# Uncertainty for Quality & Taste Product Attributes:
Competition, Information Disclosure Investments and the Role of Infomediaries

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# Model of Market Uncertainty

**Decision Variables**
- Types (taste related): $d_i$
- Qualities: $q_i$
- Quality disclosure investment: $Iq_i$
- Taste disclosure investment: $Id_i$
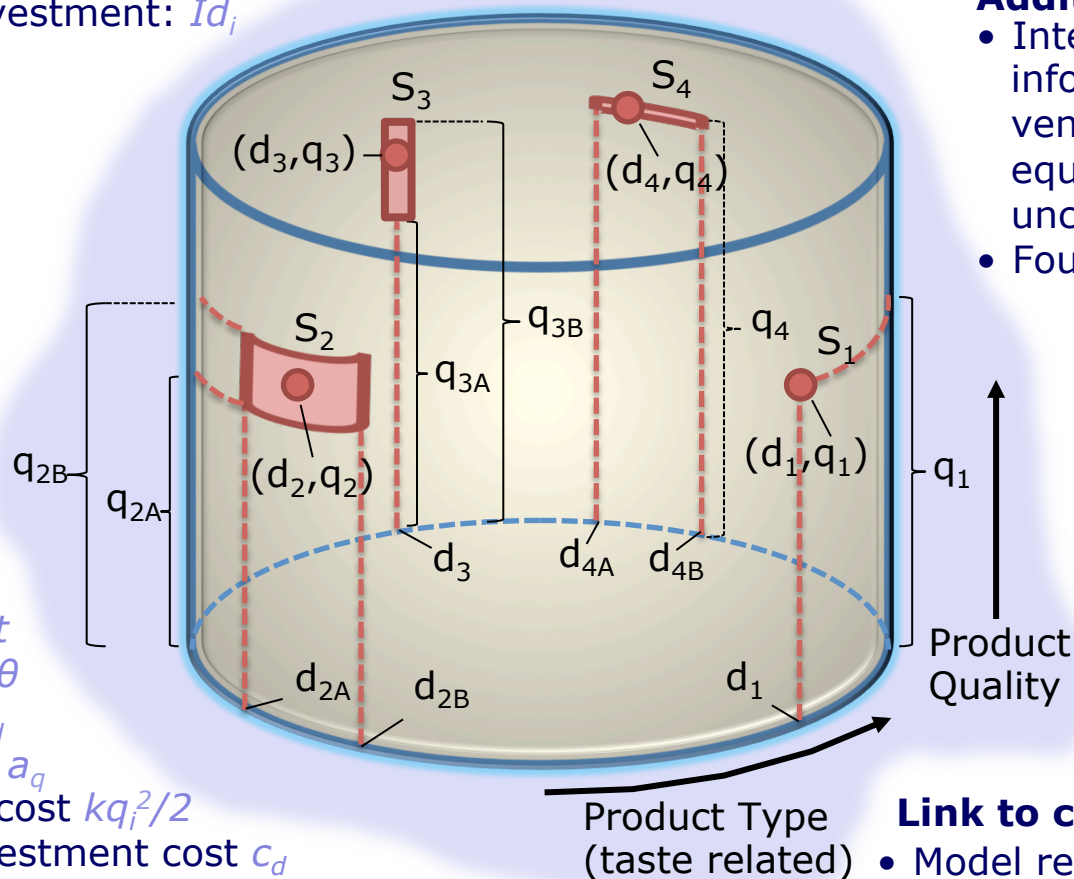- Prices: $p_i$

**Buyer Behavior**
- Uniformly distributed preferences
- Utility = $v + \theta \cdot q - t \cdot \delta d$

**Additional Assumptions**
- Intermediaries provide information so that a vendor's true location is equiprobable inside the uncertainty interval
- Four game stages:
  - type selection
  - quality selection
  - disclosure investments
  - pricing

**Model Parameters**
- $N$ vendors
- Product value $v$
- Fit cost parameter $t$
- Quality preference $\theta$
- Type uncertainty $a_d$
- Quality uncertainty $a_q$
- Quality production cost $kq_i^2/2$
- Type disclosure investment cost $c_d$
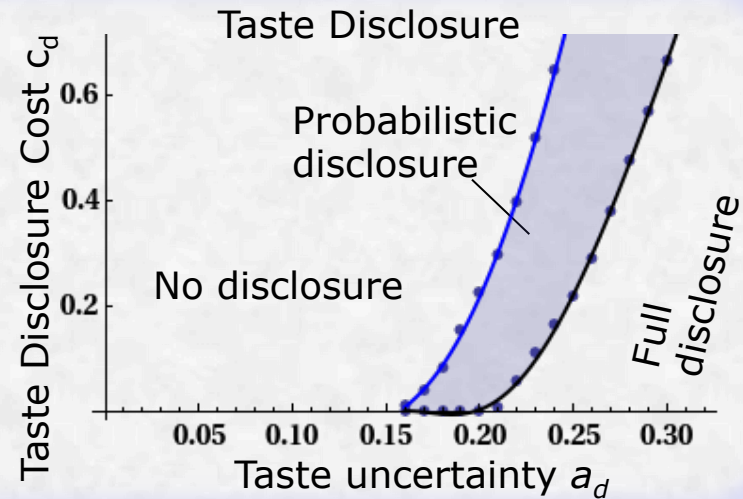- Quality disclosure investment cost $c_q$

$S_3$ $(d_3, q_3)$
$S_4$ $(d_4, q_4)$
$q_{3B}$ $q_4$ $S_1$
$q_{3A}$
$S_2$
$q_{2B}$
$q_{2A}$ $(d_2, q_2)$ $(d_1, q_1)$ $q_1$
$d_3$ $d_{4A}$ $d_{4B}$

Product Quality

$d_{2A}$ $d_{2B}$ $d_1$
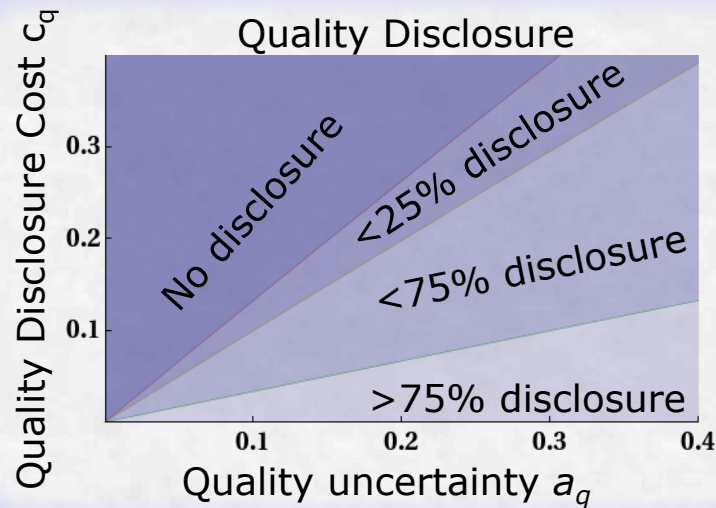
Product Type (taste related)

**Link to classic literature**
- Model reduces to Economides (1993) for $a_q = a_d = 0$

# Overview of Findings

| Key question | | Key Finding | Example used to illustrate |
|---|---|---|---|
| How should firms invest in info disclosure? | 1 | • Higher quality products should invest more in reducing quality uncertainty | • PC Games |
| | 2 | • Products whose type cannot be distinguished from competitors, should invest more in taste disclosure | • Warby Parker |
| | 3 | • Firms should account for ambient info availability and opportunity to free-ride | • Magazine Advertising |
| How should firms produce under higher transparency? | 4 | • Firms should account for (potential) info investment in their production of quality ROI calculations | • AMD Processors |
| | 5 | • Firms should account for info investment costs & ambient market info when considering their product quality level | • LA Restaurants |
| | 6 | • Firms should try to compete along quality dimensions for which only few firms disclose | • PC processor market |
| | 7 | • Firms should produce more in the long tail | • Beer, clothing |
| How to prop up the long tail? | 8 | • Retailers should focus on reducing product taste uncertainty | • Netflix |
| How should info-mediaries raise social welfare? | 9 | • Infomediaries should focus on roles that do not substitute vendors' own info disclosure options, such as fact checking or educating consumers about product category | • Overview of infomediary roles |

# When to invest in reducing consumer product uncertainty?



Quality Disclosure — Quality Disclosure Cost $c_q$ vs Quality uncertainty $a_q$: No disclosure, <25% disclosure, <75% disclosure, >75% disclosure

Taste Disclosure — Taste Disclosure Cost $c_d$ vs Taste uncertainty $a_d$: No disclosure, Probabilistic disclosure, Full disclosure
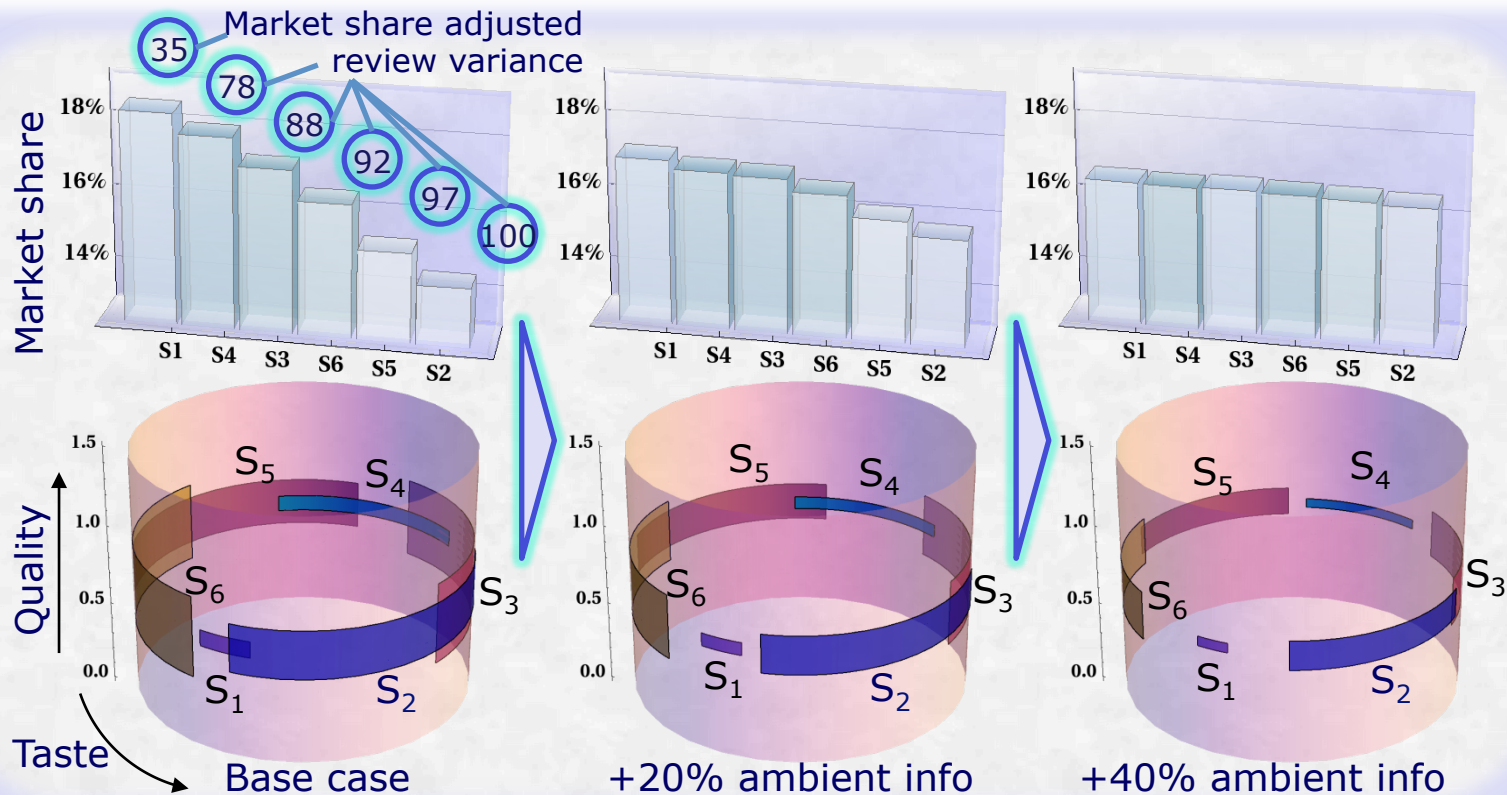
## Managerial Implications

- Firms should account for ambient info availability and for an **opportunity to free-ride**

- Firms may be able to forgo info investments when there already exists enough information about their products

- Opportunity to free-ride is higher **for product attributes that are not very important** to consumers (lower $t$ and lower $\theta$)

## Justification/ Intuition

- For product taste, ambient information increases the chances that product types will already appear "distinct" to the marginal buyer

- For product quality, ambient information reduces the worst case quality discount that buyers can apply to products that do not disclose quality

# What to produce under higher transparency?



Market share adjusted review variance

35 78 88 92 97 100

Market share

18% 16% 14%

S1 S4 S3 S6 S5 S2

Quality

Taste

1.5 1.0 0.5 0.0

$S_5$ $S_4$ $S_6$ $S_3$ $S_1$ $S_2$

Base case

+20% ambient info

+40% ambient info

## Managerial Implications

- As the amount of ambient information in the market increases, **firms should produce more "long-tail" products**
- Buyer reviews' **variances can predict** the products that **grow faster** as info increases

## Justification/ Intuition

- Differences in products' market shares can be caused by (among other things) differences in the info consumers have about products
- Review variance captures discrepancies between expectations/reality & acts as uncertainty gauge