Life Insurance Expenses – An Economic Analysis[1]

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Introduction

Economists have been studying the life insurance company's expenses rates and premium since long. In the earlier years non-quantitative arguments were used to assert the presence or absence of scale economies. The first study which used quantitative techniques was due to Johnston, J and G.W. Murphey [1957] while studying the "growth of life insurance companies in UK since 1880". A brief outline had also appeared in Johnston's celebrated book on "Statistical cost analysis" [1960]. Around the same time, simple techniques were attempted asserting scale economies in non-life insurance companies. Subsequently, Houston and Simon [1970] studied in detail the economies of scale across a cross section of 237 life insurance companies. A recent study with rigour is due to Segal [2000]. Of late the importance of such studies have been well recognized with the increasing contribution of the services sector in the national economies and economists have started analyzing productivity trends in the services sector and at a disaggregate level for insurance sector. As such studies involve cost function and many researchers are involved in these areas and also using latest techniques like DEA etc.

In all studies of life insurance, the main issue concerns the measurement of output of an insurance company and the input prices. Certain assumptions need to be made while arriving at conceptually acceptable measure. Though the System of National Accounts [SNA 1993] theoretically argued for a measure of output, the implementation of the same depends on the availability of the necessary data at the individual country level. But economists have been using 'Premium' as a surrogate of the output in all cost analysis studies and assumes homogeneity of products. However, one may need to recognize that premium is revenue and not an output in the strict sense. It may be well recognized that life insurance companies sell variety of products with varied prices suiting the needs of their customers. The products of life insurance companies can be broadly classified into life insurance, annuities, health etc. As they are different the costs associated with them are also different. Further, as insurers are allowed freedom in the methodology of allocating costs across the lines of business, different allocation methods adopted by the insurers while presenting the data do not give 'true' costs.

Theoretical background

The total expenses of an insurance company comprises of expenses (costs) associated with selling and issuing new policies (acquisition costs) and the costs of maintaining existing policies (maintenance costs). Over a period of time, the ratio of insurance expenses to maintenance expenses becomes stable. Other factors which have a bearing on expenses like mortality rates, lapse ratios, technology etc. do not change widely or quickly. As such it could be argued at least in economic sense that costs could be explained by the premium it is earning with suitable explanatory variables. The total expenses as a ratio of premium which roughly is average cost (AC) to a company is the dependent variable in such studies. This depends on the product mix, rate of growth, lapse ratio besides many variables. As costs associated with selling individual

policies (ordinary) and group policies differ, besides annuities, health etc., two variables IP/P and GP/P are used to distinguish the products where IP and GP are Individual and group premium earned and P is the total premium. One would expect the former to have positive impacts on AC and negative impacts for the latter.

Life insurance companies which are expanding rapidly are expected to show higher costs due to higher commission payments. To take care of this, a variable NP/P where NP is the new premium is included and it is expected that it will have a positive impact on average costs.

Another important variable is the lapse ratio. If the insurance amount lapsed and surrendered occurs from the new policies, their impact on the average costs is higher as heavy expenses have not yet been earned. It is expected that lapse ratio will have a positive impact on average costs. In the Indian context, since the liberalization process has started very recently and the LIC of India still dominates the life segment, a dummy variable is used to catch the size effect. There are other variables which are relevant for assessing the scale economies of a life insurance companies. As a preliminary investigation into this important aspect, we have taken the above variables. In a subsequent study, other relevant variables are being used.

Data and Methodology
Data for the purpose of this study was obtained from various reports submitted by the companies to IRDA. The data covered 2002 to 2005. The reports *inter alia* provide detailed account of the insurer's costs incurred during the financial year in conducting various lines of business. Expenses are shown separately for each line of business [life insurance, annuity, pension, health etc.]. The reports also give as far as possible the expenses incurred separately for individual and group business. Relevant data are extracted from the reports. Premium income separately for first year and renewal are also available together with the commission paid on the first year premium and renewal premium. The administrative expenses are also given. Collating data from these reports is however fraught with a problem as there has been no uniformity in the submission of data. While some companies reported individual and group business separately for each line of business, others have reported details in the case of individual business whereas no such details are available under the group business. This poses a problem in ascertaining the exact nature of information given under the group business. As such, though it is desirable to consider expenses for each line of business in the analysis data at the aggregate level has been used. The conclusions need to be interpreted with this caveat.

If the number of companies operating are large in each year three years data could have been helpful for panel estimation. Further as the companies have started doing business in India at different points of time, subsequent to the liberalization of the industry in 2000, the panel will be unbalanced. The study could be attempted for each year but the degrees of freedom available will be much similar. In order to avoid this problem the data have been stacked. By stacking we essentially ignore the panel structure of the data and a linear model is estimated. The assumption underlying the linier model would be that the errors are iid's with mean '0' and variables σ^2 for all time periods and for each observation i.e., for a given company observations are serially uncorrelated and across individual companies and time the errors are homoscedastic. We recognize that by assuming such a simplistic model we lose vital information on the company characteristics. However use of the dummy variables and variable to account for growth of a company will in a way circumvent the above problems to some extent as they reflect the characteristics of the companies which essentially the panel data explores.

Three types of size variables are used. (p), ln (p), 1/p

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Based on the statistical criteria equation with 1/p is taken for interpretation. Of the estimated equations, an equation which has proper signs for the independent variables is considered. Though one variable is not significant in the statistical sense, the variable is retained as it has meaningful economic interpretation.
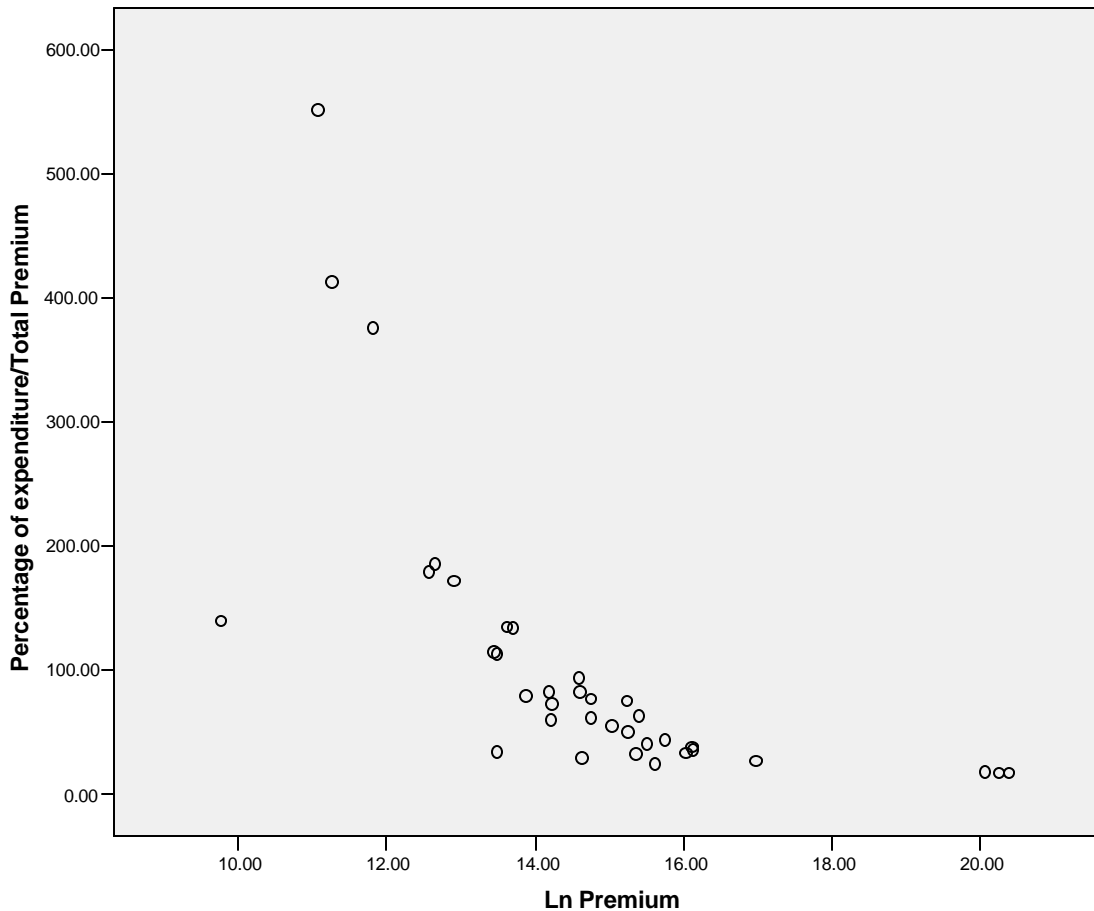
The estimated equation is
AC = 0.476 + 349259.5 (1/P) − 0.355 (D) + 0.107 (I p / P) − 0.784 (Gp/P) + 0.034 (NP ratio)
Std. Errors (0.363) (18478.46) (0.282) (0.149) (0.328) (0.484)

Case Summaries

AC

Premium_group	N	Average cost
<10 crores	3	3.6819
10 - 50 crores	4	2.2799
50 - 100 crores	5	1.0638
100- 250 crores	7	.7165
250 - 500 crores	7	.5940
500-750 crores	3	.3673
750 - 1000 crores	2	.3610
1000-10000 crores	2	.3134
>10000 crores	3	.1776
Total	**36**	**1.0456**

Findings

Two conclusions can be drawn that there is a negative correlation between the expense ratio and the premium earned as depicted from the graph and as the size increased the average cost has been declining (Table 1).

References

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