Experience rating and Profit-Sharing in Group Insurance

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K Raghavarao & K Iyer
Agenda

- Introduction
- Current Issues
  - Data
  - Credibility factor
  - Profit-sharing
- Going forward…
Definition

A process by which the past claim experience of a group is used to adjust the premiums of the future
Introduction
Experience Rating

- Two types
  - Prospective
    to set a rate before the insurance cover commences
    usually referred to as “experience rating”
  - Retrospective
    to review the previous rate at the end of the term of insurance
    sometimes confounded with “profit-sharing”,
Introduction
Experience Rating

- Why Experience Rating?
  - Use the submitted information (to the extent credible) in prospective rating to price correctly – acquire business
  - Profit sharing - share in good experience (customer) - an incentive to retain the group (insurer)
  - Failure to incorporate experience could result in
    - In case of good experience → loss of business
    - In case of a bad experience → underwriting losses
Experience rating

- Prospective - use of data submitted
- Credibility of data source
- Assumptions required
  - Unreported claims
  - Exposures, Future Claims
- Carried out irrespective of profit-sharing
- Used to determine “best-estimate” risk rate, over time
- Subjective considerations, not communicated

Profit sharing

- Retrospective - use of actual claims
- Own experience
- Assumptions required
  - Unreported claims
- Only for participating groups
- Average (premium + profits) closer to “true” risk rate in long term
- A defined formula
Data
Current Issues

Data

- Data required for prospective rating ideally is
  - Exposure periods
  - Amount & timing of claims, claims description (e.g. cause of death) during each exposure period
  - Type of benefits paid
  - Amount (or number) exposed at various points during exposure period
  - Changes in membership during exposure period
  - Changes in benefit structures
  - Large or unusual claims, catastrophes
  - Description of source of statistics
Current Issues
Data

- Are all of these sought in the first place?
- If sought, are these given?
  - Common issues
    - Sums exposed, Premiums and claim amounts – rarely given
    - Number of employees – only the current number and not relating to exposure periods
    - Aggregate number of claims - not split by exposure period
    - Incomplete information – claims reported only till a particular date
    - Claim description – rarely given
  - Credibility of data source
Current Issues
Data

- Role of intermediaries
  - Usually brokers
  - Usually reluctant to share full information, quality of data
  - Groups propensity to cut costs each year → opportunity for higher first year commission → further bargaining
  - Possibly incentives for bargaining lowest quote?

- Tenders, Bids
  - Limited scope to seek information

- Information Arbitrage → healthy for insurance?
Consider a software group with high employee turnover is due for renewal during April which has every year

- 30% of the employees leave the company after performance appraisal in January, most of them have high coverage
- Employee strength increases by 40% say during April, and these have low coverage amounts
- Without this info, cannot assess the significant impact on exposed amounts
- If the group has mad a loss in past …
- Info even more crucial in smaller groups
Consider a group, due for renewal during April, has given employees data up to December and claims particulars up to October.

- Can we use the same rate of claims for the balance period?
- What if only death claims were disclosed and there were CI claims too in the previous year?
- The company actually had more claims than for the previous period after the group decided to renew with a new insurer!
Credibility Factors
Current Issues
Credibility Factors

- Assumption for level at which Full credibility accorded → Reasonable?
- An example using Confidence interval method (normal approximation to binomial)

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<th>f%</th>
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- % error assumption and level of confidence selected can vary
- Methods → models and underlying model assumptions
Current Issues
Credibility Factors

- Zero claims
  - Credibility factor - nil

\[
\left( \sqrt{\frac{d}{d^*}} \right)
\]

- Credibility for small groups
  - Too much variance, difficult to accord credibility

- However, group expects lower rates despite small size or zero claims

- Similar problem in case of groups with limited past exposure or high turnover

- Impact of trends in past experience → undermine computed credibility
Rate setting for small groups

- Claims pooling approach

Basis for equitable allocation of pooled claims to each group: example:

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<th>(3)</th>
<th>(4)</th>
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<td>150,000</td>
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<td>340,265</td>
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<td>70,000</td>
<td>130,000</td>
<td>206,119</td>
<td>276,119</td>
<td>76,119</td>
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<tr>
<td>3</td>
<td>226,415</td>
<td>20%</td>
<td>181,132</td>
<td>20.03%</td>
<td>100,000</td>
<td>20,000</td>
<td>80,000</td>
<td>152,211</td>
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<td>5</td>
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<td>1,000,000</td>
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Impact of factors such as occupation class
Profit-sharing formula

\[ X\% \times (y\% \times P - C) \]

Without rate stabilization reserve, the formula assumes a loss carry forward.

Market practice - in a loss scenario, groups will shift insurers – with minimal information (Data issues).

Profit sharing formula with rate stabilization reserve (rsr)

\[ X\% \times (y\% \times P + \text{Interest on rsr} - C - \text{Increase in rsr}) \]
Current Issues
Profit-sharing

- Regulations stipulate
  - Minimum experience of 1000 life-years
  - Cap on profits to be shared
  - Floor risk charge

- Minimum experience requirement - is this alone adequate?
  - What about groups with very high turnover? – profit share based on average experience over 2-3 years?
  - Mandatory Lock-in?

- Floor risk charge – Groups with true rates much less than prescribed floor may move towards a non-profit sharing arrangement.
Current Issues
Profit-sharing

- Profit sharing – commercial (speculative?) interest to share “profit”
- Insurer has to load - so that profits made are indifferent to profit share
- Loadings for Profit share – results sensitive method of computation
- Sensitive parameters
  - Expense charge y%
  - Profit giveaway x%
  - Group profile – low risk v/s high risk
  - Group size
- Ideally loads or profit share formulae (y%, X%) should vary based on these factors - Market practice?
Going forward ...
Going forward..

- Data issues
  - Seek accurate data & make disclosure mandatory for insured groups
  - Make intermediaries responsible

- Credibility
  - Reasonable level for full-credibility
  - Small groups - Claims pooling approach

- Profit-sharing
  - Rate stabilization reserve
  - Average over period, Lock-in
  - Loadings
Thank you for your kind attention.

The floor is open for discussion…