

Price Discrimination Policy in Intermediate Markets

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¹The views expressed herein are my own and do not necessarily represent the views of Compass Lexecon.

Large retailers sometimes obtain discounts that make it harder for rivals to compete against them. For example:

- NorgesGruppen is a large Norwegian grocery chain:
 - ▶ 1835 grocery stores in 89% of Norway's municipalities
 - ▶ 40,000 employees and 1200 business partners
 - ▶ Approximately 43.3% market share (newsinenglish.no, Nov. 2018)
- Coop (29%), Rema (23.9%), Bunpris (3.7%), Kolonial.no (tiny%) compete with NorgesGruppen. (newsinenglish.no, Nov. 2018)
- Kolonial.no claims they pay 20 percent more than NorgesGruppen for some products.



Q. Should competition authorities do anything about this?

Age-old question: Should competition authorities forbid price discrimination that may harm some competitors?

Long time policy issue in the U.S., beginning with the chain store movement in the 1930s.

- “Mom & Pop” stores complained that large chains received discounts that made it hard for them to compete.

In the U.S., the Robinson-Patman Act was passed in 1936 to help small retailers compete.

This law became perhaps the most vilified competition law in the U.S., but largely for its primary line impact.

What does economics tell us about laws that forbid price discrimination to protect secondary line competition?

Price Discrimination in Intermediate Markets

Q. For starters, what do we mean by price discrimination?

An old classification due to A.C. Pigou distinguished 1st, 2nd, and 3rd degree price discrimination.

- 3rd degree is the one that involves charging different linear prices to different buyers (or buyer groups).

Much of my focus today is on 3rd degree price discrimination by suppliers selling to downstream firms.

However, price discrimination in intermediate markets often involves aspects of all three types, and I discuss some of the issues.

- Buyer-specific nonlinear pricing
- Menus that discriminate across units and therefore across buyers of different sizes

Third Degree Price Discrimination in Final Good Markets

There is a long literature on 3rd degree price discrimination—different linear prices to different buyers—in final good markets.

Effects depend on demand curvature.

- A necessary condition for price discrimination to raise welfare is that it raises total output.
 - ▶ Efficient allocation of fixed output requires equal marginal utilities.
- Under linear demand, output does not change, so price discrimination reduces welfare.

Thus, under linear demand, forbidding price discrimination tends to raise welfare in final good markets.

Q. Does this result motivate an aggressive stance against 3rd degree price discrimination to protect secondary line competition?

Differences Between Final and Intermediate Markets

Three differences between final and intermediate markets are important for many competition issues, including price discrimination. In intermediate markets:

- 1 Buyers more often have interdependent demand
- 2 Price terms are more often negotiated
- 3 Price terms are more often nonlinear

Katz (1987) was the first to address the effects of forbidding price discrimination in a model that accounts for the first factor and partly accounts for the second.

Katz (1987) – Model and Results

Model

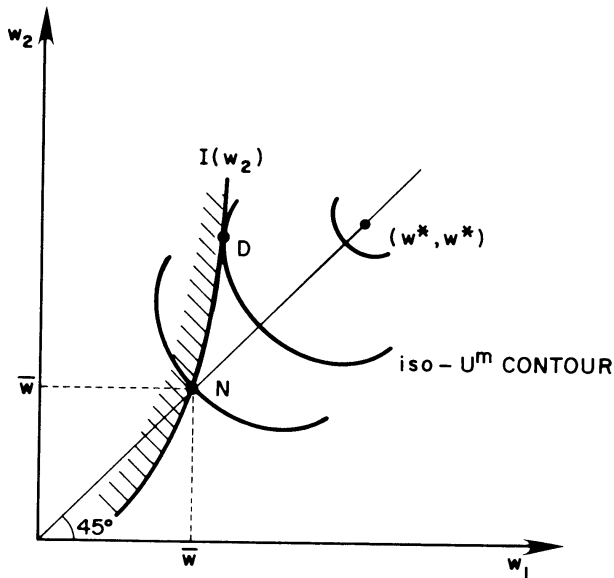
- Upstream monopoly
- Downstream Cournot competition among competing stores
- Take-it or leave-it, linear wholesale prices
- Large “chain stores” can integrate backward at lower cost than smaller stores

Katz' Main Result

If there is no integration in either regime, total output and welfare are lower when price discrimination is practiced than when it is forbidden.

This is an *important result*. Prior to this result, the Robinson-Patman Act was widely panned.

Katz (1987) – Explanation of Main Result



A More Complete Bargaining Analysis

All the “bargaining power” in Katz’s model comes from the threat to integrate backward (or seek alternative supplies).

- This source of bargaining power is what the bargaining literature calls an “outside option.”

But bargaining power comes from four sources:

- Relative inflicted losses (which depend in part on disagreement profits)
- Bargaining weights
- Concession costs
- Outside options

Q. What are the effects of forbidding price discrimination after accounting for all four elements of bargaining power?

A More Complete Bargaining Analysis (O'Brien, 2014)

Model

- Upstream monopoly
- Downstream oligopoly (unspecified) among competing stores
- Simultaneous Nash bargaining over linear wholesale prices
- Large “chain stores” can integrate backward at lower cost than smaller stores

Generalizes the ways that chains can negotiate discounts. Chain's bargaining problem solves:

$$\max_{w_1} \phi_1(w_1, w_2) = [U(w_1, w_2) - d_{u1}(w_2)]^{1-\gamma_1} [\pi_1(w_1, w_2) - d_1(w_2)]^{\gamma_1}$$

$$s.t. \pi_1(w_1, w_2) \geq \pi^I(v, w_2^I)$$

Relative inflicted losses:

$$\max_{w_1} \phi_1(w_1, w_2) = [U(w_1, w_2) - d_{u1}(w_2)]^{1-\gamma_1} [\pi_1(w_1, w_2) - d_1(w_2)]^{\gamma_1}$$

$$s.t. \pi_1(w_1, w_2) \geq \pi^I(v, w_2^I)$$

Bargaining weights:

$$\max_{w_1} \phi_1(w_1, w_2) = [U(w_1, w_2) - d_{u1}(w_2)]^{1-\gamma_1} [\pi_1(w_1, w_2) - d_1(w_2)]^{\gamma_1}$$

$$s.t. \pi_1(w_1, w_2) \geq \pi^I(v, w_2^I)$$

Concession costs: $\partial U/\partial w_1$ and $\partial \pi_1/\partial w_1$:

$$\max_{w_1} \phi_1(w_1, w_2) = [U(w_1, w_2) - d_{u1}(w_2)]^{1-\gamma_1} [\pi_1(w_1, w_2) - d_1(w_2)]^{\gamma_1}$$

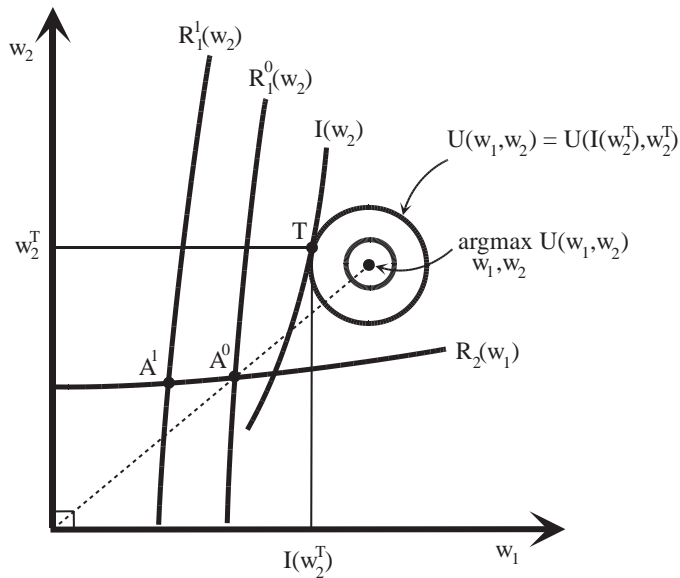
$$s.t. \pi_1(w_1, w_2) \geq \pi^I(v, w_2^I)$$

Outside options:

$$\max_{w_1} \phi_1(w_1, w_2) = [U(w_1, w_2) - d_{u1}(w_2)]^{1-\gamma_1} [\pi_1(w_1, w_2) - d_1(w_2)]^{\gamma_1}$$

$$s.t. \pi_1(w_1, w_2) \geq \pi^I(v, w_2^I)$$

Chain Discounts Under Bargaining



The Concession Cost Effect

Suppose the integration constraint is slack. When discrimination is allowed, the Nash bargaining solution solves:

$$\frac{\gamma_i[-\partial\pi_i(w_1^A, w_2^A)/\partial w_i]}{\pi_i(w_1^A, w_2^A) - d_i(w_j^A)} = \frac{(1 - \gamma_i)[\partial U(w_1^A, w_2^A)/\partial w_i]}{U(w_1^A, w_2^A) - d_{ui}(w_j^A)}$$

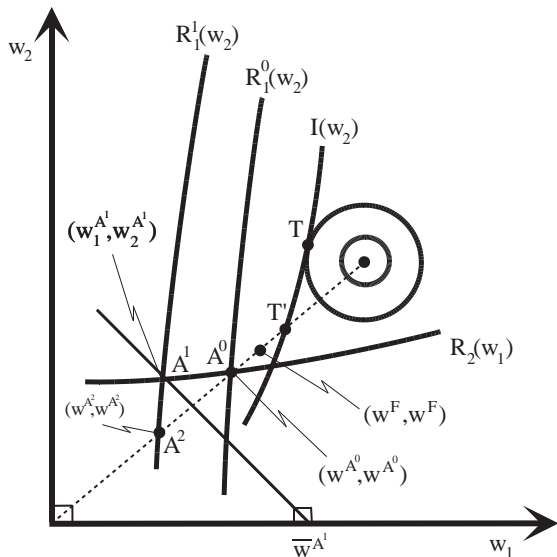
or

$$\frac{\text{Firm } i\text{'s weighted concession cost}}{\text{Firm } i\text{'s net profit}} = \frac{\text{Supplier's weighted concession cost}}{\text{Supplier's net profit}}.$$

When discrimination is not allowed, the Nash bargaining between the supplier and firm 2 solves:

$$\frac{\gamma_2[(-\partial\pi_2/\partial w_2) + (-\partial\pi_2/\partial w_1)]}{\pi_2 - d_2} = \frac{(1 - \gamma_2)[(\partial U/\partial w_2) + (\partial U/\partial w_1)]}{U - d_{u2}}.$$

A More Complete Bargaining Analysis – O'Brien (2014)



Result 1

Symmetric case – If the chain's integration advantage is insufficient to induce a discount and there is no integration under either regime, the wholesale price is higher and welfare is lower when price discrimination is forbidden than when it is practiced.

Result 2

Asymmetric case – If the chain receives a discount due to bargaining advantages unrelated to its integration threat and the supplier can select which downstream firm will negotiate the common price, then if there is no integration under either regime, the average wholesale price is higher when discrimination is forbidden than when it is practiced.

O'Brien (2014) Main Results

These results are the opposite of Katz! Why?

- Natural bargaining effect is the concession cost effect
- *Outside option principle* implies the natural bargaining effect arises unless the outside option is credible (binding)
- A binding outside option changes the character of bargaining – everything is driven by the constraint

Effects occur even if there is no discrimination when price discrimination is allowed.

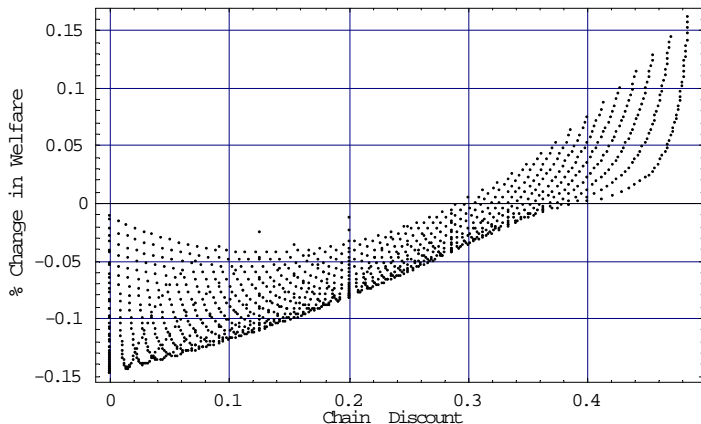
- Price discrimination allows bilateral bargaining and *multilateral competition*
- Forbidding price discrimination removes impact of purely bilateral bargaining and multilateral competition

When the Chain Negotiates Price

Q. If the chain negotiates price, can it pull the independent's price down enough to lower the final price?

A. Maybe, but the chain discount has to be large.

Welfare Effects of Forbidding Price Discrimination
For Different Chain Discounts

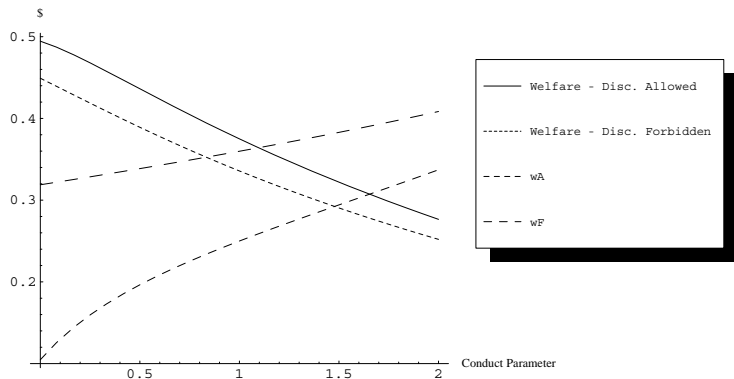


When Retailers are Intensely Competitive

Q. Does intense retail competition eliminate the concession cost effect?

A. No.

Wholesale Price and Welfare Effects For Different Downstream Competitive Intensities



Adelman (1959) argued that suppliers with strong brand positions that sold to A&P benefitted from Robinson-Patman.

- Consistent with chain bargaining power arising from concession costs, disagreement profits, bargaining weight
- Not consistent with the take-it or leave-it model

Ross (1984) conducted an event study showing that stock values of major grocery chains fell after Robinson-Patman was passed.

- Consistent with the bargaining model
- Not consistent with the take-it or leave-it model

Summary of Linear Price Bargaining Models

Reasoning from take-it or leave-it final good models misses important issues in the analysis of price discrimination in intermediate markets where demands are interdependent and prices are often negotiated.

Katz's important paper addressed interdependent demand and partly addressed bargaining (outside options under take-it or leave-it).

A more complete bargaining analysis shows that it is critical whether discounts arise from outside options or other bargaining advantages.

The impact of forbidding price discrimination is ambiguous, but there are significant forces under bargaining that can make forbidding price discrimination a bad idea.

Limited empirical work is consistent with discounts being driven by factors other than outside options.

Models discussed so far abstract from *buyer-specific non-linear pricing*.

But many supply contracts have non-linear tariffs.

- Buyer-specific volume discounts (e.g., all-units discounts, retroactive rebates, take-or-pay arrangements)
- Menus with volume discounts

Buyer-specific nonlinear pricing and menu pricing create additional reasons why forbidding price discrimination can be a bad idea.

Bargaining Over Non-linear Tariffs (O'Brien & Shaffer, 1994)

Three Stage Model

- 1 Upstream monopolist offers private nonlinear contracts (two-part tariffs) to two downstream differentiated Bertrand competitors.
- 2 Absent laws constraining price discrimination, the upstream firm can bilaterally renegotiate (secretly) with each downstream buyer.
- 3 Downstream buyers set prices as Bertrand competitors.

There are challenges in defining what it means to forbid price discrimination.

Three interpretations of no price discrimination:

- 1 Uniform wholesale price, no fixed fees
- 2 Uniform wholesale price, common fixed fee
- 3 Uniform wholesale price, discriminatory fixed fees

Bargaining Over Non-linear Tariffs – Results

Price discrimination is allowed:

- Wholesale price equals marginal cost
- O'Brien & Shaffer (1992), Rey & Verge (2004)

Uniform wholesale price, no fixed fees:

- Wholesale price exceeds marginal cost (double marginalization)
- Welfare falls; small retailers prefer over discriminatory fees if bargaining power is low

Uniform wholesale price, common fixed fee:

- Wholesale price exceeds marginal cost (essentially metering)
- Welfare falls; small retailers lose

Uniform wholesale price, discriminatory fixed fees

- Wholesale price exceeds marginal cost (competition softening)
- Welfare falls; small retailers prefer over no fees if bargaining power is high

Bilateral Contracting and Price Discrimination

Both linear and nonlinear pricing models of price discrimination involve a general force through which price discrimination tends to enhance competition: **bilateral contracting**

Bilateral contracting gives rise to contracting externalities that dissipate rents but enhance price competition.

Firms have incentives to make commitment to eliminate these externalities.

- For example: commitments to non-discrimination

Laws forbidding price discrimination create such commitments.

Price effects of such commitments are bad, but investment effects may make optimal policy murky.

Menu Pricing and Price Discrimination

Kolay and Shaffer (2019) interprets Robinson-Patman as requiring a single menu.

Model

- Upstream monopoly and downstream differentiated Bertrand
- Monopolist makes observable take-it or leave-it offers (either buyer-specific non-linear tariffs or a menu)
- Downstream firms set prices

Results

- When discrimination is allowed, the fully integrated outcome arises. (Mathewson & Winter, 1984)
- When discrimination is forbidden (requiring a single menu), all wholesale retail prices rise.
 - ▶ Buyer information rents lead to a greater wholesale price distortion for small retailer
 - ▶ Wholesale price also rises to large retailer to relax the small retailer rationality constraint

Kolay & Shaffer in context:

- Begins filling gap regarding menu pricing v. buyer-specific nonlinear contracts
- Effects would be even worse if the benchmark were unobservable buyer-specific nonlinear contracts

A wide range of models finds that forbidding price discrimination harms consumers.

Competition Authority's Objective

In the linear price model, forbidding price discrimination is beneficial when the chain's outside option constraint binds.

Q. Is this a basis for constraining price discrimination?

A1. A general policy against price discrimination could increase welfare in some markets in some circumstances, but it could substantially harm welfare in others.

A2. If the objective is to protect small business, the authority should recognize the potentially substantial social cost of doing this by prohibiting price discrimination.