



# Optimization for the US Market

Introduction and Fundamentals

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11 March 2009



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# Agenda

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- Departure from cost-based pricing
- Data
- Operational Concerns
- Product development and product management implications
- Marketplace considerations



# Departure from cost-based pricing

## Departure from cost-based pricing

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- From a professional actuarial perspective, there is the 'crisis of faith'. How do we address this and overcome it?
- It could add significantly to profitability which would ultimately lead to lower rates for the most elastic and price conscious consumers.
- Likely the consumers who most need insurance at lower rates.
- Hardly ever go strictly to the indication.
- Allows you to systematically choose the best rate.

## Departure from cost-based pricing

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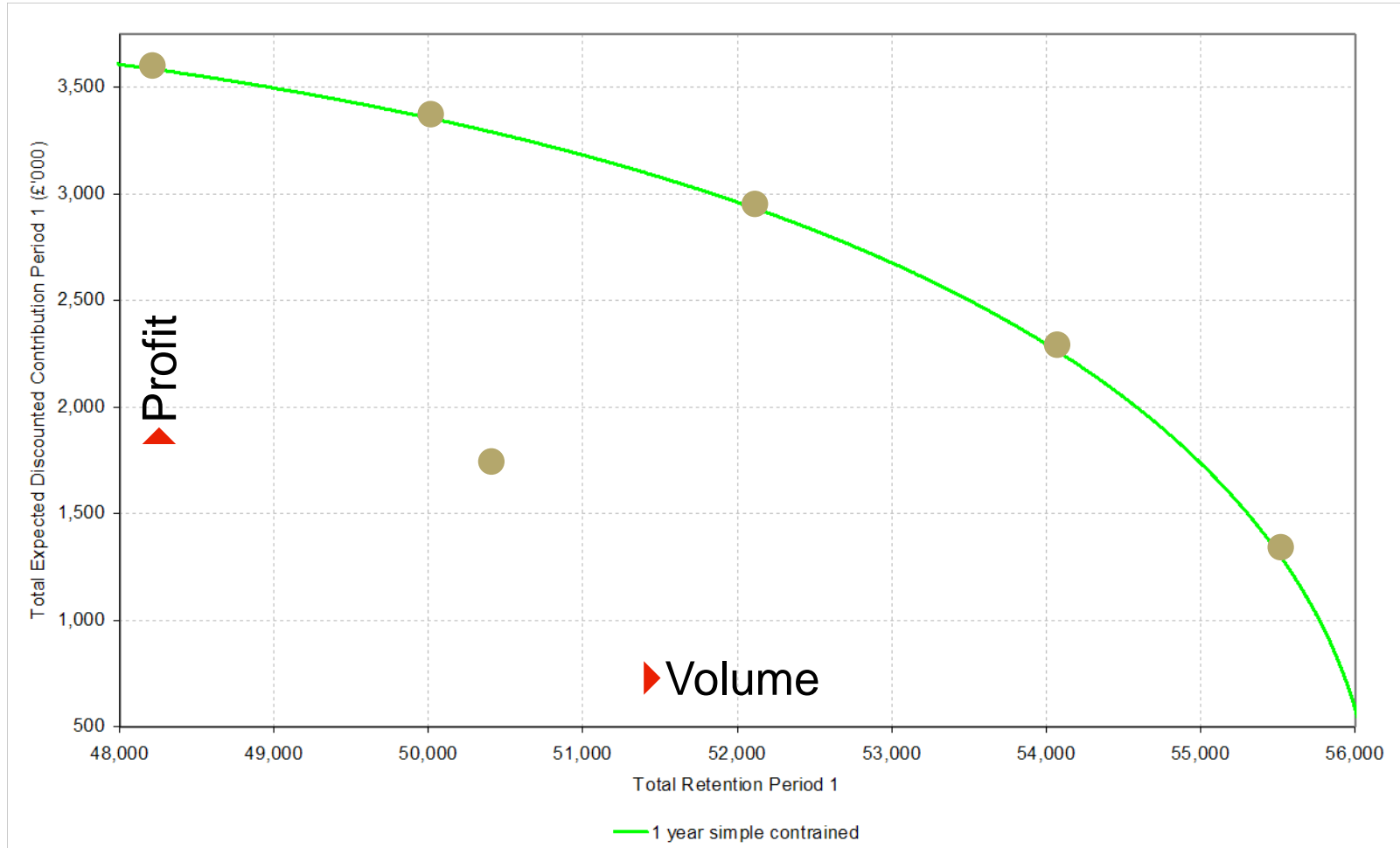
- Potential to raise the regulatory profile
- A well designed program will provide a systematic means to select rates within the confidence interval of expected costs.
- This is both actuarially sound and will be acceptable to the majority of regulators.
- Supportable adequate rates. The issue with price optimization, rate level is sometimes a political issue.
- Should make more consumers happy with their rate and reduce complaints.
- Use rate observation from competition.

## Departure from cost-based pricing

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- Can price optimization be dangerous when used on inadequate or unsophisticated risk models?
- The validity of the risk models is critical to successful price optimization. A price optimization model by definition will take advantage of inadequate prices and sell a ton to subsidized risks.
- Need to be very involved in the algorithm and understand it because you need to choose the outcome that fulfills your corporate objectives and you choose the correct placement on the efficient frontier.

# One year efficient frontier





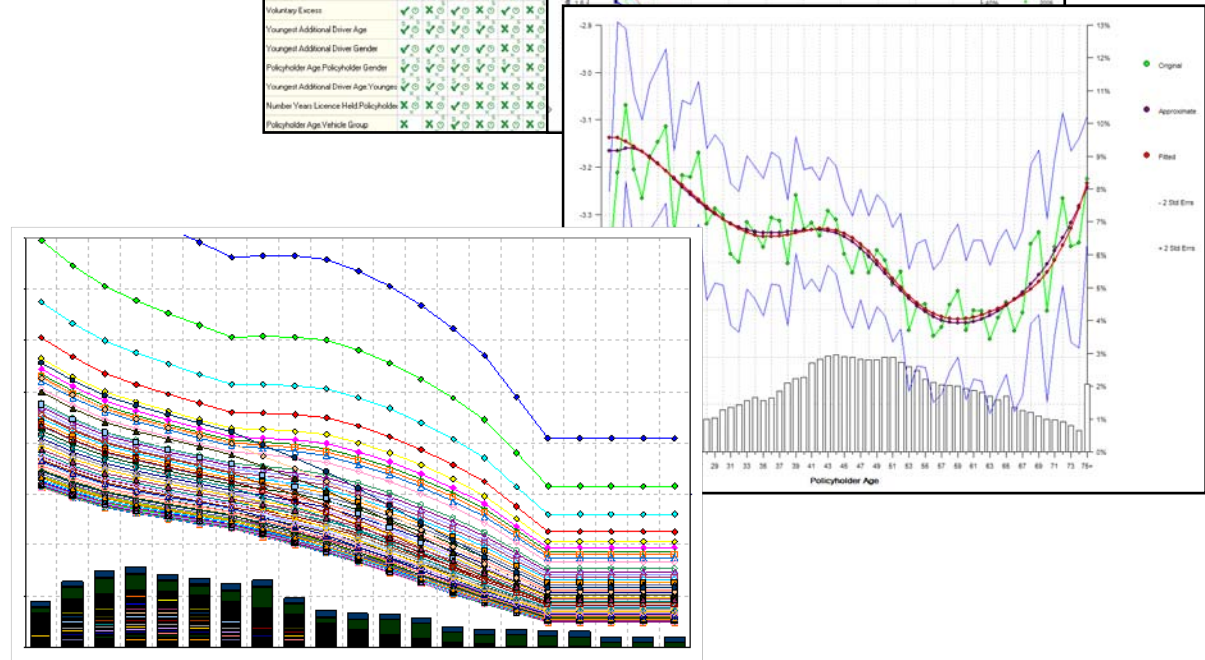
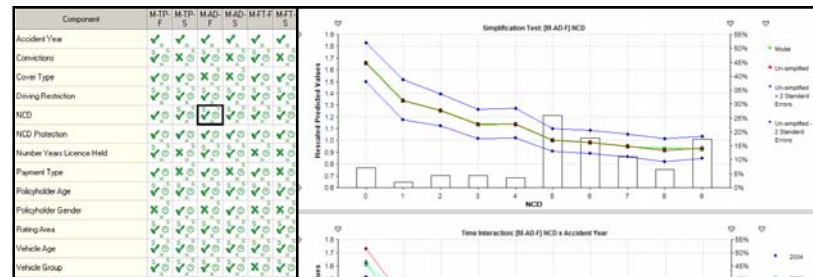
## Departure from cost-based pricing

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- Is it even worth the trouble on subjects that are not highly segmented (legacy and runoff portfolios)?
- There is considerable opportunity in legacy books to optimize the retention.
- Optimization will provide a plan for rate revisions in the most profitable books to insure maximum retention of the highly profitable risks.
- Maximize the lifetime value of the asset.
- Important to have practical optimization approach which pays due regard to long term value.

# Risk premium models

- GLM global industry standard; just using them is not enough - need to be used
  - with increased data
  - and high degree of sophistication
  - coupled with practical experience
- E.g...
  - multiple interactions
  - factor simplification
  - curve fitting within GLM framework
  - model validation
  - Classification
    - Zip codes
    - vehicle make/models



# Data

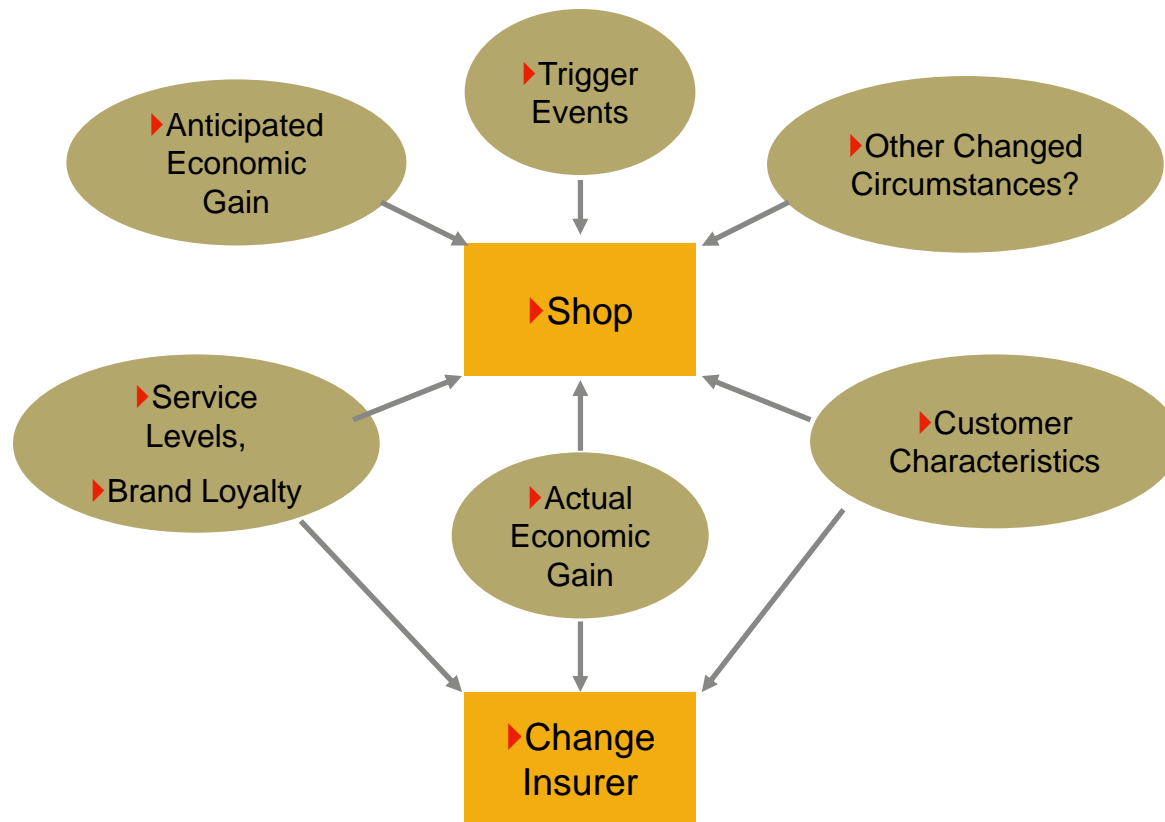
- Quote data and its importance— what if it is unavailable or inadequate in terms of detail?
- This is much easier to obtain for direct writers, but agency companies can also obtain this for sample risks or in some cases, for large blocks of business.
- If a company uses a server based quoting system, this is very easy.
- Companies that use aggregators face some of the most difficult challenges.
- Because the conversion data is binary, it takes less data than it would to build a loss cost model.

- How granular does the data have to be?
- The more granular, the better.
- However, even modest levels of conversion and retention data can provide a better plan for implementing price changes than simple gut feelings, intuition, and guessing.
- Many non-price variables influence elasticity.

# Which factors drive customer buying behaviors?

## Recognizing the human decision-making process

▶ Renewals - a two-stage decision-making process



- Accurate competitor rates are difficult to come by.
- Important to know your market competitiveness.
- This can be a lot of work. Internal library, comparative raters, etc.

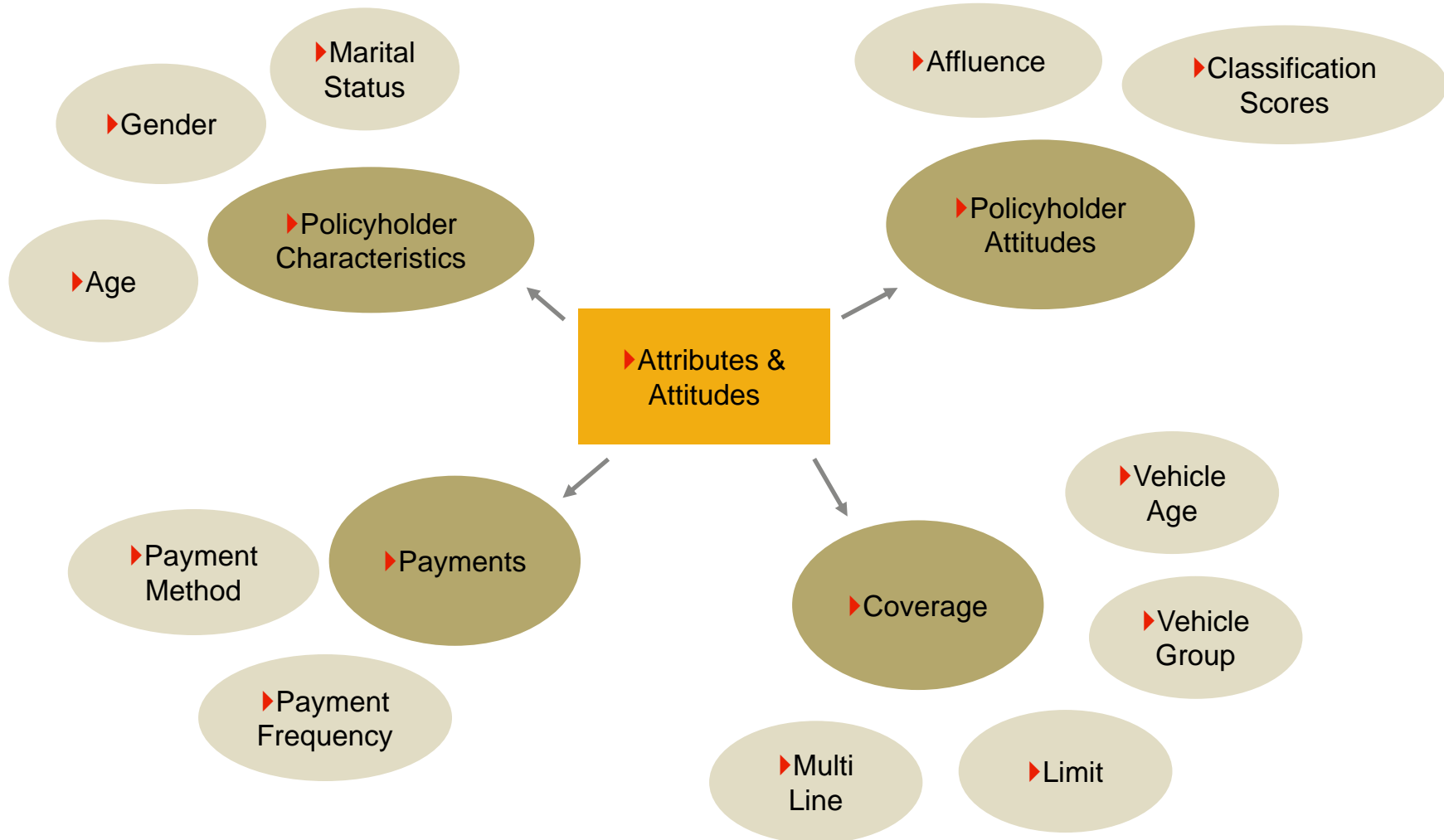
- Credibility concerns – how does one make a good call in a smaller state?
  
- It is still necessary to implement rate changes.
  
- Because conversion and retention decisions are strictly binary, yes or no decisions without severity components, lesser amounts of data are still sufficient for decision making.
  
- Doing nothing is not an option.



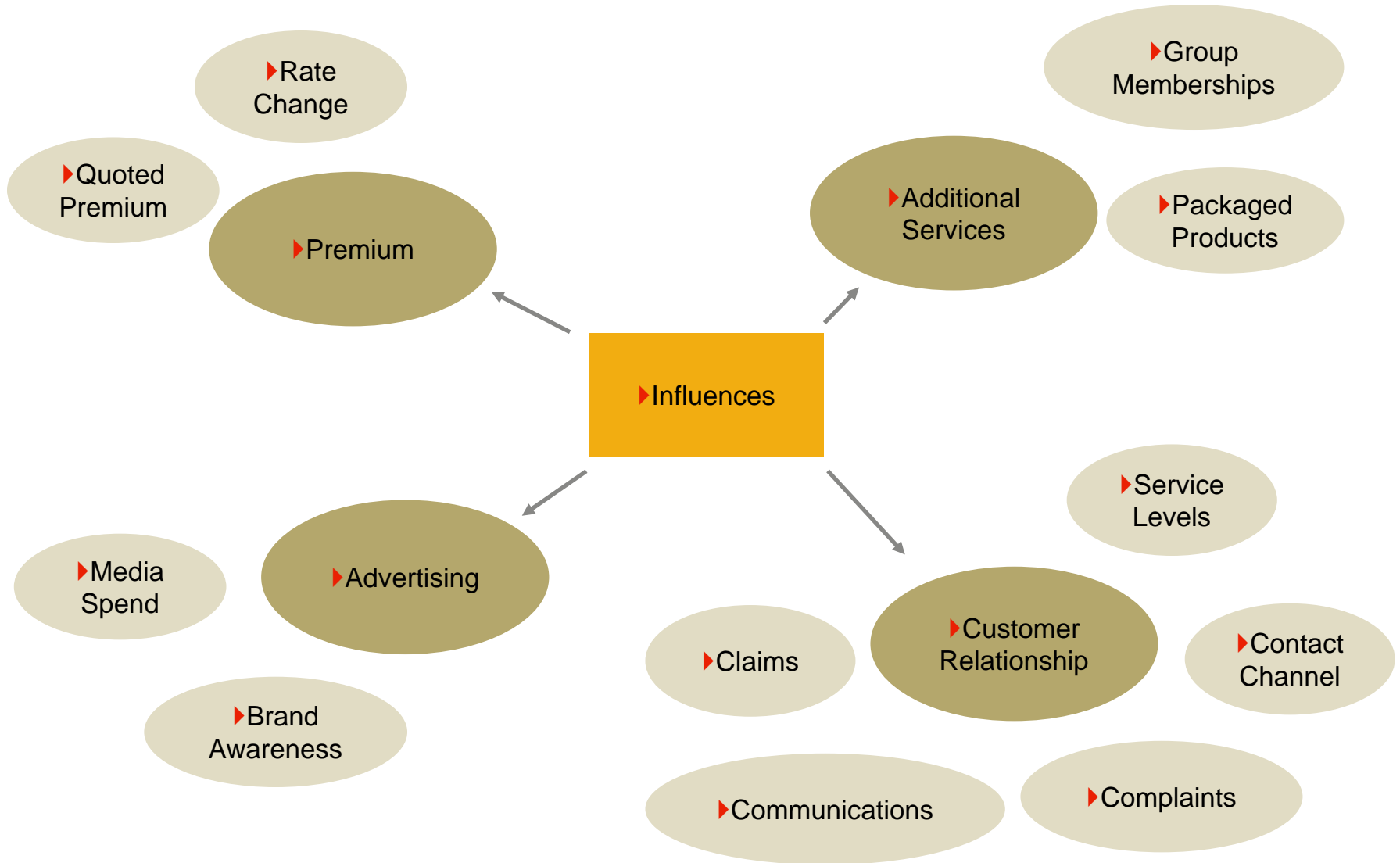
- Having deployed, how does one create price perturbation in the data to measure elasticity more precisely?
- Vary the rate within a territory or symbol grouping, class factors.
- Small changes in rate occur frequently.
- Interactions like class, point, and tier.

- Demand model refinement – the list of potentially valuable data elements is vast. How does one organize an analytical plan around countless hypotheses?
- The element must be currently captured or available for capture at a reasonable cost.
- Once available, what differences in retention appear? This is likely to indicate a variation in elasticity.
- A good retention analysis of customer profiles and behaviors is essential.
- A good modeling strategy. A loss cost model may start with over 300 variables.
- Agent attributes, billing variables, external demographics and psychographics not used in rating.

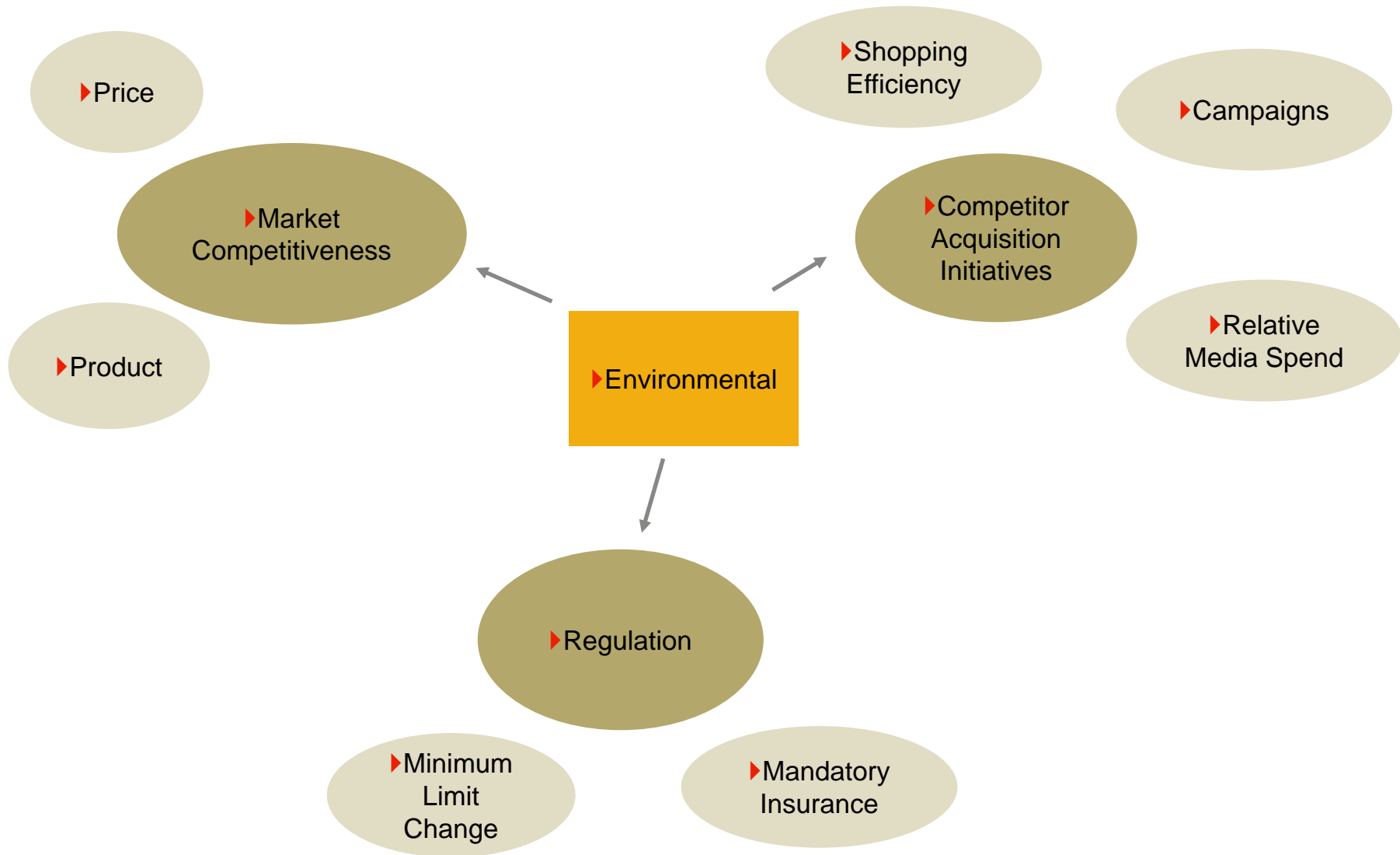
# Customer characteristics



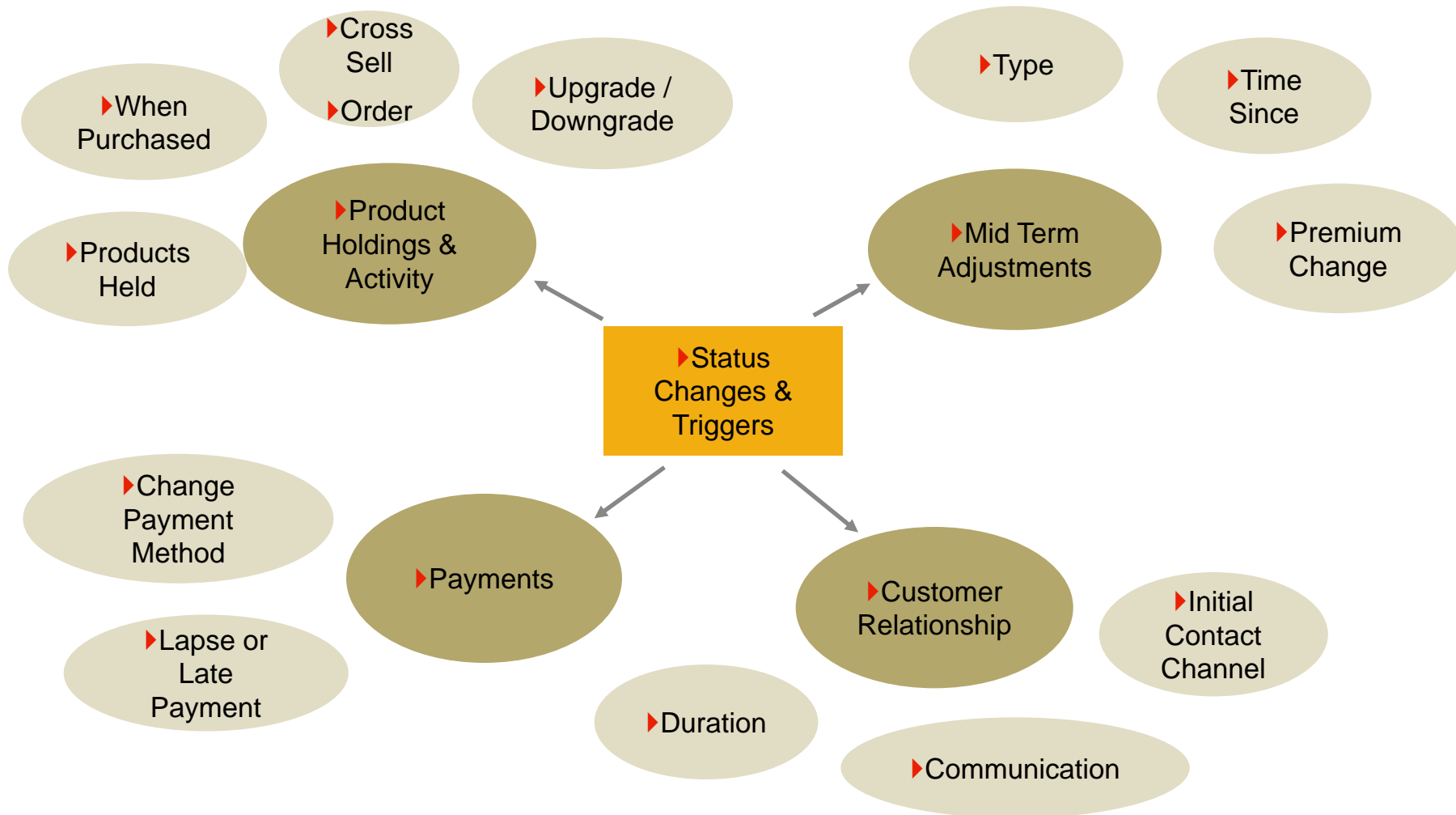
# Company triggered changes



# External influences

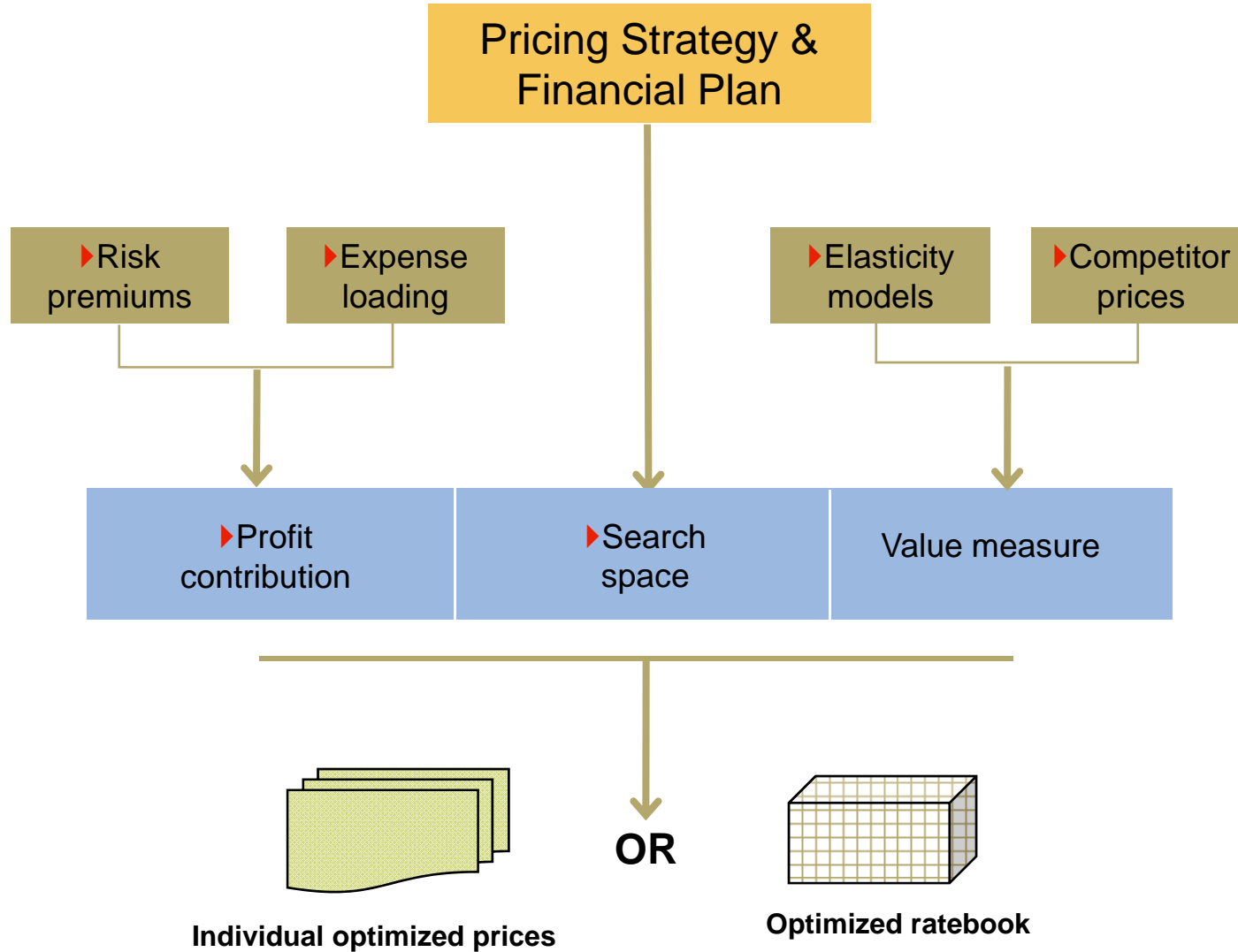


# Customer triggered changes



# Operational Concerns

# Price optimization





# Operational Concerns

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- It's more than software. It's a process. Who owns it?
- If the process is implemented using assistance of an outside vendor, the ideal situation provides ownership and control of the ongoing process to the implementing company.
- A good process map for inside the company implementation is important.
- Define who owns the analysis and decision making.
- Business process architecture for applying the principles to the pricing outcomes.

## Operational Concerns

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- Among the important goals – avoid complication of the business process.
- An optimization process, once implemented, should not add substantially to the normal rate revision process.
- Speed to market and flexibility of rate action are competitive advantages that should not be compromised.
- UK companies largely employ optimization and change rates monthly.

# Operational Concerns

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- Integration – How does it fit within/without/alongside the rate revision process?
- Optimization should flow with the rate revision process.
- Needs to be robust to be a part of the production environment.
- Need a sound phased approach to implementation.

# Operational Concerns

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- Functional handoffs – potential for compromised quality.
- One person in pricing can be trained to handle all phases of optimization; loss cost, elasticity, and optimization model.
- Alternately, model in a research area and have pricing iterate around selected constraints.

# Product development and product management implications

- Consistency with enterprise strategy – output may suggest something contrary or otherwise inconsistent.
- Valid point because optimization may bring the enterprise strategy into question.
- At the very least, it provides new information and an analytic framework for reviewing the potential cost and outcome of specific strategies.
- Some compromises may be necessary, but important constraints should be in your optimization model.
- Systemize the factor selection process in face of alternative financial goals and constraints.
- Places decision making in hands of business unit managers with a process for factor selection.

- Influence on product development and evolution – changes implied to risk and/or operational models
- Because of the knowledge gained regarding elasticity, easier to judge the potential growth alternatives and build accurate models of the operational needs to staff effectively for marketing decisions.
- This can both improve profitability through tighter controls on expenses and ensure better customer satisfaction through adequate staffing.
- You may choose to write more or less elastic business.
- Quantify the likely mix changes and help you prepare.

# Marketplace considerations



## Marketplace considerations

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- What happens to the benefits of price optimization when a majority of the market is using it to some degree?
- What is the cost to an organization that isn't using price optimization when most of the industry is? They will potentially have high profitability with a shrinking market share.
- The better you know your customers, the better you'll be able to service them.
- A better understanding of non-price elastic variables provides a rich field for testing additional programs to improve retention.

## Marketplace considerations

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- Sensitivity to changes in consumer behavior. Segments of the market have changed their behavior in response to shopping messages. How can one compensate or account for these ‘moving targets’?
- A good optimization strategy must take into account variables besides price.
- Many non-price variables are very important to an accurate elasticity model.
- Using relatively brief periods of quoting and do it frequently to understand the macro and micro forces.

## Marketplace considerations

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- Sensitivity to changes in broad market and economic conditions – will elasticity behave in a consistently relative fashion or will behaviors change profoundly? How does one take this into consideration?
- An elasticity model is not static.
- As with price loss cost models that must be updated to understand changing trends.
- Aggregators in the UK and Internet sales in the US have revolutionized the market places and you need to react accordingly.

## Marketplace considerations

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- Potential public relations problems
- People who care the most about price will benefit the most from price optimization.
- Other industries are already doing this. Gas stations, airlines, hotels.
- These other industries don't have the same regulatory hurdles.
- How is knowledge of the process managed within an organization?
- Proper communication at the right levels is important.

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