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Agenda

1. Key Commercial Stats

2. Role of Actuary in Commercial Pricing

3. Pricing Techniques
   - Components of Technical Price
   - Generalised Linear Models
   - Experience Rating
   - Blended Premium / Credibility
   - Industry Rating
   - Other Techniques

4. Technical Models to Trading
Key Commercial Stats

- Insurance Institute – 2017 Data (published April 19)

<table>
<thead>
<tr>
<th>Class</th>
<th>2017 Gross Written Premium</th>
<th>Net Underwriting Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comm Motor</td>
<td>€407, 27%</td>
<td>€29</td>
</tr>
<tr>
<td>Comm Property</td>
<td>€387, 26%</td>
<td>€27</td>
</tr>
<tr>
<td>Total Liability</td>
<td>€622, 42%</td>
<td>-€47</td>
</tr>
<tr>
<td>Other Business</td>
<td>€74, 5%</td>
<td>€17</td>
</tr>
<tr>
<td>Total</td>
<td><strong>€1,491, 100%</strong></td>
<td><strong>€26</strong></td>
</tr>
</tbody>
</table>
Role of Commercial Pricing Actuary

- Supporting Operational Plan
- Monitoring & Reflect Trends
- Supporting Portfolio Management
- Engaging with Underwriters
- Technical Reviews
- Large / Non-Standard Risks

Technical Price
Pricing Techniques – Components of Technical Price

- Non-Claim Cost Components
  - Expenses
  - Commission
  - Reinsurance
  - Cost of Capital

- Claim Cost Components
  - Large

- Attritional

- Technical Price (TP)
  - Portfolio Price
    - (1 – Z)
  - Credibility Model
    - Z
  - Experience Price
  - Technical Underwriting Adjustment

- Actual Price (AP)

- Commercial Adjustment
Pricing Techniques – Generalised Linear Models (GLMs)

Fleet Portfolio

- €20m
- 1000 policies
- 10,000 vehicles

Vehicle Type
- Forklift
- Car
- Van
- Artic
- Special

Trade
- Construction
- Manufacturing
- Distribution
- Haulage
- Waste Management

Risk Size
- < 10 Vehicles
- 11-50 Vehicles
- 51-100 Vehicles
- > 100 Vehicles

GLMs
- Homogenous Lines
- Fleet & SME
- Data Volume
- Multivariate

Limitations
- Less Data
- More Heterogeneity
- More Basic Models
- Data VS Variation
Pricing Techniques – Experience Rating

ABC Ltd (Large Commercial Fleet)

ABC Ltd Policy Experience

<table>
<thead>
<tr>
<th>U/W Year</th>
<th>Vehicle Years</th>
<th>Third Party Injury</th>
<th>Own Damage</th>
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<tbody>
<tr>
<td>2014</td>
<td>330</td>
<td>€122,132</td>
<td>€23,123</td>
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<tr>
<td>2015</td>
<td>390</td>
<td>€213,021</td>
<td>€75,000</td>
</tr>
<tr>
<td>2016</td>
<td>440</td>
<td>€22,000</td>
<td>€81,133</td>
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<tr>
<td>2017</td>
<td>470</td>
<td>€1,321,000</td>
<td>€123,000</td>
</tr>
<tr>
<td>2018</td>
<td>500</td>
<td>€32,132</td>
<td>€8,165</td>
</tr>
</tbody>
</table>

Key Considerations

- Stability of Experience
- Risk Expanding/Contracting
- Risk Management
- New Vehicles /Exposure
- Non-Standard Features
- Large Claims
- IBNR and Inflation
- Data Credibility
- Confidence in TP

Model / Data Price → Technical Underwriting Adjustment → Technical Price
Pricing Techniques – Blended Premium / Credibility

Experience Price $\times w + Portfolio Price \times (1 - w)$

**Blended Price Approach**
- Medium/Large Commercial Risks
- All Commercial Lines
- Based on Credibility Model

**Weight ($w$)**
- Determined by Credibility Model
- Directly related to fleet size
- Range of approaches available
- Risk of model error

**XYZ Ltd (medium liability risk)**
- €30k Portfolio Price
- €70k Experience Price
- $W = 30\%$

**Blended Price**

$\text{Blended Price} = \text{€70k} \times 0.3 + \text{€30k} \times 0.7 = \text{€42k}$
Pricing Techniques – Industry Rating

**Commercial Liability**

- Very Diverse Portfolio
- Trade - Key Rating Factor
- 100s of Unique Trades

**Key Rating Factor** = Industry / Trade

**Portfolio Manager**
- Rates based on judgement..
- Judgement based on experience and on knowledge of market

**Pricing Actuary**
- Calibrate base rates
- Assist in validating rates
- Claims trending
- Experience rating model

**Rating Model**
- Technical Underwriter Adjustment
- Credibility

**Industry Rating**

- Sparse Claims Experience
- Commercial Property, EL, PL etc.
### Pricing Techniques – Other Methods

#### Stochastic Methods
- Non-standard policy features
- e.g. Aggregate Deductible
- Problem? No claims data...
- Solution – parameterise frequency/ severity distributions...
- Estimate expected claims cost using Monte Carlo simulations
- Consider non-claim cost components i.e. cost of capital etc.

#### Machine Learning
- Used mainly in Personal Lines Market
- Requires large volumes of data
- Technology like telematics will facilitate adoption in CLs
- More accurate models but more difficult to explain to the business
- Used in UK marine market..
- .. to support GLM analysis
Technical Models to Trading

Underwriter Buy-In

- Critical part of commercial pricing process
- Needed during model development & after model deployment
- During development, engage with underwriters on:
  - Proposed Technical Rates
  - Impact Analysis
  - Application of Underwriter Adjustment
- Following deployment:
  - Training
  - Leveraging APTP

APTP

- Very powerful tool for underwriters and portfolio managers
- Gives indication of expected profitability of policy
- At policy level, used to assist underwriters in setting price
- At portfolio level, gives PMs transparency to steer portfolio to align to Plan
- APTP is joint effort requiring buy-in from both underwriting and pricing
- “Even when the technical price is wrong, it’s right”
Summary

Market performance shows strong cross-subsidies across commercial classes and some disconnect with technical price.

Pricing role requires more ongoing engagement with Underwriting to ensure effective implementation of Technical Price across the business.

Range of robust commercial pricing techniques available but understanding of commercial-specific limitations is crucial.

Choice of approach influenced by various factors such as class of business, the available data and the size of risk. Need to tailor approach to specific review.

Buy-in from the Business required throughout pricing process. APTP needs to be used across all commercial lines.
Questions