Multiproduct intermediaries

JPE, 2021

Andrew Rhodes, Makoto Wanabe, Jidong Zhou

February 10, 2026

Outline

1. Introduction
2. Model
3. Discussion

Motivation

- Many intermediaries sell *multiple products* (retailers, platforms, malls).
- Core decision: product assortment and exclusivity.
- Standard view: intermediaries earn profits by lowering prices or improving search.
- **This paper:** a multiproduct intermediary can earn strictly positive profits *without lowering prices or search costs*.
- Mechanism: assortment reallocates consumer search across products.

Related Literature

Intermediaries:
search, certification, information
(Rubinstein–Wolinsky 1987; Gehrig 1993; Spulber 1996) *Profits without improving searc*

Bundling:
pricing-based mechanisms
(Stigler 1968; Adams–Yellen 1976; McAfee et al. 1989) *Assortment-based bundling*

Multiproduct search:
exogenous product ranges
(McAfee 1995; Shelegia 2012; Zhou 2014; Rhodes 2015) *Endogenous assortment choice*

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?

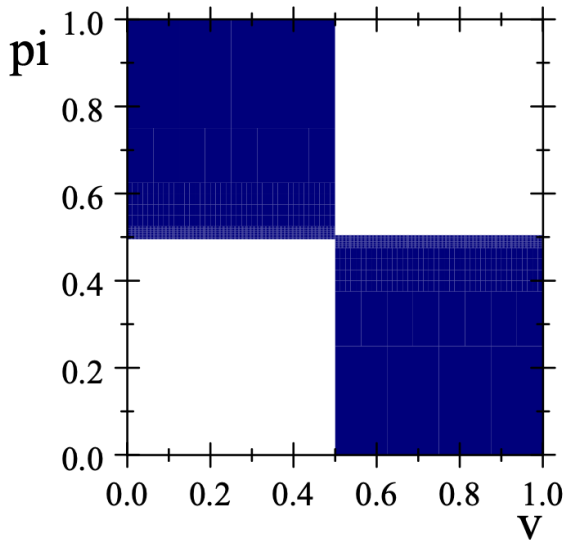

Figure 1: Optimal product range in the simple case

Beyond the Simple Model

- The paper extends the benchmark to a richer environment:
  - endogenous exclusivity vs non-exclusivity
  - capacity constraint on assortment size ($\bar{m}$)
  - general search cost technology $h(m)$
- **Key insight:** the same search-reallocation mechanism survives, but now interacts with:
  - the exclusivity margin
  - the capacity margin
- As a result, the intermediary may optimally stock:
  - traffic-generating products
  - profit-generating products
  - *and* products that do both.

Applications (Overview)

- **Retail platforms / malls**
  - Some products are used to *attract consumers* (anchors), others to *generate profits*.
  - Explains subsidies to high-value sellers and cross-store externalities.
- **Exclusivity and private labels**
  - Exclusive products optimally have high consumer surplus but low standalone profitability.
  - Predicts overuse of exclusivity relative to the social optimum.
- **Direct-to-consumer (DTC) sales**
  - Easier DTC weakens the intermediary and shrinks its assortment.
  - Intermediaries respond by relying more on exclusivity.

Applications illustrate the mechanism; the contribution is the framework.

Summary

- Introduces a new framework to study multiproduct intermediaries with consumer search frictions and endogenous assortment.
- Main result: a multiproduct intermediary can earn strictly positive profits *without improving prices or search efficiency*.
- Mechanism: assortment choice reallocates consumer search across products with different roles.
- The framework provides a unified way to think about exclusivity, capacity, and DTC competition.

Discussion and Limitations

- **Scope of the pricing environment**
  - Prices are fixed at monopoly levels to isolate pure assortment and exclusivity effects.
  - The paper establishes profitability under this austere benchmark, but does not quantify how strong these forces are relative to pricing distortions.
- **Absence of intermediary competition**
  - The analysis focuses on a single intermediary.
  - With competing intermediaries, exclusivity may be disciplined by consumer switching and differentiation, potentially altering welfare conclusions without eliminating profitability.
- **Consumer search structure**
  - Consumer heterogeneity operates solely through search costs.
  - The sensitivity of the mechanism to alternative forms of consumer search or platform choice is not fully characterized.