The Institute of Actuaries of India

Subject CA3 – Communications

22nd May 2007

INDICATIVE SOLUTION

Introduction

The indicative solution has been written by the Examiners with the aim of helping candidates. The solutions given are only indicative. It is realized that there could be other points as valid answers and examiner have given credit for any alternative approach or interpretation which they consider to be reasonable.

Arpan Thanawala
Chairperson, Examination Committee

Indicative Solution & Marking Guide: Question 1

Memo

To: Senior Management Members
From: Actuary
Date: 15 March 2007

De-Tariffication

This memo covers the impact of the imminent de-tariffication. In particular it covers the likely impact of the lifting of price controls on the industry and the subsequent pricing actions available to the Company.

Summary

De-tariffication is likely to lead to the market adopting risk based pricing. Support from one line of business to another will reduce over time. This will lead to premium rates increasing for motor insurance and reducing for fire insurance. Health insurance premium rates will continue to be driven by individual company's experience and pricing philosophy.

The premium rates for each line of business must be set taking into consideration risk based pricing, the profit objective and competition.

Industry impact

There are three lines of business with tariff restrictions applying on two of them as shown in the table below:

Table 1

Line of Business	Tariff
Motor insurance	√
Fire insurance	√
Health insurance	×

Under the tariff business the industry is suffering losses in motor insurance and experiencing significant profits in fire insurance. Since companies are not able to set the price for these two lines of business they are managing the overall profitability by selling a mix of motor and fire insurance.

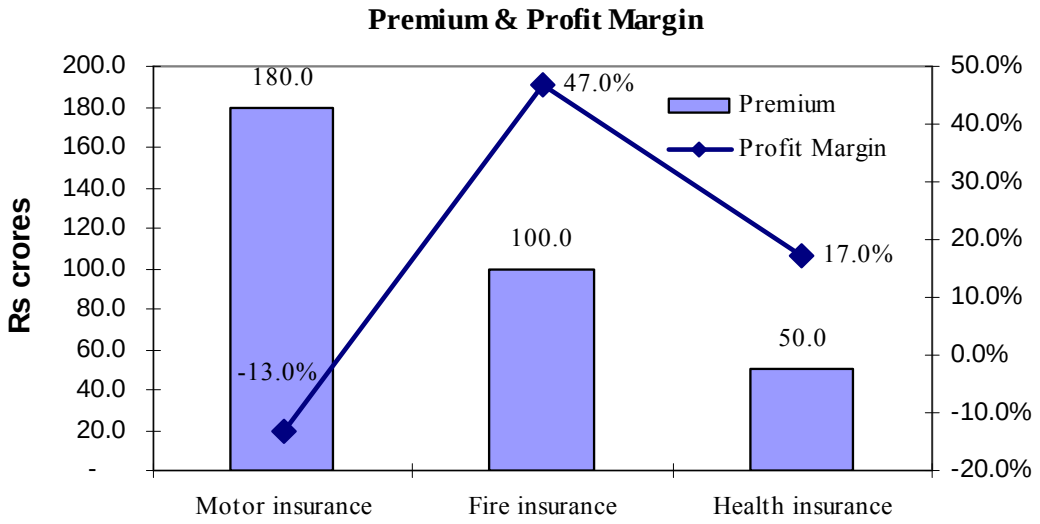
Risk based pricing

"Risk based pricing" refers to the technique by which premium rates are set such that they provide a fair compensation to the insurer for the risk insured. For example, a risk based pricing approach will identify that for motor insurance the claims exceed premiums. Thus the premium rate is inadequate in relation to the risk insured and should be increased such that premiums exceed claims and expenses.

Subsequent to de-tariffication, companies are likely to raise premium rates for motor insurance in order to make the product line profitable. Fire insurance premium rates are likely to come under pressure due to competitive forces and premium rates may go down, although the timing of such reductions is uncertain.

Pricing actions

The financial results for 2006 illustrate that the contribution to premium and profitability varies significantly by line of business, as shown in the graph below:



Motor insurance

Clearly, premium rates for motor insurance must be raised. The extent by which premium rates are increased will need to bear the reaction of other companies after de-tarrification and also our internal profit criterion. Motor insurance contributes over half of the total premium income and therefore any increase will need to consider its possible impact on overall premium income. In as much, however, as the Company's experience is broadly in line with the general experience in the industry, movements in the reprising exercise in the market could be expected to be similarly directed and fine tuning will need to take into account relative market shares in other lines of business notably fine, where premium reductions could be expected to be seen.

Fire insurance

Fire insurance is extremely profitable and contributes around a third of the overall premium income. It is likely to get competitive as other insurers may see an opportunity to gain market share by offering discounts on premium rates. For the Company, the considerations will be of adjusting to increases in Motor Insurance premium and the effect on relative market shares in both Motor and fire lines of business, as corresponding

fine premium rates are brought down, and had overall, the Company could continue with profitable operations.

Health insurance
Health insurance is not under any price restriction. Therefore, de-tariffication does not directly impact this line of business. In the short term the health insurance premium rates may need to be reduced to compensate for possibly lower than fair motor insurance rates. However, over the longer term it is expected that the rates will stabilise in the market to a level that reflects the risks in the health insurance business.

[60]

Indicative Solution & Marking Guide: Question 2

Dear Ram,

Stochastic modelling and assessing the adequacy of reserves

I explain below the concept of reserving for life insurance companies and how stochastic modelling is helping companies in the reserving process.

What are reserves?

Reserves are monies that life insurance companies set aside so that they can meet required payments falling due on existing policies in the future.

The amount of money a company needs to set aside depends upon how the future experience emerges and therefore assumptions have to be made about certain variables including the future investment return, the probability of people dying in the future, expense levels and the chances of people surrendering their contracts in the future.

As companies need to be sure that they can make the necessary payments they err on the side of caution by for example assuming a lower investment return and a higher level of expenses than anticipate of experience would suggest. However, as life insurance contracts are complex and actual experience could way from the assumptions made the companies end up without having a measure of the chances that the reserves as determined will be enough to make the required future payments which is where stochastic modelling comes in.

Stochastic modelling

Under stochastic modelling the various variables are modelled taking into account the random nature of future events. So, for example, instead of assuming a fixed investment return of say 6% for every year in the future a long-term average rate of 6% may be assumed for annual investment returns but the investment return for a particular year is allowed to fluctuate around the level of 6%.

The company would model the various variables as explained above and then run its stochastic model to generate the reserves. However, a single run of the model only gives one view of the future and so does not capture the uncertainty about the future. Therefore, the company typically runs the model at least 1,000 times and therefore generates a range of possible reserve figures. The company can then see where its current reserves fit in.

So for example if 1,000 runs have been carried out the resulting reserves are then ranked in an increasing order. Then suppose the current reserves are equal to the 600^{th} one; we can then say that there is a 60% chance that the current reserves can meet future obligations. If the company wants to be 75% sure that it can make the required payments in the future, then the reserves can be increased to the 750^{th} figure.

I trust the above satisfactorily explains the various issues.

Regards/Madhu

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