Measuring Damages from Price-Fixing to Direct and Indirect Purchasers

FNE Competition Day

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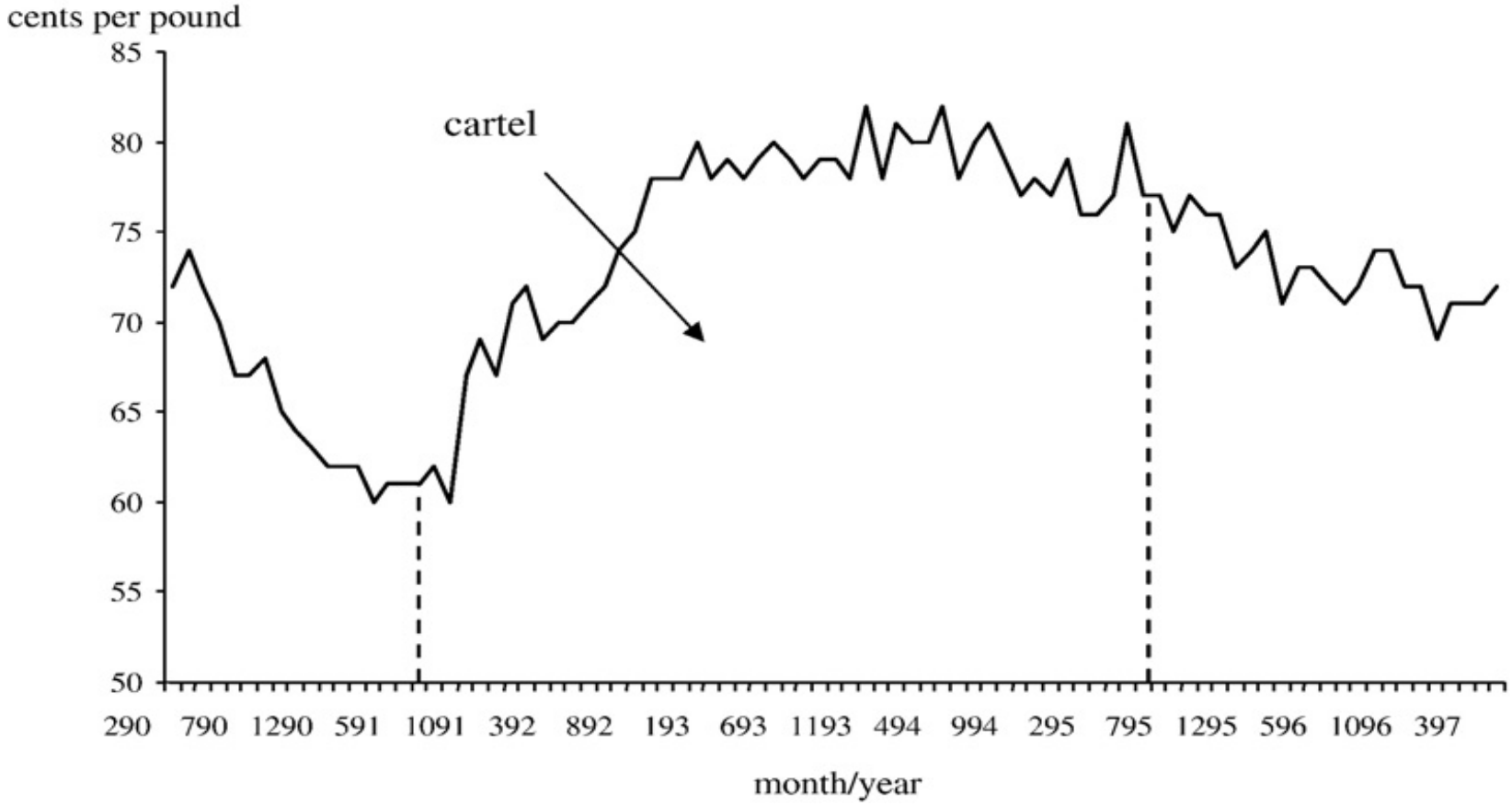
Estimating Damages

Two tasks we want to discuss briefly:

(1) Establish magnitude of damages due to price fixing – at first level ("overcharge")

(2) Determine distribution of damages down vertical chain ("passing on" or "pass-through")

Citric Acid



source: Bolotova, Yuliya, John M. Connor, and Douglas J. Miller. 2008. The Impact of Collusion on Price Behavior: Empirical Results from Two Recent Cases. *Industrial Journal of Industrial Organization* 26:1290–1307.

Summary of Economic Surveys of Cartel Overcharges

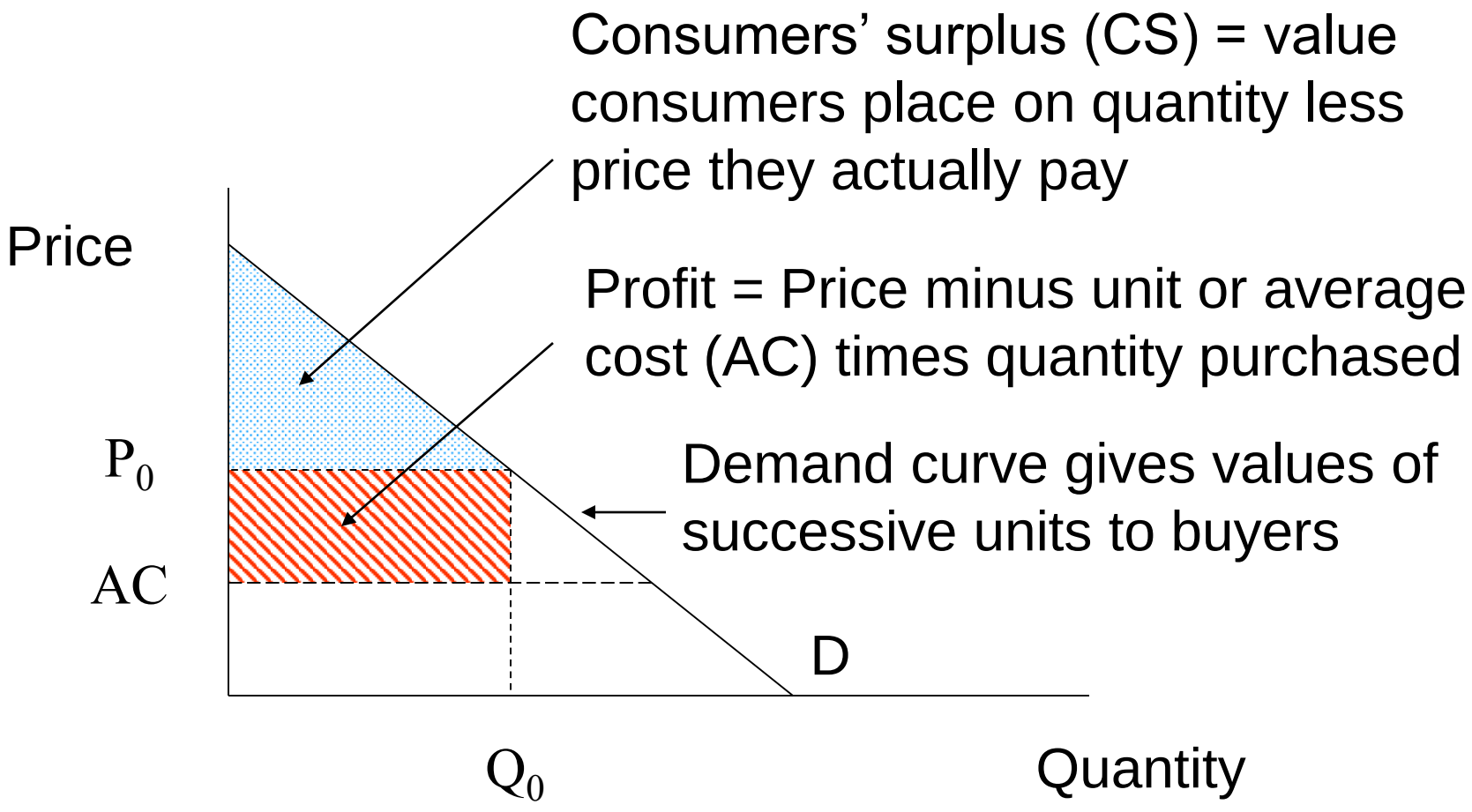
	No. Cartels	Mean %	Median %
Mark A. Cohen & David T. Scheffman	5–7	7.7–10.8	7.8–14.0
Gregory J. Werden	13	21	18
Richard A. Posner	12	49	38
Margaret Levenstein & Valerie Suslow	22	43	44.5
James M. Griffin	38	46	44
OECD (excluding peaks)	12	15.75	12.75
John M. Connor (Bid Rigging)	330	54.5	18.7
John M. Connor (Classic Price Fixing)	1205	47.2	24.5
Yuliya V. Bolotova	406	21.88	20

Part of the table is extracted from John M. Connor & Robert H. Lande, "Cartels as Rational Business Strategy: Crime Pays." Cardozo Law Review, 2012, 34 (2), pp. 427 - 490.

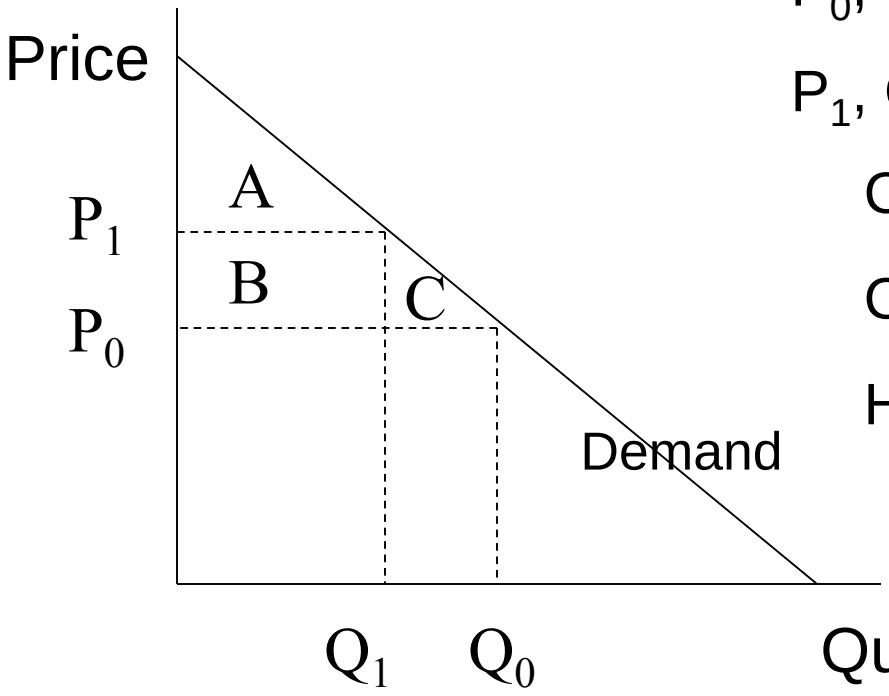
Bolotova, Yuliya V. "Cartel overcharges: An empirical analysis", Journal of Economic Behavior & Organization, 2009, 70 (1–2), pp. 321–341.

Connor, John M. "Cartel Overcharges." in James Langenfeld (ed.) *The Law and Economics of Class Actions (Research in Law and Economics, Volume 26)*, 2014, Bingley: Emerald Group Publishing Limited, pp.249 – 387.

Estimating Damages – background



Estimating Damages – The Total Harm



P_0, Q_0 = "But-for" price and quantity

P_1, Q_1 = Collusive price and quantity

CS but-for price fixing = A + B + C

CS with price fixing = A

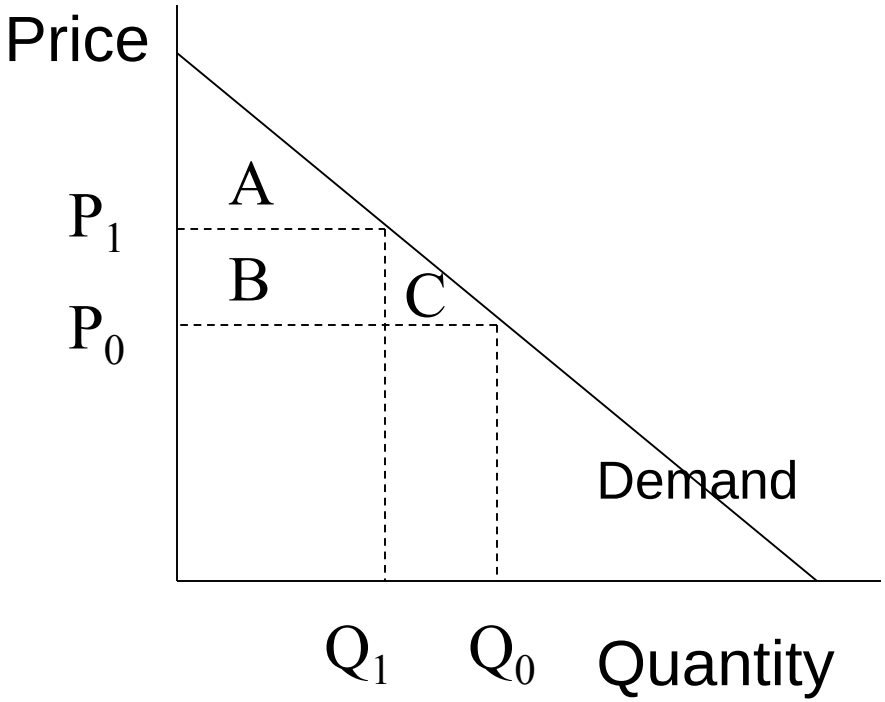
Harm = B + C

Two parts to harm:

1. Overcharge = $(P_1-P_0) \times Q_1$ = area B
2. "Missing triangle" = area C

Note: This makes assumptions about downstream distribution

Ignoring the Missing Triangle



Why?

- Often small – but be careful
- Difficult to measure
- Hard to find non-consumers

Estimating Damages with Overcharge

Typical measure = $(P_{actual} - P_{but\text{-}for}) \times Q_{actual}$

- We observe P_{actual} and Q_{actual}
- Challenge: establishing but-for price: $P_{but\text{-}for}$

Estimating the Reference ("But-for") Price

Methods:

(i) Simple before/after method

(ii) Marginal or average cost method

(iii) Comparative benchmark methods

(iv) Reduce-form econometric estimation of price

(i) Simple Before/After Method

Basic idea

- Compare price during conspiracy with price before and/or after

- Challenges:
  - Dating the conspiracy
  - Other reasons for different prices
  - Post-collusion pricing may be affected by collusion

(ii) Marginal or Average Cost Method

Basic idea:

- Under perfect competition price should equal marginal cost and likely also average (unit) cost

- **Challenges**
  - Measuring the cost accurately
  - What if the market would not have been competitive?

(iii) Comparative Benchmark Methods

Basic idea:

- Compare prices in fixed market with prices in a related market not subject to price fixing

Challenges:

  - Many other things could be different between markets
  - Is other market also influenced by price fixing?
- Might work best: different geographic markets for the same product

(iv) Reduced-form Econometric Estimation of Price: Regressions

Basic Idea

- Probably the most popular
- Combine all factors into one price equation to be estimated
- $P_t = a + b_0 \times (\text{Demand Factors}_t) + b_1 \times (\text{cost factors}_t) + b_2 \times PF_t$
- Eg. Demand factors could be: income, output of buyers
  Cost factors could be: wages , other input costs, technology

PF_t: Price fixing 0-1 "dummy variable"

A Challenge for all Methods

Measuring the harm down a distribution chain:

- Assessing market structure and competitiveness
- Adjusting magnitude of total harm
- Evaluating degree of pass-through (sharing of harm)

But what if the direct purchaser resells the product downstream? The simplest case:

- Manufacturer (cartel) sells to Retailer (at wholesale price "w") who sells on to final consumers (at retail price "p")
- Harm to final consumers depends on the degree to which retailers increases retail price in response to higher wholesale price
- Pass-through rate: $PTR = \frac{(p_1 - p_0)}{(w_1 - w_0)}$
- Pass-through rate will typically depend on the nature and extent of competition downstream as well the shape of demand (and maybe cost) curves

Pass-Through Rate: Cases

- If the downstream (retail) market is highly competitive, retailers will already be selling at close to cost and retail prices will have to rise at the same rate as wholesale prices. In this case: PTR = 100%

- If the downstream market is highly competitive for price increases (e.g. constrained by imports to market), but retailers are making profits at current prices, retailers may absorb wholesale price increases: PTR = 0%

- If the downstream market is a monopoly facing a linear demand curve (and constant unit costs): PTR = 50%

- If the downstream market is a monopoly facing a constant elasticity demand curve with elasticity e (and constant unit costs): $PTR = e/(e-1) > 100\%$

- If downstream firms use simple mark-up rules (e.g. marking up everything a common k%): PTR = $(100+k)$%

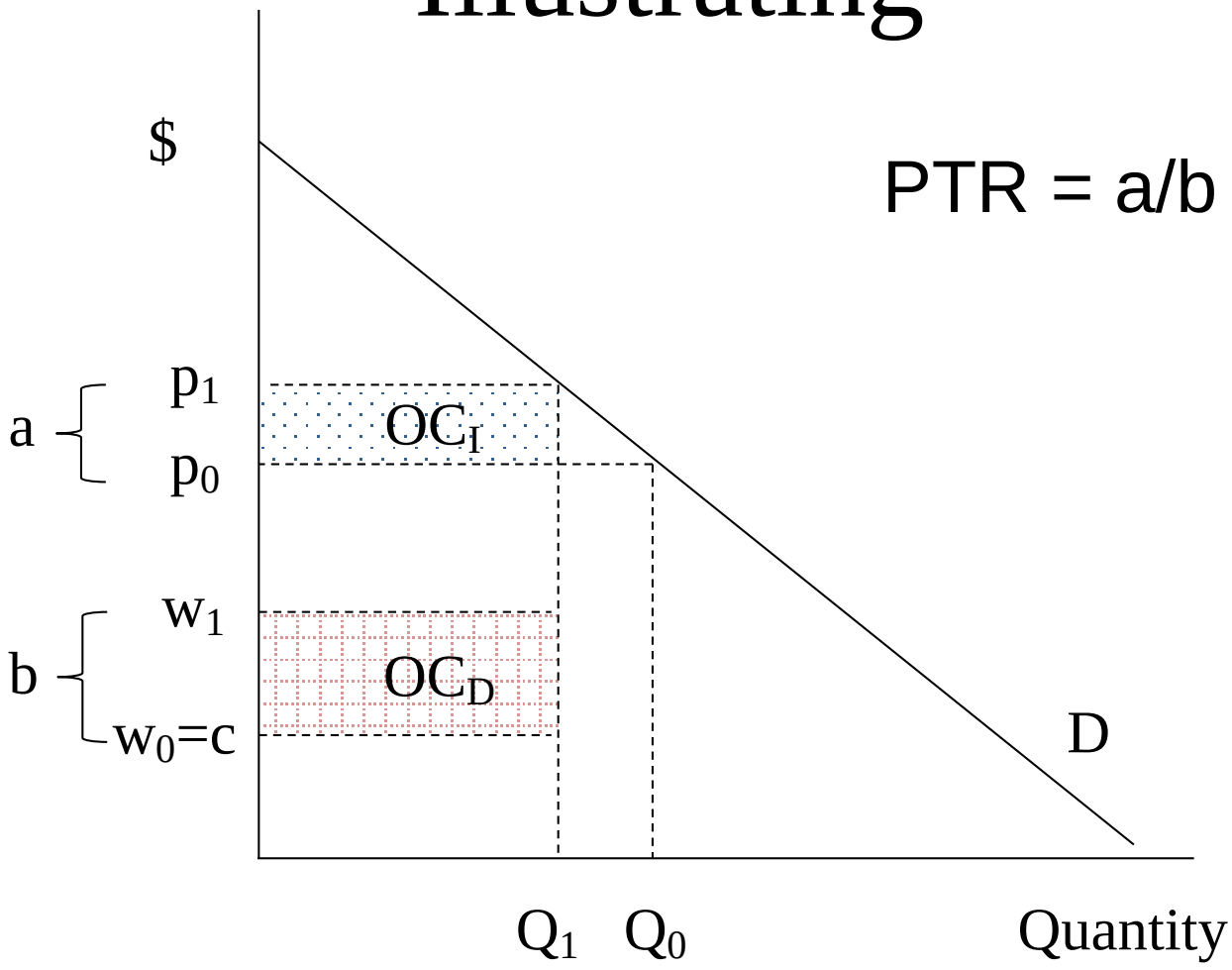
Harm to Indirect Purchasers

- Conventional way to measure the harm to indirect purchasers (in this example, final consumers):

$$\text{Overcharge to indirects} = (p_{actual} - p_{but\text{-}for}) \times Q_{actual}$$

$$\text{where: } (p_{actual} - p_{but\text{-}for}) = (w_{actual} - w_{but\text{-}for}) \times PTR$$

Illustrating



w_0, p_0, Q_0: but-for values w_1, p_1, Q_1: actual values

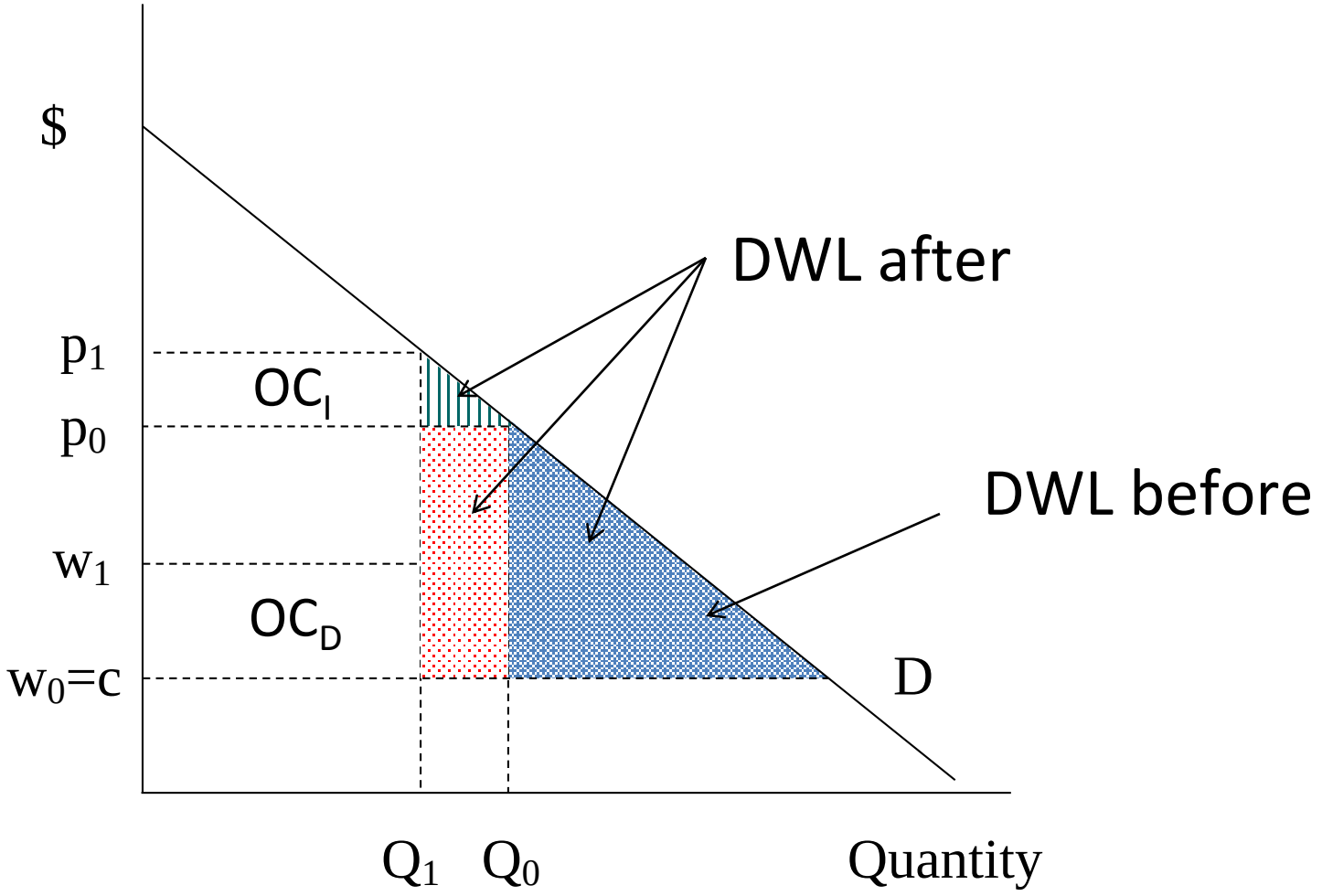
Harm to Indirect Purchasers

- But this ignores deadweight losses which can be significant with imperfect competition downstream

- e.g. it can be shown that the overcharge to direct purchasers can represent less than half of the overall harm of the price-fixing to others when downstream markets are not competitive

- Also important to recognize that even with 100% pass-through, direct purchasers can be harmed through lost profits from reduced sales at higher prices

Other Harm with Downstream Market Power (assuming no additional costs downstream)



Allocation of Harm between Direct and Indirect Purchasers

Theoretical results in the literature suggest that the fraction of harm borne by the direct purchasers will fall as the market in which the direct purchasers operate becomes more competitive. (to some extent, depending on cost and demand conditions).

Note: it is also possible (but not inevitable) that awarding full overcharge damages to directs and full pass-through overcharge damages to indirects can lead to damage awards larger than the harm created (even considering DWLs) – more likely with greater competition downstream

General Methods to Measure Pass-Through:

1. Direct regression analysis – explaining downstream (retail) price as a function of demand and cost variables and cartel period.

2. Infer effect of direct overcharge on downstream prices through an econometric study of normal relationship between downstream firm's costs and prices.

3. Benchmark methods, e.g. comparing margins or rates of return (e.g. Microsoft)

4. Qualitative – e.g. starting with assumption of perfect competition downstream, with adjustments for contracts, price-adjustment lags, limited competition etc.

Direct Estimates via Regressions

Just as with estimate of direct overcharge:

$p_t = a + b_0 \times (\text{Demand Factors}_t) + b_1 \times (\text{cost factors}_t) + b_2 \times PF_t$

But here p_t and the demand and cost factors refer to the downstream market (e.g. the price of laptops) while PF_t is an indicator variable that refers to the price-fixing upstream (e.g. price-fixing of DRAM)

Problem: downstream price effects can be very hard to tease out if the price-fixed component is only a small part of the downstream product – too many other cost elements involved.

Inferring Pass-Through

- This approach focuses on normal relationship between costs and prices downstream, e.g.

$$p_t = a + b_0 \times (\text{Demand Factors}_t) + b_1 \times (\text{Unit Costs}_t)$$

- Again: p_t and the demand and cost factors refer to the downstream market
- Here the coefficient b_1 tells us how a dollar increase in unit costs normally translates into increases in retail prices – we can use this to infer what a (previously estimated) direct overcharge would translate to downstream.

Key: this treats the price-fixed input just as any other cost component

What if there are multiple intermediate levels?

Can just repeat these steps at each stage, e.g.

1. Estimate directly at each level downstream:

$$p_t = a + b_0 \times (\text{Demand Factors}_t) + b_1 \times (\text{cost factors}_t) + b_2 \times PF_t$$

2. Or, once you have an estimate of the overcharge landing at one stage, by estimating:

$$p_t = a + b_0 \times (\text{Demand Factors}_t) + b_1 \times (\text{Unit Costs}_t)$$

To infer what the price overcharge to the next level was – and then repeating further downstream as necessary

Thank you

Comments/Questions:

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