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The Complete Pricing Actuary

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INTRODUCTION AND SCOPE

- GLM based rate reviews as the basis (for developing markets)
- WHAT does it include
- WHO does what
- WHY to challenge status quo
- A very simple example
- Gaps from a Pricing Perspective
- The Ideal World Pricing Actuary
- The Complete (Business World) Pricing Actuary



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GLM Based Rate Reviews

- Volume based – Personal Lines (motor, household); SME (motor, shops)
- Raw (untrended, undeveloped) data to develop GLM models
- Output of the model – risk propensity differentials (relativities) between different segments
- Pre-selected risk levels (perils/heads of damages) – Own Damage (OD), Third Party Injury (TPI)
- Post modelling additions to build final technical (theoretical) price
- (Raw) Claims cost differentials Vs Technical price differentials
- Market adjustments off of the technical price to build final street price

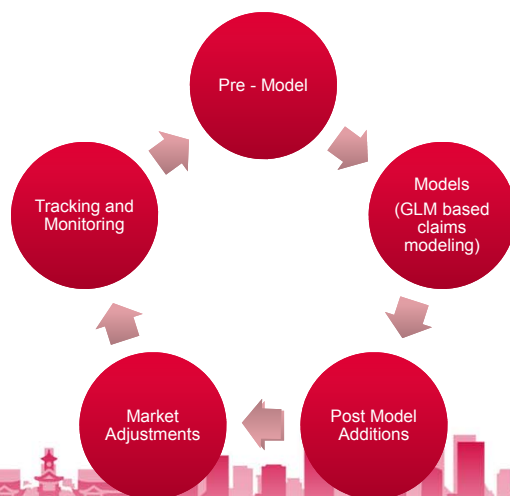


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3

The Rate Review Cycle



- Modelling takes up the majority share
- Pre-model explorations and post-model additions receive less attention
- Appreciation of the complete picture is critical
- Scope of this presentation – technical price build up

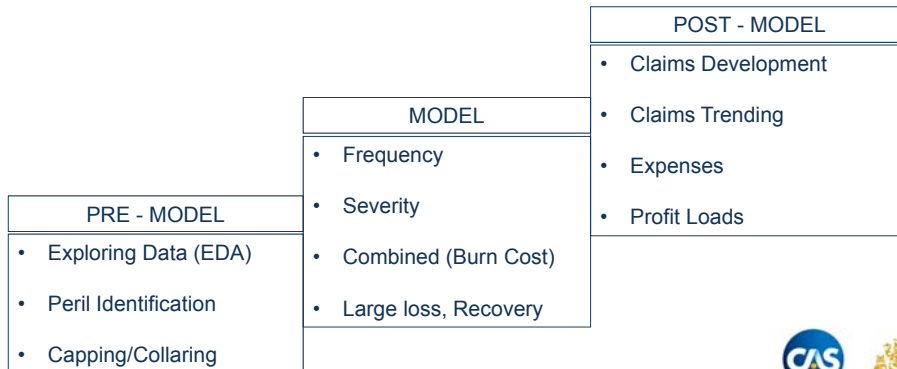


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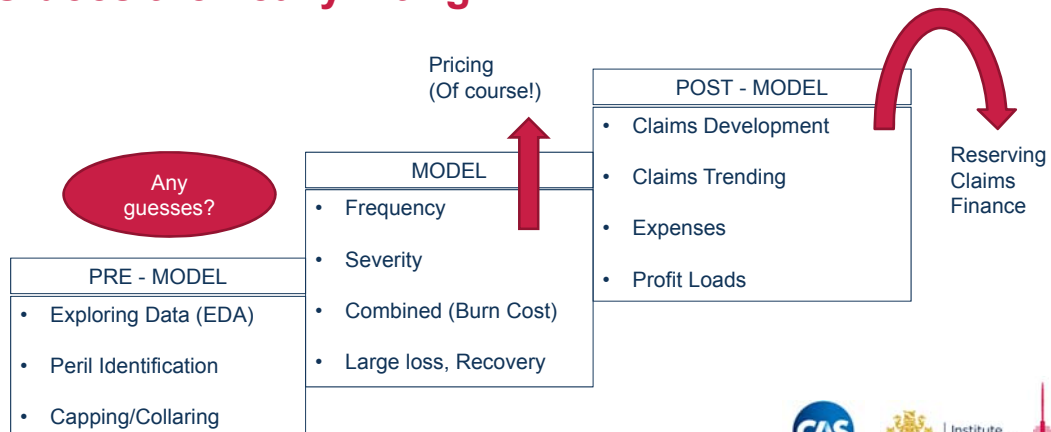
4

WHAT does it include



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WHO does the heavy lifting



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GOALS of a Pricing Actuary

- Maximize value addition through sophisticated models
- Consistent assumptions across all stages of rate review
 - Perils/Heads of Damages
 - Claims Development
 - Claims Trends
 - Expense allocation
 - Profit loads
- Most straightforward solution to consistency – borrow numbers
- Downside – modeling with assumptions underlying other functions

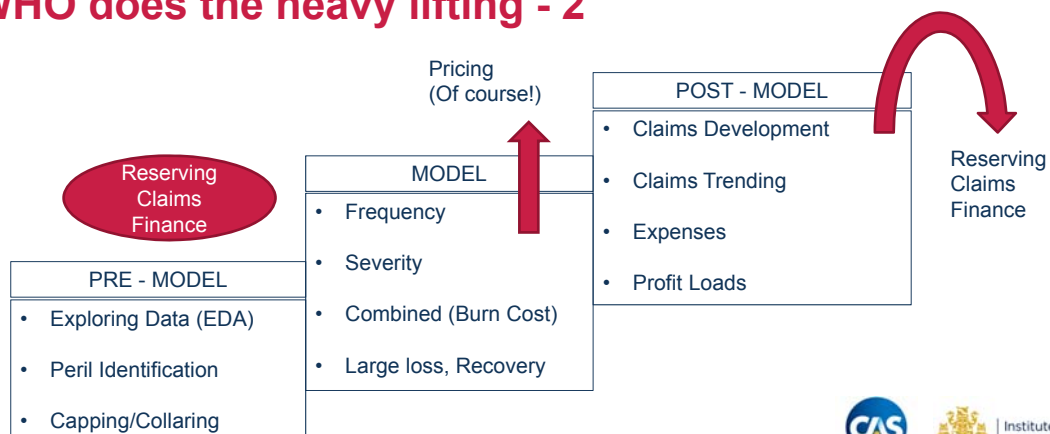


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7

WHO does the heavy lifting - 2



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8

WHY is this not optimum

- Part erosion of the value added by GLM modeling
- Flexibility lost due to compliance with assumptions from other functions
- Pricing Perspective unavailable across all stages of the process
- Sub-optimal market adjustments
- Strategy may be being driven (unintentionally) by non pricing functions
- What other departments produce is fit for their purpose, but may not necessarily be for Pricing

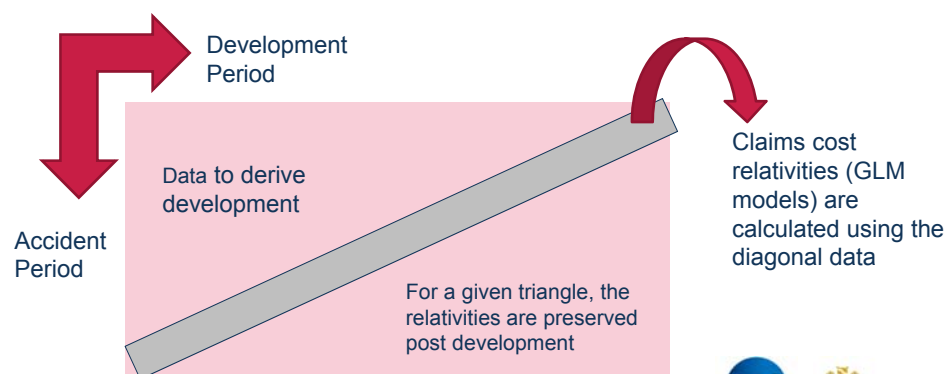


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9

Triangle and Pricing



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10

A very simple example

AY	Overall	Ultimate
180		450
Seg A = 90		Seg A = 225
Seg B = 90		Seg B = 225

Reserving done at overall level. When done at constituent peril levels, it still preserves the overall IBNR number which serves the purpose for Finance, but for Pricing?

AY	Peril 1	Ultimate	AY	Peril 2	Ultimate
90		180	90		270
Seg A = 60		Seg A = 120	Seg A = 30		Seg A = 90
Seg B = 30		Seg B = 60	Seg B = 60		Seg B = 180



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Gaps from Pricing Perspective

- Difference in the segments: Overall vs By-peril
- Pricing model consistent with the perils used by reserving department, but insights for risk selection and product development remain hidden
- Let's see the Ultimate position as well

Segments	Overall Analysis	By-peril Analysis
A	225	210 (= 120 + 90)
B	225	240 (= 60 + 180)

The segment level differential depends on what level the claims are developed



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Gaps from Pricing Perspective - 2

- Other differences in Pricing and Reserving bases arise
- Large loss thresholds
- What is analyzed – e.g. separate claim count triangles?
- How much is analyzed
- Gross versus Net
- Frequency of analysis



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13

Options for the Pricing Actuary

- Balance of effort and accuracy
- Comply with the perils that are used for reserving purposes
- Use perils identified from Pricing perspective for GLM modelling, but use the development produced (at different levels) by reserving
- Use perils identified from Pricing perspective for GLM modelling and claims development



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14

Claims Trending

- Similar to claims development, trends for different perils could be different
- Overall combined trend of 5%, versus Peril 1 (0%) and Perils 2 (10%)

Segments	Overall Analysis	By-peril Analysis
A	236 (= 225 * 1.05)	219 (= 120 + 90*1.1)
B	236 (= 225 * 1.05)	258 (60 + 180*1.1)

Perform trending analysis consistent with pricing models
Engage with claims departments to understand better



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15

Expenses

- Expense information should be acquired at the right level
- Segment wise splits
- Fixed/Variable splits
- Expenses – Overall (80) vs Segment wise (Seg1: 30, Seg2: 50)

Segments	Overall Analysis	By-peril Analysis
A	276 (= 236 + 40)	249 (= 219 + 30)
B	276 (= 236 + 40)	308 (= 258 + 50)

Engagement with Finance is the key to get the data you need



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Profit

- Single profit load for example versus a more reasonable split by perils/products
- Continuing with the example, overall profit load = 45
- But if peril 2 is far more risky, it will require a greater share of this load (say 30)

Segments	Profit (Peril 1)	Profit (Peril 2)	Overall Analysis	By-peril Analysis
A	10 (2:1)	10 (1:2)	298.5 (= 276 + 22.5)	269 (= 249 + 20)
B	5	20	298.5 (= 276 + 22.5)	333 (= 308 + 25)

The final price differential in the two segments differs depending on how they are placed for analysis



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17

The Ideal World Pricing Actuary

- Perform a sophisticated exploratory data analysis - Perils, Thresholds
- Model all the perils identified separately for
 - Frequency, and
 - Severity with the claims capped and collared at their respective thresholds
- Perform Claims development analysis consistent with the granularity of pricing models
- Perform Claims trending analysis consistent with the granularity of pricing models
- Perform expense analysis consistent with the granularity of pricing models
- Calculate the required profit load consistent with the granularity of pricing models



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18

The Complete (Business world) Pricing Actuary

- Perform the exploratory analysis - identify the most material perils
- Analyze these perils separately consistent with the granularity of pricing models
- Reasonable combination of other perils – using perhaps the same basis as other departments
- Make the peripheral processes around core (GLM) modeling efficient and robust
- Appreciate these fine points and
 - form a pricing view
 - allocate the time appropriately across all the activities
 - challenge the status quo
- Track! Monitor! Adjust!



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19

Questions

Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenter.



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20