shriram Life Insurance Co. Ltd., Bharti AXA Life Insurance Co. Ltd., Future Generali India Life Insurance Co. Ltd., IDBI Fortis Life Insurance Co. Ltd.,Canara HSBC Oriental Bank of Commerce Life Insurance Co.Ltd., Argon Religare Life Insurance Co.Ltd., DLF Pramerica Life Insurance Co.Ltd., Star Union Dai-ichi Life Insurance Co. Ltd. and India First Life Insurance Co.Ltd.

Hypothesis

Ho: The cost efficiency score of Life Insurance Companies in India is equal.

Tool of data analysis:

The present study involves calculation of cost efficiency score of life insurance companies in India with the use of Data Envelopment Analysis.

Data Envelopment Analysis (DEA):

Data Envelopment Analysis (DEA) is a non-parametric linear programming tool generally used for performance evaluation of economic units through the construction of an economic frontier. It was originally developed for performance measurement. The advantage of DEA is that it requires very few prior assumptions on input-output relationship.

Cost efficiency of a productive enterprise is an important indicator of its performance. The cost efficiency of a firm is defined by the ratio of minimum costs to actual costs for a given output. Vector is computed by measuring the distance of its observed (cost) point from an idealized cost frontier.

The measure of cost efficiency is bounded between 0 and 1. A cost efficiency of 1 represents a fully cost efficient firm; 1-Cost Efficiency represents the amount by which the firm could reduce its costs and still produce at least the same amount of output.

In the present study we have considered two outputs i.e. (1) Benefits paid to the customers (2) Net premium and two inputs i.e. (1) Operating expenses (2) Commission expenses. The inputs and outputs have been taken from IRDA Annual Reports.

Scope of the study:

Similar studies on this line may be conducted to compare cost efficiency of public and private insurance companies in other countries.

Limitation of the study:

The present research work is undertaken to maximize objectivity and minimize the errors. However, there are certain limitations of the study, which are to be taken in to consideration for the present research work.

- The study is based on the analysis of the ten years data only.
- The study fully depends on financial data collected from the published financial statements of companies. This study incorporates all the limitations that are inherent in the financial statements.
- The data for analysis is basically derived from financial statements. They are not adjusted for inflation.

International comparison of Life insurance Density and Penetration:

Table 1 International comparison of Life insurance Density (%)

Countries	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Developed Countries										
US	1602.0	1662.6	1657.5	1692.5	1753.2	1789.5	1922.0	1900.6	1602.6	1498.3
UK	2567.9	2679.4	2617.1	3190.4	3287.1	5139.6	5730.5	5582.1	3527.6	3025.7
France	1268.2	1349.5	1767.9	2150.2	2474.6	2922.5	2728.3	2791.9	2979.8	3251.9
Germany	674.3	736.7	930.4	1021.3	1042.1	1136.1	1234.1	1346.5	1359.7	1390.5
South Korea	763.4	821.9	873.6	1006.8	1210.6	1480.0	1656.6	1347.7	1180.6	1080.7
Japan	2806.4	2783.9	3002.9	3044.0	2956.3	2829.3	2583.9	2869.5	3138.7	3865.8
Developing Countries										
Brazil	10.8	27.2	35.8	45.9	56.8	72.5	95.3	115.4	127.9	139.4

Russia	33.2	23.1	33.9	24.8	6.3	4.0	6.1	5.4	4.50	4.30
Malaysia	129.5	118.7	139.8	167.3	188.0	189.2	221.5	225.9	206.9	198.2
India	9.1	11.7	12.9	15.7	18.30	33.2	40.4	41.2	47.7	52.2
China	12.2	19.2	25.1	27.3	30.5	34.1	44.2	71.7	81.1	93.6
South Africa	377.2	360.5	476.5	545.5	558.3	695.6	719.0	707.0	574.2	498.2
Australia	1040.3	1010.4	1129.3	1285.1	1366.7	1389.0	1674.1	2038.0	1524.8	1328.6

(Source: IRDA Annual Reports)

Table 2: International Comparison of life insurance penetration (%)

Countries	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Developed Countries										
US	4.40	4.60	4.38	4.22	4.14	4.00	4.20	4.10	3.50	3.10
UK	10.73	10.19	8.62	8.92	8.90	13.10	12.60	12.80	10.00	9.20
France	5.73	5.61	5.99	6.38	7.08	7.90	7.30	6.20	7.20	8.40
Germany	3.00	3.06	3.17	3.11	3.06	3.10	3.10	3.00	3.30	3.50
South Korea	8.69	8.23	6.77	6.75	7.27	7.90	8.20	8.00	6.50	6.20
Japan	8.85	8.64	8.61	8.26	8.32	8.30	7.50	7.60	7.80	8.10
Developing Countries										
Brazil	0.36	1.05	1.28	1.36	1.33	1.30	1.40	1.40	1.60	1.62
Russia	1.55	0.96	1.12	0.61	0.12	0.10	0.10	0.00	0.00	0.00
Malaysia	3.38	2.94	3.29	3.52	3.60	3.20	3.10	2.80	2.90	3.10
India	2.15	2.59	2.26	2.53	2.53	4.10	4.00	4.00	4.60	4.90
China	1.34	2.03	2.30	2.21	1.78	1.70	1.80	2.20	2.30	2.60
South Africa	15.19	15.92	12.96	11.43	10.84	13.00	12.50	12.50	10.00	9.10
Australia	5.70	5.02	4.42	4.17	3.51	3.80	3.80	4.40	3.40	3.10

(Source: IRDA Annual Reports)

Observation:

Tables 1 and 2 provide a international comparison of Indian life insurance density and penetration levels of the Developed and Developing countries from 2000-01 to 2009-10.Note that insurance penetration is defined as a ratio (in per cent) of premium to G.D.P. and insurance density is defined as a ratio(in per cent) of premium to population. India's life insurance density and penetration is very low as compared to the developed countries and developing countries, inspite of India being the second most populous country in the world. This shows that there is much scope for life insurance sector to develop in India.

Data Analysis

Table 3 Cost Efficiency Score

Life Insurer	**Year**									
	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
HDFC standard Life	1	0.1689	0.3341	0.5415	0.0139	0.0889	0.1123	0.0126	0.0220	0.0450
MAX NEW YORK	1	0.0795	0.2081	0.2875	0.0120	0.0292	0.0302	0.0128	0.0186	0.0438
ICICI Prudential	0.2979	0.0866	0.1340	0.1840	0.0137	0.2018	1	0.0043	1	1
Kotak Mahindra	NA	0.1786	0.3796	0.5342	0.0409	0.1245	0.1795	0.0283	0.0460	0.1596
Birla Sun Life	1	0.1418	0.2616	0.3875	0.0156	0.0412	0.0453	0.0191	0.0217	0.0464
TATA AIG	NA	0.1684	0.3668	0.4337	0.0104	0.0325	0.0447	0.0159	0.0319	0.0639
SBI Life	NA	1	1	1	1	1	1	0.0692	0.1607	1
ING Vysya	NA	0.2851	0.4034	0.4592	0.0210	0.0585	0.0696	0.0276	0.0834	0.1572
BAJAJ ALLIANZ	NA	0.2649	0.3492	0.3623	0.0121	0.0249	0.0162	0.0064	0.0169	0.0322
MET Life India	NA	1	1	1	0.0521	0.0932	0.0664	0.0258	0.0414	0.0706
Reliance Life	NA	1	1	1	0.1551	1	0.0812	0.0112	0.0131	0.0805
AVIVA	NA	NA	0.7994	0.4541	0.0164	0.0371	0.0381	0.0166	0.0504	0.1332
SAHARA India	NA	NA	NA	NA	1	1	1	0.5944	0.7708	1
SHRIRAM	NA	NA	NA	NA	NA	1	0.8816	0.3020	0.5024	0.3525
Bharti Axa	NA	NA	NA	NA	NA	NA	1	0.0340	0.0634	0.1362
Future Generali	NA	NA	NA	NA	NA	NA	NA	1	0.1258	0.1334
IDBI Fortis	NA	NA	NA	NA	NA	NA	NA	1	0.5723	0.4087
Canara	NA	NA	NA	NA	NA	NA	NA	NA	0.1636	0.1923

Argon Religare	NA	NA	NA	NA	NA	NA	NA	NA	0.2458	0.4562
DLF	NA	NA	NA	NA	NA	NA	NA	NA	1	1
Star Union Dai-Ichi	NA	NA	NA	NA	NA	NA	NA	NA	1	0.9334
India First	NA	NA	NA	NA	NA	NA	NA	NA	NA	1
LIC of India.	1	1	1	1	1	1	1	1	1	1

(The cost efficiency scores have been calculated with the help of inputs and outputs taken from IRDA Annual Reports)

Table 4 Ranks given to life insurance companies based on Cost Efficiency Score

Life Insurer	**Year**									
	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
HDFC Standard	1	8	10	5	10	9	8	15	18	21
MAX NEW YORK	1	12	12	12	13	14	15	14	20	22
ICICI Prudential	5	11	13	13	11	6	1	18	1	1
Kotak Mahindra	NA	7	7	6	6	7	7	8	15	12
Birla Sun Life	1	10	11	10	9	11	12	11	19	20
TATA AIG	NA	9	8	9	14	13	13	13	17	19
SBI Life	NA	1	1	1	1	1	1	6	10	1
ING Vysya	NA	5	6	7	7	10	10	9	12	13
BAJAJ ALLIANZ	NA	6	9	11	12	15	16	17	21	23
MET Life India	NA	1	1	1	5	8	11	10	16	18
Reliance Life	NA	1	1	1	4	1	9	16	22	17
AVIVA Life	NA	NA	5	8	8	12	14	12	14	16
SAHARA India	NA	NA	NA	NA	1	1	1	4	5	1
SHRIRAM	NA	NA	NA	NA	NA	1	6	5	7	10
Bharti Axa	NA	NA	NA	NA	NA	NA	1	7	13	14
Future	NA	NA	NA	NA	NA	NA	NA	1	11	15

Generali										
IDBI Fortis	NA	NA	NA	NA	NA	NA	NA	1	6	9
Canara HSBC	NA	NA	NA	NA	NA	NA	NA	NA	9	11
Argon Religare	NA	NA	NA	NA	NA	NA	NA	NA	8	8
DLF Premercia	NA	NA	NA	NA	NA	NA	NA	NA	1	1
Star Union Dai-Ichi	NA	NA	NA	NA	NA	NA	NA	NA	1	7
India First	NA	NA	NA	NA	NA	NA	NA	NA	NA	1
LIC of India.	1	1	1	1	1	1	1	1	1	1

Table 3 and Table 4 provide the insurer wise cost efficiency score and ranks determined on the basis of cost efficiency scores for the period of observation 2000-01 to 2009-10 respectively.

It can be seen that Life Insurance Corporation of India has consistently secured a cost efficiency score of 1 in all the years from 2000-01 to 2009-10 and scored the highest rank for all the years under study. Thus Life Insurance Corporation of India has consistently been a cost efficient organization. While in the case of the private life insurance companies, the cost efficiency score has been inconsistent. Except for SBI Life insurance company which has secured a cost efficiency score of 1 in seven years out of ten years but in 2008-09 it has slipped to the 10th rank. Undoubtedly, Life Insurance Corporation of India has maintained higher score than Mean Cost Efficiency and secured 1st rank from 2000-01 to 2009-10.Thus Ho is rejected and we can conclude that cost efficiency score of all life insurance companies is not equal.

Conclusion and Suggestions:

The findings show a significant heterogeneity in the cost efficiency scores from 2000-01 to 2009-10.In the year 2009-10, ICICI Prudential Life Insurance Co. Ltd., SBI Life Insurance Co. Ltd., SAHARA India Life Insurance Co.Ltd., DLF pramercia Life Insurance Co. Ltd. , India First Life Insurance Co. Ltd. and Life Insurance Corporation of India were fully cost efficient firms as they had secure a cost efficient score 1. Star Union Dai-Ichi Life Insurance Co. Ltd. is close to a cost efficient score of 1 while the other private life insurance companies should have reduced their cost by: HDFC standard Life Insurance Co.Ltd.(0.9550), Max New

York Life Insurance Co. Ltd.(0.9562), Kotak Mahindra Life Insurance Co.Ltd.-(0.8404), Birla Sun Life Insurance Co.Ltd. (0.9536), TATA AIG Life Insurance Co.Ltd. (0.9361), ING Vysya Life Insurance Co. Ltd.(0.8428), BAJAJ Allianz Life Insurance Co. Ltd.(0.9678), MET Life India Insurance Co. Ltd. (0.9294), Reliance Life Insurance Co. Ltd.(0.9195), AVIVA Life Insurance Co.Ltd. (0.8668), Shriram Life Insurance Co. Ltd. (0.6475), Bharti Axa Life Insurance Co.Ltd.(0.8638), Future Generali Life Insurance Co.Ltd. (0.8666), IDBI Fortis Life Insurance Co.Ltd. (0.5913), Canara HSBC Oriental Bank of Commerce Life Insurance Co.Ltd. (0.8077), Argon Religare Life Insurance Co. Ltd. (0.5438) to produce the same amount of output.

It can be seen that Life Insurance Corporation of India has consistently secured a cost efficiency score of 1 in all the years from 2000-01 to 2009-10 and scored the highest rank for all the years. Thus Life Insurance Corporation of India has consistently been a cost efficient organization. The private life insurance companies' cost efficiency score is less as their operating and commission expenses are more. The private life insurance companies should improve their cost efficiency score by increasing outputs i.e. benefits paid to the customers and net premium and decreasing inputs i.e. operating expenses and commission expenses.

References:

Anthony M.Santomero and John David Cummins (1999) 'Changes in Life Insurance Industries: Efficiency Technology and Risk Management', IEMI, Springer.

Bhattacharya Dipakkumar (2003) 'Research Methodology', Excel Book, New Delhi.

Cummins, J.D., Weiss, M.A. (2000) 'Analyzing Firm Performance in the Insurance Industry using Frontier Efficiency Methods'. In: Dionne, G. (Ed.), Handbook of Insurance Economics', Kluwer Academic Publishers, Boston.

D.C. Srivastava and Shashank Srivastava (2006) 'Indian Insurance Industry', New Century Publications, Delhi. pg. 256-275.

De Borger, B., Kerstens, K., (1996) ‘Cost efficiency of Belgian local governments: A Comparative Analysis of FDH, DEA, and Econometric Approaches’, Regional Science and Urban Economics, 26 (2), pp. 145-170.

M.N.Mishra (2008) ‘Insurance: Principles and Practice’, S.Chand and Co.Ltd., Allahabad Oriental Publication, Allahabad.

Rai, A. (1996) ‘Cost efficiency of International Insurance Firms’, Journal of Financial Services Research, 10 (3), pp. 213-233.

Sinha ,Tapen (2002) ‘Privatization of insurance market of India: From British Raj to Monopoly, Raj to Swaraj’, CRIS discussion paper series (98).

Yang, Z. (2006) ‘A two-stage DEA model to evaluate the overall performance of Canadian life and health insurance companies’, Mathematical and Computer Modeling, (43), pp. 910-919.

www.licindia.com (last excess date 20th November 2011)

www.irdaindia.org (last excess date 25th November 2011)

www.indiastat.com. (last excess date 25th November 2011)