

Monopoly and Monopolistic Competition

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6.2 Monopolistic Competition

6.1 Monopoly

Monopoly: industry with only one seller

Monopoly can refer to a firm, an industry, or a market structure

Assumptions of monopoly:

- (1) Only one firm in the market.
- (2) Protected from competition by barriers to entry
 - (i) **Natural barrier:** scale economy, no one else can profitably enter
 - (ii) **Legal barrier:** eg patent
 - (iii) **Strategic barrier:** actions by the firm to prevent others from entering
- (3) Monopolists demand = market demand. Slope is negative. Firm is price maker.
- (4) Firm seeks to max profits. There are no frictions / other market imperfections.

6.1.1 Firm Behavior & Market Equilibrium

General rules for a monopoly

Demand & MR curves are downward sloping. Firm demand is industry demand.

Long run profit maximized when $MC = MR$

$P = AR > MR$ Price set is the same as average revenue, which will be greater than marginal revenue.

$a > c > 0$ Price intercept will be greater than the long run marginal & average costs, which will both be positive.

Parameters

Inverse demand curve: $P = a - bQ$

Y-intercept: a

Slope of demand curve: b

Total Revenue

$$TR = (a - bQ) * Q$$

$$TR = aQ - abQ^2$$

Total Costs

$$TC = c * Q \quad \text{eg each unit costs 3 dollars}$$

Profit Equation

$$\pi = TR - TC$$

$$\pi = (aQ - abQ^2) - (cQ)$$

Take derivative to determine maximum profit

$$\begin{aligned}\frac{\partial \pi}{\partial Q} \\&= \frac{\partial TR}{\partial Q} \\&\quad - \frac{\partial TC}{\partial Q}\end{aligned}$$

$$0 = MR - MC$$

$$0 = a - 2bQ - c$$

Profit maximizing quantity:

$$Q = \frac{a-c}{2b}$$

Profit maximizing price:

$$P = \frac{a+c}{2}$$

Profit maximization:

$$\pi = \frac{(a-c)^2}{4b}$$

English Translation:

When our inverse demand curve is $P = a - bQ$ and our total costs grows linearly with relation to our quantity produced, we should produce

$$\frac{(a-c)^2}{4b} \quad \text{which is} \quad \frac{(\text{Yintercept} - \text{cost per unit})^2}{4 * \text{slope of the demand curve}}$$

6.1.2 No Supply Curve in Monopoly

There is no supply curve in a monopoly because the quantity to produce only depends on the demand curve.

6.1.3 Allocative Inefficiency

In perfect competition, the firm produces quantity (q) where price (p) equals marginal revenue (MR) equals marginal cost (MC).

In a monopoly, however, the firm will produce less quantity and will charge a higher price. This leads to allocative inefficiency (from society's perspective).

This is called **market power**. To measure market power, we calculate the Lerner Index.

Lerner Index: In monopoly, Lerner Index = $\frac{1}{\text{Price elasticity of demand}}$

As elasticity of demand goes up, market power decreases and Lerner index decreases

If the price elasticity of demand stays constant when for a small increase in price, then the firm will pass added costs onto the consumer at a greater than 1:1 rate (eg for a \$1 increase in cost, the firm will rise prices greater than 1.)

The **Lerner Index** is inversely related to the **price elasticity of demand**.

6.1.4 X-inefficiency and Rent Seeking

Social welfare is measured by total surplus.

X-inefficiency arises from protection of the firm from competition.

Firms can operate above their cost function due to

- (1) lax work effort and
- (2) cognitive errors

These errors are more likely to occur in a monopoly setting due to lack of competition "pushing" the firm

Rent seeking behavior: investing resources into activities to retain monopoly power.

Wasteful because it is (1) costly and (2) does not lead to increase in output.

6.1.5 Dynamic (Addiction, Product Durability)

Remember that dynamic efficiency is #3 in the social welfare maximization requirements below.

In a dynamic (multi period) market, firm chooses production today that maximizes sum of profits today + in future.

Addictive products and durable products are treated in opposite ways.

An increase in production of addictive goods today will benefit demand in the future (getting people hooked).

An increase in production of durable goods today will decrease demand in the future.

If product durability is under the control of the monopolist, "planned obsolescence" may become profitable strategy.

Profit Function

$$\pi_{Total} = \pi_{Today} + \pi_{Future}$$

Derivative of profit with respect to production today

$$0 = MR_{Today} - MC_{Today} + \frac{\partial \pi_{Future}}{\partial Quantity_{Today}} \text{ (ie effect of marginal increase in price on profits)}$$

The effects on profit of a marginal increase in price will be **positive** for addictive goods and **negative** for durable goods.

Remember: Efficiency and welfare from Chapter 5

Social welfare maximization:

- (1) Macro stability
 - (2) Equitable
 - (3) Dynamically efficient
 - (4) Statically efficient
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Four types of static efficiency

Firm level:

- (a) **Technical efficiency:** using minimum quantity to inputs to produce output
- (b) **Economic efficiency:** produces output at minimum cost - lowest cost combo

Industry level:

- (c) **Productive efficiency:** produces output at minimum cost - lowest cost combo
 - (d) **Allocative efficiency:** produces socially desirable level of output (ie society marginal benefit = marginal cost of production)
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6.1.4 Social Benefits of Monopoly

(#4) Statically efficient, industry level: Monopoly is not allocatively efficient (d above), but it may be productively efficient (c above).

Example: Natural monopoly - industry output lowest cost when only one firm producing (substantial scale economies)

This is not allocatively efficient because they will produce less output + raise prices to max profits.

As a response, price in these monopolies is usually regulated.

(#3) Dynamically efficient: Firms in monopoly can be dynamically efficient because firms with monopoly power are more likely to invest in R&D.

Also, profits are a reward for success which encourages entrepreneurial activity.

6.2 Monopolistic Competition

Monopolistic competition: firms are assumed to be so small that strategic interaction is nonexistent. No game theory required.

Assumptions of monopolistic competition:

- (1) Many ID firms, no strategic interaction
- (2) Differentiated products: same basic function, slight differences
- (3) No barriers to entry or exit
- (4) Profit maximizers, no friction or other market imperfections
- (5) There are economies of scale in production

Long run equilibrium:

- (1) Each firm has monopoly over their own brand, so demand curves downward sloping (price makers)
- (2) Free entry means that long run profits are 0.

That is, price equals long run average costs. This is the point where demand = AC.

Long run average costs are greater than long run marginal costs. Long run econ profits are 0.

Social welfare maximization for monopolistic competition:

Pros: Greater product variety for consumers

Cons: Allocatively inefficient, production is below efficient scale. Cost is pretty small though

Without economies of scale, each monopolistic competition firm would just become perfect competition instead.

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