Multiproduct intermediaries

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Outline

Motivation

- Many intermediaries sell *multiple products* (retailers, malls, platforms, TV platforms).
- A core strategic decision: product assortment and exclusivity.
- Two forces reshape this decision: direct-to-consumer (DTC) sales and exclusivity agreements.
- Existing theory offers little guidance on optimal assortment choices.

Motivation

- **Question:** how can a multiproduct intermediary create value and earn profits?
- Standard models: profits require lower prices or better search.
- **Key result:** a multiproduct intermediary can earn strictly positive profits *without reducing prices or search costs*.
- Profits arise from assortment choice and cross-product search incentives.

Related Literature

Intermediaries

- Search / matching efficiency (Rubinstein–Wolinsky, 1987; Gehrig, 1993; Spulber, 1996)
- Certification, asymmetric information (Biglaiser, 1993; Lizzeri, 1999)

⇒ **This paper:** intermediaries earn profits even without improving search efficiency.

Bundling

- Classic bundling mechanisms (Stigler, 1968; Adams–Yellen, 1976; McAfee et al., 1989)

⇒ **This paper:** focuses on which products are bundled via endogenous assortment choice.

Multiproduct search

- Consumer search with exogenous product ranges (McAfee, 1995; Shelegia, 2012; Zhou, 2014; Rhodes, 2015)

⇒ **This paper:** endogenous product range choice with upstream manufacturers and vertical structure.

Setting

- **Products / Manufacturers**
  - Continuum of products $i \in [0,1]$, marginal cost $c_i \geq 0$
  - Demand $Q_i(p)$, monopoly price p_i^m
  - Per-consumer profit and surplus:

$$\pi_i = (p_i^m - c_i)Q_i(p_i^m), \qquad v_i = \int_{p_i^m}^{\infty} Q_i(p)\,dp$$

- **Consumers**
  - Unit mass, additive utility across products
  - Identical preferences; heterogeneity only in search cost $s \sim F$
  - Observe availability, not prices
- **Intermediary**
  - Chooses assortment $A \subset [0,1]$, $|A| \leq \bar{m}$
  - TIOLI contracts (τ_i, T_i), exclusive or not
  - Search cost $h(|A|) \cdot s$

Timing

Add a simple line, that is all, shimplesh

1. The intermediary simultaneously makes TIOLI offers (τ_i, T_i) to manufacturers, specifying exclusivity or non-exclusivity. Manufacturers accept or reject.
2. All firms that sell to consumers set retail prices for their products.
3. Consumers observe availability, form rational expectations over prices, then search sequentially and purchase.

Lemma 1 (Pricing and Contracting)

Lemma

In any equilibrium where product markets are active:

1. *All sellers of product i charge the monopoly price $p_i = p_i^m$.*
2. *If product i is stocked by the intermediary, there exists an equilibrium contract with*

$$\tau_i = c_i, \qquad T_i = \pi_i F(v_i),$$

both under exclusivity and non-exclusivity.

Add definition of Ω!!!!!!!!

Implication: products can be indexed by

$$(\pi_i, v_i) \in \mathbb{R}_+^2,$$

with joint distribution $G(\pi, v)$.

Simple Case: Consumer Decision

Assumptions: exclusivity, $h(m) = m$, $\bar{m} = 1$

Intermediary stocks $A \subset \Omega$ exclusively.

$$\text{Visit } I \iff \underbrace{\int_A v \, dG}_{\text{expected surplus}} \geq \underbrace{s \int_A dG}_{\text{search cost}}$$

$$\iff \quad s \leq \hat{v} \equiv \frac{\int_A v \, dG}{\int_A dG}$$

Consumers compare average surplus to their search cost.

Simple Case: Intermediary Problem

Consumers visiting intermediary: $F(\hat{v})$

Net profit from product (π, v):

$$\pi \left[F(\hat{v}) - F(v)\right]$$

(gains from extra consumers − lump-sum paid to manufacturer)

$$\max_{A \subset \Omega} \int_A \pi \left[F(\hat{v}) - F(v)\right] dG$$

Low-v products earn profits. High-v products attract consumers.

Solution: Optimal Product Selection

Reformulation

Stocking decision:

$$q(\pi, v) = 1 \iff (\pi, v) \in A$$

Intermediary problem

$$\max_q \int_\Omega q(\pi, v) \Big[\underbrace{\pi(F(\hat{v}) - F(v))}_{\text{direct profit}} + \underbrace{\lambda(v - \hat{v})}_{\text{search externality}} \Big] dG$$

Optimal policy: cutoff structure

$$q(\pi, v) = 1 \iff \begin{cases} v < \hat{v} \text{ and } \pi \geq \dfrac{\hat{v} - v}{F(\hat{v}) - F(v)} \\ v > \hat{v} \text{ and } \pi \leq \dfrac{\hat{v} - v}{F(\hat{v}) - F(v)} \end{cases}$$

High-π, low-v products make money. Low-π, high-v products attract consumers.

Clarify the constraint, where does it come from

Solution: Optimal Product Selection

mention proposition 1?

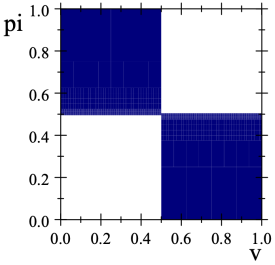

Figure 1: Optimal product range in the simple case

Main Model

- richer environment
  1. $q(\pi, v) \in ((0,0),(1,0),(0,1))$, allow for (q^e, q^{ne})
  2. $\hat{m} \leq 1$
  3. $h(m) \lesseqgtr m$
- $\rightarrow$ adds one more layer of complexity: firms also find it optimal to provide high π, high v goods.
- Now results endogeneously depend on $h(m), \bar{m}$, this provides scope for richer applications: exclusivity/nonexclusivity margin and caapcity margin.
- **Applications**: re

Summary

- New framework to study multiproduct intermediaries when consumers face heterogeneous demand and search frictions.
- Main result: show that a multiproduct intermediate is profitable even if it is does not provide search efficiencies.
- Mechanism: bundling + effects of technology/exclusivity under more complex contracts
- Provide applications to DTCs.

Critiques/review

- I would add critique + possible solutions; be nice and fair with them. This is to do.
- Mostly, consumers are passive agents, accept the monopoly price.
- Also, absence of price competition among I (only one; this is the most obvious critique, but their model serves the purpose of starting a conversation)-¿they aknowledge this... and actually is part of their research agenda. How would this look like?
- What else?