Large buyer discounts

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Does buyer size matter for prices?

- Not obvious, but there are some formal theories that may help us explain when and why size matters for negotiated prices:

- **Supply side explanations** – size discounts can be explained by the seller's technology (costs)

  [**Demand side explanations** – size discounts may be explained by the shape of demand in the final market (consumers) – but this is also really linked to the supply side technology]

- **Strategic explanations** – unlike small buyers, large buyers may have more credible "fallback strategies", or they may have other business strategies at their disposal that may help them squeeze the sellers

- **Risk aversion** – size discounts may be explained by risk averse sellers

Preface: size ≠ market power

- Buyer size does not necessarily imply more market power for the buyer

- For example, a merger may increase the buyer's size AND market power, whereas a purchasing agreement increases only the buyer's size (ideally)

- So the question is then what are the effects of of the buyers' "pure size" on the bargained prices?

Bargained prices: a simple framework

- The "bargaining problem" deals with the question of how two (or more) parties should split some joint surplus

- For a seller and a buyer, we may refer to the relevant surplus as their "incremental gains from trade"

- In each negotiation (if there is more than one buyer), we may think of the buyer as receiving …

    – his "fallback profit" (the profit he earns if he refuses to trade with the seller)

    – plus some (fixed) share of the buyer and the seller's incremental gains from trade

- All factors that increase the sum of the buyers' fallback profits, and/or the sum of their incremental gains from trade, may therefore contribute to reducing the average price paid by the buyers

    – If the overall profit is unaffected, profit is then simply shifted away from the seller towards the buyers

Incremental gains from trade

- Suppose there is one seller, S, and two buyers, B1 and B2

- A buyer requires just one unit from the seller

- We will assume B1 earns the profit $\pi - p_1$ when buying one unit from the seller for the price p_1

- Each buyer earns π_0 in the event that trade does not take place (the buyers' "fallback profit" or "outside option")

- Let $c(N)$ be the seller's cost when delivering N units of the input:
$$c(0) < c(1) < c(2)$$

- The incremental gains from trade between the S and B1 (which in turn partially determines the buyer's price), are equal to

$$\underbrace{\overbrace{p_1 + p_2 - c(2)}^{\text{S's profit}} + \overbrace{\pi - p_1}^{\text{B1's profit}}}_{\text{joint surplus when trading}} - \underbrace{[\pi_0 + \overbrace{p_2 - c(1)}^{\text{S's profit}}]}_{\text{surplus when not trading}}$$

The buyer's share of the profit

- The incremental gains from trade between S and B1 simplify to

$$\pi - \pi_0 - [c(2) - c(1)] \qquad \textbf{(1)}$$

- Note that if each buyer receives 50% of the incremental gains from trade, then the sum of the buyers' profits can be written

$$2\pi_0 + \boxed{\pi - \pi_0 - [c(2) - c(1)]} \qquad \textbf{(2)}$$

- We may notice two main factors that affect the buyers' profits:

  1) the size of the buyer's fallback profit π_0 (+)
  2) the seller's incremental cost from supplying one unit to the buyer, $c(2) - c(1)$ (−)

Incremental gains from trade with a PA

- Suppose B1 and B2 sign a *purchasing agreement* (PA)

  (assume that a central agency "A" negotiates a joint price p for the buyers)

- Suppose that a buyer's fallback profit when he is a member of A, is π_0^A

- The incremental gains from trade between S and A, are now equal to

$$\overbrace{p - c(2)}^{\text{S's profit}} + \overbrace{\pi + \pi - p}^{\text{A's profit}} \quad - \quad \overbrace{[\,\pi_0^A + \pi_0^A - c(0)\,]}^{\text{A's profit}}$$

$$\underbrace{}_{\text{joint surplus when trading}} \qquad \underbrace{}_{\text{surplus when not trading}}$$

which simplifies to

$$2(\pi - \pi_0^A) - [c(2) - c(0)] \qquad\qquad \textbf{(3)}$$

The buyers' profits under a PA

- If the buyers receive 50% of the incremental gains from trade (like before), then the sum of the buyers' profits can be written

$$2\pi_0^A + \pi - \pi_0^A - \frac{c(2) - c(0)}{2},$$

compared to

$$2\pi_0 + \pi - \pi_0 - [c(2) - c(1)]$$

before the PA

- Hence, there are two primary ways through which the buyers' prices (and hence the buyers' profits) may have been affected
  - By changing each buyer's fallback profit, from π_0 to π_0^A
  - By shifting the seller's *average incremental cost* from trading with the two buyers, from $c(2) - c(1)$ to $\frac{c(2) - c(0)}{2}$

Did the price become lower?

- Fallback profits (outside options) may have been affected:

    - With a purchasing agreement, if the negotiations fail, they fail with both buyers simultaneously, and in this case the buyers may jointly secure an alternative source of supply

    - Securing an alternative source of supply may involve fixed costs (e.g., sponsoring entry)

    - With a PA, this fixed cost will be spread over the quantity purchased by *both* buyers, instead of the quantity purchased by just one of them (the case without the PA) – which makes the alternative supply more affordable for them (in this case: $\pi_0^A > \pi_0$)

- The seller's average incremental cost from trading may be smaller when the buyers are large; i.e., we may have:
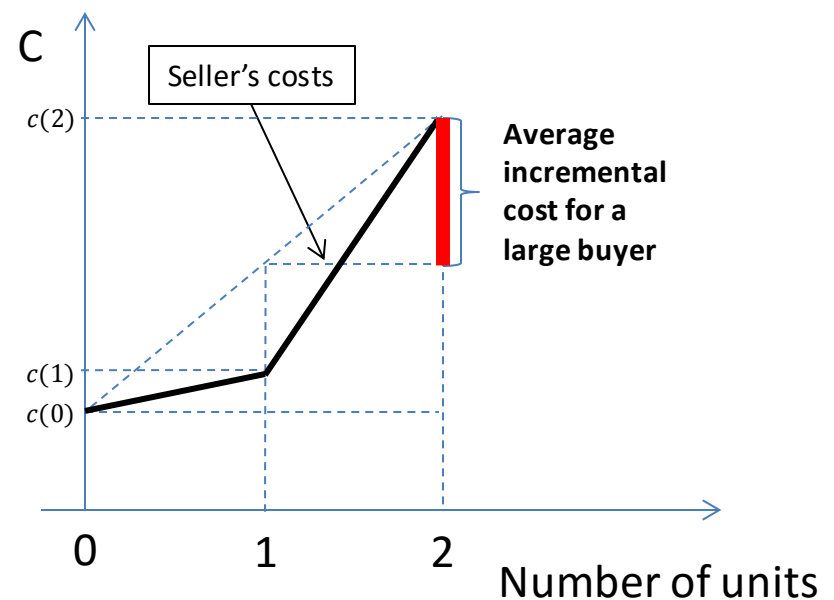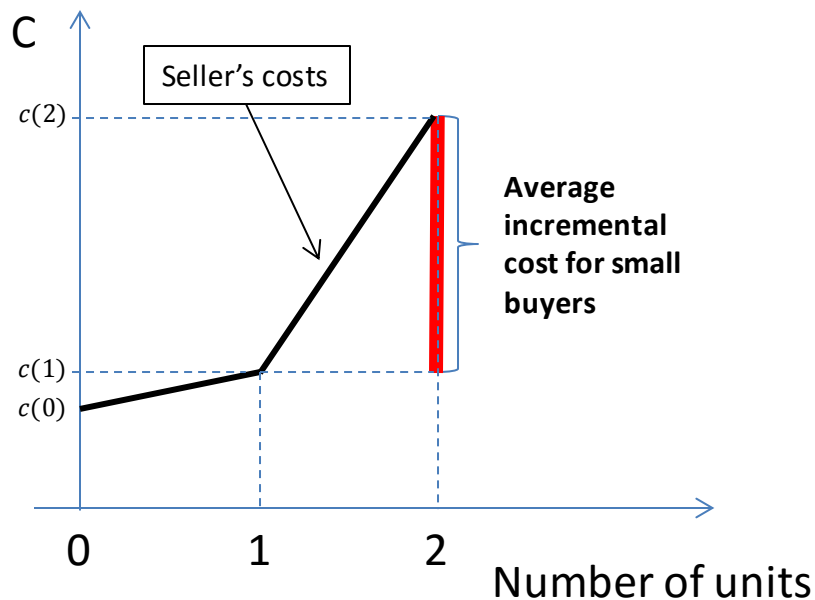
$$\frac{c(2) - c(0)}{2} < c(2) - c(1)$$

    - If this is the case, then a PA implies a discount to the buyers

Shape of the seller's costs

- The latter holds if there are *diseconomies of scale in production*
- Diseconomies of scale implies that small buyers contribute more than proportionally to the seller's cost
- In turn this means that small buyers will have to pay higher prices

Diseconomies of scale

Sellers' risk aversion

- A seller's risk aversion may also give rise to large buyer discounts

- The intuition is very similar to the intuition for why the shape of the seller's cost function may give rise to quantity discounts

- For a risk averse seller, the first unit sold is more valuable than the final unit sold (unlike a risk neutral seller)

  - Not because the first unit is less costly to produce – but because the seller's marginal utility of money is decreasing in the amount of wealth it accumulates

- The more risk averse the seller is, the larger is the discount to large buyers

Alternative business strategies

- A large buyer may more easily succeed in inducing more competition between its sellers

- Large buyers may commit to "single-sourcing" across multiple stores and regions (i.e., commit to carrying the same product at all locations)

- If sellers have comparative advantages, each in their own region, then the buyers can create a more level playing field – by joining forces and make the sellers compete for the business of all stores combined

- A commitment to single sourcing in this setting makes the sellers "less differentiated", in the sense that the comparative advantages are lessened – which in turn makes them compete more fiercely

- The increased competition will reduce the prices for the buyers – but it also reduces the overall profit created

  - There is a trade off for the buyer because products are no longer stocked optimally (the "wrong" product is stocked in some of the stores)

Thank you!