

# The Role of a Firm's Internal Pricing Process in Explaining Collusive Practices: Theory and Cases

## Association of Competition Economists

Joe Harrington

Penn - Wharton

19 November 2020

# Introduction

## Outline

- 1 Perplexing collusive practices
  - 1 Surcharges
  - 2 List prices
- 2 Solution? Internal pricing processes
- 3 Some facts about internal pricing processes
- 4 Collusive theories constructed on internal pricing processes
  - 1 Coordinating list prices
  - 2 Sharing list prices

Note: I am a consulting expert for some plaintiffs in customer damage litigation associated with the trucks cartel.

# Perplexing Collusive Practices

- Surcharges
  - fuel: air freight (global), air passenger (UK), rail freight (U.S.)
  - lead (Belgium)
- List prices
  - Public list prices - urethane (U.S.), cement (UK)
  - Private (internal) list prices - trucks (EU)

# Perplexing Collusive Practices

## Surcharges

Competitors coordinating on a common surcharge for a critical input

- Fuel surcharge - Air freight (global), 2000-06
  - Over 40 air cargo companies
- Fuel surcharge - Air passenger (U.K.), 2004-06
  - Virgin Atlantic admitted to colluding with British Airways
- Fuel surcharge - Rail freight (U.S.), 2003-07
  - On-going private litigation against four rail companies
- Lead surcharge - Batteries (Belgium), 2004-11
  - Six battery manufacturers found guilty

# Perplexing Collusive Practices

## Surcharges

- Air freight
  - Surcharge was per kilogram; independent of origin, destination, and distance
  - BA increased fuel surcharge from 4 to 72 cents/kilogram
  - Damages > US\$1.2 billion
- Air passenger
  - Surcharge was per ticket
  - Transatlantic round-trip: US\$10 in 2004, US\$110 in 2006
- Rail freight
  - Association of American Railroads: new cost index that excluded fuel costs.
  - Surcharge was a % of the rail freight transport base rate
  - Surcharges increased 55% more than the rise in fuel costs

# Perplexing Collusive Practices

List prices (public)

Urethane (U.S.), 1999-2003

- 10th Circuit Court (2014)

*“The industry’s standardized pricing structure presumably established an artificially inflated baseline for negotiations. Consequently, any impact resulting from a price-fixing conspiracy would have permeated all polyurethane transactions, causing market-wide impact despite individualized negotiations.”*

# Perplexing Collusive Practices

List prices (public)

## Cement (U.K., 2016)

- Annually, suppliers sent letters to their customers announcing price increases.
- Prices were individually negotiated so the full price increase was rarely implemented.
- Competition and Markets Authority: *“Price announcement letters served to coordinate on list prices and soften customer resistance to price increases.”*

# Perplexing Collusive Practices

List prices (internal)

## Trucks (EU), 1997-2011

- Pricing process
  - (internal) gross list prices  $\Rightarrow$  wholesale prices  $\Rightarrow$  dealer prices  $\Rightarrow$  customer prices
- Collusion with regards to gross list prices:

*“The top management of the parties’ headquarters . . . discussed their pricing intentions, the future gross price increases . . . and occasionally agreed their respective gross price increases.”*  
(European Commission Decision, 2016)



# Perplexing Collusive Practices

- Surcharges: How can collusion be effective when firms coordinate on one (arbitrary) component of price?
  - Why couldn't an air freight company reduce its base rate in order to get more business?
- List prices: How can collusion be effective when firms are left to set discounts?
  - Justin Coombs (Compass Lexecon) on the cement case: *"How do price announcements help firms coordinate on prices if prices are ultimately individually negotiated?"*

# Collusion Affects Buyers' Conduct

Coordination on list prices and surcharges could affect final prices by affecting buyers' conduct

- List prices (public)
  - If list price is a signal of a seller's cost then it will influence buyer-seller bargaining.
  - Higher list price results in a higher negotiated price.
  - By coordinating on higher list prices, sellers result in higher negotiated prices.
- Surcharges
  - A firm-specific fuel surcharge may not be credible to buyers about fuel costs.
  - A common fuel surcharge may credibly signal a component to cost that buyers accept as non-negotiable.
  - By coordinating on a surcharge (not justified by fuel costs), sellers result in higher negotiated prices.

# Collusion Affects Buyers' Conduct

Harrington and Ye (JIE, 2019)

- Sellers' costs are private information.
- Sellers can be competing or colluding.
  - Under competition, a seller posts a low (high) list price when it is a low (high) cost type (separating equilibrium)
  - Under collusion, sellers always post a high list price (pooling equilibrium)
- Buyers are uncertain about whether sellers are competing or colluding.
- By coordinating on high list prices, sellers cause buyers to assign a higher probability that sellers are high cost types.
- Collusion results in higher final prices
  - even though sellers do not coordinate on discounts off of list prices
  - because buyers bargain less aggressively.

# Internal Pricing Process

- "Affect buyers' conduct" theory
  - is a credible explanation for collusion in publicly observed list prices
  - is a less credible explanation for collusion in surcharges
  - is not an explanation for collusion in internal list prices
- "Internal pricing process" theory
  - Collusion is among high-level executives who do not set final prices
  - Final prices are set or influenced by other employees (air freight, urethane, trucks) or an algorithm (air passenger)
  - Collusion on list prices or surcharges may be effective because colluding executives do NOT control final prices

# Internal Pricing Process

What do we know about the process within a firm determining prices?

- Hallberg, “The Micro-Foundations of Pricing Strategy in Industrial Markets: A Case Study in the European Packaging Industry,” *Journal of Business Research* (2017).
- Homburg, Jensen, and Hahn, “How to Organize Pricing? Vertical Delegation and Horizontal Dispersion of Pricing Authority,” *Journal of Marketing* (2012).
- Simonetto et al, “Structuring and Managing an Effective Pricing Organization,” in *The Oxford Handbook of Pricing Management* (2012).
- Zbaracki et al, “Managerial and Customer Costs of Price Adjustment: Direct Evidence from Industrial Markets,” *Review of Economics and Statistics* (2004).

# Internal Pricing Process

## Takeaway #1: Pricing is costly, complex, takes time, and involves multiple employees.

- “Many companies establish a multidisciplinary pricing council typically headed by the executive leading the pricing organization, and may include representatives from different functions, business units, and product lines.”
- “The decision and internal communication costs rise with the size of the price adjustment as more people are involved, more internal discussions, more attention and controversy.”
- “Changing the list price takes place over a period of several months. The internal communication costs involve the time and effort to inform the sales force about the motives behind the price change.”

# Internal Pricing Process

## Takeaway #2: Pricing authority is delegated to different parts of the organization.

- “Two key dimensions of the organizational structure of pricing authority are the vertical delegation of authority over tactical pricing decisions within sales and the horizontal dispersion of authority over strategic pricing decisions across sales, marketing, and finance.”
- “Pricing activities began with a price list, which was set annually. The marketing group set list prices, standard discount structures, and procedures for handling exceptions. The sales group then negotiated discounts for individual bids.”
- “Three different set-ups regarding pricing authority were identified: (1) pricing authority held by a sales and marketing manager, (2) pricing authority held by key account managers or internal sale reps, and (3) pricing authority held by external sales reps.”

# Internal Pricing Process

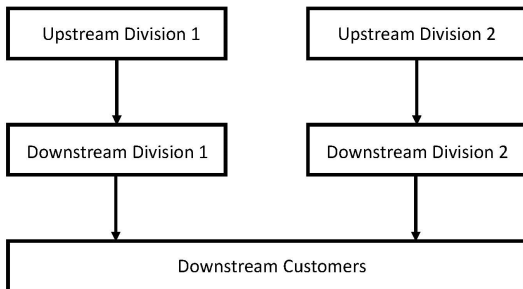
## Rudiments of a theory of collusion

- Senior managers have a large influence at an early stage of the pricing process - such as the setting of the list price or the imposition of a surcharge - but less influence regarding discounts and prices down the vertical chain.
- While they have the authority to intervene in the vertical pricing process, it would be costly and cause delay.
- Senior managers do not coordinate on final prices but rather prices that influence final prices.
- That they do not have full control over the final prices is what will make collusion work.



# Coordinating Internal List Prices

Joint with Maarten Pieter Schinkel (U. of Amsterdam)



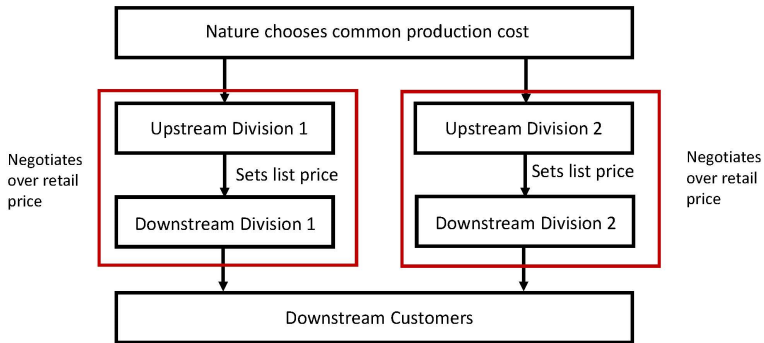
*How can coordination by companies' upstream divisions with respect to internal list prices be effective?*

# Coordinating Internal List Prices

## Extensive form

- 1 Nature chooses a common marginal cost  $c$ .
- 2 Upstream division  $U_i$  learns  $c$  and then chooses an internal list price  $list_i$ ,  $i = 1, 2$ .
  - List price is a "cheap talk" signal of  $c$ .
- 3 Downstream division  $D_i$  observes  $list_i$  and draws inferences on  $c$ .
  - At a separating equilibrium,  $D_i$  will exactly infer  $c$ .
- 4  $U_i$  and  $D_i$  negotiate over a key market variable (e.g., wholesale price, downstream price).
- 5 Downstream divisions  $D1$  and  $D2$  compete in the downstream market with differentiated products.

# Coordinating Internal List Prices



# Coordinating Internal List Prices

- Consider a separating strategy: internal list price is increasing in the true cost  $c$ .
- Let  $\sigma$  denote  $D_i$ 's point belief about  $c$ . In a separating equilibrium,  $\sigma = c$ .
- $U_i$  can choose a list price that misleads:  $\sigma \neq c$ .
- $U_i$  and  $D_i$  bargain "as if" cost is  $\sigma$ .
  - If  $U_i$  wants to mislead  $D_i$  on cost with the list price then it will want to bargain "as if" cost is  $\sigma$ .
  - Intuitively, results extend to when only  $D_i$  bargains "as if" cost is  $\sigma$ .

# Coordinating Internal List Prices

- Downstream division cares more about selling units compared to the upstream division
  - Upstream division cares about profit
  - Downstream division  $i$  cares about output or revenue
- Negotiate over the retail price  $p_i$ .
- Nash Bargaining Solution:  $p^*(\sigma)$  is the negotiated retail price based on inferred cost  $\sigma$ .

# Coordinating Internal List Prices

- Conjecture a separating list price strategy:  $list_i = f(c)$  where  $f$  is strictly increasing.
- Downstream division's point belief:  $\sigma = f^{-1}(list_i)$ .
- Relationship between the list price and the retail price:  
 $p^*(\sigma) = p^*(f^{-1}(list_i))$ .
- Given  $p^*(f^{-1}(list_i))$ , the upstream division decides whether to choose a list price that reveals cost.
- **Separating equilibrium exists** when products are sufficiently similar or the upstream division has sufficient bargaining power.
  - Internal list price  $\Rightarrow$  informs downstream division on cost  $\Rightarrow$  affects negotiations on the retail price
  - Partial alignment of interests comes from downstream demand

# Coordinating Internal List Prices

*How can coordination by companies' upstream divisions with respect to internal list prices be effective?*

- Higher common list prices  $\Rightarrow$  higher inferred costs by downstream divisions  $\Rightarrow$  higher negotiated downstream prices
- Coordination on list prices is equivalent to coordinating on an "inflated cost" which is injected into the vertical pricing process which is then passed through to final prices.
- Efficacy rests on the upstream division not having full control over the final prices.

# Information Exchange of Prices

- European Commission
  - Whish and Bailey (2018): “Mere attendance at a meeting where an undertaking discloses its confidential pricing plans to its competitors is likely to be caught by Article 101(1).”
  - Guidelines (2011): “Information exchange can constitute a concerted practice if it reduces strategic uncertainty ... because it reduces the independence of competitors’ conduct and diminishes their incentives to compete.”
- Open question: *How does "sharing prices" result in higher prices?*



# Information Exchange of Prices

Harrington, "Anti-competitiveness of Sharing Prices," March 2020

- Consider an information exchange of prices
  - prior to consumers transacting
  - leaves some discretion as to the prices charged to consumers.
- Examples
  - Sharing list prices, and net prices are still to be set or negotiated (trucks, bananas)
  - Sharing sticker prices, and rebates could still be offered

# Information Exchange of Prices

## Extensive form

- Stage 1: In each firm, the senior manager chooses internal list price.
- Stage 2 (when there is an information exchange): Firms' senior managers share their list prices.
- Stage 3: A senior manager can decide to intervene in the process determining the net price. Doing so incurs an *intervention cost*.
- Stage 4: Net price is determined.

# Information Exchange of Prices

- If the *intervention cost* is neither too low nor too high then the information exchange raises list and net prices.
- Equilibrium without information exchange: firms set low list prices which results in low net prices (and there is no intervention)
- Equilibrium with information exchange: firms set high list prices which result in high net prices (and there is no intervention)
  - If a firm instead set a low list price then the other firm would reduce its net price to compete, as long as the *intervention cost* is not too high.
  - If both firms set high list prices, a firm would not undercut its rival with a low net price, as long as the *intervention cost* is not too low.

# Information Exchange of Prices

- Senior managers control and privately share list prices, and they have partial influence in the setting of net prices faced by consumers.
- If senior managers have significant control over net prices (low *intervention cost*) then an information exchange has no effect because they will set low net prices after sharing list prices.
- If senior managers have insignificant control over net prices (high *intervention cost*) then an information exchange has no effect because they will set low list prices knowing the rival executive cannot easily respond.
- If senior managers have modest control then an information exchange results in supracompetitive list and net prices.

# Concluding Remarks

## Main insight

- Coordination of final prices is *less* effective when the colluding executives do not fully control final prices.
  - In lysine cartel, ADM reduced sales representatives' pricing authority.
- Coordination of intermediate prices (e.g., list prices) is *more* effective when the colluding executives do not fully control final prices.

# Concluding Remarks

## Future research

- If an executive does not have full control over the final price, why doesn't it acquire it so as to be able to cheat?
  - It may forego other advantages from delegating pricing authority (e.g., information).
  - It may look suspicious, leading some in the organization to suspect collusion.
  - Organizational change may be costly.
- Why pursue this form of collusion? Why not coordinate over final prices rather than a price that *affects* final prices? How and when is this form of collusion effective?
- Need to learn more about how price is set within the firm.