



# Casualty Actuarial Society Ratemaking and Product Management

## Price Optimization

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## Distribution and Use

- This presentation is intended solely for the 2018 CAS RPM Meeting 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

# 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

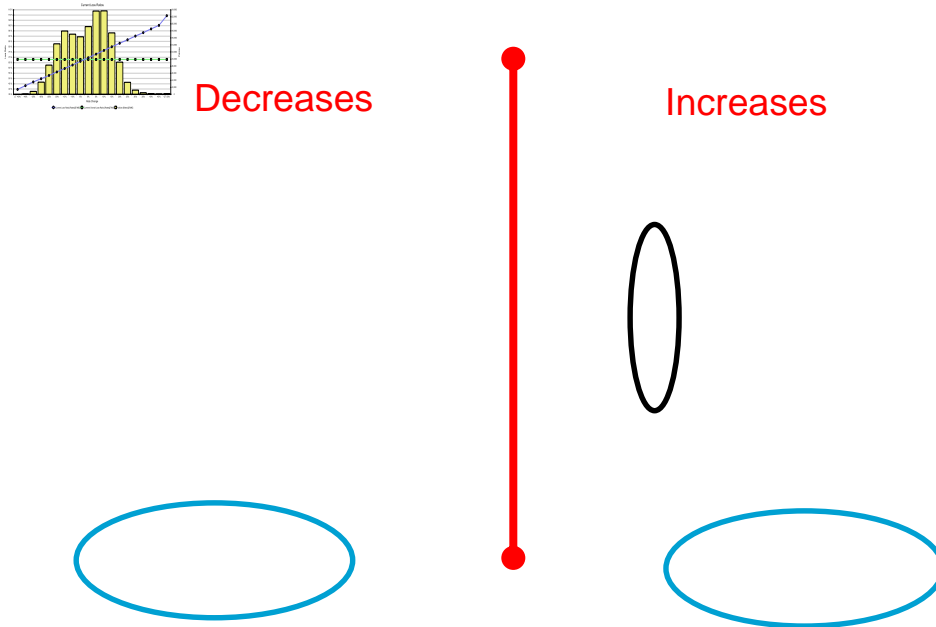
## Conceptually, Price Optimization works within this SOP

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

**“A process for suggesting adjustments to cost-based prices in order to better achieve business objectives”**

# Case Study: Rates based only on Expected Loss Costs

- The following scenario compares the current to the proposed rates where the proposed rates reflect the cost and expenses only
- The increases and decreases are perfectly correlated with the current loss ratio

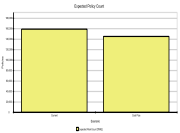


## ■ Notes

- Overall current expected loss ratio is 68%
- Proposal suggest rates should be increased by 10% for the 23K policies that have a current loss ratio of 77%
- 14.7K policies will see a rate increase of 20% or more and 27K policies will see a rate decrease of 20% or less

# Case Study: Rates based only on Expected Loss Costs

- Based on the demand model if the company moves to the cost based rate the retention is expected to drop from 90% to 82%



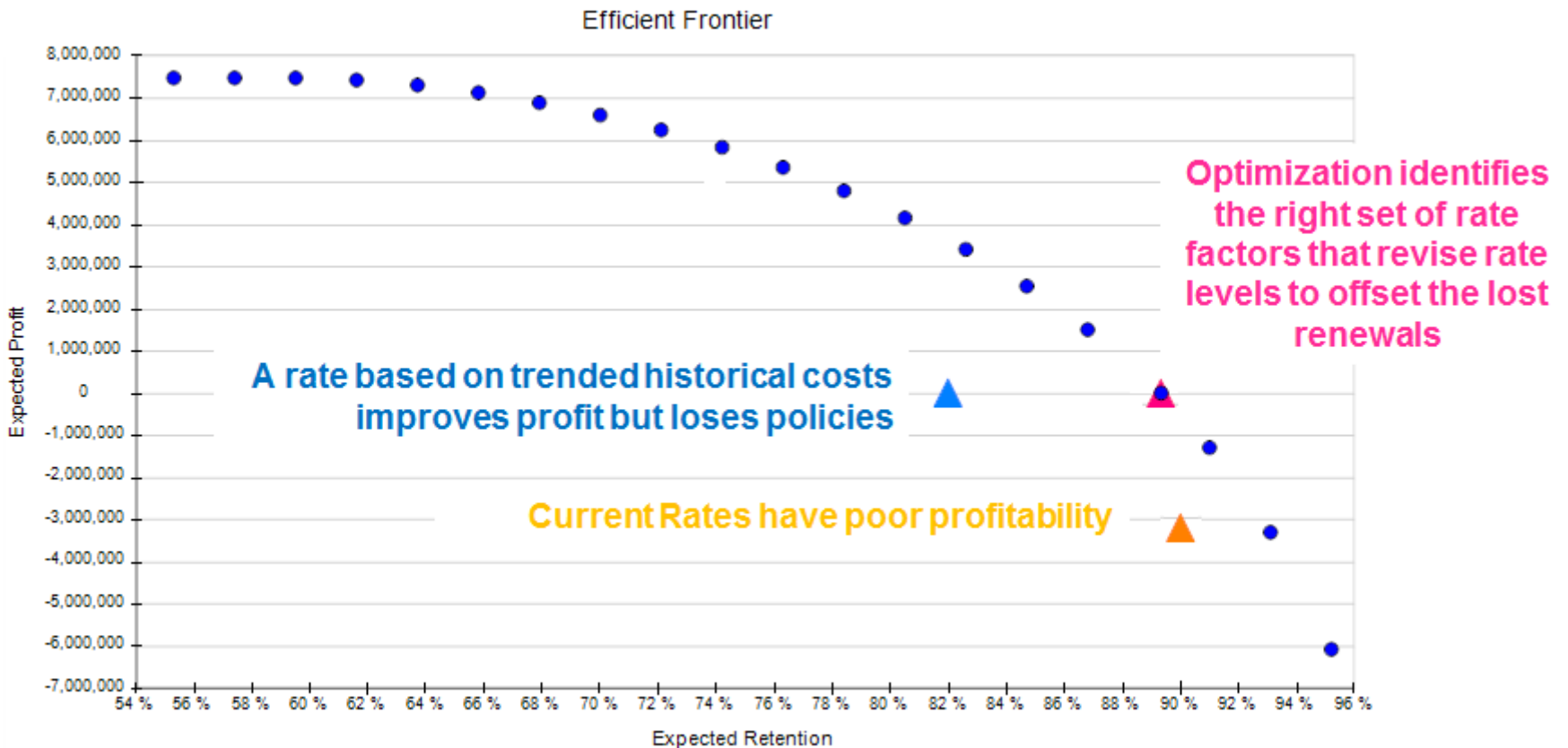
159,382

145,185

- Notes
  - Currently there are 159K policies
  - Moving to cost based rates will result in 145K policies
- How do we move to a more cost based solution and stabilize consumer's continuity of experience

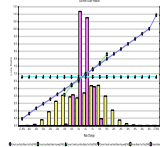
# Case Study: Rates based using Optimization Techniques

- Optimization can be used to mitigate the impact of a rate change



# Case Study: Comparing Optimized Rates to the Cost Based Rates

- Algorithms within optimization identify adjustments to the cost based relativities resulting in:

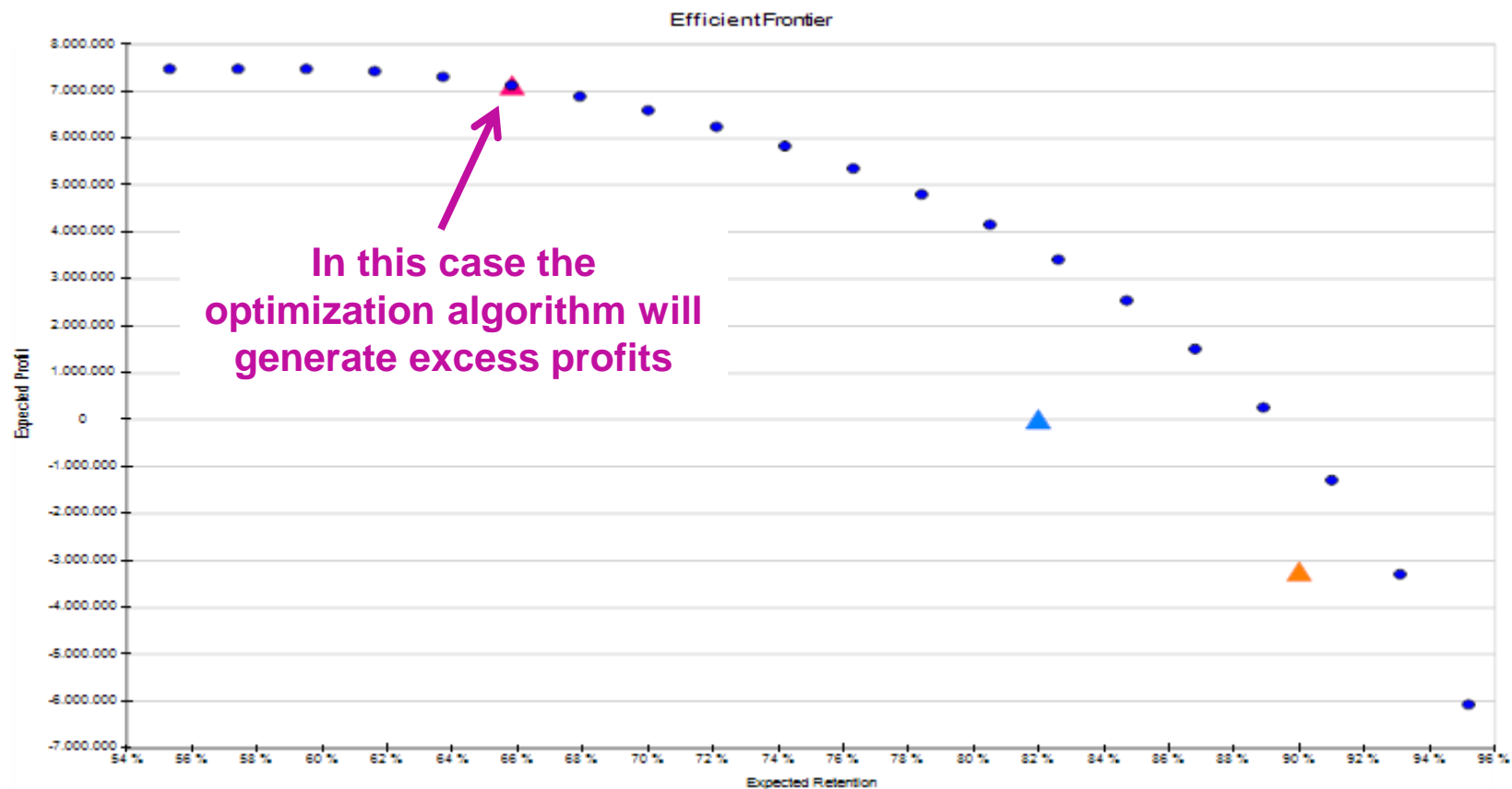


- **More modest rate changes**
  - **Rate increases and decreases are still correlated with loss ratio (but no longer perfectly correlated)**
- 
- And generates a positive impact:
    - Insurers can move toward the cost based indications and stabilize impact
    - Competitive positioning is explicitly recognized in the process



## Case Study: Rates based using Optimization Techniques

- Optimization selections can be made that violate actuarial principles



# 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
- There is nothing inherent in the use of price optimization methods that violates law. It is a tool that guides pricing decisions.
- Regulators will continue to assess whether filed rates comply with the law.

# Contact



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