

# Vertical Supply Relationships - Firm Boundaries and Vertical Pricing

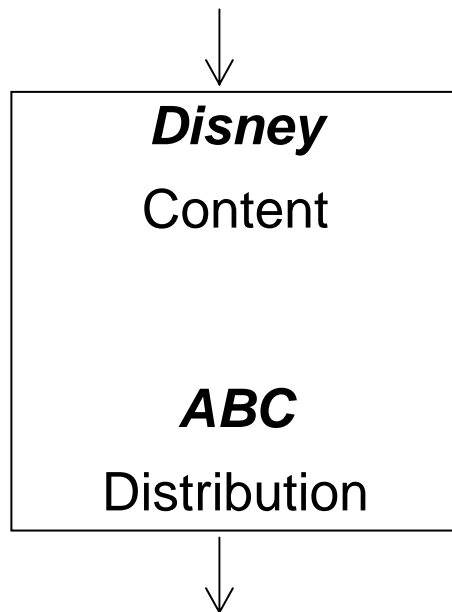
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- What is a firm?
- Why do firms exist?
- What determines the size of a given firm?

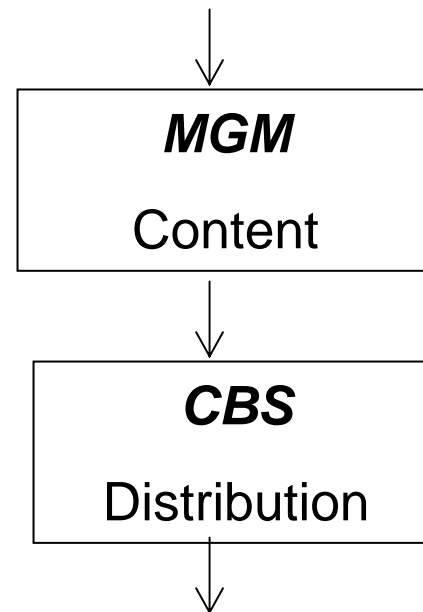
# The make or buy decision.

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Make: Vertical Integration



Buy: Vertical separation



# Advantages of buying.

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# Advantages of making.

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- Facilitates coordination of the production process.
- Incomplete contracts.
- In the extreme, this is the “hold up” problem.
- Facilitates price discrimination between downstream markets.
- Marketing (car companies/car rental agencies).

# Additional advantages of making.

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- Avoid market power in the upstream or downstream market.
- Market foreclosure.
- Entry deterrence.

# Double marginalization.

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- Basic problem: each seller in the vertical chain ignores the effect of its markups on the profits of the other firms in the chain.
- Example: think about two markets, one upstream from the other (e.g. retail and wholesale).
- **Retail level:**           MC:  $r = 1$   
  Demand:  $Q = 10 - P_r$
- **Wholesale level:**   MC:  $w = 2$   
  Demand: we will derive; sells to retailer at price  $P_w$  and wholesale sales exactly equal retail sales.

# Double marginalization example (cont').

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We will consider three cases:

- 1) Vertically integrated monopolist.
- 2) Competitive retail sector /monopolistic wholesaler.
- 3) Monopolistic retailer/monopolistic wholesaler.

# 1) Vertically integrated monopolist.

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– Monopolists  $MC = r + w = 1 + 2 = 3$ .

–  $MR = 10 - 2Q$ .

→  $Q^{VIM} = 3.5$ ,  $P^{VIM} = 6.5$ ,  $\pi^{VIM} = (6.5 - 3) * 3.5 = 12.25$

## 2) Comp retailers/monop wholesaler.

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- Wholesaler knows retailer's costs will be  $P_w + 1$ .
- Since retail market is competitive  $\Rightarrow P_r = P_w + 1$ .
- How many units will the retailer sell?:

$$Q = 10 - P_r = 10 - (P_w + 1)$$

- Since the quantity sold at the retail level exactly equals the quantity sold at the wholesale level, this is the wholesaler's demand function:  $P_w = 9 - Q$ .
- Wholesaler sets  $MR=MC$ :  $9 - 2Q = 2 \Rightarrow Q^{CM} = 3.5$ ,  $P_w^{CM} = 5.5$ ,  $P_r^{CM} = 6.5$ ,  $\pi_w^{CM} = (5.5 - 2) * 3.5 = 12.25$ ,  $\pi_r^{CM} = 0$ .

### 3) Monop retailer/monop wholesaler.

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- Again, we'll solve using backwards induction: the wholesaler can figure out what the retailer will do for a given  $P_w$  and then charge the optimal  $P_w$  knowing how many sales it will lead to.
- Retailer will set  $MR = MC \Rightarrow 10 - 2Q = 1 + P_w$ .
- This gives us the wholesaler's demand curve:  $P_w = 9 - 2Q$ .
- Wholesaler sets  $MC = MR: 9 - 4Q = 2 \Rightarrow Q^{MM} = 1.75, P_w^{MM} = 5.5$ .
- Plug  $Q^{MM} = 1.75$  into retailer's demand function to get  $P_r^{MM} = 8.25$ .
- $\pi_w^{MM} = (5.5 - 2) * 1.75 = 6.125, \pi_r^{MM} = (8.25 - 1 - 5.5) * 1.75 = 3.1$ .

***Retailer plus wholesaler profits are lower than with VI monopoly.  
This is the double-marginalization problem.***

# Comparing the three market structures.

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	VI Monopoly	Monop W, Comp R	Monop W, Monop R
Retail price	6.5	6.5	8.25
Wholesale price	NA	5.5	5.5
Q	3.5	3.5	1.75
Retail profit	NA	0	3.1
Wholesale profit	NA	12.25	6.12
Total profit	12.25	12.25	9.22

# Is VI really the only solution?

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There are other ways to avoid the double marginalization problem:

- Two-part tariffs.
  - AOL's strategy? Slotting fees?
- Price ceilings.
- Quantity forcing.

# Market power and vertical integration.

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- Market power at the wholesale level can also cause inefficient production decisions.
- It may be more difficult to enter a vertically integrated market.
- A vertically integrated firm may be able to foreclose sales to or purchases from non-vertically-integrated competitors.