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EFFICIENCY ANALYSIS OF SELECTED HEALTH INSURANCE COMPANIES IN INDIA: A DEA APPROACH

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ABSTRACT

In India, 33 general insurance companies have been granted registration for carrying on general insurance business as on 31st October, 2018. Of these, 6 are in the public sector and the rest 27 are in the private sector.

	In India	***In World***
Life insurance penetration	*3.1%*	*3.5%*
Non-life insurance penetration	*0.8%*	*2.8%*

From the above, it shows that, India is still remains repellently 'under- insured' in terms of insurance penetration and density. Non-life insurance industry in India is basically controlled by motor insurance (43%) followed by health insurance (25%).

This study includes efficiency analysis of selected health insurance companies(eighteen) in India over the period 2008-2009 to 2018-2019 using Data Envelopment Analysis(DEA) method. Two basic DEA models have been used i.e. CCR & BCC. In this study, inputs are claims incurred (net) and operating expenses and the outputs are net premium income (earned) and income from investments. The DEA result shows that, among selected four public sectors health insurance companies only New India Assurance Company (NEW INDIA) is on the efficiency frontier and has an efficiency score of 1. Among selected 14 (fourteen) private sectors health insurance companies only Apollo Munich Health Insurance Company Limited (APOLLO), Star Health and Allied insurance company Limited (STAR), MAX Bupa Health Insurance Company Limited (MAX), TATA AIG General Insurance Company Limited (TATA), HDFC ERGO General Insurance Company Limited (HDFC), Royal Sundaram Alliance Insurance Company Limited (ROYAL) and Cholamandalam MS General Insurance Company Limited (CHOLAMANDALAM) are on the efficiency frontier and have an efficiency score of 1.

Keywords: *DEA, Health Insurance, Technical Efficiency, Pure Technical Efficiency, Scale Efficiency.*

Introduction

India's insurance segment is divided in two parts i.e. Life insurance and Non-Life insurance. Health insurance comes under non-life insurance. This non-life insurance sector in India has been considered one of the major budding sectors in the financial services sector. Over a decade steady growth has been observed in this sector due to increasing of premium.

There are so many companies in this insurance sector. For which competition increases among them in this sector. There need to analyze the performance of the non-life insurer due to the high risky nature of the industry. Thus efficiency measurement is very much essential for business performance analysis.

Table 1: Comparison of Insurance Penetration (both Life and Non-Life)

	In India	**In World**
Life insurance penetration	3.1%	3.5%
Non-life insurance penetration	0.8%	2.8%

Sources: IRDA Annual Report

[6] Burdwan University, Burdwan, West Bengal, India.

Non-life insurance industry in India is basically controlled by motor insurance (43%) followed by health insurance (25%). This report shows that, awareness level about health insurance in India is rising but not at par with other insurance segments.

As on 31st October, 2018, 34 general insurance companies have been granted registration for carrying on general insurance business in India. Of these, 6 are in the public sector and the rest 28 are in the private sector.

Apart from these, there are major players in the private domain as well which can be put into two categories: (i) those which provide both health insurance and others like transport, fire, marine etc. (23 insurance companies) and (ii) that provide only health insurance (5 insurance companies).

Both private and public health insurers offer various health insurance schemes, the most popular being the Mediclaim policy. Some other popular Mediclaim policies are Group Mediclaim Policy (as (i) popular among employees for expenses bear by health insurance and (ii) tax savings in 80D), and Group Mediclaim Policy for card holders etc. Government of India launched Aayushman Bharat Scheme in the year 2017. Apart that others government health insurance schemes are National Health Insurance Scheme named as CGEPHIS (Central Government Employees & Pensioners Health Insurance Scheme), Aam Aadmi Bima Yojana (AABY), etc.

Literature Review

Many empirical studies had done in assessing the efficiency of health insurance companies in India. A summary of the previous studies are shown in Table 2.1.

Table 2.1. Summary Sheet of Previous Research

Authors	Method	Units	Inputs	Outputs
Gaedener and Grace,1993	Cobb- Douglas Frontier	561 Life Insurance Companies in USA	Labour, Capital & Misc. Items	Ordinary , Group Life insurance premium,Ordinary, Group annuity, Group accident and health premium
Fukuyama, 1997	DEA and Malmquist index	25 Japanese life insurance companies	Asset value, number of workers and tied agents or sales representatives	Insurance reserves, loans.
Barros et al.,2003	DEA and truncated bootstrapped regression	71 insurance companies	Labour cost, non labour cost and equity capital	Invested assets, losses incurred, reinsurance reserves and own reserves.
Yang, 2005	Comprehensive two stage DEA model	Canadian Life & health insurance companies	Labour expenses, general operating expenses, capital equity, claims incurred	Net premium written, net income
Bawa and Ruchita, 2011	Data Envelopment Analysis and Stochastic Frontier	10 general insurance companies in India, 2002-03 to 2009-10	Equity capital and labour(including commission, agents' fees, referral and other expenditure)	Net premium
Varabyova and Schreyögg,2013	Non parametric Data Envelopment Analysis and parametric stochastic frontier analysis	Hospital sector of OECD countries, 2000-2009	Beds, income inequality,market influences, hospital employment, length of stay, health status	Discharges, mortality
Nandi, 2014	Output oriented DEA	13 Life insurance companies in India	Commission paid, operating expenses	Premium Income & net benefit
Chakraborty, 2016	Non parametric Data Envelopment Analysis	18 Life Insurance companies in India, 2008-09 to 2014-15	Commission paid, operating expenses	Premium Income & net benefit

Sources: Authors' summarization

Objective of the Study

The objective of this study is to analyze the relative performance efficiency of selected (18 Nos.) health insurance companies operating in India.

Research Methodology

In this section, the detail about the approach adopted is given.

- **Sample Selection**

This study is done on eighteen (18) health insurers in India, comprising of four (4) from public sector, eleven from the private sector and the remaining three covering insurers dealing exclusively in health insurance business. Under this scope of study the companies are National Insurance Corporation (NATIONAL), New India Assurance Company (NEW INDIA), Oriental Insurance Company (ORIENTAL), United India Insurance Corporation (UNITED), Apollo Munich Health Insurance Company Limited (APOLLO), Star Health and Allied insurance company Limited (STAR), MAX Bupa Health Insurance Company Limited (MAX), Future General India Insurance company Limited (FUTURE), Bajaj Allianz general Insurance Company limited (BAJAJ), ICICI Lombard General Insurance Company Limited (ICICI), Iffco Tokyo General Insurance Company Limited (IFFCO), Reliance General Insurance Company Limited (RELIANCE), TATA AIG General Insurance Company Limited (TATA), HDFC ERGO General Insurance Company Limited (HDFC), Bharati AXA General Insurance Company Limited (BHARATI), Universal Sompo General Insurance Company Limited (UNIVERSAL), Royal Sundaram Alliance Insurance Company Limited (ROYAL), Cholamandalam MS General Insurance Company Limited (CHOLAMANDALAM). The above these are called Decision Making Unit (DMU). The basic reason behind the selection of these DMUs is availability of data for maximum period.

- **Nature of the Data Requirement and Sources of Data**

The major part of this study is based on secondary data collected from various sources which include IRDA annual reports from the year 2008-09 to 2018-19.

- **Study Period**

This study is carried out for the period from 2008-09 to 2018-19. The basic reason behind the selection of base year as 2008-09 lies in the fact that, maximum number of health insurance companies operating in India and also covering all sectors.

- **Tools and Techniques of Analysis**

For the purpose of the study, Data Envelopment Analysis (DEA) technique has been used. In DEA study, efficiency of a DMU is calculated relative to the group's observed best practice. The standard DEA model has both input and output orientation. Two basic DEA models are – Charnes-Cooper-Rhodes (CCR) model for constant return to scale (CRS) and Banker-Charnes-Cooper (BCC) model for variable return to scale (VRS). These two models have been applied to estimate the relative efficiency of the selected health insurance companies in India. Scale efficiency (SE) is calculated as below: Scale Efficiency = TE obtained from CRS/ TE obtained from VRS

DEA model allows us to determine how a productive unit should change its behavior to become efficient and rise to the efficiency curve. Basically data envelopment analysis can be classified into input and output oriented. Input oriented model minimize the inputs for a desire level of output to be achieved and output oriented model maximizes the outputs, minimize the inputs and thus maximize the efficiency. In this study output oriented model has been used. In this study, inputs are share capital and commission expenses and the outputs are net earned premium and income from investments. To determine the DEA result in this study DEA software has been used.

- **Variables of the Study**

In our study we have chosen claims incurred (net) and operating expenses as input variables and net premium income (earned) and income from investments as output variables based on the both production and investment approach. Also based on the two criteria i.e. relevance and availability, we have selected both the input and output variables for efficiency analysis.

Analysis and Findings

Table 3: Descriptive Statistics of Input and Output Variables

DMU	Input		Output	
	Claims Incurred (Net)	Operating Expenses	Net Premium Income (Earned)	Income from Investments
NATIONAL	28.5129	20.4672	25.5464	4.6776
NEW INDIA	37.1731	22.0452	35.7990	12.0858
ORIENTAL	22.9336	16.2857	20.2496	4.0535
UNITED	31.8156	18.5388	27.2071	5.8145
APOLLO	3.9334	2.3046	6.3600	0.1592

STAR	8.8286	4.0861	13.2579	0.2242
MAX	1.4398	1.6961	2.6482	0.1214
FUTURE	1.1019	2.7937	1.3303	0.3391
BAJAJ	5.6715	9.0856	7.2425	1.4712
ICICI	9.5268	12.0519	11.3108	2.2867
IFFCO	3.0884	4.7962	3.1300	0.6789
RELIANCE	3.9978	5.7057	3.9927	0.8029
TATA	1.7057	5.3444	2.5405	0.7295
HDFC	2.7303	4.2410	4.3606	0.6326
BHARATI	0.9599	3.2459	1.0797	0.1096
UNIVERSAL	0.6679	1.4428	0.6920	0.2268
ROYAL	1.0929	3.7133	1.9621	0.4551
CHOLAMANDALAM	1.1188	4.3547	2.0973	0.3535
Mean	9.2388	7.8999	9.4893	1.9568
Median	3.5109	4.5754	4.1766	0.6557
Standard Deviation	12.0194	6.8531	10.6554	3.0611
Kurtosis	0.7130	-0.2151	0.8567	6.7949
Skewness	1.4663	1.1279	1.3847	2.4864
Range	36.5053	20.6024	35.1070	11.9762
Minimum	0.6679	1.4428	0.6920	0.1096
Maximum	37.1731	22.0452	35.7990	12.0858

Note: Amount in Billion
Source: Calculated by researcher

From the Table 3 we see that mean of the variables claims incurred (net), operating expenses, net premium income (earned) and income from investments are 9.2388, 7.8999, 9.4893 and 1.9568 respectively. That means all the data is distributed centrally. Median of the above mentioned variables are 3.5109, 4.5754, 4.1766 and 0.6557 respectively. It is observed that, both mean and median of the variables are not same. So the data is asymmetric. From the table also it has been shown that mean of all the variables is greater that median of all the variables. That means the data appear to be skewed to the right. In our analysis standard deviation of the variables claims incurred (net), operating expenses, net premium income (earned) and income from investments are 12.0194, 6.8531, 10.6554 and 3.0611 respectively. Most of the observations of the variables are spread within 1 standard deviation of each side of the mean.

Table 4: Pearson Correlation among Input and Output Variables

Variables	Claims Incurred(Net)	Operating Expenses	Net Premium Income(Earned)	Income from Investments
Claims Incurred(Net)	1			
Operating Expenses	0.9576	1		
Net Premium Income(Earned)	0.9899	0.9399	1	
Income from Investments	0.9239	0.8957	0.9222	1

Source: Calculated by researcher

According to Jenkins and Anderson, 2003 in the Pearson correlation test if the co-efficient of correlation of the variables is above 0.6 that means there is no need of variable elimination. But if the co-efficient of correlation of the variables is below 0.6 that means the variables can be changed as per the specification to reflect the true efficiency. From the Pearson correlation test it has been shown that, there is a positive correlation among all the variables.

Table 5: Efficiency Scores under CCR and BCC Model

DMU	Technical Efficiency Score(CRS)	Pure Technical Efficiency Score(VRS)	Scale Efficiency Score	RTS
NATIONAL	0.715297	0.851575	0.839969	Decreasing
NEW INDIA	1	1	1	Constant
ORIENTAL	0.726183	0.774859	0.937181	Increasing
UNITED	0.750092	0.828812	0.905021	Increasing
APOLLO	1	1	1	Constant
STAR	1	1	1	Constant

MAX	1	1	1	Constant
FUTURE	0.790331	0.853565	0.925918	Increasing
BAJAJ	0.884572	1	0.884572	Decreasing
ICICI	0.871273	0.993358	0.877099	Decreasing
IFFCO	0.725364	0.729075	0.994910	Increasing
RELIANCE	0.71056	0.711365	0.998868	Increasing
TATA	1	1	1	Constant
HDFC	1	1	1	Constant
BHARATI	0.602159	0.825394	0.729541	Decreasing
UNIVERSAL	0.874292	1	0.874292	Decreasing
ROYAL	1	1	1	Constant
CHOLAMANDALAM	1	1	1	Constant

Source: Calculated by researcher

From the above Table 5 it can be easily observed that only NEW INDIA among public sector, APOLLO, STAR, MAX, TATA, HDFC, ROYAL and CHOLAMANDALAM among private sector are quiet consistent in their performance. According to CCR model it can also be observed that among selected four public sectors health insurance companies only NEW INDIA is on the efficiency frontier and has an efficiency score of 1. Among selected fourteen private sectors health insurance companies only APOLLO, STAR, MAX, TATA, HDFC, ROYAL and CHOLAMANDALAM are on the efficiency frontier and have an efficiency score of 1. The APOLLO, STAR and MAX which are the insurance companies deal only in health insurance business. According to BCC model it can be seen that among selected four public sectors health insurance companies only NEW INDIA is on the efficiency frontier and have an efficiency score of 1. Among selected fourteen private sectors health insurance companies only APOLLO, STAR, MAX, TATA, HDFC, BAJAJ, UNIVERSAL, ROYAL and CHOLAMANDALAM are on the efficiency frontier and have an efficiency score of 1. The eight overall health insurance companies are NEW INDIA, APOLLO, STAR, MAX, TATA, HDFC, ROYAL and CHOLAMANDALAM out of selected eighteen companies. Their OTE, PTE and SE are equal i.e. 1. Other selected health insurance companies i.e. NATIONAL, ORIENTAL, UNITED, FUTURE, ICICI, IFFCO, RELIANCE, BHARATI and UNIVERSAL are inefficient due to overall efficiency score is less than 1. Among them ORIENTAL, UNITED, FUTURE, IFFCO and RELIANCE health insurance companies present increasing returns to scale that can increase the scales to effectively improve the efficiency. The NATIONAL, BAJAJ, ICICI, BHARATI and UNIVERSAL health insurance companies present decreasing returns to scale. Among them only BAJAJ and UNIVERSAL have pure technical efficiency score of 1. But technical efficiency score and scale efficiency score are of less than 1. A health insurance company may be scale inefficient if it is not taking the full advantage of increasing returns to scale.

Table 6: Showing Year wise Overall Technical Efficiency (OTE), Pure Technical Efficiency (PTE), and Scale Efficiency (SE) Scores of Health Insurers

DMU	2008-09			2009-10			2010-11		
	OTE	PTE	SE	OTE	PTE	SE	OTE	PTE	SE
NATIONAL	0.704	0.843	0.835	0.789	0.938	0.841	0.802	0.949	0.845
NEW INDIA	0.917	1.000	0.917	1.000	1.000	1.000	1.000	1.000	1.000
ORIENTAL	0.604	0.730	0.827	0.725	0.807	0.898	0.824	0.951	0.866
UNITED	0.695	0.851	0.816	0.976	0.982	0.994	0.865	0.884	0.978
APOLLO	0.498	0.510	0.976	0.801	0.850	0.942	1.000	1.000	1.000
STAR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
MAX	NA	NA	NA	1.000	1.000	1.000	1.000	1.000	1.000
FUTURE	0.402	0.417	0.963	0.582	0.626	0.929	0.700	0.777	0.900
BAJAJ	0.713	0.956	0.746	0.887	1.000	0.887	0.891	1.000	0.891
ICICI	0.893	1.000	0.893	0.979	1.000	0.979	0.894	1.000	0.894
IFFCO	0.580	0.602	0.963	0.645	0.646	0.999	0.634	0.660	0.961
RELIANCE	0.688	0.852	0.807	0.615	0.666	0.925	0.577	0.618	0.935
TATA	0.933	1.000	0.933	1.000	1.000	1.000	1.000	1.000	1.000
HDFC	0.572	0.573	0.999	0.660	0.662	0.996	0.895	0.898	0.997
BHARATI	0.504	1.000	0.504	0.479	0.479	1.000	0.701	0.702	0.998
UNIVERSAL	1.000	1.000	1.000	1.000	1.000	1.000	0.715	1.000	0.715
ROYAL	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
CHOLAMANDALAM	0.544	0.548	0.994	0.547	0.559	0.979	0.832	0.858	0.970

DMU	2011-12			2012-13			2013-14		
	OTE	PTE	SE	OTE	PTE	SE	OTE	PTE	SE
NATIONAL	0.723	0.911	0.794	0.732	0.951	0.770	0.738	0.927	0.796
NEW INDIA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
ORIENTAL	0.809	0.897	0.903	0.811	0.914	0.888	0.740	0.808	0.917
UNITED	0.976	1.000	0.976	0.857	1.000	0.857	0.766	0.836	0.916
APOLLO	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
STAR	1.000	1.000	1.000	0.923	1.000	0.923	0.961	1.000	0.961
MAX	0.904	1.000	0.904	0.924	1.000	0.924	1.000	1.000	1.000
FUTURE	0.749	0.801	0.936	0.823	0.854	0.964	0.838	0.914	0.917
BAJAJ	0.905	1.000	0.905	0.798	0.961	0.831	0.791	0.893	0.886
ICICI	0.787	1.000	0.787	0.747	1.000	0.747	0.725	0.915	0.792
IFFCO	0.770	0.786	0.980	0.619	0.670	0.924	0.790	0.817	0.968
RELIANCE	0.865	0.871	0.992	0.883	0.886	0.996	0.777	0.781	0.994
TATA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
HDFC	0.950	0.972	0.977	0.969	0.970	0.999	0.786	0.797	0.986
BHARATI	0.634	0.649	0.977	0.602	0.613	0.983	0.665	0.684	0.972
UNIVERSAL	0.702	1.000	0.702	0.968	1.000	0.968	0.702	1.000	0.702
ROYAL	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
CHOLAMANDALAM	0.780	0.790	0.987	0.843	0.844	1.000	0.931	0.954	0.976

DMU	2014-15			2015-16			2016-17		
	OTE	PTE	SE	OTE	PTE	SE	OTE	PTE	SE
NATIONAL	0.684	0.903	0.758	0.813	0.998	0.815	0.682	0.782	0.873
NEW INDIA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
ORIENTAL	0.699	0.792	0.882	0.712	0.841	0.846	0.631	0.782	0.807
UNITED	0.717	0.853	0.840	0.797	0.916	0.870	0.605	0.900	0.672
APOLLO	1.000	1.000	1.000	0.891	0.899	0.992	1.000	1.000	1.000
STAR	0.970	1.000	0.970	1.000	1.000	1.000	0.858	1.000	0.858
MAX	1.000	1.000	1.000	0.870	0.915	0.950	1.000	1.000	1.000
FUTURE	1.000	1.000	1.000	1.000	1.000	1.000	0.682	0.723	0.943
BAJAJ	0.916	0.981	0.934	1.000	1.000	1.000	1.000	1.000	1.000
ICICI	0.719	0.879	0.819	0.804	0.957	0.840	0.809	0.930	0.870
IFFCO	0.637	0.664	0.960	0.595	0.609	0.977	0.854	0.860	0.992
RELIANCE	0.686	0.700	0.981	0.768	0.776	0.991	0.743	0.747	0.994
TATA	0.947	0.950	0.996	1.000	1.000	1.000	1.000	1.000	1.000
HDFC	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
BHARATI	0.553	0.563	0.982	0.522	1.000	0.522	0.529	1.000	0.529
UNIVERSAL	0.703	1.000	0.703	0.779	1.000	0.779	0.904	1.000	0.904
ROYAL	1.000	1.000	1.000	0.982	1.000	0.982	0.845	0.873	0.968
CHOLAMANDALAM	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

DMU	2017-18			2018-19		
	OTE	PTE	SE	OTE	PTE	SE
NATIONAL	0.705	0.814	0.867	0.607	0.758	0.801
NEW INDIA	1.000	1.000	1.000	1.000	1.000	1.000
ORIENTAL	0.560	0.803	0.698	0.752	0.800	0.940
UNITED	0.786	0.894	0.879	0.614	0.833	0.737
APOLLO	1.000	1.000	1.000	0.998	1.000	0.998
STAR	0.968	1.000	0.968	1.000	1.000	1.000
MAX	1.000	1.000	1.000	1.000	1.000	1.000
FUTURE	0.620	0.684	0.906	0.698	0.732	0.953
BAJAJ	0.734	0.806	0.911	0.789	0.824	0.958
ICICI	1.000	1.000	1.000	0.972	1.000	0.972
IFFCO	0.761	0.820	0.928	0.776	0.813	0.954
RELIANCE	0.519	0.563	0.922	0.662	0.686	0.964
TATA	0.948	0.975	0.973	0.722	0.824	0.876
HDFC	1.000	1.000	1.000	0.938	1.000	0.938
BHARATI	0.820	1.000	0.820	0.599	0.603	0.993
UNIVERSAL	0.620	1.000	0.620	0.659	1.000	0.659
ROYAL	0.922	1.000	0.922	1.000	1.000	1.000
CHOLAMANDALAM	1.000	1.000	1.000	1.000	1.000	1.000

From the above Table 6 it has been found that among public health insurance companies only NEW INDIA has overall technical efficiency (OTE), pure technical efficiency (PTE) and scale efficiency (SE) score is equal to 1 for all the study period except the year 2008-09. That means NEW INDIA is efficient. But other i.e NATIONAL, UNITED AND ORIENTAL Aare inefficient as score is less than 1. Among private health insurance companies (dealing exclusively health insurance business), STAR is efficient during the year 2008-09, 2009-10, 2010-11, 2011-12, 2015-16 and 2018-19 as both OTE, PTE and SE is 1. APOLLO is efficient during the year 2010-11, 2011-12, 2012-13, 2013-14, 2014-15, 2016-17 and 2017-18. MAX is efficient during the year 2009-10, 2010-11, 2013-14, 2014-15, 2016-17, 2017-18 and 2018-19. Among private remaining health insurance companies, TATA is efficient during the year 2009-10, 2010-11, 2011-12, 2012-13, 2013-14, 2015-16 and 2016-17. UNIVERSAL is efficient during the year only 2008-09 and 2009-10. ROYAL is efficient during the year 2008-09, 2009-10, 2010-11, 2011-12, 2012-13, 2013-14, 2014-15 and 2018-19 as both OTE, PTE and SE are equal to 1. Remaining private companies are inefficient as their both OTE, PTE and SE score are less than 1 for all the study periods.

Conclusion

It is observed that, the average overall technical efficiency, average pure technical efficiency and average scale efficiency of selected insurance companies carrying health insurance business are 82.921%, 89.436% and 86.845% respectively. On the other hand sector wise performance analysis indicated that, average overall technical efficiency, average pure technical efficiency and average scale efficiency of selected public health insurance companies are 80.494%, 90.560% and 88.452% respectively which is more than 1.445%(PTE) and 2.066%(SE) of selected private health insurance companies. This can indicate that four public health insurance companies are operating on increasing return to scale taking the more advantage of pure technical efficiency and scale efficiency than others insurers. In case of private health insurance companies who are dealing exclusively health insurance business, average overall technical efficiency, average pure technical efficiency and average scale efficiency are 92.621%, 94.469% and 95.044% respectively which is also more than 11.463%(OTE), 6.814%(PTE) and 11.019%(SE) of selected others private health insurers. This can indicate that, three private health insurers who are dealing exclusively health insurance business are also operating increasing return to scale. Both private and public health insurers are mature and started operating on decreasing return to scale. Competition in health insurance market gradually increased and one position taken over by another. Still private health insurers are lagging behind the public health insurers. It is experienced that, by carrying more claims incurred (net) and efficient handling of operating expenses and on the other hand by improving more net premium income (earned) and income from investment, less efficient company can be achieved the optimum performance level. At the and it may be said that, those insurance companies who are having increasing return to scale and who are efficient can expand their business to reach at optimum level of output by providing quality of services, using modern technology and utilizing more input resources. Further studies are required to identify approaches for each health insurance company to increase income from investments and premium income by moving towards the efficient frontier.

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