CAS Ratemaking and Product Management Seminar

Effective Predictive Models
Senior Leadership Perspective
Larry Haefner

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Key Areas of Consideration

- Intuitive understanding of model relationships

- Pricing models and underwriter beliefs

- Model Goals and Corporate Goals

- Disruption

- Monitoring Results

Intuitive understanding of model relationships

- The model must be explained and understood; i.e., it cannot be a black box.

- If several variables in the model are proxies for other relationships, the proxy relationship must be understood and explained.

- There should be a balance between the number of variables and their intuitive appeal (Principle of Parsimony).

- Passing a test of statistical significance is not justification alone for a variable to be included in a model.

- If the model upends conventional wisdom, there must be a greater demonstration of why the model is working in this direction.

- The variable identification process should be a multi-disciplinary process. All disciplines must be truly engaged in the process.

Pricing Models & Underwriter Beliefs

- Life cycle of a model – simpler model first to get underwriter buy-in.

- Loss Cost vs Loss Ratio vs Frequency/Severity model

  – Advantages and disadvantages of each

  – Underwriters tend to think in Frequency or Loss Cost terms

- Ability of the model to quantify underwriter beliefs (e.g. underwriter A values an attribute at a 20% credit vs. underwriter B sees it as a 30% credit)

  – Models can place a price or percent on relationships that may have been intuitively understood in the past.

  – Models can be used to test past assumptions and determine the appropriate weight.

Model Goals & Corporate Goals

- What is the intended benefit of the model?
    - Lower loss ratio?
    - Expanded appetite?
    - New business quoting activity?
    - Enhanced "No-Touch" capability?
    - Lower severity?
    - Lower allocated loss adjustment expense?
- Are benefits consistent with corporate goals?
    - What if ERM goals are at odds with suggested profitability opportunities identified in the modeling effort?
    - What if the model suggests that agency distribution system is "part of the problem"?

Disruption

New + Renewal

		Revised Score Decile										Total
		1	2	3	4	5	6	7	8	9	10	
Current Score Decile	1	31.7%	5.8%	1.5%	0.5%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	39.9%
	2	2.9%	6.2%	3.7%	1.9%	0.8%	0.4%	0.3%	0.1%	0.1%	0.0%	16.2%
	3	0.3%	1.9%	2.6%	2.4%	1.4%	0.9%	0.3%	0.2%	0.1%	0.0%	10.2%
	4	0.0%	0.5%	1.3%	1.6%	1.4%	1.3%	0.8%	0.5%	0.1%	0.1%	7.4%
	5	0.0%	0.2%	0.6%	1.2%	1.3%	1.3%	0.9%	0.7%	0.4%	0.1%	6.6%
	6	0.0%	0.0%	0.3%	0.5%	0.9%	1.4%	1.1%	0.8%	0.6%	0.3%	5.9%
	7	0.0%	0.0%	0.0%	0.2%	0.5%	0.7%	0.8%	1.0%	0.6%	0.4%	4.2%
	8	0.0%	0.0%	0.0%	0.1%	0.1%	0.6%	0.8%	1.0%	1.0%	0.8%	4.4%
	9	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.3%	0.6%	0.8%	1.1%	3.0%
	10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.5%	1.4%	2.2%
Total		34.9%	14.5%	10.0%	8.4%	6.7%	6.7%	5.3%	5.0%	4.3%	4.2%	100.0%

Change in Decile	Dist.
<-2	1.3%
-2	3.4%
-1	10.6%
0	48.8%
+1	18.8%
+2	9.2%
>+2	7.8%

– Employees and Offices

- Actual Loss of authority

- Perceived loss of authority

- Process disruption

  − Robust deployment vehicle is critical
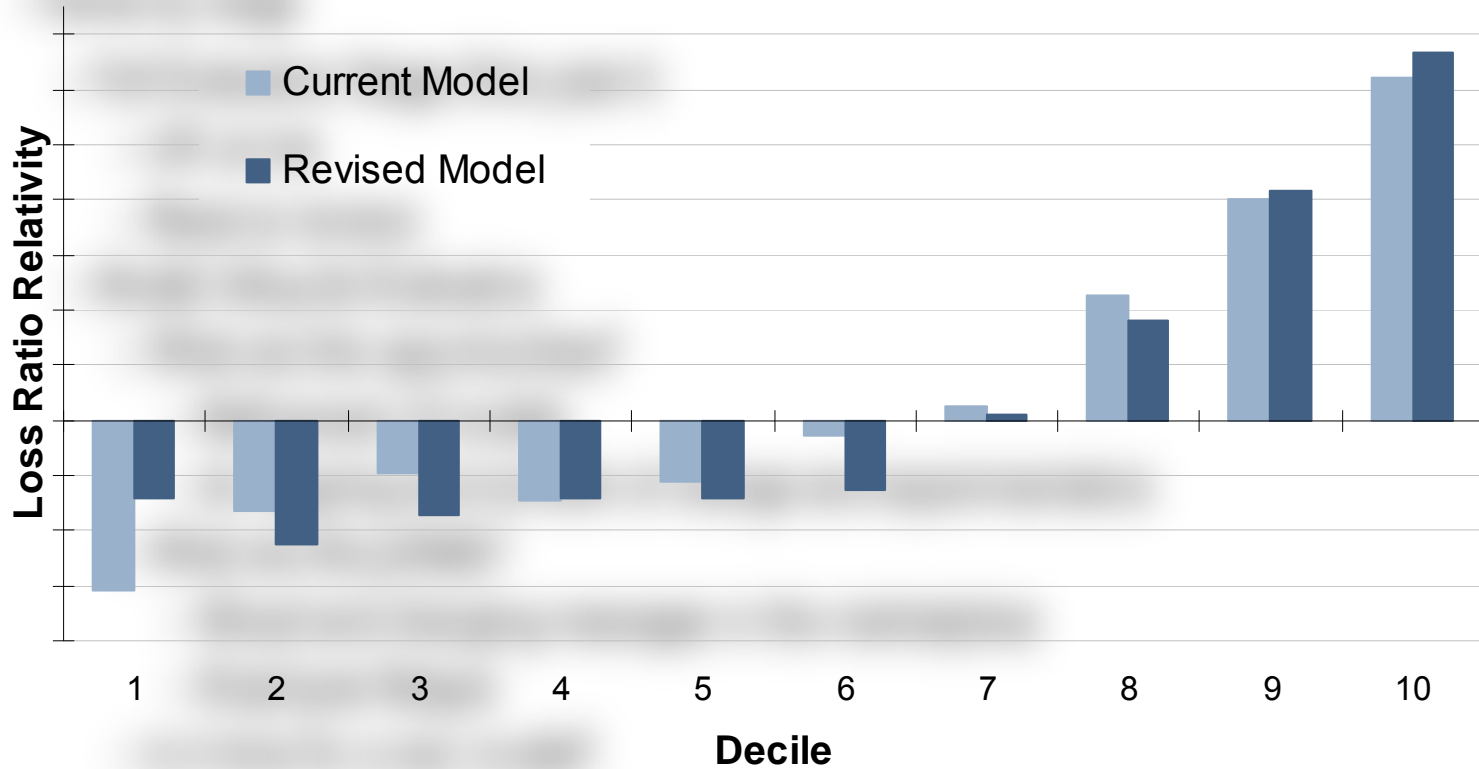
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Disruption

- What are the metrics for measuring Disruption?

  – Goal: Consistent with goals of model

  – Examples:

    – Account turnover

    – Agent satisfaction with the communication of the message in the marketplace

    – Agent flow of submissions and hit ratios

    – Employee turnover

- New vs Renewal considerations

  – Discussions with Regulators

  – Transition plans

Monitoring Results

- Varies by stage

  - Initial Stage (90-120 days) – focused on activity

    - Utilization

    - Acceptance

    - Essentially, is it driving the right behaviors?

  - Secondary Stage (120 – 365 days) – focused on initial review of metrics

    - Are early indications of results moving as intended?

      - If looking for improvement in loss ratio, are frequencies improving?

      - If looking for lower severity, are newly reporting claims showing favorable improvement?

Monitoring Results

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