What is Price Optimisation?

The process of setting prices to maximise a pre-defined measure of customer value subject to a company’s strategic and business objectives.
**The Price Optimisation equation**

![Diagram of the Price Optimisation equation with Price, Demand, Competitor Prices, and Profit models.]

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**Agenda**

- Brief intro to Price Optimisation
- Walk-through of a real-life project
- Wrap-up & discussion

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**Optimisation Project focused on better management of the renewal portfolio**

**Context**

- The company was providing quotes for renewal considering only profitability, past claims experience and previous premium.
- The market entered a price war.

**Objectives**

- Improve the renewal process.
- Forecast the impact of different strategies on profitability and premium volume.
- Maximise retention and expected profit.

**Steps**

- An analysis of claims (GLM model) and expenses was previously performed.
- The steps were the following:
  1. Agree to objectives and constraints
  2. Gap analysis
  3. Competitive Market Analysis
  4. Renewal analysis
  5. Measure and model customer price elasticity
  6. Optimisation
  7. Implementation

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Agree to objectives and constraints  
Step 1

- Initial project workshop to further understand the company’s strategy and financial objectives for the Price Optimisation process.
- Establish:
  - Maximisation/minimisation function: Maximise expected profits
  - Time horizon (One year)
  - Business constraints:
    - Global (Target retention rate: 85.0%)
    - Individual (based on individual policy profiles):
      - Number of claims in the previous years (0, 1, 2, >2)
      - Tenure (< 4 years, >= 4 years)
      - Historical loss ratio (<45%, >= 45%)

Gap analysis  
Step 2

- Understand how much of the information and analysis is already available through previous work.
- Use existing company pure pricing models based on expected cost of claims as an input to the Optimisation process. This is a fundamental part of the process and will have a significant impact on profitability.
- Understand the current rating structure and what enhancements and additional flexibility might be required to meet the objectives.

Competitive Market Analysis (CMA)  
Step 3

- CMA is a fundamental part of an insurance company’s pricing management processes and a key input into the Price Optimisation process:
  - Understand the positioning of the company’s rates in the market at any point in time.
  - Help identify segments where the company’s prices are comparatively cheap/expensive relative to the market.
  - Understand the intensity of competition in each segment.
  - Understand the scope for price changes and what impact such changes would have on market positioning.
  - Key input into later steps.
Renewal analysis

- **What is it?**
  - The renewal rate is defined as a customer (who has been offered renewal) staying with the company 12 weeks after expiring date.

- **How is it used?**
  - Assess how variable the renewal rate is across the portfolio and identify segments of the business that have higher/lower than average rates.
  - Combine with the CMA to assess how good a predictor the competitiveness measure is of retention - by customer segment and over time.
  - Provide initial insight into customer elasticity e.g. what happened to retention rates when previous price changes were implemented.
  - Assess how retention rate varies as a function of price change at renewal.
  - Data used for the statistical estimation of customer renewal demand:
    - All car policies renewed between May 2007 and July 2007.

**Price Variation vs. Competitiveness position**

**Customer price elasticity**

**Summary of models**

Note: In Europe, agencies are given discretionary “budget” to offer discounts to insureds – sometimes referred to as “commercial discounts.”
Customer price elasticity
Possible explanatory variables

**Policy characteristics**
- % change premium
- Renewal month
- Discounts
- Coverage
- Actual premium
- Absolute change in premium
- Amount of difference with market
- Percent of difference with market
- Number years policy held
- Number years client in company
- Bonus/malus TPL

**Risk characteristics (Driver)**
- Driver's age
- Driver's gender
- Driver's license age
- Driver's occupation
- Additional driver presence
- Additional driver's age
- Additional driver's license age

**Risk characteristics (Vehicle)**
- Type of vehicle
- Age of vehicle
- Usage
- Value

**Others**
- Payment type
- Payment term
- Distribution channel
- Cross sell
- Amount of agency-determined discounts
- Broker classification

Customer price elasticity
Elasticity base profile

**Illustrative example**

Step 5

<table>
<thead>
<tr>
<th>Variables</th>
<th>Base Profile</th>
<th>Statistics Range</th>
<th>Explaining Capacity</th>
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<td>Premium offered</td>
<td>400-600 €</td>
<td>0.35 - 2.15</td>
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<td>0-100 €</td>
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<td>8.4%</td>
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Customer price elasticity
Results – Elasticity curve

Illustrative example
**Optimisation**

- This step involves combining the cost models (claims and expenses) with the customer price elasticity models derived in previous steps in order to determine the optimal profit loading by customer type.
- The optimal price will be the one that satisfies the company’s objectives and constraints maximising profitability subject to a certain volume of business.

**Optimisation: Individual constraints**

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<tr>
<th>Number Of claims</th>
<th>Tenure</th>
<th>Loss Ratio</th>
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<th>Maximum Limit</th>
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<td>-3.00%</td>
<td>5.00%</td>
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<tr>
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<td>-2.50%</td>
<td>5.50%</td>
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<td>&gt;2</td>
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<td>5.00%</td>
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<td>5.50%</td>
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<td>25.00%</td>
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</table>
Alternative Strategies: Efficient Frontier

Efficient Frontier

Expected Profit (Million €)
Retention Rate (%)

Company Strategy
Strategy 1
Strategy 2
Strategy 3

Step 6

Illustrative example

Alternative Strategies: Results

Retention Rate  Average Premium  Expected Profit  Average Discount

Actual  85.0%  417  50.9  4.6
Strategy 1  85.0%  420  54.6  4.3
Strategy 2  85.7%  414  50.5  4.1
Strategy 3  86.5%  407  42.8  3.5

Policy Renewal Volume  Premium  Expected Profit  Volume Discount

Actual  86.596  36.082  4.411  345
Strategy 1  86.584  36.336  4.724  376
Strategy 2  87.329  36.195  4.409  355
Strategy 3  88.161  35.850  3.776  311

* Thousand €

Optimisation

Strategy 1: Maintain Retention/Increase Profits

Comparison of company and optimised pricing schemes

Price Strategy Comparison
Optimisation
Strategy 1: Maintain Retention/Increase Profits

- Comparison of company and optimised pricing schemes

![Graph showing comparison of company and optimised pricing schemes]

Implementation

- Optimised rates can be implemented in different ways:
  a) An algorithm that calculates the optimised price per individual customer based on their particular rating attributes. The algorithm can be built into the rating structure and operate in real-time
  b) A set of optimised premium rates that would fit into a tabular rating structure

Given the IT investment, lead time, and other operational considerations that need to be made for option (a), our current recommended approach for the company is (b)

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Summary

Price Optimisation is......

- A process by which insurers can improve profitability
- Getting to know your customers and your market better
- Integrating this knowledge with risk models
- A dynamic process
- Happening now!