ECN 594: Vertical Relationships

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Plan

1. **Vertical relationships: upstream and downstream**
2. Double marginalization problem
3. Solutions: integration and two-part tariffs

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4. Vertical restraints
5. The free-rider problem
6. Antitrust implications

Vertical relationships

- **Vertical structure:** Production chain from raw materials to consumers
- **Upstream:** Manufacturers, wholesalers
- **Downstream:** Retailers, distributors
- **Examples:**
  - Car manufacturer $\rightarrow$ dealer
  - Beverage company $\rightarrow$ restaurant
  - Book publisher $\rightarrow$ bookstore
- Key question: How should these relationships be structured?

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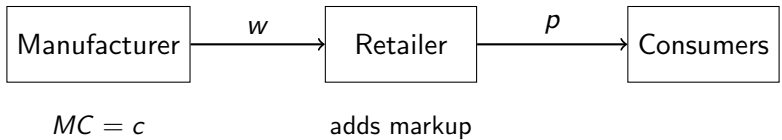
Double marginalization: setup

- **Upstream monopolist** (manufacturer): produces at $MC = c$
- Sells to **downstream monopolist** (retailer) at price w
- Retailer sells to consumers at price p
- Consumer demand: $q = D(p)$
- **Problem:** Each firm adds its own markup

Double marginalization: the chain



- Manufacturer: sets $w > c$ (first markup)
- Retailer: sets $p > w$ (second markup)
- Result: p is "too high" relative to integrated monopolist

Double marginalization: intuition

- Each firm ignores the effect of its markup on the other
- Manufacturer doesn't fully account for:
  - Higher $w \rightarrow$ higher $p \rightarrow$ lower $q \rightarrow$ lower profits for both
- This is a **vertical externality**
- Integrated monopolist would set lower price!
- **Paradox:** More competition (vertical separation) $\rightarrow$ higher price

Worked example: Double marginalization

- Consumer demand: $q = 100 - p$
- Manufacturer: $MC = 20$
- Retailer: no additional costs (just buys from manufacturer at w)
- **Questions:**
- (a) Find the price and profit of an integrated monopolist
- (b) Find the prices and profits with separate firms
- (c) Compare total industry profits

Take 7 minutes.

Worked example: Integration (solution a)

Solution

- **Integrated monopolist:**
- Inverse demand: $p = 100 - q$
- $MR = 100 - 2q$
- Set $MR = MC$: $100 - 2q = 20 \Rightarrow q = 40$
- $p = 100 - 40 = 60$
- $\pi^{Int} = (60 - 20) \times 40 = 1600$

Worked example: Separation (solution b)

Solution

- **Step 1: Retailer's problem** (given w)
- Retailer's cost is w, faces demand $q = 100 - p$
- $MR_R = 100 - 2q$, $MC_R = w$
- Set $MR_R = MC_R$: $100 - 2q = w \Rightarrow q = (100 - w)/2$
- $p = 100 - q = (100 + w)/2$
- Retailer profit: $\pi_R = (p - w)q = \left(\frac{100-w}{2}\right)^2$

Worked example: Separation (solution b, cont.)

Solution

- **Step 2: Manufacturer's problem**
- Anticipates retailer's response: $q = (100 - w)/2$
- Manufacturer profit: $\pi_M = (w - 20) \times \frac{100-w}{2}$
- FOC: $\frac{\partial \pi_M}{\partial w} = \frac{100-w}{2} - \frac{w-20}{2} = 0$
- $100 - w = w - 20 \Rightarrow w = 60$
- Then: $q = (100 - 60)/2 = 20$, $p = (100 + 60)/2 = 80$
- $\pi_M = (60 - 20) \times 20 = 800$
- $\pi_R = (80 - 60) \times 20 = 400$

Worked example: Comparison (solution c)

Solution

	Integrated	**Separated**
Final price	60	80
Quantity	40	20
Total profit	1600	1200

- Separation: price 33% higher, quantity 50% lower
- Industry profits 25% lower with separation
- Consumers also worse off (higher p, lower q)
- **Everyone loses** from double marginalization!

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Solutions to double marginalization

1. **Vertical integration**
   - Manufacturer buys retailer (or vice versa)
   - Eliminates double markup
2. **Two-part tariff**
   - Set $w = MC$ (no wholesale markup)
   - Charge franchise fee F to extract retailer profits
3. **Resale price maintenance (RPM)**
   - Manufacturer sets final price directly
   - Controversial under antitrust law

Two-part tariff solution

- Manufacturer charges:
  - Wholesale price: $w = c = MC$ (at cost)
  - Franchise fee: F
- With $w = MC$, retailer sets integrated monopoly price
- Retailer earns π^{Int} minus F
- Manufacturer sets $F = \pi^{Int}$ to extract all profit
- **Result:**
  - Price = integrated monopoly price
  - Total profit = integrated monopoly profit
  - Captured by manufacturer through F

Practice: Double marginalization

- **Question:** Consumer demand is $q = 200 - 2p$.
- Manufacturer: $MC = 30$, sells at w to retailer.
- Retailer: no additional costs, sells at p to consumers.
- (a) What is the integrated monopoly price and profit?
- (b) What is the final price with vertical separation?

Take 5 minutes.

Practice: Double marginalization (solution)

Solution

- Inverse demand: $p = 100 - q/2$
- **(a) Integrated:** $MR = 100 - q$, set $MR = MC$:

$$100 - q = 30 \Rightarrow q = 70, \quad p = 65$$

- $\pi^{Int} = (65 - 30) \times 70 = 2450$
- **(b) Separation:** Retailer: $q = (100 - w) = 100 - w$
- Actually: $q = 100 - w$ and $p = (100 + w)/2$
- Manufacturer: $\max_w (w - 30)(100 - w)/2$
- FOC: $w = 65$, then $q = 35$, $p = 82.5$

When double marginalization doesn't apply

- **Competitive retail:** Many retailers $\Rightarrow$ no downstream markup
- **Bargaining power:** Retailer negotiates for $w = MC$
- **Vertical contracts:** Two-part tariffs, RPM
- **Common ownership:** Integrated firms
- **Key insight:** Double marginalization requires:
  1. Market power at both levels
  2. Linear pricing (w per unit only)

Practice: T/F on double marginalization

- **True, False, or NEI:**
- (a) Double marginalization makes consumers worse off.
- (b) If the retailer is a perfect competitor, double marginalization doesn't occur.
- (c) Vertical integration always benefits consumers.

Take 2 minutes.

Practice: T/F on double marginalization (solution)

Solutions

- **(a) TRUE.** Higher price, lower quantity. Consumers strictly worse off relative to integrated monopoly.
- **(b) TRUE.** Competitive retailers have zero markup ($p = w$). Only manufacturer's markup remains, so no "double" margin.
- **(c) FALSE.** Integration helps consumers IF it replaces separation. But if manufacturer was already using two-part tariff, integration may not change anything.

Real-world examples: Vertical relationships

- **Auto industry:**
  - Manufacturers $\rightarrow$ dealers
  - Dealers have territorial exclusivity
- **Beer industry:**
  - Breweries $\rightarrow$ distributors $\rightarrow$ retailers
  - Three-tier system mandated in many US states
- **Tech platforms:**
  - App stores take 30% commission
  - This is a form of wholesale markup

Successive oligopoly

- What if there are multiple firms at each level?
- **Upstream oligopoly $\rightarrow$ Downstream oligopoly**
- Results depend on:
  - Number of firms at each level
  - Type of competition (Cournot vs Bertrand)
  - Bargaining power
- General result: more competition at either level reduces final price
- But double marginalization can still be present

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Vertical restraints: overview

- **Vertical restraints:** Contractual restrictions between upstream/downstream firms
- **Types:**
  1. **Exclusive dealing:** Retailer can only sell manufacturer's products
  2. **Exclusive territories:** Retailer has geographic monopoly
  3. **Resale price maintenance (RPM):** Manufacturer sets retail price
  4. **Tying:** Must buy product B to get product A

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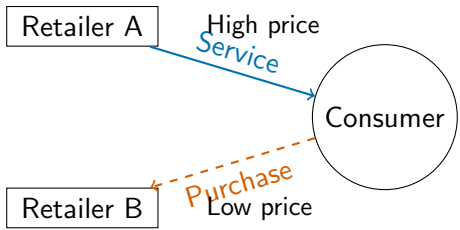
The free-rider problem

- **Setup:** Retailer provides services (advice, showroom, etc.)
- **Problem:**
  - Consumer gets service at Retailer A
  - Buys from Retailer B (lower price, no service)
  - Retailer A's service investment wasted
- **Result:** Retailers under-invest in services
- **Examples:**
  - Electronics stores vs online retailers
  - Car dealerships and test drives

Free-rider problem: graphical



- Consumer gets service from A but buys from B
- A's investment is not rewarded $\Rightarrow$ stops providing service

Exclusive dealing

- **Definition:** Retailer agrees to sell only one manufacturer's products
- **Pro-competitive:**
  - Encourages retailer investment in manufacturer's brand
  - Prevents free-riding on promotional efforts
- **Anti-competitive:**
  - May foreclose rivals from distribution
  - Especially concerning if many retailers are tied up
- **Example:** Beverage exclusivity (Coke vs Pepsi at restaurants)

RPM: A closer look

- **Minimum RPM:** Floor on retail price
  - Prevents discounting
  - Protects service margins
- **Maximum RPM:** Ceiling on retail price
  - Prevents double marginalization!
  - Generally more benign
- **Case law evolution:**
  - Minimum RPM: per se illegal (1911-2007), now rule of reason
  - Maximum RPM: always rule of reason

Solutions to free-riding

- **Resale price maintenance (RPM):**
  - Set minimum retail price
  - Prevents price competition, preserves margin for services
- **Exclusive territories:**
  - Each retailer is local monopolist
  - No other retailer to free-ride on
- Both reduce **intra-brand** competition (same brand, different retailers)

Intra-brand vs inter-brand competition

- **Intra-brand:** Competition among retailers selling same brand
  - Different Toyota dealers competing on price
- **Inter-brand:** Competition between different brands
  - Toyota vs Honda
- **Vertical restraints often reduce intra-brand competition**
- **Key question for antitrust:**
  - If inter-brand competition is strong, less concern
  - If inter-brand is weak, restraints may harm consumers

Practice: Identify the restraint

- **Which restraint is being used?**
- (a) Nike requires retailers to charge at least $150 for certain shoes.
- (b) McDonald's franchises can only sell McDonald's food.
- (c) A Pepsi distributor is the only one allowed in a region.
- (d) A printer company requires customers to buy its toner.

Take 1 minute.

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Antitrust analysis of vertical restraints

- **Rule of reason:** Case-by-case analysis
  - Weigh pro-competitive vs anti-competitive effects
- **Pro-competitive justifications:**
  - Solve free-rider problem
  - Encourage retailer investments
  - Improve product quality/service
- **Anti-competitive concerns:**
  - Facilitate collusion
  - Exclude competitors
  - Raise prices without efficiency benefit

Legal status of vertical restraints

Restraint	US Legal Status
Maximum RPM	Rule of reason
Minimum RPM	Rule of reason (since 2007)
Exclusive dealing	Rule of reason
Exclusive territories	Rule of reason
Tying	Quasi-per se illegal

- Most restraints evaluated under rule of reason
- Need to show harm to competition (not just competitors)

Practice: Vertical restraints

- **True, False, or NEI:**
- (a) Exclusive dealing is always anti-competitive.
- (b) Maximum RPM can solve double marginalization.
- (c) RPM would be unnecessary if retailers didn't compete on price.

Take 2 minutes.

Practice: Vertical restraints (solution)

Solutions

- **(a) FALSE.** Exclusive dealing can solve free-rider problems and encourage retailer investment. It's anti-competitive only if it forecloses significant distribution.
- **(b) TRUE.** By setting a maximum retail price, manufacturer can prevent excessive downstream markup.
- **(c) TRUE (essentially).** If retailers don't compete on price (e.g., exclusive territories), there's no free-riding on price. RPM addresses price-based free-riding.

Tying and bundling

- **Tying:** Must buy B to get A (separate products)
- **Bundling:** Products sold together (may be separable)
- **Antitrust concerns:**
  - Leverage market power from A to B
  - Foreclose competitors in market B
- **Efficiency justifications:**
  - Cost savings from joint production/distribution
  - Quality assurance
  - Metering (price discrimination)

Case study: Apple App Store

- Apple takes 15-30% commission on app sales
- **Is this double marginalization?**
  - Apple = upstream platform, app developers = downstream
  - Commission is like wholesale markup
- **But:** Apple argues commission pays for:
  - Payment processing
  - App review (quality control)
  - Platform development
- Antitrust cases: Epic v. Apple, DOJ investigation

Vertical mergers

- **Definition:** Merger between upstream and downstream firm
- **Pro-competitive:** Eliminates double marginalization
- **Anti-competitive concerns:**
  1. **Foreclosure:** Merged firm refuses to supply rivals
  2. **Raising rivals' costs:** Charges competitors higher prices
  3. **Access to sensitive info:** Learn rivals' costs/strategies
- **Example:** AT&T/Time Warner (approved with conditions)

Vertical relationships: summary table

Problem	**Solution**	**Mechanism**
Double margin	Two-part tariff	$w = MC$, extract via F
Double margin	Vertical integration	Single decision-maker
Double margin	Max RPM	Cap downstream markup
Free-riding	Min RPM	Protect retailer margins
Free-riding	Exclusive territories	No local competition

Connection to rest of course

- **Vertical relationships and demand:**
  - Wholesale prices affect retail prices
  - Pass-through rates: how much of Δw passes to consumers?
- **Vertical relationships and mergers:**
  - Vertical merger simulation uses similar tools
  - Need to model both levels of pricing
- **Next:** Collusion (how firms coordinate horizontally)

Key Points

1. **Double marginalization:** Two markups $\rightarrow$ price too high
2. Vertical separation hurts both firms AND consumers
3. **Solutions:** Integration, two-part tariff, RPM
4. Two-part tariff: $w = MC$, extract profit through F
5. **Free-rider problem:** Under-investment in services
6. Restraints (RPM, exclusive territories) can solve free-riding
7. Reduce **intra-brand** competition
8. **Antitrust:** Rule of reason; weigh pro/anti competitive effects

Next time

- **Lecture 12:** Collusion
  - Sustaining collusion: trigger strategies
  - Critical discount factor
  - Detection and leniency programs