

Actuarial Society of India

Examinations

May 2006

SA3 – General Insurance

Indicative Solutions

Sol 1)

- Motor comprehensive insurance to cover against damage to vehicles, third party property damage and third party liability for injury, death caused by the company's vehicles. The vehicles may be covered by under fleet rating.
- Employer's liability cover to staff and work- man's comp cover for factory workers for any accident/injury suffered while in course of employment.
- Fire and property insurance cover for factory, buildings and stock in process against damage caused by various perils like fire, flood storm, earth quake.
- Loss of profits or consequential loss cover against the damage caused as a result of these perils.
- Open cover for good in transit from/ to the factory premises
- Engineering insurance for machinery breakdown and insurance of Boilers and pressure vessels
- Product liability cover against injury/damage caused by using company's products
- Public liability as a result of environmental pollution caused by toxic effluents or pollution caused by chemicals
- Fidelity guarantee cover against fraud by employees.
- Money in transit cover for loss or theft while money is transferred from to office to banks.
- Burglary insurance cover against loss of stocks from factory premises or go-downs
- Directors and Officers cover for senior executives
- Travel insurance for senior executives.

(10)**Sol 2)**

Policy data: Policy number, risk commencement date, risk expiry date, premium, NCD, sum insured

Claims Data: Claim number, policy number, type of claims, date of loss, date reported, dates of payments. Amounts paid, estimated outstanding amounts, some consistent method relating the claim to the corresponding policy details

External data: aggregate market statistics, competitor's own rates for similar products, Data external to the insurance business such as area liable to heavy flooding, Choice of rating factors and risks should be separated into broad homogeneous groups, so that premium rates are appropriate to the experience of each such risk group and hence are broadly equitable between policyholders in different risk groups; however data may be available only for factors required under tariff regime and data of other risk factors might be available only in small proportion of cases

Fitting a model, derive claim frequency and claim amount distributions that best fit the data,

Adjustment of data for abnormally large claims, catastrophe claims, IBNR

Further adjustment for risk premiums is required for a number of factors.

Inflation of claim amounts and exposure measure from mid point of base period to the mid point of the period when claims are expected to be incurred

Trends in claim frequency

Adjustment for any changes in policy condition for example size of excess

Cost of reinsurance

Investigation of expenses: analysis of expenses split according to acquisition, fixed costs variable costs, costs related to number of policies and or premium, and hence expected volumes of business, claim settlement expenses

Decision regarding loading for contingencies and profits

GLM are effective in analyzing the effect of particular factors on risk experience and its projection for the purpose of premium rating

Decision on method for fixing sum insured or fixing rates by make and model only or by some other method and consequent impact on premium rates

Decision on modification/ continuation of no claim bonus structure and parameters and consequent impact on premium rates

Constraints that is likely to be faced in the Indian Context at present:

Only four/five year's data is available and the third party claims in the earliest accident year may not be fully matured;

The need therefore to assume a tail factor and the difficulty in estimating the tail factor

Fitting a model to the claim development factors and estimating IBNR

Dependence on case estimates

Difficulty in splitting the data into a number of rating factors may result in small number or no claims in many cells.

Lack of data like age of drivers, driving and accident experience history;

Absence of stability in the paid and incurred claim triangles as a result fast growth

Absence of credible industry data

Lack of information required for expense analysis with necessary detail to derive expense loadings in the premium formula, particularly for the first year or two of company's existence

As every insurer was using tariff rates till now, it is not possible to know what will be the competitor's rates; most insurers might not wish to move too much away from the tariff structure and levels without adequate data except in a phased manner over a period of say 2years

In view of the fast growing economy, easy vehicle loans, the past experience may not be of any use as there were only few models of cars earlier and the traffic density has since considerably grown in all cities in India with many makes and models of cars; demographic profile of customers/ policyholders is also subject to similar changes

Any limitations imposed by regulating authority in reduction or increase in the new rates

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Sol 3)

F.Y	Gross W.P.	Gross inc. claims	Net inc. claims	Net /Gross inc. claim
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2003-04	600	480	360	75%
2004-05	800	640	480	75%
2005-06	1000	1250	630	50.4%

In 2005-06, the gross incurred claim is 800+450 i.e. 1250 inclusive of flood loss

The net incurred is 600+30= 630 and the ratio is 50.4%

MCR on premium basis is $0.20 \times 1000 \times 0.7 = 140$ crores

On three year average incurred claims basis, $2370 \times 0.3 \times 0.7/3 = 165.9$ crores

The free assets are only 150 crores and hence the company needs to bring in additional capital. Even though the net to gross ratio is 50.4%, it cannot take into account the full reinsurance for calculating MCR because of the restriction of the factor to 0.7

It may be possible for the company to apply to regulating authorities for waiver of this condition if the flood loss is an exceptionally unusual event as the company satisfied the MCR on premium basis. It may be noted that the increase in MCR in this and next two years as a result of the big loss is $450 \times 0.3 \times 0.7/3 = 31.5$ crores assuming that there is no further catastrophe. Net to gross ratio will return to 75% after three years. If the premium increase is substantial, MCR calculations will revert to premium basis.

Impact on reinsurance: The catastrophe cover is nearly wiped out and if there were to be any further catastrophe loss, the company needs to go in for additional catastrophe cover this year. The reinsurance terms are likely to harden on renewal.

The claims department will obviously has to work overtime to clear the additional large number of claims and this may have impact on the settlement of the regular claims and there is leakage of claims because of overwork and stress. The settlement pattern may slow down.

The underwriting department will find it tough to negotiate reinsurance on favourable terms without an appropriate of its premium rates to allow for an increase in the perceived risk of flood losses in future. It has also to see that there is no further accumulation of risks in areas prone to flooding and/ or maintain controls over proportion of risk volumes with high flood loss risk.

There are different ways of dealing individual large losses.

1. Do not extract large claims from data.
 - Simple and quick
 - Fairly robust if large claims is fairly stable from year to year
 - Ensures reasonable allowance for unreported large claims
 - May result in over/underestimation of IBNR if the large claim experience is not stable
 - Does not recognize trend in large claims
2. Extract the whole of each large claim and associated history if it exceeds a certain figure say 50lakhs
 - Does not distort non large claims triangulation
 - Need to restate the history if non-large claims become large each year.
 - Hence reconciliation with last year become difficult
 - Difficult to allow for claims now classified as non large when it becomes large
3. Recognise that once a claims is large, it is large even if the incurred claims falls below the fixed large amount
 - Reduces the need to amend the history of non-large claim each year
 - Recognises that a large claim mat become a non-large claim and avoids overestimation of reserves for large losses
 - May distort the average claims average cost analysis
4. Only extract the excess over the figure of 50lakhs of each large loss (top slicing)
 - The non-large aggregate claims history does not change over time
 - If the threshold amount of 50lakhs is in line with excess point of excess loss insurance, then it is easy to identify reinsurance IBNR
 - It may be difficult to extract the excess over the threshold for the system
5. Index the excess point.
 - Introduces more complexity and measure of inflation is harder.
 - Large loss definition maintain real value over time
 - If there were no indexation, then only fewer claims are extracted from earlier years of account compared to later years and this affects the reliability of development analysis.

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