Personal Lines Pricing

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Claims modelling
Didn't we sort this ages ago?

STATISTICAL MOTOR RATING: MAKING EFFECTIVE USE OF YOUR DATA


[Presented to the Institute of Actuaries, 27 April 1992]
Isn't price optimisation etc much more exciting?
A model of the aggregator world

- 20,000 example policies fed through broker quotation system for 24 months

- Pretend that:
  - these are direct insurers rates
  - the average of the standardised quotes is the "right" technical price
  - probability of purchasing depends on function of elasticity, rank and premium
  - aggregator elasticity 10, phone 3

- Consider performance of
  - real companies
  - "Simple Co" operating a crude claims model (based on simple GLM on assumed technical price)
Company X

Profit per Case

Phone

Aggregator

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Generalised linear models

- Ruthless model management
- Factor simplification
- Regression splines
- Thorough testing for interactions, with simplification
- Bodily injury propensity models
Postcode sector - market discrepancies
Spatial smoothing

- Loss ratio improvement of 1-3 points
- Make better use of recent data
- Avoids overreactions
- Strengthens communication between analysts and underwriters
- Increased effectiveness of marketing
Vehicle grouping - market discrepancies
New techniques in vehicle grouping

![Graph showing vehicle grouping data with a spatial smoothing factor of 0.7, 0.8, 0.9, 1, 1.1, 1.2, 1.3. The graph includes bars for % Exposure and lines for Relativity, Relativity + 2 SE, and Relativity - 2 SE. The graph is labeled with a text "x 1.4."
Model validation & monitoring

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Engagement - Example 1: Marketing

Profit
- Underwrite profitably
- Reduce cross-subsidies
- Increase prices

Customer Value Management

Sales
- Minimise acquisition cost
- Improve customer satisfaction
- Cut prices

Marketing

Pricing
## Engagement - Example 2: Underwriting

<table>
<thead>
<tr>
<th>Quote</th>
<th>Driving</th>
<th>Age</th>
<th>Garage</th>
<th>Claims</th>
<th>NCD</th>
<th>Postcode</th>
<th>Premium</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>IOD</td>
<td>24</td>
<td>Road</td>
<td>1</td>
<td>0</td>
<td>SE18 1PT</td>
<td>£3,425</td>
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<td>IOD</td>
<td>24</td>
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<td>0</td>
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<td>£2,960</td>
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<td>24/51</td>
<td>Road</td>
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<td>0</td>
<td>SE18 1PT</td>
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<tr>
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<td>51/24</td>
<td>Road</td>
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<td>SE18 1PT</td>
<td>£1,026</td>
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</table>

£3,425 ➔ £435!
Engagement - Example 3: Claims

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<tr>
<th>Cost header</th>
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<th>Expected average settled</th>
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<tbody>
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<tr>
<td>AD</td>
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<tr>
<td>TPBI</td>
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<td>£12,000</td>
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<td>Theft</td>
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<tr>
<td>Fire</td>
<td>500</td>
<td>£1,250</td>
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<tr>
<td>Windscreen</td>
<td>12,000</td>
<td>£100</td>
</tr>
<tr>
<td>Large claims</td>
<td>10</td>
<td>£450,000</td>
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</tbody>
</table>

Resource planning:
- Recruitment
- Training
- Office space
- Cash flow projection
- Handler performance targets
- Supplier targets
- Scale deals

Pricing Analysis:
- Growth
- Exposure
- Mix
- Trends

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Engagement - Example 4: IT

- Degradation of optimisation uplifts
  - data capture
  - rating engine flexibility
  - individual optimisation
- Planning / prioritisation

![Diagram showing relationship between Profit and Volume with data points.]
Moving the frontier

- Improve price setting
- Improve capability & process
- Improve engagement

Profit

Growth

Current frontier

Best practice frontier

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