INTRODUCTION TO PROPERTY AND CASUALTY INSURANCE PRICING
NON-INSURANCE PRICING

- Cost to manufacture
- Profit margin
- Competitive Position
- Mostly locked in before sale
INSURANCE PRICING

- Loss costs and expenses
- Target return
- Competitive Position
- Mostly unknown at sale
TOPICS

• Risk Classification
• Relativity Analysis
• Rate Level Indication
KEY IDEAS

• Retrospective Analysis
• Credibility
• Restating to Current
RISK CLASSIFICATION

• Unlike traditional products the cost of insurance can vary widely between insureds

• Pricing all policies at the same average rate would be unfair and lead to adverse selection

• Risk based pricing creates an incentive to sell insurance to all segments of the market
RISK CLASSIFICATION CONSIDERATIONS

- Operational
- Social
- Statistical
STATISTICAL

- Homogeneity
- Credibility
- Stability
OPERATIONAL

• Expense
• Constancy
• Availability
• Objective
• Manipulation
• Measurability
SOCIAL

• Affordability
• Public acceptability
• Causality
• Controllability
EXAMPLES

• Accident and violation history
• Coverage levels
• Vehicle information
• Territory
RELATIVITY ANALYSIS

• The next step is to price these classifications based on their relative risk
• The goal is to produce relativities that will lead to equitable performance for all segments
GENERALIZED LINEAR MODEL (GLM)

- Develop relativities for many rating variables simultaneously
- Incorporate interactions and correlations between classifications
- Allows for multiplicative model
- Models distributions other than normal
ONE-WAY ANALYSIS

- Classical analysis that focuses on a single rating variable at a time
- Lacks the statistical framework seen in GLMs
- Simple and effective method that can lead to bias and errors if not cautious
RATE LEVEL INDICATION

- How much premium in total needs to be collected to achieve the targeted rate of return?
PREMIUM

- Current level
- Trend
LOSSES

- Trend
- Develop
- Adjust
  - Smoothing
  - Large losses
OTHER CONSIDERATIONS

• Expenses
• Rate of return
• Complement of credibility
FURTHER READING

• Risk Classification Statement of Principles

• Basic Ratemaking
  • https://www.casact.org/library/studynotes/Werner_Modlin_Ratemaking.pdf

• Generalized Linear Models for Insurance Rating
QUESTIONS?