

Multiproduct intermediaries

JPE, 2021

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February 9, 2026

Outline

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2 Model

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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:

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

- **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*

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

both under exclusivity and non-exclusivity.

Add definition of $\Omega!!!!!!$

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.

$$\begin{aligned}\text{Visit } I \iff & \underbrace{\int_A v \, dG}_{\text{expected surplus}} \geq \underbrace{s \int_A \, dG}_{\text{search cost}} \\ \iff & s \leq \hat{v} \equiv \frac{\int_A v \, dG}{\int_A \, dG}\end{aligned}$$

Consumers compare average surplus to their search cost.

Simple Case: Intermediary Problem

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

Net profit from product (π, v) :

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

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

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

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

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

Optimal policy: cutoff structure

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

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?

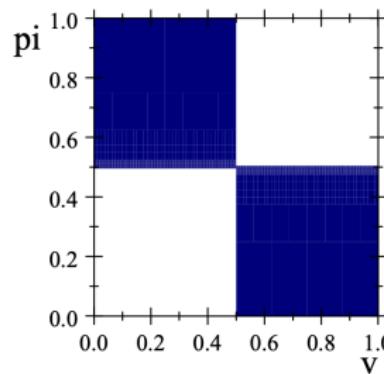


Figure 1: Optimal product range in the simple case

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 $h(m) \leq m$
- → adds one more layer of complexity: firms also find it optimal to provide high π , high v goods.
- Now results endogenously depend on $h(m)$, \bar{m} , this provides scope for richer applications: exclusivity/nonexclusivity margin and capacity 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 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)-; they
acknowledge this... and actually is part of their research agenda. How
would this look like?
- What else