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CAS Ratemaking and Product Management Seminar

Model Validation – Seconds Anyone?
Senior Leadership Perspective
Larry Haefner

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Effective Predictive Models
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March 2013

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Key Areas of Consideration

- Review Goals of Initial Model
- Pricing models
- Reasons for New Model
- Considerations for Developing New Model
- Evaluation of New Model

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Review Goals of Initial Model

What was the intended benefit of the model?

- Pricing Models
 - Lower loss ratio?
 - Expanded appetite?
 - New business quoting activity?
- Claims Models, typically more effective claim categorization/assignment
 - Enhanced "No-Touch" capability?
 - Lower severity?
 - Lower allocated loss adjustment expense?

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Pricing Models

- Goal: Improve growth and profit margins by out performing competitors through better pricing of the exposure at the sub-account level.
 - Sub-account level can mean coverage, risk location, etc.
- Steps in achieving goal:
 - Find the right portfolio price for a segment of the entire book.
 - Find "Credible cells" and determine appropriate rate level
 - Traditional actuarial techniques can be used
 - More sophisticated, multivariate techniques used to better allocate/spread the portfolio price through the accounts comprising the credible cell
- Benefit of Model – Growth in top and bottom line
- "Cost" of model – Disruption of existing book of business

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Reasons for a New Model

- Not achieving initial goals
 - Benefits less than expected or desired
 - Disruption greater than expected
- Modeling feedback loop – better information from underwriters
- Enhanced Data
 - Better internal data quality
 - Better volume of data to use
 - New external data
- Conditions change
 - External factors: economy, trends, competitors, regulatory or legal environment
 - Experience can differ from expected

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Reasons for a New Model: Not Achieving Initial Goals

- Are 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?
 - If looking for appetite expansion,
 - what is happening with "hit ratios"?
 - what is happening with class or territory expansion?
- Is disruption occurring as intended?
 - What are actual retention levels vs. expected?
 - Are we retaining desired classes of business?

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Reasons for a New Model: Enhanced Data

- Improved data quality
 - Longer history of "corrected" data
 - Better initial data capture rather than after-the-fact data cleansing
- Greater volume giving greater insights
- New variables or 3rd party data source
 - Previously used a "proxy"
 - Better capture of more granular data
 - Incorporating new external data
 - New data source
 - Loss of existing data source

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Reasons for a New Model: External Factors

- Many pricing models today are static
 - Dependent on time period in which data is captured
 - Particularly if using historical loss information
- Incorporating economic conditions
 - Adjusting data to reflect current economic conditions
 - Incorporating economic variable(s) into the model
- Significant regulatory or legal environment change
 - Adoption or elimination of tort reform changes (caps on non-economic damages)
 - New legal precedents
- Competitors actions

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Considerations for Developing a New Model

- For a second model, lift is typically not as beneficial
- Disruption must be carefully examined
 - No reversals unless fully understood
- What are the pitfalls?
 - Mixed and changing messages in the marketplace
 - Employee acceptance and/or fatigue

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Evaluation of New Model – Benefits

Lift Chart

The chart shows Loss Ratio Relative on the y-axis and Decile (1-10) on the x-axis. Two series are plotted: Current Model (light blue) and Revised Model (dark blue). The Revised Model shows a clear upward trend in loss ratio relative to the Current Model starting from decile 8, indicating better performance in higher risk deciles.


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Evaluation of New Model – 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%	7.6%
	5	0.0%	0.2%	0.8%	1.2%	1.3%	1.3%	0.9%	0.7%	0.4%	0.1%	6.8%
	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%	0.8%	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	Disruption
<-2	1.3%
<-1	3.4%
0	10.8%
+1	18.8%
+2	9.2%
>+2	7.8%



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