

# **Posted Prices vs. Haggling: The Economics of Isoperfect Price Discrimination**

6 June 2009

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We would like to thank Michael Alexeev, Maria Arbatskaya, David Hirshleifer, Justin Johnson, John Lott, and Thomas Lyon and seminar participants at the University of East Anglia and Warwick for helpful comments.

*“First-degree* price discrimination is perfect price discrimination—the producer succeeds in capturing the entire consumer surplus. **This occurs, for instance, when consumers have unit demands and the producer knows exactly each consumer’s reservation price and (if these reservation prices differ) can prevent arbitrage between consumers.** It then suffices for the producer to charge an individualized price equal to the consumer’s reservation price.” Jean Tirole *The Theory of Industrial Organization* (p. 135):

**The absolutely best position for a monopoly to be in is (a) to know the precise utility function of every consumer, (b) to be able to tailor a “price schedule” for each individual consumer, and (c) to be able to control absolutely any resale of the good being sold.** Then the monopoly can make a “take-it-or-leave-it” offer to each individual consumer, which extracts from the consumer all the surplus that this consumer would otherwise obtain from consumption of the good in question.” David Kreps, *A Course in Microeconomic Theory* (p. 306)

**“3 Perfect Price Discrimination.** This combines interbuyer and interquantity price discrimination. When the monopolist does have perfect information and can charge each buyer that buyer’s reservation price for each unit bought, Smith might end up paying \$50 for his first hot dog and \$20 for his second, while next to him Jones pays \$4 for his first and \$3 for his second.” Eric Rasmusen, *Games and Information* (p. 296):

Arthur Pigou's 1920 *The Economics of Welfare*:

When a degree of non-transferability ... sufficient to make discrimination profitable, is present, **the relation between the monopolistic monopolist and each buyer is, strictly, one of bilateral monopoly.** The terms of the contract that will emerge between them is, therefore, theoretically indeterminate and subject to the play of that "bargaining" whose social effects were analysed at the end of Chapter VIII....

Usually, however, where discrimination is of practical interest, the opposed parties are, not a single large monopolist and a few large buyers, but a single large monopolist and a great number of relatively small buyers. The loss of an individual customer's purchase means so much less to the monopolistic monopolist than to any one of the many monopolistic purchasers that, apart from combination among purchasers, all of them will almost certainly accept the monopolistic monopolist's price. They will recognize that it is useless to stand out in the hope of bluffing a concession, and will buy what is offered, so long as the terms demanded from them leave to them *any* consumers' surplus. **In what follows I assume that the customers act in this way.**

## 2. The Model

A monopolist's marginal cost at output  $z$  is  $c(z)$ .

Demand arises from a unit mass of consumers, where a consumer's willingness to pay  $v$  for a single unit is drawn from  $F(\cdot)$  with positive density  $f(\cdot)$  over a support bounded above by  $\bar{v} > c(0)$ .

The price  $p$  yields demand quantity  $z(p) = 1 - F(p)$ .

The monopolist may sell either by posting a single price or by bargaining with individual consumers. Bargaining splits the surplus, with fraction  $\lambda$  going to the monopolist and  $(1 - \lambda)$  to the consumer.

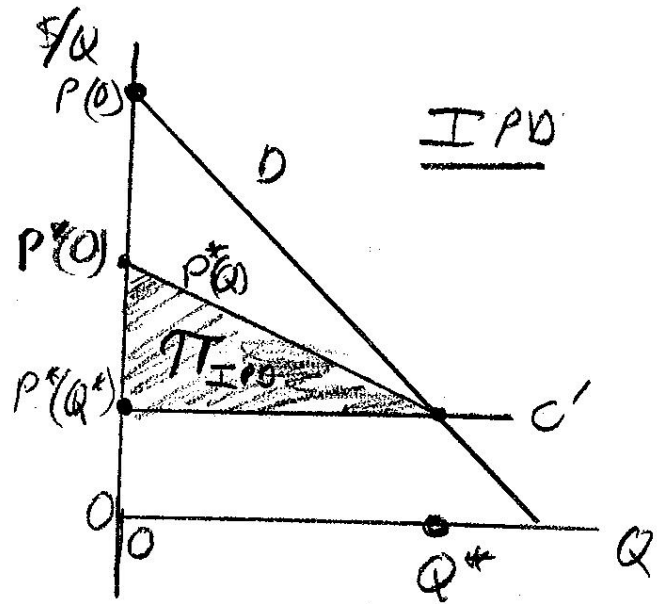
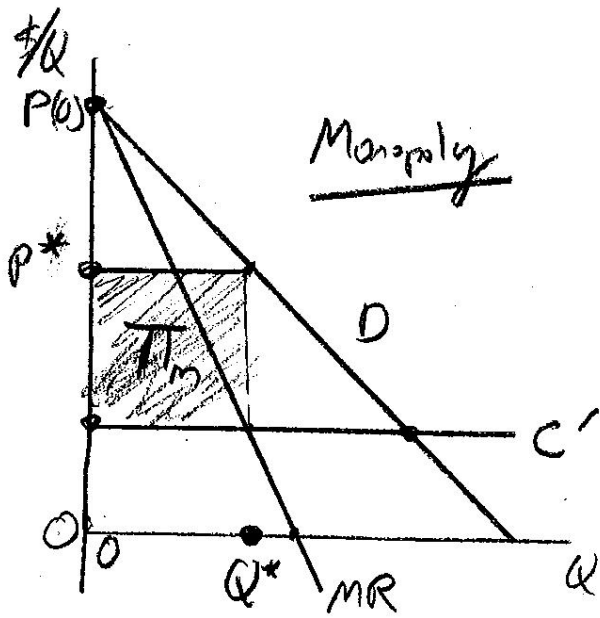
All functions and parameters are common knowledge. The monopolist knows each consumer's reservation price, can identify each consumer, and can prevent resale.

In the basic model, transaction costs are zero, bargaining power is equal, marginal cost is constant, demand is linear, and consumers are fully informed of their tastes:  $t_p = t_b = 0$ ,  $\lambda = .5$ ,  $c(z) = c$ , and  $p''(z) = 0$ .

*Definition:* Under “**monopoly pricing**” the monopolist posts a single price, which buyers may only accept or reject.

*Definition:* Under “**Pigouvian perfect price discrimination**” the monopolist bargains with each buyer separately, and captures the entire surplus.

*Definition:* Under “**isoperfect price discrimination**” the monopolist bargains with each buyer separately, and captures half of the surplus from each buyer.



**Proposition 1:** In the basic model the monopolist is indifferent between monopoly pricing and isopropyl price discrimination, earning profits in each case of half of the total surplus.

## DISCUSSION 1: WHY THIS IS IMPORTANT

We teach our students about perfect price discrimination. We say it never happens in reality, but it is a useful limiting case. We use it to teach them that **it is better for a seller with market power if he knows more about each consumer's valuation and can charge them more rather than fewer prices.**

Our big point is: **That's wrong.**

Knowing more about the consumers and being able to charge more different prices is sometimes bad for the seller, not good, depending on the shape of the demand curve.

## DISCUSSION 2: COMMITMENT ASSUMPTIONS

When we talk about pricing, we make three kinds of assumptions.

(1) The degree of market power– the slope of the demand curve facing the firm.

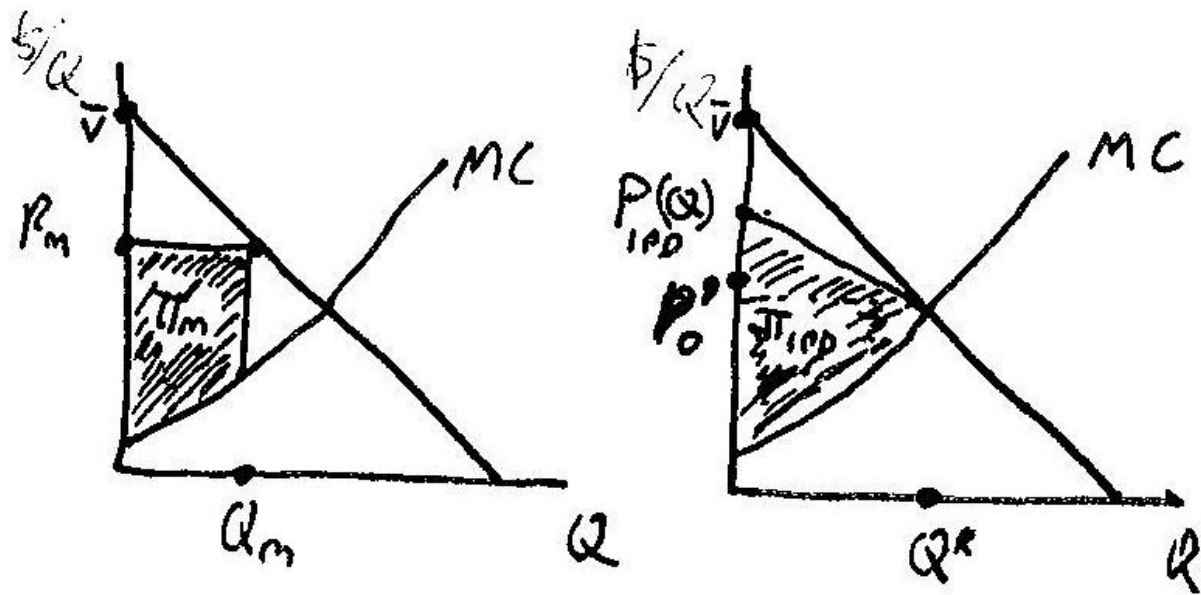
(2) Whether the seller can sell at different prices to different consumers (based on resale, his information)

(3) Whether the seller can commit to his pricing scheme.

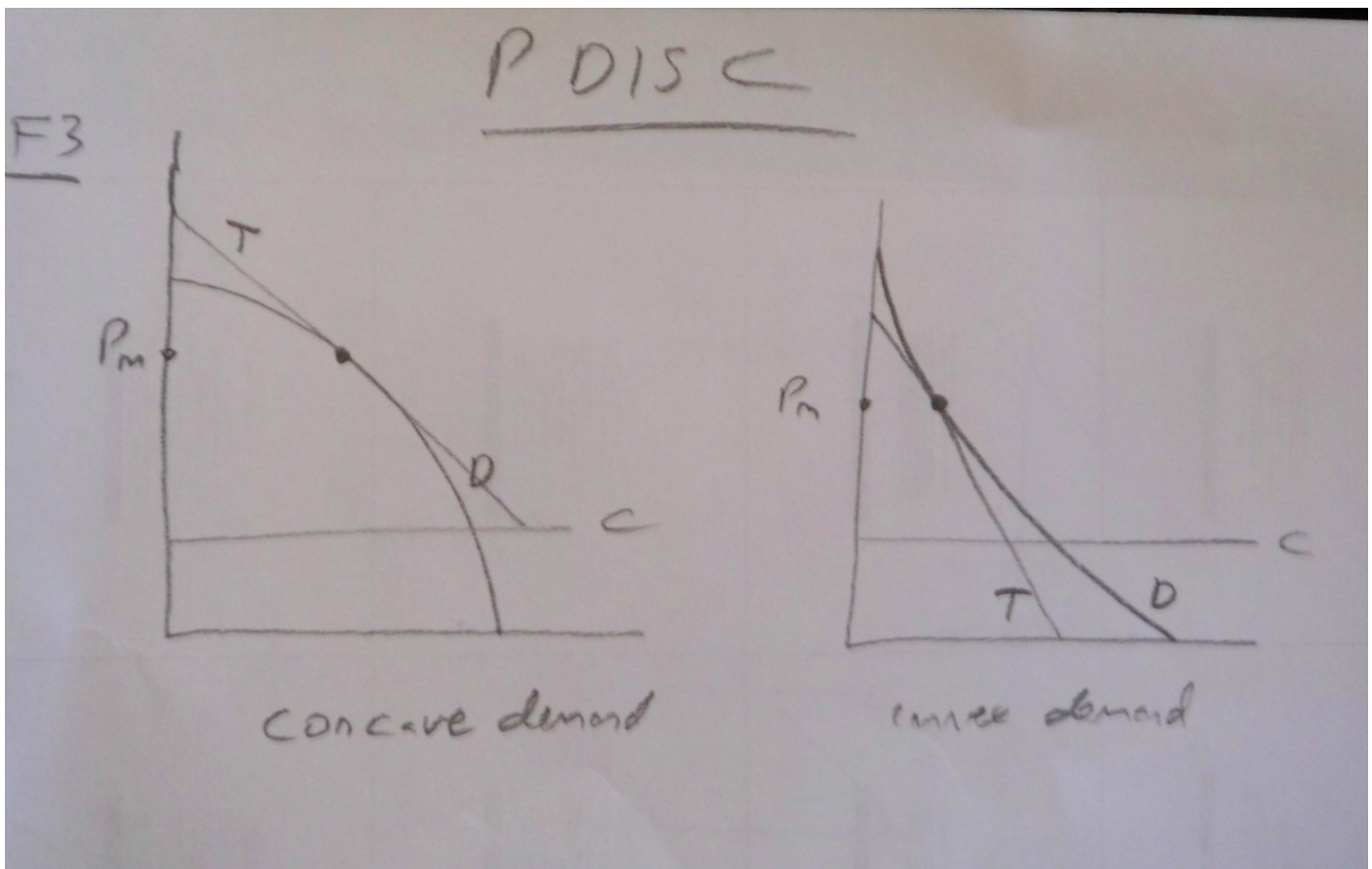
In most situations, commitment is unimportant. A simple monopoly seller in a static market does not need commitment. Nor does a monopoly seller in a dynamic market if each period is independent of the other.

But it matters a lot to price discrimination. And that's where it's toughest to achieve, either by publication or reputation. It's too easy to cheat unobserved on promises never to reduce a price.

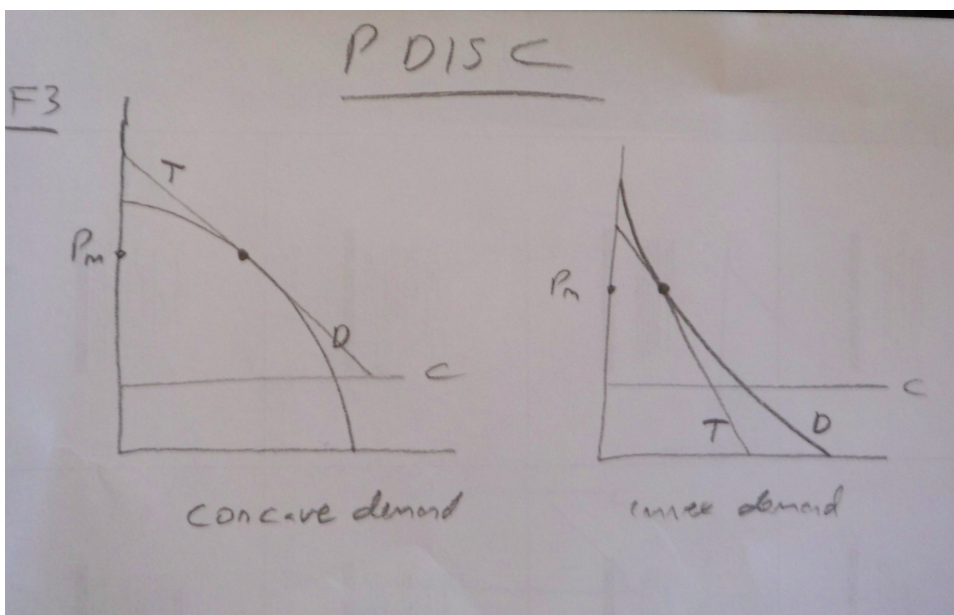




**Proposition 2: If marginal cost is increasing ( $c'(z) > 0$ ), the monopolist prefers isoperfect price discrimination to monopoly pricing. If marginal cost is decreasing ( $c'(z) < 0$ ), he prefers monopoly pricing.**



**Proposition X.** Isoperfect price discrimination is more profitable than monopoly pricing if demand is convex, and less profitable if demand is concave.



If demand is convex, many consumers have low reservation prices.

If demand is concave, high reservation prices are the most common.

**For a single-price monopolist, having lots of similar high-reservation price consumers is more important than having a lot of similar low-reservation price consumers.**

For a price discriminator, having more high-reservation-price consumers is desirable, but not quite so important. He can capture the surplus of even a few high-reservation-price consumers, whereas the simple monopolist cannot.

Another way of putting this is that under asymmetric information and a take-it-or-leave-it offer, informational rents to each high-value consumer are larger if there are fewer of them.

## Some Lessons

1. Monopolists should often be glad, not unhappy, that transaction costs forbid them from engaging in perfect price discrimination.
2. Market power is heavily influenced by the ability to commit. This has been obvious in bargaining models, but it is true in what are usually considered old-fashioned monopoly models.
3. Being small is not the same as being powerless. An atomistic consumer still has market power unless demand is perfectly elastic. He is the only consumer with that particular level of demand—or at least one of a limited number (maybe demand is elastic over an interval). His problem under a monopoly arises because of transaction costs: he is too small to spread a fixed cost.

# Application: SECRET DISCOUNTING HELPS CONSUMERS BY FAVORING ISOPERFECT PRICE DISCRIMINATION

(1) Secret discounting undermines profits in cartels.

The standard reasoning is that it allows sellers to compete for customers.

As a result, the law should encourage secret discounting.

(2) We suggest **another reason why secret discounting hurts cartels and helps consumers: bargaining price discrimination.**

Suppose the cartel could allocate customers by territory, so that price competition among members was not a threat.

Discounting would still hurt cartel profits, and would still be tempting because of bargaining with individual customers.

## **Application: IF WORKERS ARE IN A POOR BARGAINING POSITION WITH AN EMPLOYER, IT IS NOT BECAUSE OF SIZE**

An argument sometimes made is that the employer is large, and has market power, whereas the worker is small and has no market power.

Then, unionization helps turn simple monopsony into bilateral monopoly.

We suggest that size is not what is important. Each worker does have market power, since he is the sole provider of his labor, whereas it is rare for an employer to have a monopsony.

**Hence, if worker's are in a bad bargaining position, it isn't because of size.**

## **Application: EVEN A “SMALL” COUNTRY CAN INFLUENCE THE TERMS OF TRADE IN BILATERAL NEGOTIATIONS**

A basic dichotomy in international trade models is between large countries, which are big enough to influence world prices by their tariff levels, and small countries, which are not.

A small country cannot benefit from imposing a tariff, because it cannot cause the terms of trade to change in its favor, but for a large country there is a positive optimal tariff.

If tariffs are the result of bargaining between large and small countries, however, and if resale can be prevented, then the situation is one of bargaining price discrimination.

The small country's demand is irreplaceable, and it can bargain with the large country for a more favorable price.

Pakistan, for example, might be a very minor consumer of coffee, but it could nonetheless negotiate with Brazil for a favorable coffee price.

This is interesting because the small country has no market power against the world as a whole, but it does against one other large country.