Overheads, G601: Tirole Chapter 1, Monopoly

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TOPICS:

1. Market power

2. Bad things about monopoly

3. Monopoly pricing

4. Taxes

multiproduct monopoly

learning by doing

durable-goods monopoly

The firm of basic price theory has a U-shaped cost curve and a perfectly elastic demand curve for its products.

Basic price theory commonly doesn't seem to correspond to real-world firms in several ways:

1. Firms seem to be operating on the downward sloping part of the average cost curve. Most simply, a better model seems to be to have a fixed cost and flat MC.

2. Firms don't sell identical products, and they do have market power— demand curves that are not perfectly elastic.

3. Firms engage in bargaining with large customers and suppliers.

4. Firms earn ex ante positive economic profits.

Adding differentiated products to the model brings in all of these things. They do not change the comparative statics much, which is why basic price theory works so well.

–effect of a cost increase

– effect of a sales tax

–effect of a corporate income tax

–effect of a demand increase

– incentives to reduce costs

The more complicated model does explain why firms like to get more business, and why firms are heterogeneous.

But note that even the basic model can easily allow some firms to have better production technologies, better cost curves.

What is Bad About Monopoly?

1. Triangle, Harberger Loss from the Decline in Output and Trade. Harberger showed that this is relatively unimportant.

2. Rentseeking to get the Monopoly

3. Managerial Slack (Farrell in the Reader)

4. A Lower-Cost Entrant cannot Enter

5. The Monopolist Does Not Innovate as Much (but maybe a monopoly would innovate MORE—consumer surplus capture problem. Schumpeter emphasized this in Capitalism Socialism Democracy) (related: the monopolist seeks to destroy rival innovations—a form of the rentseeking problem).

6. The Monopolist produces the wrong level of quality (too low OR too high)

All of these apply to monopolistic labor unions as much or more than to corporations.

It is quite possible to have a zero-profit monopoly, and that monopoly might create all the inefficiencies listed above.

ELASTICITIES AND PRICING WITH MARKET POWER I: The Price Approach

Market Power, Monopoly Pricing: The demand curve facing the firm slopes down. Its sales are responsive to price.

The Lerner Index. p. 66 of Tirole. Let demand be $q = D(p)$. $C(q)$ is total cost. The firm maximizes by choice of p,

$$pD(p) - C(D(p)) \tag{1}$$

giving us first-order condition

$$pD' + D - C'D' = 0, \tag{2}$$

so

$$(p - C')D' = -D, \tag{3}$$

and

$$p - C' = -\frac{D}{D'}, \tag{4}$$

and

$$\frac{p - C'}{p} = -\frac{D}{D'p}, \tag{5}$$

This says that the percentage margin of price over marginal cost should depend on D and D'.

The elasticity of demand is

$$\epsilon_{pp} = \frac{\%\Delta Q^d}{\%\Delta P} = \frac{dQ^d/Q}{dP/P} = \frac{dQ}{dP}\frac{P}{Q} = D'\frac{p}{D} \tag{6}$$

Thus,

$$\frac{p - C'}{p} = -\frac{D}{D'p} = \frac{1}{\epsilon_{pp}}. \tag{7}$$

The left-hand-side is the Lerner Index.

Price increases with inelasticity, roughly speaking, and so does profit, but deadweight loss does not. Price rises a lot if demand is inelastic, but quantity does not fall so much.

Usually, we look at this as the monopoly choosing quantity instead of price. The result is exactly the same; it is just a matter of convenience and interpretation, unlike in the Cournot and Bertrand strategic models. Even in those models, it would not matter if a firm took price or quantity as its choice variable– except that it is essential in the Cournot model that it takes the quantity of the OTHER firm as given, and in the Bertrand model that it take the PRICE as given.
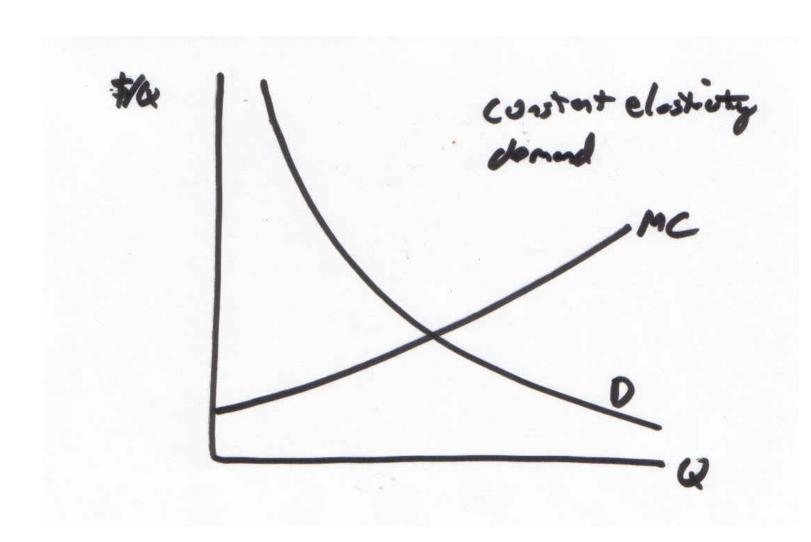
A necessary but not sufficient condition for profit maximization is to pick Q so that MR=MC.
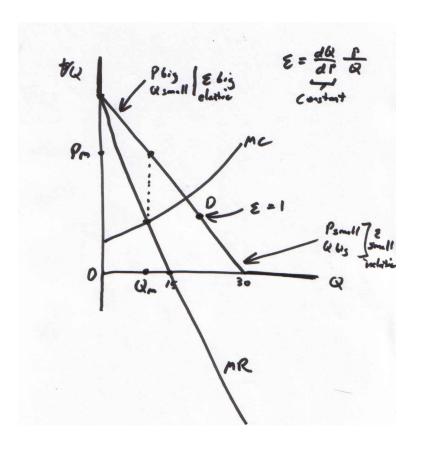
Look at linear demand first.

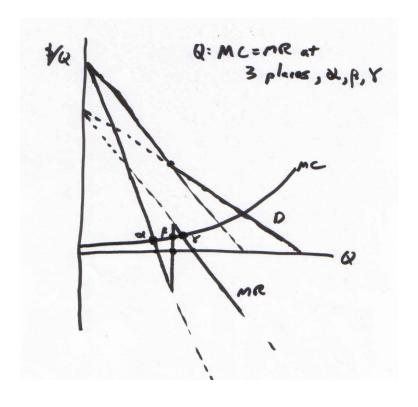Why is this not a sufficient condition, for general demand curves?

What happens with a constant elasticity demand function if the demand curve is elastic? (elasticity magnitude greater than one, quantity demanded highly responsive to price) What if the firm's marginal cost is zero?

What happens with a constant elasticity demand function if the demand curve is inelastic? (elasticity magnitude less than one, quantity demanded not very responsive to price)

Constant elasticity of demand

$$\varepsilon = \frac{dQ}{dP} \underbrace{\frac{P}{Q}}_{\text{Constant}}$$

P big | ε big
Q small | elastic

MC

D ← ε = 1

P small | ε
Q big | small inelastic

P_m

O Q_m 15   30   Q

MR

Pring and elasticity

Q: MC = MR at 3 places, α, β, γ

MC

D

α β γ

MR

Convex demand

What about imposing a sales tax? That makes the monopoly welfare loss increase. But it does reduce monopoly profit. Think about the US and OPEC.

What about imposing an income tax? That just reduces monopoly profit, and creates no distortion. But if the tax is on economic profit AND the return to capital, it does distort.

What about a SUBSIDY per unit? That can get us back to the first-best, it seems, at the expense of rewarding the monopolist.

But how do we get the money to pay the subsidy? — by taxes. And those taxes distort, though not as much as monopoly prices, since the taxes are spread over all products rather than just a price increase for one.

Suppose two goods being sold by one firm have separable costs.

$$C(q_1, q_2) = C_1(q_1) + C_2(q_2) \tag{8}$$

The monopolist maximizes

$$p_1 D_1(p_1, p_2) + p_2(D_2(p_1, p_2) - C_1(q_1) - C_2(q_2) \tag{9}$$

The first order condition yields

$$D_1 + p_1 \frac{\partial D_1}{\partial p_1} + p_2 \frac{\partial D_2}{\partial p_1} = \frac{\partial C_1}{\partial q_1} \frac{\partial D_1}{\partial p_1} + \frac{\partial C_2}{\partial q_2} \frac{\partial D_2}{\partial p_1} \tag{10}$$

Each part of this formula has some economic meaning.

Doing some algebra yields

$$\frac{p_1 - C_1'}{p_1} = \frac{1}{\epsilon_{11}} - \frac{[p_2 - C_2')D_2 \epsilon_{12}}{D_1 p_1 \epsilon_{11}} \tag{11}$$

, where

$$\epsilon ij = -\frac{\partial D_i}{\partial p_j} \frac{p_i}{D_j} \tag{12}$$

Note that under this definition of elasticity, the own-price elasticity is positive, the elasticity with respect to the price of a substitute is positive, and the elasticity with respect to a complement is negative.

What is interesting about this formula are the comparative statics.

If $\epsilon_{12} < 0$, the goods are complements. Then p_1 is lower than it would be if the goods were independent.

If $\epsilon_{12} > 0$, the goods are substitutes. Then p_1 is higher than it would be if the goods were independent.

Think about the effect of $D_1 p_1$ and D_2 and ϵ_{11} also.

Note that it is possible that $p_1 < C_1'$.