Describe price optimization.

Price optimization is the process of maximizing or minimizing a business metric (profitability, marketing, retention) using sophisticated tools and models to quantify business considerations.

Benefits of Price Optimization

Concerns of Price Optimization

Price optimization can limit policyholder disruption and improve rate stability. It also allows insurers in an analytical way to deal with what-if scenarios and have more precision rather than subjective judgment.

There are several concerns stated in the paper so two of the following: Prices may be unfairly discriminatory as same risk is charged different rate. Price optimization increases profits by raising premiums on people who are less likely to shop. Price optimization introduces a component to rate setting that is unrelated to expected losses or expenses. Consumer advocates argue that price optimization disfavors consumers with fewer market options, less market power, and less propensity to shop.

Compare and contrast price and rate.

Rate is an estimate of all future costs associated with an individual risk transfer. Price or Premium incorporates management decisions after taking into account other considerations such as underwriting, marketing, competition, law and claims. Using actuarial principles, an actuary will determine an indicated rate, but then the actuary incorporates the other considerations to select a charged price which may be equal or different.

Briefly describe unfairly discriminatory rates.

Unfair discrimination exists if, after allowing for practical limitations, price differentials fail to reflect equitably the differences in expected losses and expenses.

Examples of Unfairly Discriminatory Rates

- Insurer utilizes race in rating
- Insurer utilizes salary in rating
- Insurer charges separate prices for two identical risks

Traditional Ratemaking Approach vs. the Price Optimization Approach

Both traditional ratemaking and price optimization use a similar rating plan development where a base rate is multiplied by a set of adjustment factors. The adjustments are likely the same between traditional and price optimization as well. At this point, the approaches start to vary. Traditional ratemaking uses qualitative assessment to adjust for market and regulatory considerations whereas price optimization uses quantitative assessments in addition to qualitative. These assessments may be informed by risk-related and non-risk-related data. Finally, traditional ratemaking uses insurer judgment whereas price optimization uses modeling analysis.

Describe a concern that regulators have regarding filing disclosure for price optimization.

Price optimization may not be clearly disclosed. Also, price optimization may be used in a manner that is not directly part of a filed rating plan.

Explain why rates developed using price optimization could be unfairly discriminatory.

Critics have argued that price optimization is unfairly discriminatory since external, non-insurance databases are used to model consumer demand and predict the response of consumers to price changes. Price optimization increases profits by raising premiums on people who are less likely to shop. Some argue these people are also low-income consumers. Price optimization introduces a component to rate setting that is unrelated to expected losses or expenses. Drivers with the same risk profile may be charged different rates.

Two Reasons for the Rise in Price Optimization

1. The rise in big data

2. More sophisticated data mining tools has allowed more emphasis to be placed on objective and quantitative information for setting rates

Judgment in Traditional Ratemaking Compared to Price Optimization

In traditional ratemaking, insurer judgment was utilized but typically qualitative assessment or anecdotal evidence. In price optimization, the judgment is objective while relying on quantitative information and modeling. Price optimization is a tool and does not replace actuarial judgment in ratemaking. Judgment remains a separate and distinct exercise that is fully consistent and permitted by actuarial standards.

Briefly describe price elasticity of demand.

Price elasticity of demand measures the rate of response of quantity demanded due to a price change.

Briefly describe the relationship between price elasticity and insured sensitivity to price.

The higher the price elasticity, the more sensitive to price.

Describe rate transition rules.

Rate transition rules provide stability to the insurer's book of business when large premium changes are possible. For example, an insured's premium may only change by +10% per renewal even though the indicated increase is +25%. The insured will transition to the indicated premium over several renewals.

One Benefit of Rate Transition Rules to the Insurer

One Benefit of Rate Transition Rules to the Insured

Insurer – Rate transition can improve retention as price change is a primary driver of insurance cancellation.

Insured – The insured benefits from a lower premium.

Three Types of Price Optimization

1. **Ratebook Optimization**: Use cost and demand models to adjust factors in an existing structure to achieve business goals. Insurers engaging in this optimization will not charge different premiums to consumers with same risk profile.

2. **Individual Price Optimization**: Non-parametric rate engine to build a price based on costs and demand at the individual policy level

3. **Hybrid Optimization**: Create a new rate factor based on demand model that overlays the cost-based rate algorithm. The new factor allows an insurer to achieve its business goals while it may or may not be correlated with costs

Identify two differences between traditional ratemaking and price optimized ratemaking.

1. Market demand and customer behavior are quantified in optimization instead of subjectively determined

2. The effect of deviation from cost-based rate on business metrics is mathematically measured with optimization

Identify four disclosures that would increase transparency for filing requirements.

1. Disclosure of whether price optimization and/or customer demand is used

2. Disclosure of differences in proposed prices for the insurer's existing and new customers with the same risk profile

3. Disclosure of all data sources, models, and risk classifications

4. Disclosure of which rating factor(s) are affected by price optimization

Regulatory Responses for Addressing Price Optimization

- Determine which price optimization practices are allowed
- Define any constraints on the price optimization process and outcomes
- Develop regulatory guidance on the meaning of statutory rate requirements so that rates are not excessive, inadequate, or unfairly discriminatory
- Enhance filing requirements using a specific definition of actuarial indication
- Require specific explanation or reasoning to support any proposed or selected rate that deviates from the actuarially indicated rate
- Change filing requirements to require more transparency

Benefit for Consumers of Price Optimization

Rate Stability

Three Consumer Segments that Price Optimization Disfavors

1. Consumers that do not shop
2. Consumers with fewer market options
3. Consumers with less market power

Two Regulatory Constraints to Price Optimization

1. Limit the selected rate to be between the current and indicated while always moving in direction of indicated

2. Optimization can only be applied to larger class sizes, since price optimization on small class sizes could be applied at individual level

Benefit to Regulators of Increased Transparency in a Rate Filing

Drawback of Increased Transparency in a Rate Filing for an Insurer

The rate filing can be fully evaluated under the laws and statutes of its state. Increased transparency also creates consistency across insurers to protect consumers and insurer solvency.

Insurers want to protect competitive advantages and innovative analytical work.

Identify one concern of price optimization that can occur with rate transition.

Through rate transition rules, two identical risks may be charged different premiums.

Identify three considerations from a regulatory perspective when reviewing rate transition rules.

1. Length of time to reach approved level
2. Size of upper and lower cap
3. Extent that capping one rate affects others

Identify four practices that should be followed for rate development.

1. From sound actuarial analysis
2. Be Cost-Based
3. Comply with state laws
4. Be consistent with ASOPs from ASB

Identify three solutions for a regulator to improve communication and review of price optimization.

1. Issue a bulletin to address insurers' use of methods that may result in non-cost based rates

2. Enhance requirements for personal lines rate filings to improve disclosure and transparency

3. Analyze models used by insurers in ratemaking to ensure the model adheres to state law and actuarial principles

Define “commutation.”

An agreement between a ceding insurer and the reinsurer that provides for the valuation, payment, and complete discharge of all obligations between the parties under a particular reinsurance contract.

Provide four reasons commutations arise.

1) The cedant or reinsurer wishes to exit a line of business

2) The cedant or reinsurer may have concerns about one another's solvency

3) The relationship between the cedant and reinsurer may have deteriorated over time due to disputes over claim resolution or contract provisions

4) The cedant and reinsurer may have drastically different views concerning loss development for the underlying policies

Commutations may arise due to a cedant's concern about a reinsurer's solvency. In this case, briefly explain why a commutation might be beneficial for the cedant.

The commutation eliminates credit risk to the cedant since financial health is no longer tied to reinsurer.

Commutations may arise due to a reinsurer's concern about a cedant's solvency. In this case, briefly explain why a commutation might be beneficial for the cedant AND the reinsurer.

Beneficial for the **cedant** because it provides the cedant with an immediate cash in-lay. Beneficial for the **reinsurer** because it allows the reinsurer to avoid potential future problems with a liquidator who may take over the cedant.

Briefly explain why a commutation distorts claim closure rates for a reinsurer.

The commutated claims are considered closed from a reinsurer's standpoint.

Identify three activities in which actuaries must consider distortions to loss/claim triangles caused by commutations.

1) Calculating loss development factors

2) Assessing reserve adequacy

3) Using Schedule P to review claim severity or closure trends

Fully describe the disclosures required by the primary insurer for a commutation.

Commutations must be disclosed in the Notes to the Financial Statements. This disclosure must include the following:

- List of reinsurers
- Amount of loss, LAE, and earned premium commuted from each of the reinsurers to cedant during the year

The disclosure must be in aggregate (i.e. not broken down by AY/PY or line of business).

Provide one reason why the discount factors might differ between the primary insurer and the reinsurer in a commutation.

Applied different payment patterns

Other than differences in discount factors, provide one reason why the absolute tax amounts may differ between the primary insurer and the reinsurer in a commutation.

Differences in reserve amounts. For instance, the reinsurer may place additional reserves on top of the primary insurer's reserves.

Provide the formulas for the following primary insurer quantities AFTER a commutation occurs:

- Gross Ultimate Losses
- Ceded Ultimate Losses
- Net Ultimate Losses

- Gross Ultimate Losses = Gross Paid Losses + Gross Reserves (no impact from commutation here)

- Ceded Ultimate Losses = Ceded Paid Losses (before comm.) + Ceded Reserves (before comm.) + Comm. Effect on Paid Losses (i.e. the comm. Price, which is a positive number) + Comm. Effect on Reserves (a negative number since ceded reserves go to zero)

- Net Ultimate Losses = Gross Ultimate Losses – Ceded Ultimate Losses (after comm.)

Provide the taxable income change for the primary insurer and the reinsurer due to a commutation.

- Primary: Taxable income change of **[commutation price – (increase in reserves) x (primary insurer discount factor)]**

- Reinsurer: Taxable income change of **[(decrease in reserves) x (reinsurer discount rate) – commutation price]**