



Society of Actuaries in Ireland

Commercial Pricing: from Technical Models to Trading

Matthew Brophy
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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)

| Irish Commercial Insurance Market, 2017 | | | |
|---|----------------------------|-------------|-------------------------|
| Class | 2017 Gross Written Premium | | Net Underwriting Result |
| | €m | % | €m |
| Comm Motor | 407 | 27% | 29 |
| Comm Property | 387 | 26% | 27 |
| Total Liability | 622 | 42% | -47 |
| Other Business | 74 | 5% | 17 |
| Total | 1,491 | 100% | 26 |

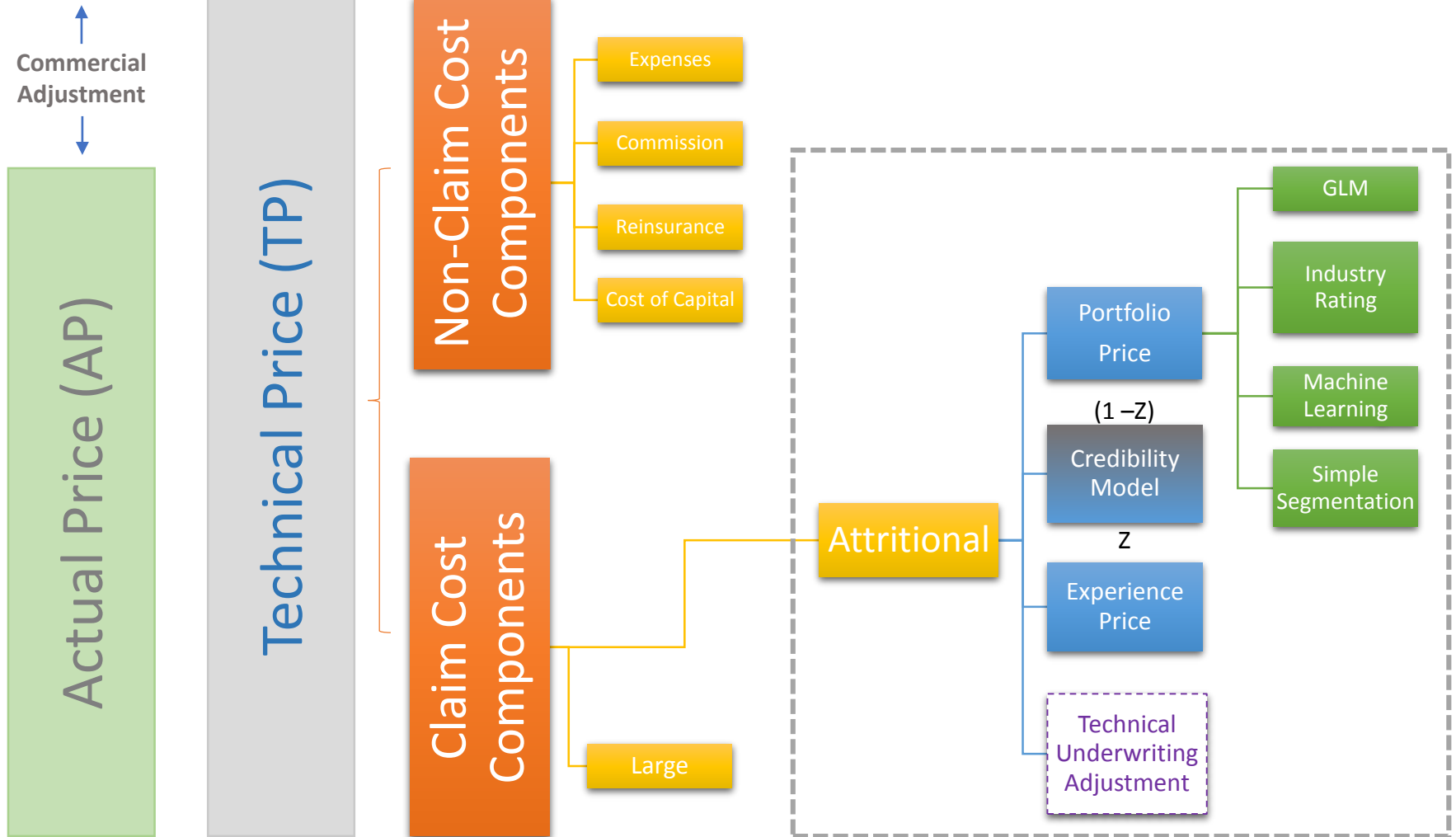


Role of Commercial Pricing Actuary



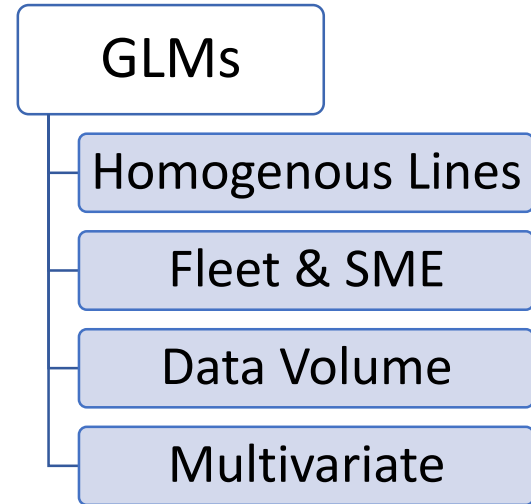
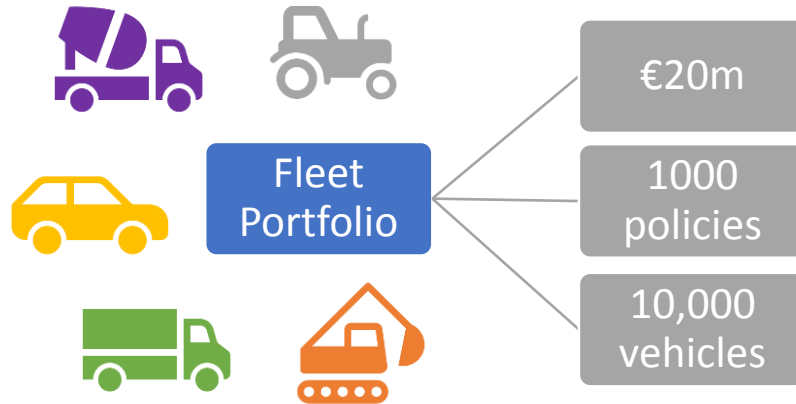


Pricing Techniques – Components of Technical Price





Pricing Techniques – Generalised Linear Models (GLMs)



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

Limitations

Less Data

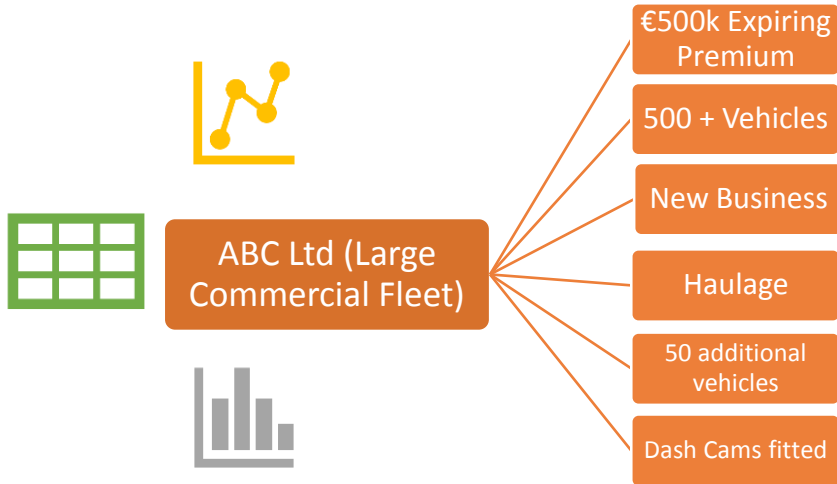
More Heterogeneity

More Basic Models

Data VS Variation



Pricing Techniques – Experience Rating



ABC Ltd Policy Experience

| U/W Year | Vehicle Years | Third Party Injury | Own Damage |
|----------|---------------|--------------------|------------|
| 2014 | 330 | €122,132 | €23,123 |
| 2015 | 390 | €213,021 | €75,000 |
| 2016 | 440 | €22,000 | €81,133 |
| 2017 | 470 | €1,321,000 | €123,000 |
| 2018 | 500 | €32,132 | €8,165 |

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



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

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

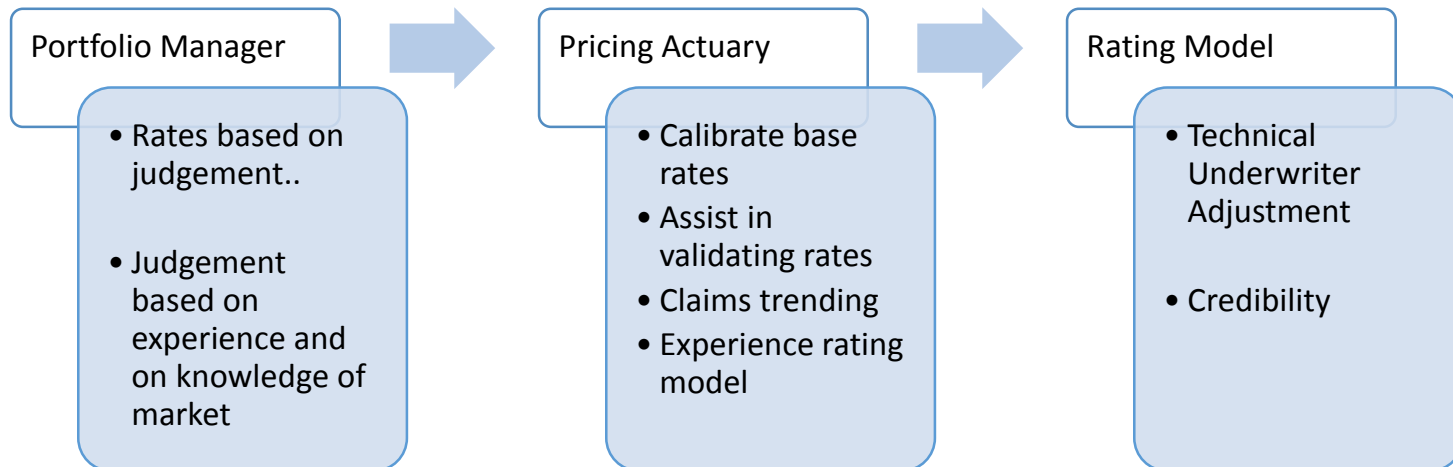
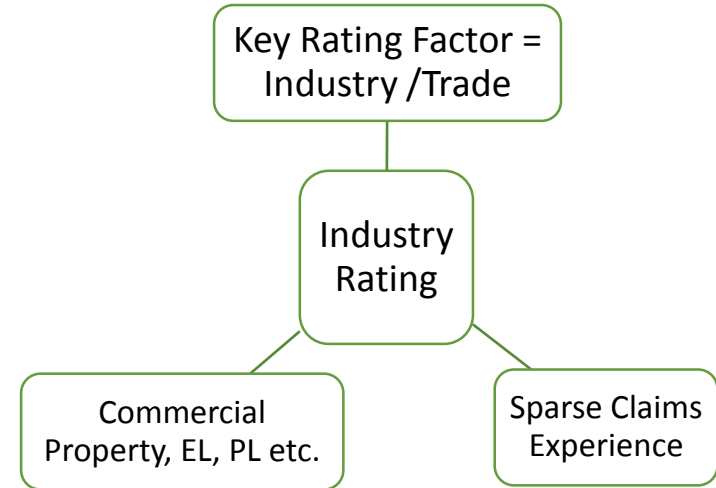
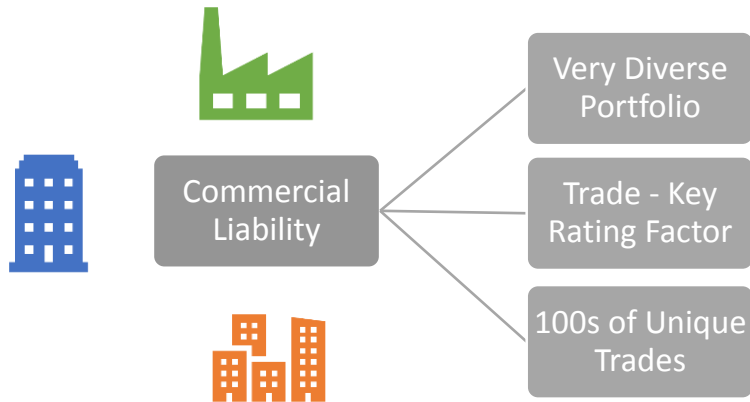
$w = 30\%$



$$\begin{aligned} \text{Blended Price} = \\ \text{€}70k \times 0.3 + \text{€}30k \times 0.7 = \\ \text{€}42k \end{aligned}$$



Pricing Techniques – Industry Rating





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
