



II-4: Intelligent Use of Competitive Analysis

CAS 2013 Ratemaking and Product Management

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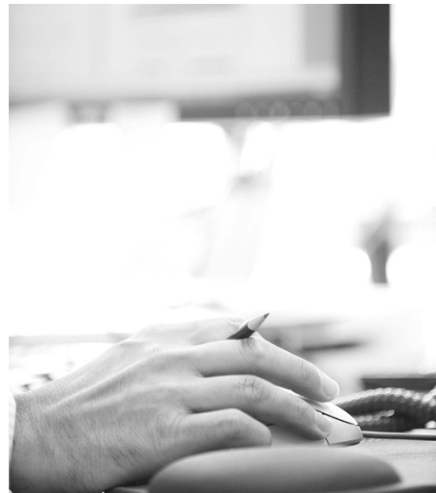
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Agenda

- Background
- Competitive Demand
- Market Simulations
- Pricing Integration
- Conclusion



Background

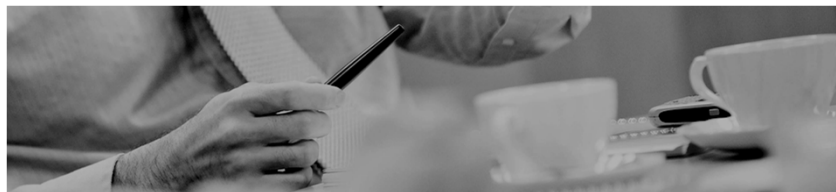
- Competitive Market Analysis
 - Indications: what is the cost of writing the business?
 - Marketing: will the price of the product be accepted by the customer
- Cost based pricing is “best” long run but often impractical in the short run
- Marketing considerations
 - Renewals
 - Quotes



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Background

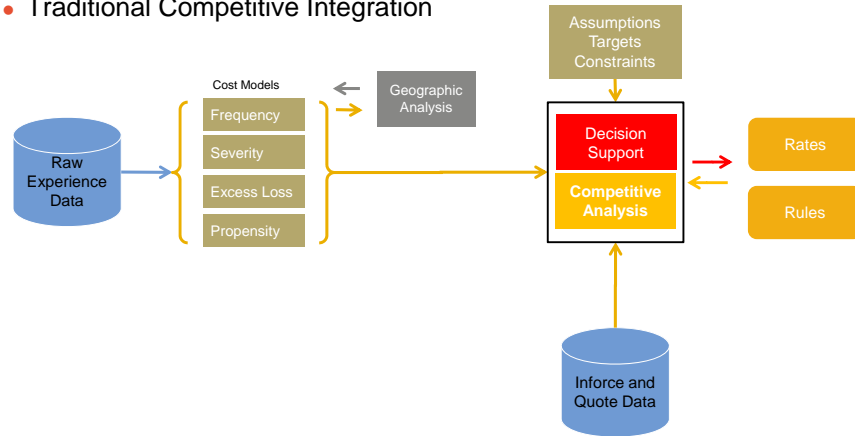
- Standard Competitive Market Analysis
 - General approaches that insurers have used to study competitor's rate
 - Factor by factor relativity analysis to estimate the competitiveness of a segment
 - Rate comparisons either with existing policies/quotes OR with a representative market basket
 - Aggregate close rate and retention rates



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Background

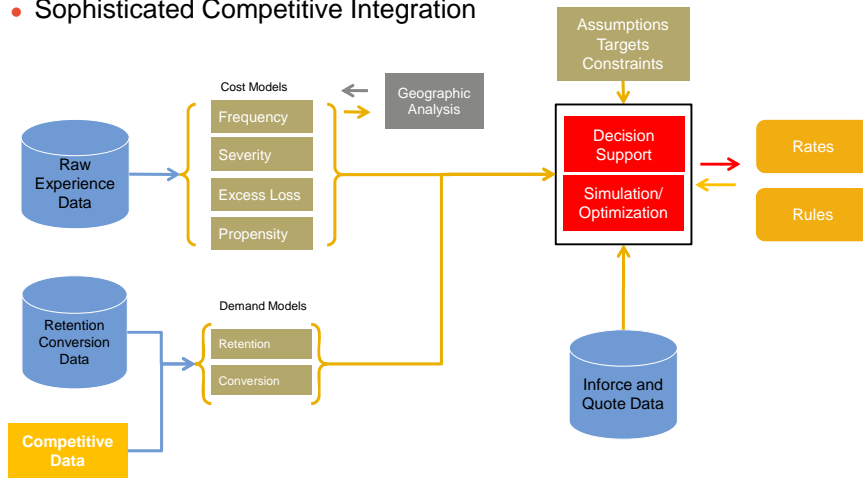
- Traditional Competitive Integration



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Background

- Sophisticated Competitive Integration



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Background

- Sophisticated Competitive Analysis
 - Complex problems require more sophisticated tools
 - Demand modeling
 - Greater sophistication requires more precise action items
 - Simulation
 - Optimization



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Competitive Demand

Competitive Demand

- Fundamental Question:
 - Which customers are influenced by the fact that Insurer A is 10% cheaper than the market?

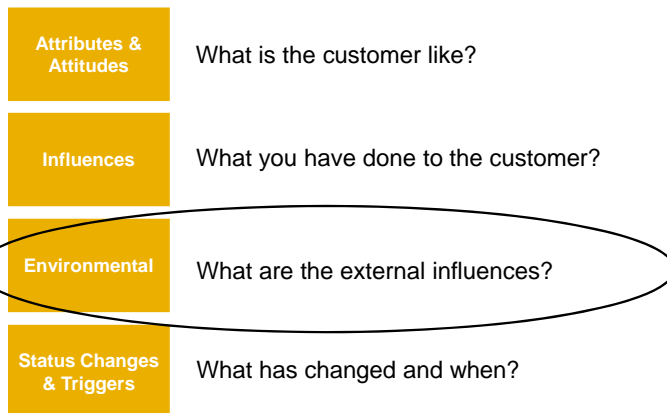
- Demand Modeling
 - Expected probability of conversion/retention
 - Acceptance/Rejection
 - Competitive position is a key predictor



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Competitive Demand: Data

- What affects demand?



Competitive Demand: Regression Modeling

- Model form
 - Non price factors (segments)
 - Price factors (P)
 - Competitive metrics
 - Current price/quote
 - Response

Generalized Linear Models

$$y = \frac{1}{1 + \exp(-X \beta_{segments} + \Delta P \beta_{\Delta P})} + error$$

ΔP can either be represented by a categorical factor or by a curve

Generalized Non-Linear Models

$$y = \frac{1}{1 + \exp(-X \beta + \Delta P e^{zz})} + error$$

Forces elasticity to be positive

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Competitive Demand Predictors

- Standard competitive ratio within the linear predictor

$$Demand_1 = \frac{1}{1 + \frac{1}{\exp(\beta_0 + \alpha_1 \times \frac{P_1}{P_0} + \alpha_1 \times \frac{P_1}{Cp})}}$$

- Alternate competitive metrics:

$$Demand_1 = \frac{1}{1 + \frac{1}{\exp(\beta_0 + \alpha_1 \times \frac{P_1}{P_0} + \alpha_2 \times Rank(P_1, Cp_1, Cp_2))}}$$

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Competitive Demand: Modeling Issues

- Underestimating elasticity
 - Very common
 - Leads to over aggressive pricing behavior

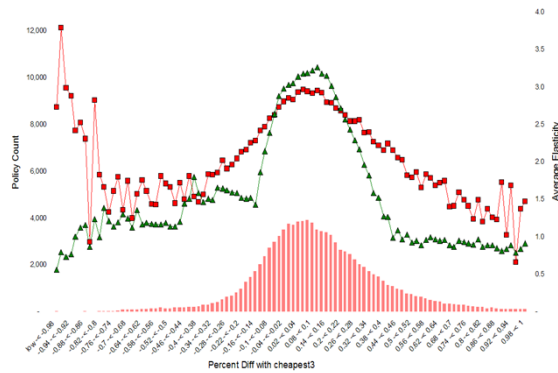
- Causes
 - Inadequate rate change information
 - Inaccurate competitive data
 - Different competitors for different segments
 - Multicollinearity between price and non price factors



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Competitive Demand: Modeling Issues

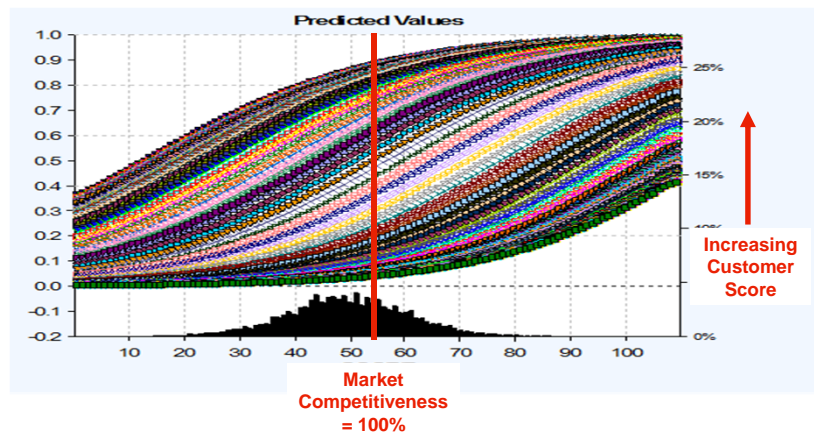
- Overcoming the challenges
 - Include factors that reflect relative inaccuracy of competitor factors
 - External media exposure factors interacted with competitor factors
 - Brand preference models interacted with competitor factors



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Competitive Demand: US Auto New Business

- Non price parameters compiled into a customer score interacted with competitive ratio



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Market Simulations

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Market Simulations

- Fundamental Question:
 - For each customer what is the expected demand as Insurer A changes rates relative to the market?
- Demand Elasticity
 - Change in expected probabilities given a change in the competitive metrics
 - Simulations and extrapolations from models



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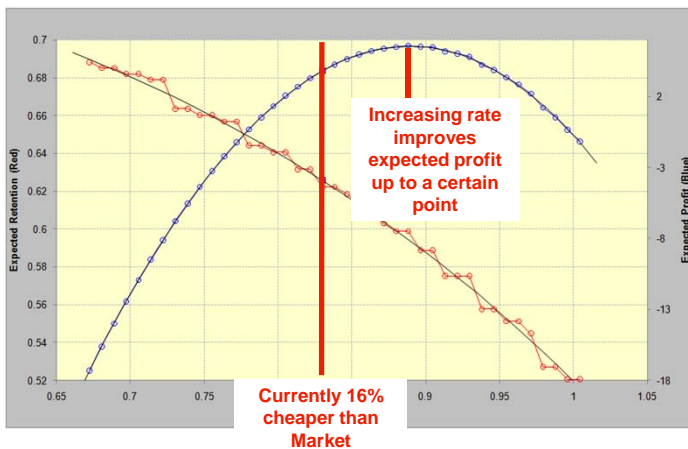
Market Simulations

- Demand Elasticity Options
 - Change in actual demand versus change in price
 - Not useful for individual customer analysis
 - Change in expected demand versus change in price
 - Extrapolation from the underlying models
 - Change in expected demand versus change in competitive metric
 - As insurer simulates increases/decreases the market position and thus the expected demand changes
- Customer level analysis
 - Customer specific knowledge
 - Policy premiums
- Include profitability numbers

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Market Simulations

- Price changes simulated for an individual insured



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Pricing Integration

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Pricing Integration

- Fundamental Question:
 - Given the new understanding of how customers react to competitive positioning, what should my rate algorithm be?

- Price Optimization
 - Systematic incorporation of cost and demand models
 - Find best prices to meet company goals



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Price Integration

- What is price optimization

Use customer level knowledge of:

- › Risk costs
- › Expenses
- › Competitive positioning
- › Price elasticity
- › Buying behavior
- › Retention behavior
- › Existing product-holdings
- › Likelihood to purchase additional products
- › Marketing activities



... to improve portfolio performance

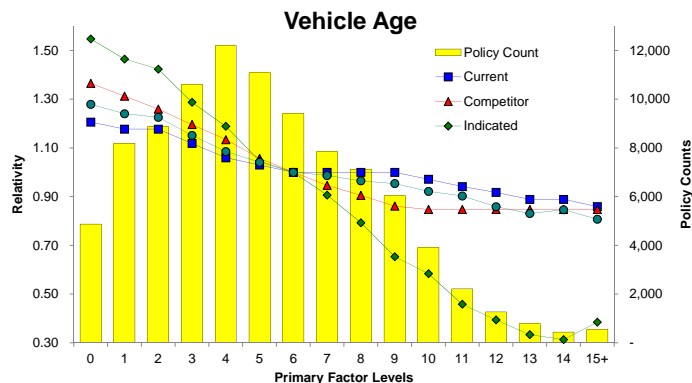
- › Immediate volume and/or profit uplift
- › Sustained long-term improvement
- › Aligned with strategy

- Systematically selecting a rating algorithm to balance market and profit measures

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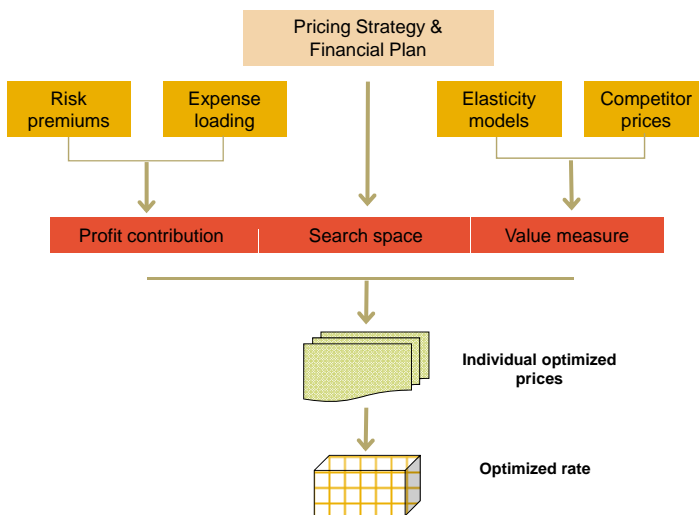
Pricing Integration

- Systematic approach to selections:



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Pricing Integration



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Conclusion

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Conclusion

- Traditional competitive data and metrics allow you to understand current **competitive position**
- Bringing competitive data into the demand model allows you to understand how customers react to the competitive position
- Parametric models give you capabilities to simulate the effect that different rates would have for individual customers
- Price optimization allows you to systematically integrate competitive demand information into a new rate structure

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