Price Optimization vs. Actuarial Standards

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Price Optimization – What Is It?

- Pricing based on three considerations
  - Cost-based analytics – losses and expenses
    - Growing ever more refined
  - Competitive considerations
    - Also becoming more refined
    - Consider level of own competitiveness, and range of competition in market for the class
  - Demand considerations
    - A relatively new consideration in pricing
    - Consider elasticity of demand (what proportion of risks will move given a certain level of rate increase)

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Price Optimization – How does it fit with the actuarial profession?

- Cost-based analyses are clearly actuarial
- Insurers have consistently looked at competitive considerations
- Demand modeling is relatively new

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Price Optimization – How does it fit with the actuarial profession?

- Is putting the three considerations together an actuarial exercise?
- Is it ratemaking?
- Is it in compliance with Statements of Principles (SOPs) and Actuarial Standards of Practice (ASOPs)?
  - SOPs and ASOPs refer to "costs"
  - Do "costs" only consider losses and expenses? Or do they include the effects of demand elasticity and competition?

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Documents to Consider

- SOP Regarding Property and Casualty Insurance Ratemaking ("SOP Rate")
- Risk Classification SOP ("SOP Class")
- ASOP 12 – Risk Classification
- ASOP 23 – Data Quality
- ASOP 36 – Statements of Actuarial Opinion Regarding Property/Casualty Loss and Loss Adjustment Expense Reserves
- ASOP 41 – Actuarial Communications

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SOP Rate:

- "Principle 1: A *rate* is an estimate of the expected value of future costs."
- "Principle 2: A rate provides for all costs associated with the transfer of risk."
- "Principle 3: A rate provides for the costs associated with an individual risk transfer."
  - Does this mean that Price Optimization is NOT ratemaking?
  - Are all considerations other than cost-based NOT ratemaking?
  - Is there a difference between ratemaking and premium development?

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SOP Rate:

- "Principle 4: A rate is reasonable and not excessive, inadequate, or unfairly discriminatory if it is an actuarially sound estimate of the expected value of all future costs associated with an individual risk transfer."
  - How does the concept of a range of reasonable estimates fit in with this?

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ASOP 36:

- "The actuary should consider a reserve to be reasonable if it is within a range of estimates that could be produced by an unpaid claim estimate analysis that is, in the actuary's professional judgment, consistent with both [ASOP 43] and the identified stated basis of reserve presentation."
  - Similarly, should an actuary consider a *rate* to be reasonable if it is within a range of estimates that could be produced by a rate analysis with reasonable assumptions and methodologies?

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SOP Class:

- "Risk classification is intended simply to group individual risks having reasonably similar expectations of loss."
- "Risk classification is only one factor in an entire set of factors which bear on private, voluntary insurance programs. Other factors -- such as marketing, underwriting and administration -- combine with risk classification to provide an entire system of insurance. Changing one factor has possible implications on other factors. Changes must be considered in the context of the entire system."
  - Should a carrier's selected risk classification rate relativities reflect these other factors?

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ASOP 12:

- "Risk Classification System—A system used to assign risks to groups based upon the expected cost or benefit of the coverage or services provided." (2.10)
- "Relationship of Risk Characteristics and Expected Outcomes—The actuary should select risk characteristics that are related to expected outcomes. A relationship between a risk characteristic and an expected outcome, such as cost, is demonstrated if it can be shown that the variation in actual or reasonably anticipated experience correlates to the risk characteristic." (3.2.1)
  - Should (or may) an actuary consider outcomes other than cost when making rates?

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ASOP 12:

- "Credibility—A measure of the predictive value in a given application that the actuary attaches to a particular body of data" (2.3)
- "It is desirable that risk classes in a risk classification system be large enough to allow credible statistical inferences regarding expected outcomes. When the available data are not sufficient for this purpose, the actuary should balance considerations of predictability with considerations of homogeneity. The actuary should use professional judgment in achieving this balance." (3.3.2.b)
  - As risk classification plans become more refined, and credibility by class possibly decreases, might this lead to a wider range of reasonable estimates by class?

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ASOP 12:

- "Adverse Selection—Actions taken by one party using risk characteristics or other information known to or suspected by that party that cause a financial disadvantage to the financial or personal security system" (2.2)
- "Effect of Adverse Selection— … The actuary should assess the potential effects of adverse selection that may result or have resulted from the design or implementation of the risk classification system. Whenever the effects of adverse selection are expected to be material, the actuary should, when practical, estimate the potential impact and recommend appropriate measures to mitigate the impact." (3.4.1)
  - What measures should be recommended regarding adverse selection and demand modeling?

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ASOP 23:

- "Data that are completely accurate, appropriate, and comprehensive are frequently not available. The actuary should use available data that, in the actuary's professional judgment, allow the actuary to perform the desired analysis." (3.1)
- "…the actuary should review the data for reasonableness and consistency, unless, in the actuary's professional judgment, such review is not necessary or not practical. In exercising such professional judgment, the actuary should take into account the extent of any checking, verification, or auditing that has already been performed on the data, the purpose and nature of the assignment, and relevant constraints." (3.5)
  – What special data issues arise in Price Optimization analyses?

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ASOP 41:

- "The actuary should complete an actuarial report if the actuary intends the actuarial findings to be relied upon by any intended user" (3.2)
- "In the actuarial report, the actuary should state the actuarial findings, and identify the methods, procedures, assumptions, and data used by the actuary with sufficient clarity that another actuary qualified in the same practice area could make an objective appraisal of the reasonableness of the actuary's work as presented in the actuarial report. (3.2)
  – How are methods and assumptions documented?

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