An Empirical Study of Revenue Efficiency in Nepalese Life Insurance Companies

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Abstract: The paper examines the revenue efficiency of Nepalese life insurance companies based on their periods of operation. Secondary data have been used in order to observe the revenue efficiency of companies during five-year period from 2009 to 2013. Major indicators used in the study are Commission paid to Agents, Operating Expense, Death Claim Expense, and Total Assets as input variables and Gross Premium as output variable. The study concludes that companies having longer years of business operation have better efficiency in terms of GPAC and GPOE ratios while companies with shorter period of business operation have better efficiency in terms of GPCE and GPTA ratios. The inferential test shows that there is significant difference on revenue and GPOE ratios between shorter and longer period of operation among the life insurance companies. But the difference is not significant on GPAC ratio, GPCE and GPTA ratios in between shorter and longer period of operation among the life insurance companies.

I. INTRODUCTION

Efficiency is an ability of firm producing desired goods or services with minimum resources, expenses and wastage. Efficiency is assumed to be improved when more outputs of a given quality are produced with the same or fewer amount of inputs (resources), or when the same amount of output is produced with fewer amount of inputs. Efficiency indicates how well an organization uses its resources to produce goods and services. Thus, it focuses on resources (inputs), goods and services (outputs), and the rate (productivity) at which inputs are used to produce or deliver the outputs. Inputs are resources (e.g., human, financial, equipment, material, facilities, information, energy, land, etc.) used to produce outputs (OAGC, 2007). According to Jorgenson (1987) efficiency is ratio of output divided by input. Productivity is the ratio between amount of acceptable goods and services produced (outputs) to amount of resources (inputs) used to produce them. Productivity is expressed in monetary

term, in quantity or in percentage. Outputs are goods and services produced to meet client's needs. Quantity refers to amount, volume, or number of outputs produced. Quality refers to various attributes and characteristics of outputs such as reliability, accuracy, timeliness, service courtesy, safety, comfort, etc. According to Jarraya and Bouri (2012), Koopmans proposed a measure of efficiency concept and Debreu empirically evaluated it in 1951. Jorgenson et. al (1987)also suggests the input output ratio in order to obtain the operational efficiency.

Revenue efficiency shows the ability of a firm to generate revenue with minimum expenses. It shows how effectively a firm can maximise its income using minimum resources. The present study measures the revenue (or gross premium) efficiency and correlates it with the agents' commission expense, operating expense, and death claims expenses which measure revenue efficiency in short-term perspective. For the longterm perspective, the revenue efficiency has been measured in terms of total assets of the company (Cummins, Weiss, Xie, and Zi, 2010). Gross premium is the output of business operation whereas other four variables (agents' commission expense, operating expense, death claims expenses, and assets of the company) are inputs for achieving the organisational goal.

The income of life insurance companies includes gross premium, return on investment, and commission income from reinsurance, penalty, and other direct income. But, this study has considered only gross premium income of the companies and excluded the other sources of the income while calculating the revenue efficiency as gross income occupies 76 percent of total revenue in Nepalese life insurance companies.

The objectives of this paper is to examine the revenue efficiency of life insurance companies and compare the efficiency between the firms having longer and shorter period of operation. Remaining part of the paper has been divided in four sections. Second section reviews the relevant literature, third section presents the methodology and fourth section discusses the results and the final section presents the findings of the study.

II. REVIEW OF LITERATURE

Different scholars have defined efficiency in different ways. Farrell (1957) states that efficiency of a firm consists of two components: technical efficiency and allocative efficiency. Technical efficiency reflects the ability of a firm to obtain the maximal output from a given set of input or ability of obtaining a fixed level of output using minimal input. Allocative efficiency reflects the ability of a firm to use input in optimal proportions given their respective prices. Technical and allocative efficiency combined together measures the economic efficiency. Kazemi (2007) defines efficiency as a ratio of expected result to real result. It is also defined as a ratio of real yield to anticipated yield. Similarly, it is the ratio between works done to work that should be done.

There has been considerable interest of scholars on efficiency of international insurance markets. Rai (1996) examined the cost efficiency of insurance firms located in 11 countries over 1988-1992 and found that X-inefficiencies (Harvey, 1996) not only vary by country but by size and specialization¹. Firms in Finland and France had the lowest X-inefficiency, while firms in the United Kingdom had the highest. On average, small firms were more cost efficient than large firms. Similarly, specialized firms were more cost efficient than diversified firms2.

Cummins and Zi (1996) analysed the efficiency of insurance companies with 445 U.S. life insurance companies for a period of five years (1988-1992) using two different methodologies: Data Envelopment Analysis (DEA) and Free Disposal Hull (FDH) mathematical programming. The study found different results on the same sample while applying the different methodologies. They advised to use more than one methodology when analyzing the efficiency to ensure that the findings are not being driven by specification errors.

Bernier and Sedzro (2002) examined the efficiency of 69 Canadian insurance companies for the period of five years (1996-1999) and found that the efficiency scores in the industry varied significantly by insurers' size, i.e. larger firms were more efficient than smaller firms. The size had a significant impact on cost efficiency while size did not matter on revenue efficiency. The study suggested that many insurers seem to have a hard time choosing the cost-minimizing combination of inputs.

Jametti and Sternberg (2003) compared the cost efficiency between the private and public firms that offered casualty property insurance in Switzerland covering 18 years data (1981-1998) of companies based on claim to premium ratio. The study showed that the public insurance companies are about 20 percent more cost efficient than their private counterparts.

Greene and Segal (2004) explored the relationship between cost inefficiency and profitability in the U.S. life insurance industry using the Stochastic Frontier (SF) method. The study found that cost inefficiency in the life insurance industry is substantial relative to earnings; inefficiency is negatively associated with profitability (return on equity); and stock (shareholder-owned) companies are as efficient and profitable as mutual (policyholder-owned) companies.

According to Eling and Luhnen (2009), there was steady efficiency growth in international insurance markets during 2002-2006 with large efficiency differences between the 36 countries. They found highest efficiency for Denmark and Japan, the lowest for the Philippines; the stock companies were more efficient than mutual companies; larger companies were more efficient than smaller companies. There was minor difference between distribution types (agency-based vs. direct writers) and very little evidence for economies of scope (i.e., multi-line insurers vs. mono-line insurers). They also reported that there is not much difference between the two frontier efficiency methodologies: data envelopment analysis and stochastic frontier analysis. Eling and

^{1.} X-inefficiency is the difference between efficient behavior of businesses assumed or implied by economic theory and their observed behavior in practice. It occurs when technical-efficiency is not being achieved due to a lack of competitive pressure. The concept of x-inefficiency was introduced by Harvey Leibenstein.

^{2.} Specialised firm operates only one type of product (either life or nonlife) while diversified firms operates both life and nonlife business

Huang (2011) examined the efficiency of non-life insurance companies in fastest-growing markets of four emerging BRIC countries (Brazil, Russia, India, China) during the period of 2000-2008 using frontier efficiency analysis method. They found Brazil the most efficient followed by Russia, China, and India.

Saad and Idris (2011) analyzed the performance of the insurance companies in Malaysia and Brunei. This study measured the efficiency of life insurance companies in Brunei and Malaysia for the year 2000-2005 using the Data Envelopment Analysis. The finding indicates that the bigger the size of the companies, the higher the probability for the companies to be more efficient in utilizing their inputs to generate more outputs. Due to the positive impact of both efficiency and technical changes, the overall total productivity change for these firms during the period of study had been found higher than one.

Ismail, Alhabshi, and Bacha (2011) argued that takaful life insurance company has lower technical efficiency than conventional insurance. They further explored that organizational structure influences the efficiency and conventional insurers have higher scale efficiency than takaful company.

Mathur and Paul (2014) examined the efficiency of 20 nonlife insurance companies in India based on one year's (FY 2012/13) data. The study found that only seven companies were completely efficient in terms of technical efficiency scores. The study showed that seven insurers were employing their inputs effectively and judiciously in producing the existing level of output while 13 insurers were reported as inefficient as they were operating below the efficient frontier. The study further highlighted the issue of inappropriate management and control of the inputs by them.

III. METHODOLOGY

3.1 Nature of Data and Period of the Study

The study uses secondary data and covers a period of five years (2009 to 2013). Data have been obtained from annual reports of sample organisations.

3.2 Sample

Among the nine life insurance companies operating in Nepal, eight companies (National, Nepal, MetLife, LIC, Asian, Surya, Gurans and Prime) are owned by private sector and Rastriya Beema Sansthan is state owned corporation. Rastriya Beema Sansthan has not published audited financial statements for FY 2009-2013 therefore only private sector life insurers have been included in the sample for the study.

3.3 Variables

Four efficiency ratios viz. GPAC, GPOE, GPCE and GPTA have been computed by using the following formula:

| i. | Gross Premium to Agents' Commission (GPAC) ratio (times) = | Cross Premium |
|------|---|--------------------|
| ١. | dioss i territarii to Agents Commission (di Ae) tatio (times) = | Agents' Commission |
| ii. | Gross Premium to Operating Expenses (GPOE) ratio (times) = | Cross Premium |
| 11. | Gloss Fremium to Operating Expenses (GFOE) fatio (times) = | Operating Expenses |
| ::: | Cross Dramium to Claims Evanges (CDCE) ratio (times) - | Cross Premium |
| iii. | Gross Premium to Claims Expenses (GPCE) ratio (times) = | Claims Paid |
| | C | Cross Premium |
| iv. | Gross Premium to Total (GPTA) ratio (times) = | Total Assest |

3.4 Approach of Analysis

Eight companies have been divided in two categories: old group and new group. Companies established prior to 2002 (i.e. National, Nepal, MetLife and LIC) have been included in "Old group" which have longer years of work experience. Similarly, companies established in 2008 (i.e. Asian, Surya, Gurans and Prime) have been included in "New group" which have shorter period of work experience. Five-year average ratio (2009 to 2013) of each company has been calculated and compared within the companies of same group. Each company has given rank value 1 to 4 on the basis of performance. Here, 1 refers as the best performing company and 4 refers as the worst performing company. The performance of the firm has been decided based on five-year average efficiency ratio. Aggregate efficiency score has been obtained by reversing the rank value of each company and summing up of the efficiency score value of four ratios.

3.5 Hypothesis

Following hypothesis has been formulated in order to test the significance of revenue efficiency between the old and new companies.

H0: There is no difference on Gross premium, GPAC ratio, GPOE ratio, GPCE ratio, and GPTA ratio between the old and new companies.

Descriptive tools - mean and ratio, and inferential tool- independent sample t test have been used to analyze the results.

IV. DISCUSSION AND FINDINGS

4.1 Gross Premium of Life Insurance Companies

Gross premium of life insurance companies constitutes first year premium, renewal premium, and single payment premium. The gross premium earned by old and new eight

life insurance companies during five years period, their rank based on five-year average along with the p value of t test have been presented in Table 1:

Table 1: Gross Premium and p Value of t Test

(Rs. in million)

| Name of LICs | 2009 | 2010 | 2011 | 2012 | 2013 | Average | Rank |
|-------------------|----------|----------|----------|----------|----------|---------|------|
| I. Old Companies | | | | | | | |
| National | 809 | 1,440 | 1,607 | 2,182 | 2,273 | 1662 | 3 |
| Nepal | 1,348 | 1,974 | 2,317 | 3,201 | 3,900 | 2548 | 1 |
| LIC | 1,196 | 1,543 | 1,876 | 2,538 | 3,169 | 2064 | 2 |
| MetLife | 1,522 | 1,465 | 1,433 | 1,486 | 1,600 | 1501 | 4 |
| Old Average | 1,219 | 1,606 | 1,808 | 2,352 | 2,735 | 1,944 | |
| II. New Companies | | | | | | | |
| Asian | 465 | 820 | 939 | 1,038 | 1,152 | 883 | 1 |
| Surya | 33 | 77 | 117 | 162 | 215 | 121 | 4 |
| Gurans | 34 | 89 | 197 | 320 | 352 | 198 | 3 |
| Prime | 280 | 429 | 673 | 940 | 1,126 | 690 | 2 |
| New Average | 203 | 354 | 482 | 615 | 711 | 473 | |
| Average | 711 | 980 | 1,145 | 1,483 | 1,723 | 1,208 | |
| p value | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | | |
| H0* | Rejected | Rejected | Rejected | Rejected | Rejected | | |

Source: Annual Reports of respective companies, 2009-2013.

The above table shows that among the old companies Nepal (Rs. 2,548 million) and among the new companies Asian (Rs. 883 million) have earned highest amount of gross premium during the study period. National and Surya have earned lowest amount of gross premium among the old and new companies respectively. The five-year average gross premium of old companies has been found four times higher than that of new companies. The p value of t test shows that there is significant difference on average gross premium of old and new companies during five years (2009-2013). It can be concluded that gross premium income of life insurance depends on their years of operation. Obviously, old companies have larger numbers of endowment policyholders, the management is also more experanced and there agents also have wider networking.

4.2 Gross Premium to Agents' Commission Ratio

Agents' commission is direct expenses of life insurance companies and is based on the gross premium collected by agents. As per the Insurance Regulation 1993, the rate of agents' commission ranges from 5 percent to 25 percent for one year to up to 10 years. The gross premium to Agents' commission (GPAC) ratio reveals - how much gross premium income is earned by paying a unit commission. Higher GPAC ratio is always desirable to the company. The five-year average GPAC ratio of eight companies along with p value of t test have been presented in Table 2.

^{*}At 5 percent level of significance

Table 2: Gross Premium to Agents' Commission Ratio and p value of t test (times)

| Name of Company | 2009 | 2010 | 2011 | 2012 | 2013 | Average | Rank |
|-------------------|----------|----------|----------|----------|----------|---------|------|
| I. Old Companies | | | | | | | |
| National | 11.4 | 12.9 | 10.0 | 10.3 | 10.9 | 11.1 | 2 |
| Nepal | 7.6 | 7.6 | 8.3 | 9.3 | 10.0 | 8.5 | 3 |
| LIC | 8.2 | 7.4 | 8.2 | 7.8 | 8.0 | 7.9 | 4 |
| MetLife | 12.3 | 14.2 | 14.4 | 15.5 | 14.5 | 14.2 | 1 |
| Old Average | 9.4 | 9.4 | 9.4 | 9.6 | 9.9 | 9.6 | |
| II. New Companies | | | | | | | |
| Asian | 5.7 | 5.6 | 5.8 | 8.4 | 7.9 | 6.7 | 2 |
| Surya | 4.8 | 4.7 | 5.6 | 6.6 | 8.6 | 6.1 | 3 |
| Gurans | 5.4 | 5.1 | 5.1 | 5.5 | 6.5 | 5.5 | 4 |
| Prime | 9.3 | 8.2 | 7.2 | 7.7 | 9.7 | 8.4 | 1 |
| New Average | 5.2 | 6.5 | 6.0 | 6.1 | 7.5 | 8.3 | |
| All Average | 8.9 | 8.6 | 8.5 | 9.1 | 9.5 | 8.9 | |
| p value | 0.06 | 0.05 | 0.03 | 0.09 | 0.13 | | |
| H0* | Accepted | Accepted | Rejected | Accepted | Accepted | | |

Source: Annual Reports of respective companies, 2009-2013.

Table 2 shows that MetLife and Prime have highest, LIC and Gurans have lowest averaged GPAC ratio among the old and new companies respectively. The industry average GPCA ratio 8.9 times means that companies had earned Rs. 8.9 gross premium paying Re. 1 agent's commission during 2009-2013. It has been found that the ratio of old group's average is 1.4 times higher than new group's average but p value of t test shows that for all years except 2011, the average GPAC ratios of old and new companies are not significantly different as the p values for the years FY 2009, 2010, 2012 and 2013 are more than 5 percent.

The amount of agent's commission depends on various factors because commission amount of endowment plan is higher than term plan, longer term plans need to pay more commission than shorter plan, first and second years' commission is higher than third year and thereafter. Profit participating plan has more commission over the nonparticipating plan. The GPAC ratio of MetLife has been found highest because its policy retention ratio is highest (86%) and share of term policy also highest (38%) while LIC has lowest GPAC ratio because its policy retention ratio is lowest (78.7%) and share of term policy also lowest (3%) among the old companies. Prime has highest policy retention ratio (71.6%) and share of term policies also highest (63%) while Surya has lowest policy retention ratio (53%) and lowest share of term policies (3%) among the new companies. The discussion leads us to conclude that LIC and Gurans should increase the sales of term plans and pay proper attention in order to retain the existing policies so that their GPAC ratio will be increased in future. Companies should balance between the endowment and term plans portfolios to minimise the agents' commission and maximise

^{*}At 5 percent level of significance

the profitability of the company.

4.3 Gross Premium to Operating Expenses Ratio

The operating expense includes management expenses but excludes death and maturity claims expenses. The gross premium to operating expenses (GPOE) ratio reveals how efficiently management controls operating expenses to earn given level of gross premium. In other words, GPOE ratio articulates that how much gross premium is generated by spending per unit of operating expense. The five years' average ratio of eight companies, p value of t test along with the rank of each company has shown in following table.

Table 3: Gross Premium to Operating Expenses Ratio and p value of t test (times)

| Name of LICs | 2009 | 2010 | 2011 | 2012 | 2013 | Average | Rank |
|-------------------|----------|----------|----------|----------|----------|---------|------|
| I. Old Companies | | | | | | | |
| National | 6.2 | 6.2 | 3.5 | 3.8 | 5.7 | 5.1 | 3 |
| Nepal | 4.4 | 3.9 | 3.9 | 4.1 | 12.4 | 5.7 | 2 |
| LIC | 4.7 | 4.3 | 4.6 | 4.4 | 5.1 | 4.6 | 4 |
| MetLife | 6.4 | 7.1 | 6.9 | 7.1 | 7.0 | 6.9 | 1 |
| Old Average | 5.3 | 4.9 | 4.3 | 4.4 | 7.0 | 5.2 | |
| II. New Companies | | | | | | | |
| Asian | 2.9 | 2.6 | 2.8 | 3.0 | 4.5 | 3.2 | 1 |
| Surya | 2.0 | 2.0 | 2.1 | 2.3 | 3.0 | 2.3 | 3 |
| Gurans | 2.1 | 2.1 | 2.1 | 2.1 | 2.8 | 2.2 | 4 |
| Prime | 3.7 | 2.3 | 1.8 | 2.4 | 3.5 | 2.8 | 2 |
| New Average | 3.0 | 2.5 | 2.3 | 2.6 | 3.7 | 2.8 | |
| Average | 4.1 | 3.7 | 3.3 | 3.5 | 5.3 | 4.0 | |
| p value | 0.01 | 0.01 | 0.02 | 0.02 | 0.06 | | |
| H0* | Rejected | Rejected | Rejected | Rejected | Accepted | | |

Source: Annual Reports of respective companies, 2009-2013.

Table 3 exhibits that GPOE ratio is highest for MetLife (6.9) and Asian (3.2), and is lowest for LIC (4.6) and Gurans (2.2)in their respective groups. During five years period, industry earned 4 times gross premium spending a unit of operating expenses. The GPOE ratio of old and new companies have been found 5.2 times and 2.8 times respectively. The GPOE ratios between the old and new firms have been found significantly different every year except in 2013 according to the p value of t test. The increasing trend of the ratios indicates that the efficiency of companies have gradually increased over the period. It has been suggested that all new companies including LIC should either control the operating expenses or increase the gross premium income sharply in coming years. They should avoid poor operating efficiency by adopting efficient sales strategies.

^{*}At 5 percent level of significance

4.4 Gross Premium to Claim Expense Ratio

There are different types of claim expenses; among them only death claim expense has been included in GPCE ratio (Horton and Macve, 1996). The death claim is inevitable in life insurance business but excessively higher death claim is not good for the financial health of the company. The gross premium to claim expense (GPCE) ratio measures how efficiently underwriting department sold life insurance policy. Higher GPCE ratio indicates that company is following standard underwriting policies and vice versa. Following table exhibits the five years (2009-2013) average GPCE ratio of eight companies along with p value of t test between the old and new companies.

Table 4: Gross Premium to Claim Expense Ratio and p value of t test (times)

| | Name of LICs | 2009 | 2010 | 2011 | 2012 | 2013 | Average | Rank |
|-----|----------------------|----------|----------|----------|----------|----------|---------|------|
| I. | Old Companies | | | | | | | |
| 1 | National | 38.2 | 32.1 | 19.1 | 11.5 | 9.4 | 22.1 | 4 |
| 2 | Nepal | 64.2 | 51.2 | 34.8 | 31.4 | 21.4 | 40.6 | 2 |
| 3 | LIC | 51.6 | 56.8 | 54.7 | 57.2 | 55.1 | 55.1 | 1 |
| 4 | MetLife | 34.2 | 35.6 | 29.0 | 37.6 | 35.6 | 34.4 | 3 |
| | Old Average | 44.4 | 42.3 | 30.8 | 25.1 | 20.7 | 32.7 | |
| II. | New Companies | | | | | | | |
| 5 | Asian | 35.3 | 16.6 | 15.2 | 23.4 | 41.6 | 26.4 | 3 |
| 6 | Surya | 54.2 | 154.5 | 101.6 | 97.0 | 97.8 | 101.0 | 1 |
| 7 | Gurans | 61.2 | 29.5 | 42.9 | 115.7 | 34.1 | 56.7 | 2 |
| 8 | Prime | 11.6 | 8.4 | 8.6 | 10.0 | 9.5 | 9.6 | 4 |
| | New Average | 21.1 | 13.6 | 13.2 | 17.3 | 17.9 | 16.6 | |
| | Average | 38.3 | 30.6 | 24.1 | 22.9 | 20.1 | 27.2 | |
| | P value | 0.64 | 0.82 | 0.74 | 0.37 | 0.49 | | |
| | H0* | Accepted | Accepted | Accepted | Accepted | Accepted | | |

Source: Annual Reports of respective companies, 2009-2013.

Among the old companies, LIC has highest (55.1) and National has lowest (22.1) GPCE ratio. Likewise, the GPCE ratio of Surya has been found highest (101) and Prime has been found lowest (9.6) among the new companies. The average GPCE ratio 27.2 indicates that firms have paid Re. 1 death claims out of Rs. 27.2 gross premium earned during five years period. The fluctuation of average GPCE ratio of new companies is wide during the period which indicates that new companies have suffered more from the claim expenses. Since old companies have enforced more number of life insurance policies than new companies, it is usual to pay higher amount of claim by old companies than new companies. The p value of t statistics is higher than 5 percent during 2009-2013, it can be said that there is no significant difference on GPCE ratios between old and new companies. It has been suggested that National, Asian and Prime should review their existing underwriting policy and minimise the death claim and increase the GPCE ratio in future.

^{*}At 5 percent level of significance

4.5 Gross Premium to Total Assets Ratio

The gross premium to total assets (GPTA) ratio indicates the relationship between the volume of business in terms of gross premium and size of the company. The GPTA ratio of old and new companies, p value of t test and rank based on five-year average has been presented in Table 5:

Table 5: Gross Premium to Total Assets Ratio and Test of Significance

(times)

| Name of LICs | 2009 | 2010 | 2011 | 2012 | 2013 | Average | Rank |
|-------------------|----------|----------|----------|----------|----------|---------|------|
| I. Old Companies | | | | | | | |
| National | 0.20 | 0.27 | 0.26 | 0.28 | 0.25 | 0.25 | 4 |
| Nepal | 0.32 | 0.33 | 0.29 | 0.30 | 0.28 | 0.30 | 1 |
| LIC | 0.32 | 0.30 | 0.27 | 0.27 | 0.25 | 0.28 | 2 |
| MetLife | 0.38 | 0.30 | 0.25 | 0.21 | 0.20 | 0.27 | 3 |
| Old Average | 0.30 | 0.30 | 0.27 | 0.27 | 0.29 | 0.30 | |
| II. New Companies | | | | | | | |
| Asian | 0.93 | 0.83 | 0.52 | 0.37 | 0.29 | 0.59 | 2 |
| Surya | 0.12 | 0.18 | 0.22 | 0.24 | 0.24 | 0.20 | 4 |
| Gurans | 0.12 | 0.26 | 0.34 | 0.39 | 0.32 | 0.29 | 3 |
| Prime | 0.81 | 0.71 | 0.72 | 0.66 | 0.55 | 0.69 | 1 |
| New Average | 0.50 | 0.49 | 0.49 | 0.45 | 0.42 | 0.46 | |
| Average | 0.30 | 0.33 | 0.33 | 0.30 | 0.30 | 0.31 | |
| p value | 0.00 | 0.42 | 0.27 | 0.15 | 0.15 | | |
| H0* | Rejected | Accepted | Accepted | Accepted | Accepted | | |

Source: Annual Reports of respective companies, 2009-2013.

Among the old companies, Nepal has highest (0.30 times) (and National has lowest (0.25 times) and among the new companies, Prime has highest (0.69 times) and Surya (0.20 times) has lowest GPTA ratio. The industry average GPTA ratio 0.31 times reveals that the size of life insurance business is 0.31 times higher than total gross premium written during the study period. The average GPTA ratio of new companies is guite higher (0.46 times) than that of old companies (0.30 times) because the total asset of old companies is almost 7 times higher but gross premium is just 4 times higher than new companies. The reason behind the lower GPTA ratio of old companies is that old companies have already large amount of premium accumulated since 1988 (National) and 2001 (Nepal, MetLife and LIC) but new companies have earned their assets since 2008. The p value of t test suggests that there is significant difference on GPTA ratio between old and new companies for 2009 but no significant difference during 2010 -2013.

4.6 Revenue Efficiency Score

Based on the rank value of revenue efficiency ratios viz.: GPAC, GPOE, GPCE and GPTA, the Revenue Efficiency Score (RES) has been obtained by converting the rank

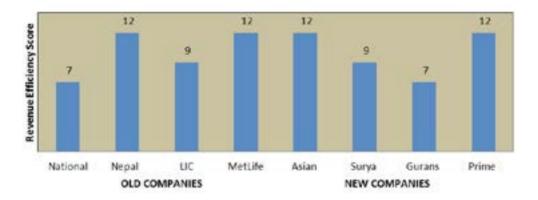
^{*}At 5 percent level of significance

value to rank score. First of all the rank value 1 has been converted into rank score 4. Similarly, rank value 2 converted into rank score 3, rank value 3 converted into rank score 2 and rank value 4 converted into rank score 1. Secondly, the revenue efficiency score has been obtained by summing up the four rank scores. The revenue efficiency scores of eight life insurance companies have been presented in Table 7.

| Types of Company | Name of LICs | GPAC Score | GPOE Score | GPCE Score | GPTA Score | Total Score | Rank |
|---------------------|-----------------|---------------|---------------|---------------|---------------|----------------|------|
| | 1.National | 3 | 2 | 1 | 1 | 7 | 3 |
| Old | 2.Nepal | 2 | 3 | 3 | 4 | 12 | 1 |
| Old | 3. LIC | 1 | 1 | 4 | 3 | 9 | 2 |
| | 4.MetLife | 4 | 4 | 2 | 2 | 12 | 1 |
| | 1.Asian | 3 | 4 | 2 | 3 | 12 | 1 |
| N1 | 2.Surya | 2 | 2 | 4 | 1 | 9 | 3 |
| New | 3.Gurans | 1 | 1 | 3 | 2 | 7 | 2 |
| | 4.Prime | 4 | 3 | 1 | 4 | 12 | 1 |

Table 7: Revenue Efficiency Score

Nepal and MetLife have obtained highest score (12) while National has obtained lowest score (7) among the old companies. Similarly, Asian and Prime have obtained highest score (12) while Surva has obtained lowest score (7) among the new companies. The aggregate revenue efficiency score has been depicted more clearly in Figure 1.



V. CONCLUSION

The paper tries to explore the status of revenue efficiency of Nepalese life insurance companies based on four different revenue efficiency ratios. In aggregate, Nepal and MetLife among the old companies and Asian and Prime among the new companies have shown highest efficiency while National and Surya have shown lowest efficiency among the old and new companies respectively. Among the old companies, National is the oldest firm but the revenue efficiency has been found poorest. It shows that having

more years of experience does not increase the revenue efficiency. The finding is similar to the findings of Bernier and Sedzro (2002).

It is palpable that National Life needs to control the death claims expenses by implementing stringent underwriting policy. It has been suggested that National, LIC, Surya, and Gurans should increase their revenue efficiency. Specially, Gurans has been suggested to control the commission expenses by selling higher number of term plans, retaining the existing enforced policies and minimising the surrender and policy lapse along with control the operating expenses.

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