



CAS RPM SEMINAR

Price Optimization – A Regulatory Perspective

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Distribution and Use

- This presentation is intended solely for the CAS Ratemaking and Product Management Seminar for discussing and understanding price optimization
- The document is incomplete without the accompanying discussion
- It is not intended nor necessarily suitable for any other purpose

Agenda

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Defining Price Optimization

Current Statement of Principles Regarding P&C Ratemaking

“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”

Mix of Business: Consideration should be given to **distributional changes** in deductibles, coverage limitations or **type of risks** that may affect the frequency or severity of claims.

Operational Changes: Consideration should be given to **operational changes** such as changes in the underwriting process, claim handling, case reserving and **marketing practices** that affect the **continuity of the experience**.

Actuarial Judgment: **Informed actuarial judgments** can be used effectively in ratemaking. Such judgments may be applied throughout the ratemaking process and should be documented and available for disclosure

Conceptually, price optimization works within this SOP:

“Selecting a price that deviates from cost-based indications”

Mix of Business: Demand models inform on the distributional impact a rate change can have on the book

Operational Changes: Demand models help guide where rate increases and decreases indicated by the cost models would most likely to affect continuity of experience

Actuarial Judgment: Optimization puts more rigor behind the judgment process and thus minimizes bias

Optimization in Ratemaking: Current US Practices

“The only two sorts of deviations from cost-based rates I have seen in rate filings are when a **very large increase or decrease in a class or territory is capped so that the increase/decrease is not too much of a shock to the buyers** or a **downward adjustment to the indication is requested by the filing insurer on a specific territory rate for competitive reasons.**”

CFA Comments on Towers Watson Presentation Regarding Price Optimization
http://www.naic.org/documents/committees_c_d_auto_insurance_study_group_140728_cfa_comments_towers_watson.pdf

- **Adjusting factors for competitive reasons:** Note the downward adjustment to a specific territory is normally offset by change in the base rate to achieve an overall revenue neutral effect. In this price optimization strategy the downward adjustment is paid for with upward adjustments from the base
- **Rate capping:**
 - Rate capping can come in the form of adjusting factors (i.e. parametrically) or capping the overall rate change (this is a price optimization methodology that is unrelated to the expected cost of risk transfer)
 - Who gets to define buyer shock – for low income insured a 2% increase could shock

Optimization in Ratemaking: US Regulation

- CA Sequential Analysis
 - Introduces predictors into the model in a sequential manner - this will create a path dependency based on the sequence.
 - Best practices in a multivariate framework is to simultaneously calculate the predictors.
 - Price optimization occurs because the procedure results in prices that deviate from the best practice estimate of the expected costs
- Price Optimization with other predictors
 - Banning Gender: Net effect is that female rates will increase and male rate will decrease.
 - Banning Credit: Rates on low credit policies will decrease and rates on high credit policies rates will increase
 - Preventing rate increases on 65+ drivers: In this price optimization the rates are below indication for senior market. This decrease puts upward pressure on the overall indication causing an overall increase throughout the remaining book
 - Limiting Coastal Risk Charges: For this price optimization, the full indication is not taken which creates subsidization

Modern approaches to price optimization help eliminate judgmental bias

“A process for adjusting prices away from a cost-based benchmark to better achieve business objectives”

Types of Optimization in Ratemaking

- **Ratebook Optimization** – using mathematical algorithms informed by cost and demand models to adjust factors in an existing structure
- **Individual Price Optimization** – a non parametric rate engine the builds a price based on the cost and demand for the product
- **Hybrid Optimization** – add a new rate factor based on the demand model
 - Is policy rate capping a new factor?
 - What if the new rate factor is correlated with losses?
 - At any rate the new factor has to be filed and approved



Providing Regulatory Support

How does the information provided to the regulator change?

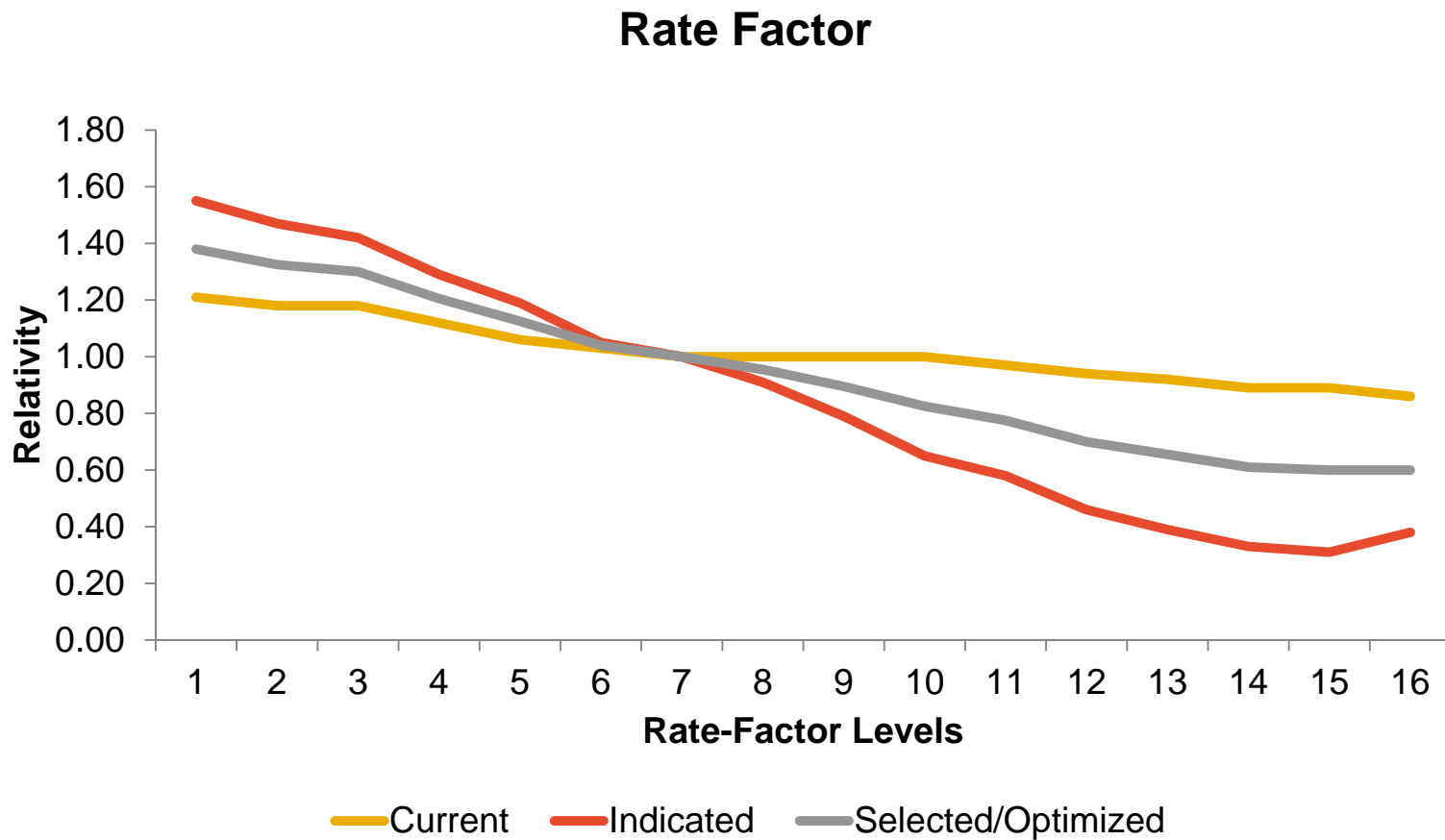
The regulatory process remains the same: “Rates should not be inadequate, excessive or unfairly discriminatory”

- Optimization is a tool that guides the selection
- Goal is to ensure selected price is in line with regulation

Selections can still be compared to indications

ILLUSTRATIVE

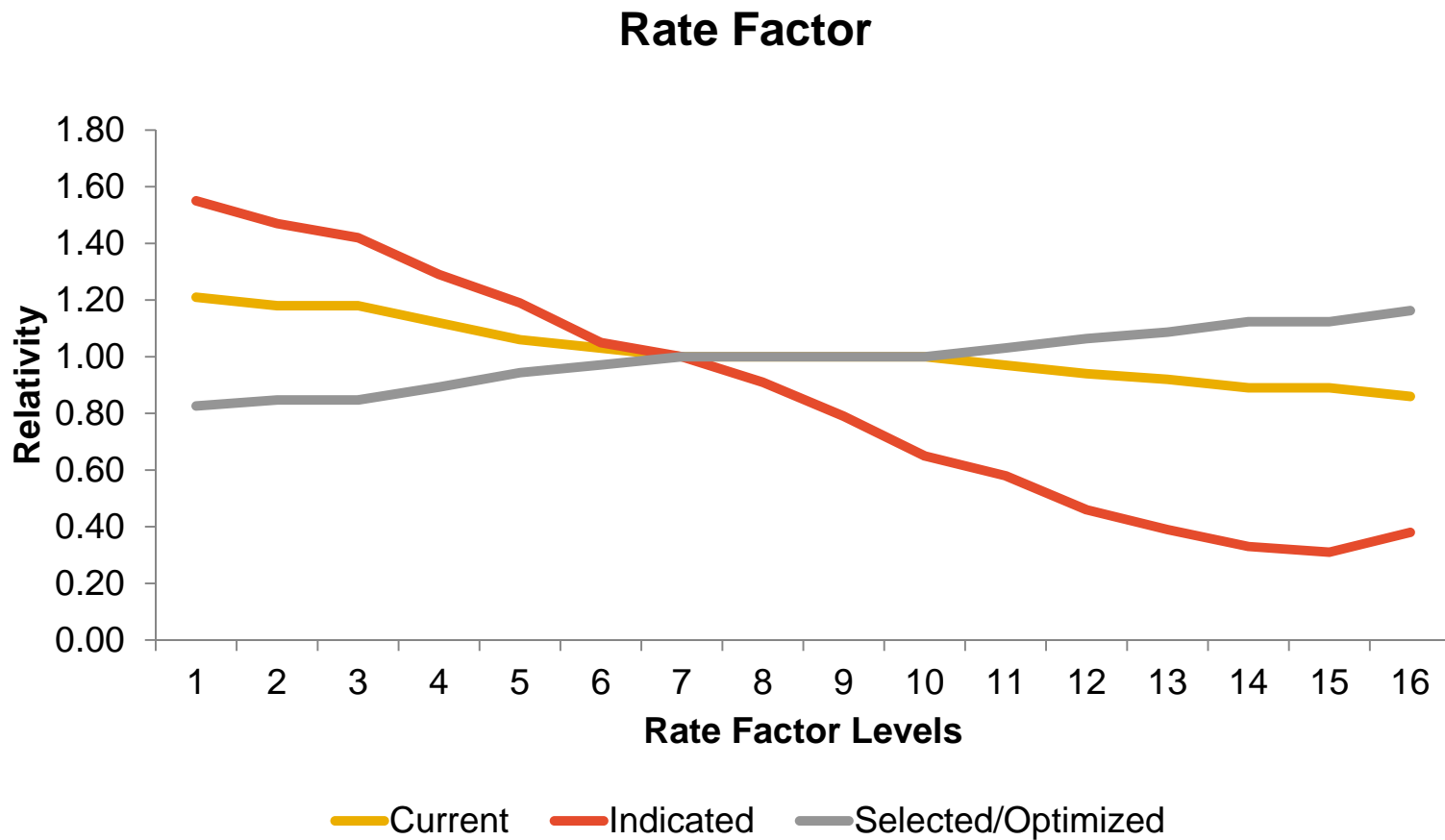
- This selection is likely to be acceptable



Is the selection in line with the indication?

ILLUSTRATIVE

- This selection is likely to be challenged

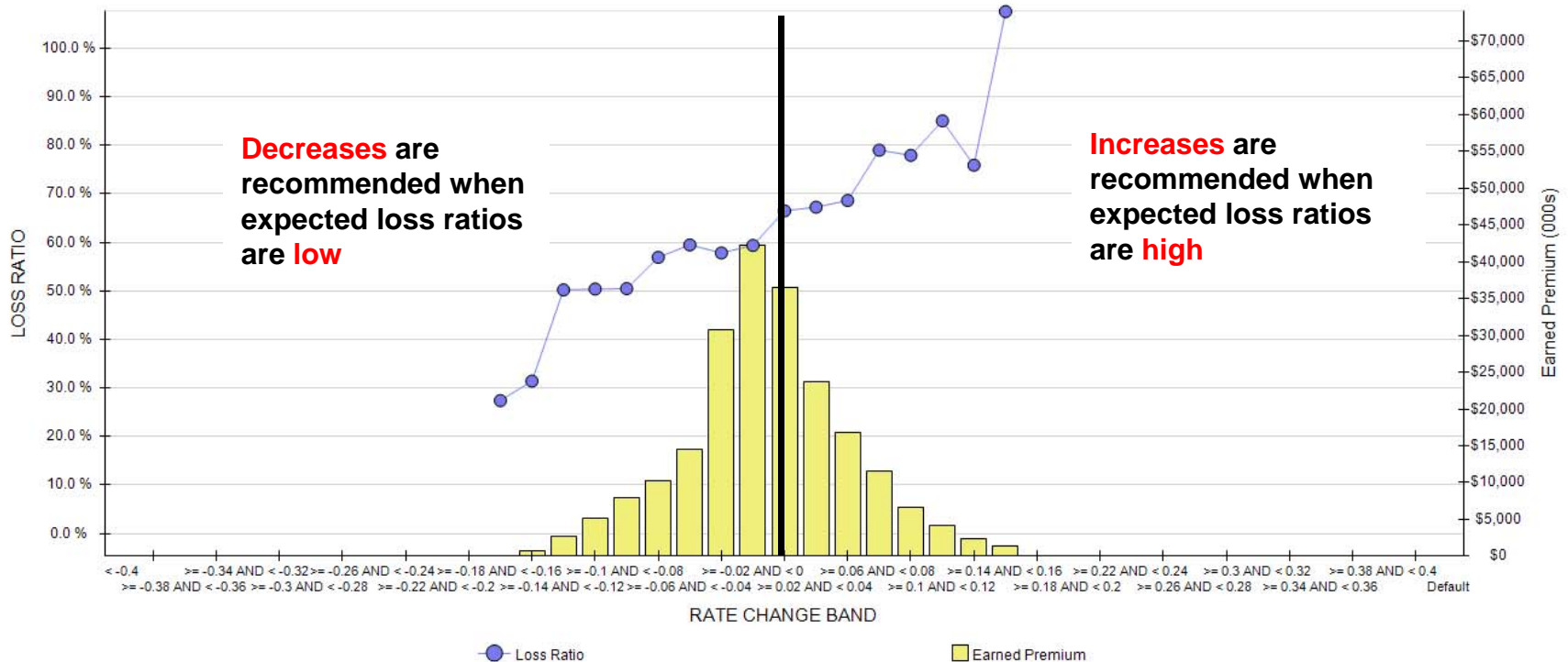


Complexity in risk models requires a more holistic view to understand impact from all selections

ILLUSTRATIVE

Goal is to gain insight on overall impact

- Compile the rate factor selections and compare dislocation to subsidization

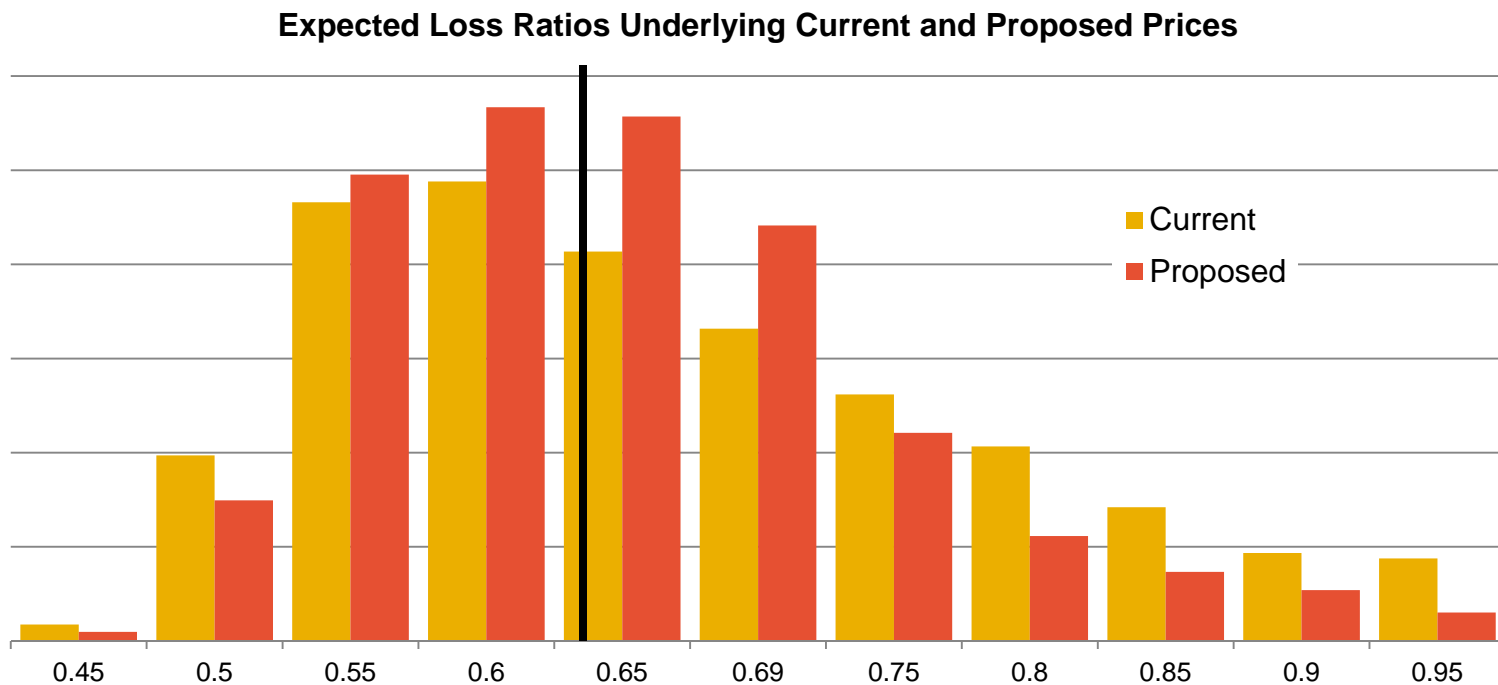


Complexity in risk models requires a more holistic view to understand impact from all selections...

ILLUSTRATIVE

Additional metrics can be used to assess performance

- By comparing to the cost model, the regulator can assess subsidization change



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Wrapping Up

Summary

- Historically, actuaries have made selections that deviate from indications and are not inadequate, excessive, or unfairly discriminatory, but this has been a judgmental process
- Price optimization is a scientific approach to rate selection, attempting to eliminate the bias in traditional judgment
- Regulatory support needs to continue to ensure that selections are actuarially justified

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