When Affordability is more useful than Elasticity

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What measure of price sensitivity is best?

- Most price management systems start with an estimate of consumer sensitivity to price.

- The usual tools for measuring price sensitivity are scanner-based elasticities and conjoint models.

- Consumers may be motivated by product benefits, but behavioral change is more likely a response to constraints.
  - “I can’t afford that”
  - “That will make me fat”
  - “The kids won’t eat that”

- We will show results from the new field of constrained optimization that seeks to understand thresholds.

- Affordability is more useful than elasticity.
What are consumers’ (managers’) considerations when making purchase (pricing) decisions?

**Consumer Perspective**
- What’s the most I can afford?
- What are the attributes that I’m willing to pay more for?
- Is this worth the price premium?
- Does this provide good value for my money?
- At the lower price, I can afford to buy more
- Is this too cheap?

**Managerial Perspective**
- What’s the most I can charge?
- What are the attributes that make my product worth more?
- How do I manage gaps above and below me?
- What’s the best way to promote?
- What package sizes provide value while maximizing profit?
- Do I need to play down here?
Elasticity is about substitutability
Elasticities – Appropriate Use

<table>
<thead>
<tr>
<th>Typical scanner and conjoint-based elasticities are for situations where:</th>
<th>…and go awry when:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Products are substitutable</td>
<td>Products are different</td>
</tr>
<tr>
<td>Price changes are “near random”</td>
<td>Price is endogenous</td>
</tr>
<tr>
<td>We are interested in short-term impacts</td>
<td>We are really interested in long-term effects</td>
</tr>
</tbody>
</table>

- Quality
- Count
- Size
**Quality:** consumers may trade-up to a product of perceived superiority

- **Budweiser** 6 Pack $4.99
- **Peroni Nastro Azzurro** 6 Pack $8.99
Count: consumers may spend more in a category by buying a larger package

Peroni Nastro Azzurro
6 Pack
$8.99

Peroni Nastro Azzurro
12 Pack
$15.99
**Size:** consumers may buy a larger size package

- **Hershey’s Miniatures**
  - 12 oz bag: $3.99
  - 30 oz bag: $9.99
Pricing managers often track price by quality, count and size. However, elasticity analyses often ignore the relationship between the tiers.

**Tracking by quality tier**

**Brand Price Ladder**

- Segments: Worthmore, Mainstream, Economy
- Brands: Pilsner Urquell, Miller Lite, MGD, Miller High Life, Milwaukee's Best

**Tracking by unit count**

**Line Pricing for Cans**

- Equivalized Case Price
- Number of 12 oz Cans

- Frontline Price
- Effective Price
- Promoted Price Floor

- Brand A
- Competition
Households vary a lot in how much they can afford of various consumer packaged goods
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Analysis by brand shows detailed price layering in the yogurt category

Example: Refrigerated Yogurt
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- **Store brands**
- **Middle of the market / Regional dairies**
- **Major Brands**: Dannon, Yoplait
- **Trade-up**: Organic, Greek, etc.
Top trade-up product sells for over $6.00 per unit
Case Study:
Comparison of methodologies for telephone/audio devices

Client Issue / Needs

- We looked at several telephone/audio devices from two major companies (A&B) and assessed consumers’ preferences
- We wanted to understand consumer price thresholds
- We wanted to understand the impact of the recession on disposable income

Our solution: Trade-Up Model

- We investigated the role of brand, price, and features on predicted consumer choice
- We identified price thresholds
- We compared the results of the trade-up model to standard conjoint
Most high-end durables have a right skew as fewer and fewer people can afford the highest prices.

Expenditure Limits for Telephone/Audio Device

60% of consumers can afford a price of $425.
The Van Westendorp used similar concepts but without the strong theoretical framework.
Market share simulations: Trade-Up vs. HB Logit (Conjoint)

Market share is higher for Brand A6 in the trade-up model.
Market share simulations: Trade-Up vs. HB Logit (Conjoint)

Price elasticity is also under-estimated by HB Logit because that model is trying to fit one marginal price effect to the whole category.
Market share simulations: Trade-Up vs. HB Logit (Conjoint)

The trade-up model predicts much higher elasticity for brand A6. Many are willing to pay $300-$500 for this telephone/audio device but prices above $500 start to exceed many consumers’ budgets.
With the trade-up model, we can simulate a reduction in maximum expenditure as might occur during a recession.
With the trade-up model, we can simulate a reduction in maximum expenditure as might occur during a recession. Brand A6 share drops by -37%.
With the trade-up model, we can simulate a reduction in maximum expenditure as might occur during a recession.
Case Study:
Study conducted for global CPG company’s Oral Care division

Client Issue / Needs
- Oral care category has many complexities
- Client wanted to understand trade-up dynamics across complex line-up and right price points

Our solution: Trade-Up Model
- Dollarized value of educational TV advertising and dentist recommendation
- Identified “sonic” as key product attribute consumers would pay more for
- Recommended new consumer target, price point for rechargeables
Pricing of toothbrushes is broad, ranging from less than a dollar to $140.
Heat maps were used to study affordability by age and income.

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Income ($000)</th>
<th>Base Expenditure</th>
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<tr>
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<tr>
<td>70</td>
<td>125</td>
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Adults 25-30 who make a household income of $125k will pay about $19.

**Base Expenditure**

- $7.5k
- $20k
- $27.5k
- $35k
- $45k
- $62.5k
- $87.5k
- $125k
A doctor’s recommendation drives willingness to pay

Figure 4  Estimated Expenditure Levels by Age, Income, and Recommendation

<table>
<thead>
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A doctor’s recommendation drives willingness to pay

**Figure 4** Estimated Expenditure Levels by Age, Income, and Recommendation

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<tr>
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<th>Income midpoint</th>
<th>No recommendation</th>
<th>Recommendation</th>
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Those who are younger and higher income are willing to spend $49 but…
A doctor’s recommendation drives willingness to pay

Those who are younger and higher income are willing to spend $49 but…

…with a recommendation will spend up to $187!
Price thresholds (budget limits) can be studied for targeted demographic groups.

7% of respondents in the age 40-45, $62,500 income group would buy a product >$100.
Sonic technology drives willingness to pay

3 Styles
- Rechargeable
- Battery
- Manual

7 Brands
- Oral-B
- Philips
- Crest
- Colgate
- Aquafresh
- Reach
- Private Label

4 Technologies
- Sonic
- Oscillating
- Battery
- Manual

40 PRODUCTS
Case Study:
Optimizing pricing and package strategies for global beer manufacturer

Client Issue / Needs
■ Quantity discounts are prevalent in beer industry and our client wanted to understand how to optimize revenue by identifying right pricing and package strategies

Our solution: Trade-Up & Quantity Discount Model
■ Identify price points at which revenue is maximized through understanding of portfolio and competitive dynamics
■ Determine how strategy must differ in different regions and within different channels
Trade-up/Quantity models show more accurate price dynamics in categories with many items.

Results for Country A

TU-QD Results for Country A
Trade-up/Quantity models show more accurate price dynamics in categories with many items.
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Data may indicate more than one “sweet spot” for price

Target packages at two price points in Country A

Estimated Budget Limit

Number of People

Country A
Country B
Trade-up models allow us to simulate the addition of new pack sizes, optimizing brand/pack portfolios.

### Current
- **Volume Share**
  - 20 Pack: 5.7%
  - 15 Pack: 0.2%
  - 4 Pack: 0.5%
  - Total: 6.4%
- **Revenue Share**
  - 20 Pack: 5.8%
  - 15 Pack: 0.2%
  - 4 Pack: 0.6%
  - Total: 6.7%

### Add 24 Pack
- **Volume Share**
  - 20 Pack: 4.0%
  - 15 Pack: 0.2%
  - 4 Pack: 0.4%
  - Total: 6.8%
- **Revenue Share**
  - 20 Pack: 4.1%
  - 15 Pack: 0.2%
  - 4 Pack: 0.5%
  - Total: 6.5%

### 24 Pack Replaces 20 Pack
- **Volume Share**
  - 24 Pack: 11.3%
  - 15 Pack: 0.2%
  - 4 Pack: 0.4%
  - Total: 11.2%
- **Revenue Share**
  - 24 Pack: 10.3%
  - 15 Pack: 0.2%
  - 4 Pack: 0.5%
  - Total: 10.3%
Conclusions

Constrained optimization shows many benefits for cases that don’t fit the assumptions of standard scanner and conjoint models

- A budget threshold can be applied more directly than an elasticity
  - Gives an idea of how much you can charge
  - Translates easily into financial scenarios

- Constrained optimization models are good at handling those cases where simple substitutability breaks down
  - Quality: trade-up goods and private label
  - Count: up-counting/down-counting
  - Size: upsizing/downsizing
  - Cannibalization

- More than just a pricing model
  - Identify the attributes of products that consumers will pay more for
  - Identify the optimal assortment – prices, quantities, benefits
Contact Information

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References


