

## Principles of Microeconomics

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- When will the marginal cost of production be lowest: At stage I, II, or III?
- When firms cut prices, they often do so in dramatic ways. During which stage will the local pizza shops offer “Buy one, get one free” offers? During which stage will the local gas station be more likely to offer “Free car wash with fill-up”?
- When is  $P > AC$ ?  $P < AC$ ?  $P = AC$ ?
- Restating the previous question: When are profits positive? Negative? Zero?
- Roughly speaking, will the long-run response mostly involve firms leaving the industry, or will it mostly involve individual firms shrinking?

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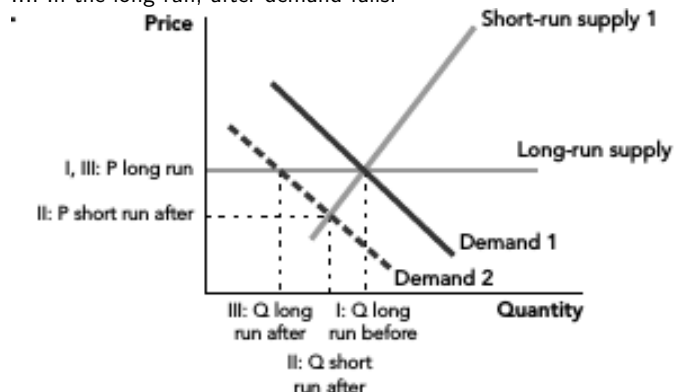
You run a small firm. Two management consultants are offering you advice. The first says that your firm is losing money on every unit that you produce. To reduce your losses, the consultant recommends that you cut back production. The second consultant says that if your firm sells another unit, the price will more than cover your increase in costs. In order to reduce losses, the second consultant recommends that you should increase production.

- As an economist, can you explain why both facts that the consultants rely on could be true?
- Which consultant is offering the correct advice?

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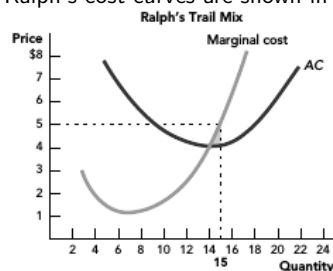
Let's see what happens when demand falls in such a constant-cost industry: ... indicate the price and quantity of output at three points in time:

- In the long run, before demand falls.
- In the short run, after demand falls.
- In the long run, after demand falls.



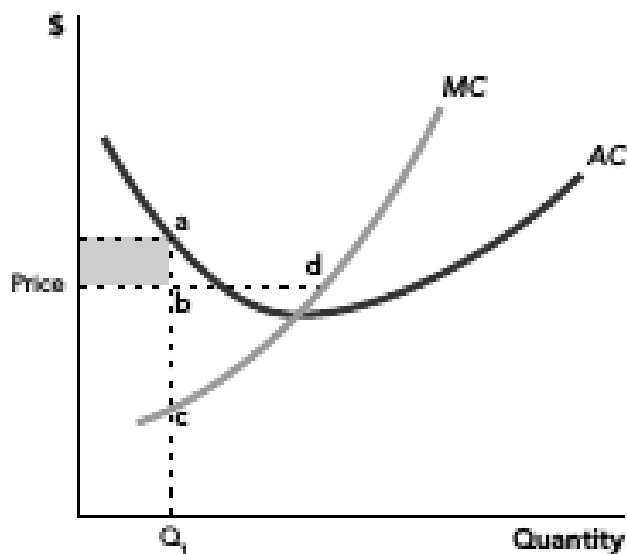
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Ralph opened a small shop selling bags of trail mix. The price of the mix is \$5, and the market for trail mix is very competitive. Ralph's cost curves are shown in the figure.



- At what quantity will Ralph produce? Why?
- When the price is \$5, shade the area of profit or loss in the graph provided and calculate Ralph's profit or loss (round up).
- If all other sellers of trail mix have the same marginal and average costs as Ralph, should he expect more or fewer competitors in the future? In the long run, will the price of trail mix rise or fall? How do you know? What will the price of trail mix be in the long run?

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## A Monopolistic Market: Barriers of Entry

In Kolkata, India, it is very common to see beggars on the streets. Imagine that the visitors and residents of Kolkata become more generous in their donations, what will be the effect on the standard of living of beggars in Kolkata? Answer this question using supply and demand, making assumptions as necessary.

- ▶ Monopoly is a market structure in which one firm makes up the entire market
- ▶ Barriers to entry into the market prevent competition
- ▶ Barriers to entry can be:
  - ?

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## A Monopolistic Market: Barriers of Entry

- ▶ Monopoly is a market structure in which one firm makes up the entire market
- ▶ Barriers to entry into the market prevent competition
- ▶ Barriers to entry can be:
  - ▶ Natural Ability
    - ▶ A firm is better at producing the good than anyone else
  - ▶ (Technological) Economies of Scale
    - ▶ Natural monopoly is when a single firm can produce at a lower cost than can two or more firms
  - ▶ (Legal) Government-Created Monopolies
    - ▶ Patents, licenses, and franchises
  - ▶ There are no close substitutes for the monopolist's product
- ▶ If there were no barriers to entry, profit-maximizing firms would always compete away monopoly profits

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## The Key Difference

### Between a Monopolist and a Perfect Competitor

- ▶ A monopolistic firm's marginal revenue is not its price
  - ▶ Marginal revenue is always below its price
  - ▶ Marginal revenue changes as output changes and is not equal to the price
- ▶ A monopolistic firm's output decision can affect price
- ▶ There is no competition in monopolistic markets so monopolists see to it that monopolists, not consumers, benefit

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## Profit Maximizing Level of Output

**Profit = Revenue - Cost**

$$\Pi(q) = R(q) - C(q)$$

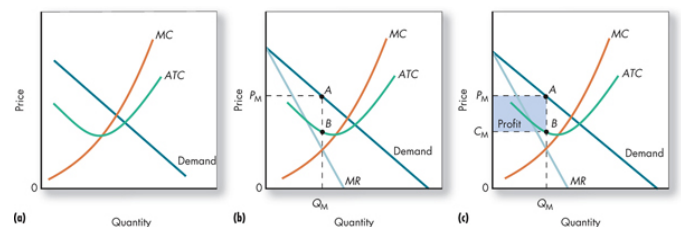
$$\Pi(q) = P(q) \times q - C(q)$$

- ▶ The goal of the monopolistic firm is to maximize profits, the difference between total revenue and total cost
- ▶ The monopoly maximizes profit when marginal revenue equals marginal cost
- ▶ Marginal revenue (MR) is the change in total revenue associated with a change in quantity
- ▶ Marginal cost (MC) is the change in total cost associated with a change in quantity
- ▶ The profit-maximizing condition of a monopolistic firm is:
 
$$MR = MC$$

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## Profits of a Monopolist

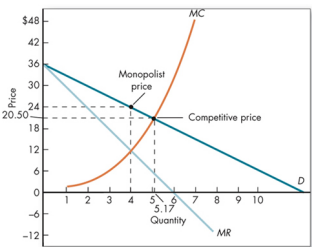


- ▶ Find output where  $MC = MR$ ; this is the profit maximizing quantity  $Q$
- ▶ Find how much consumers will pay where the profit maximizing  $Q$  intersects demand; this is the monopolist's price
- ▶ Find profit per unit where the profit maximizing  $Q$  intersects ATC

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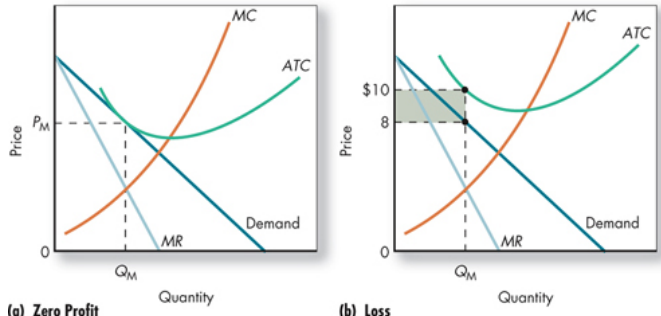
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### Monopolistic Profit Maximization Graph



- ▶ For a monopolistic firm,  $MR < P$
- ▶ A monopolistic firm maximizes total profit, not profit per unit
- ▶ If  $MR > MC$ , The monopoly can increase profit by increasing output
- ▶ If  $MR < MC$ , The monopoly can increase profit by decreasing its output

### Positive Profits are Not Guaranteed



### The Elasticity of Demand and the Monopoly Markup

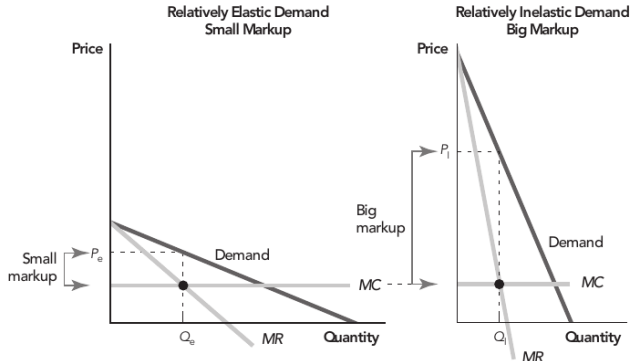
- ▶ A competitive firm cannot markup its goods: It charges a price for its goods equal to marginal cost ( $P = MC$ ) and earns zero or normal profits.
- ▶ A firm with monopoly power can markup: It charges a price greater than marginal cost ( $P > MC$ ) and earns positive or above normal profits.

If a monopolist faces a very inelastic demand curve, its mark-up over marginal cost will likely be ...?

1. zero.
2. very low.
3. rather high.
4. Impossible to tell.

### The Elasticity of Demand and the Monopoly Markup

The More Inelastic the Demand Curve the More the Monopolist Raises Price Above Marginal Cost



### Mark-up rule of a monopolist

- ▶ Goal: general formula for the relation of price and the monopolist's marginal cost
- ▶ The monopolist maximizes his profits at  $MR=MC$ .
- ▶ For monopolies we know

$$R = PQ \quad \text{revenue}$$

$$MR = \frac{\partial R}{\partial Q} = P + Q \frac{\partial P}{\partial Q}$$

$$= P \left( 1 + \frac{Q}{P} \frac{\partial P}{\partial Q} \right)$$

$$\epsilon = \frac{P}{Q} \frac{\partial Q}{\partial P} \quad \text{price elasticity of demand}$$

$$MC = MR = P(1 + 1/\epsilon)$$

$$P = \frac{MC}{1 + 1/\epsilon} > MC = MR$$



## The Principles of Price Discrimination

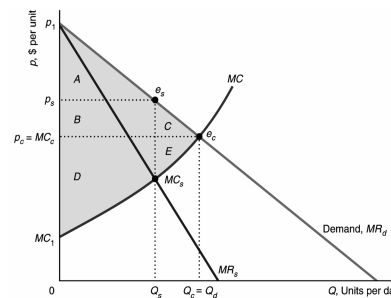
- ▶ Recall the profit-maximizing rule for firms with Monopoly power:  
produce the Quantity where  $MR = MC$  based on that Quantity, charge as much as the market will bear (found by the position of the demand curve)
- ▶ But what if you sell to more than one market, each with its own demand curve?  
E.g. senior citizens and young people, business travelers and leisure travelers.

- ▶ If the demand curves are different, it is more profitable to set different prices in different markets than a single price that covers all markets. (e.g. the firm wants to set different prices)
- ▶ To maximize profits the monopolist should set a higher price in markets with more inelastic demand.
- ▶ *Arbitrage* makes it difficult for a firm to set different prices in different markets, thereby reducing the profit from price discrimination. (e.g. the firm may not be able to set different prices)
- ▶ Arbitrage is taking advantage of price differences for the same good in different markets by buying low in one market and selling high in another market.

How can you prevent arbitrage?

## Perfect Competition

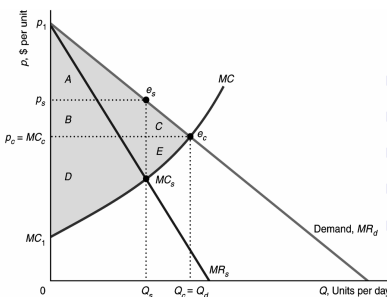
Is Price Discrimination Bad?



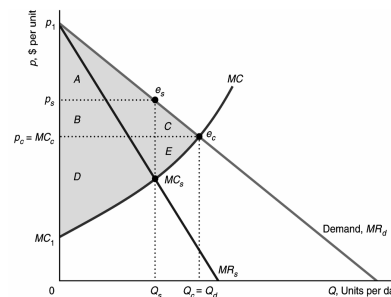
- ▶ Equilibrium at  $e_c$ ,  $p=MC$
- ▶  $CS = A+B+C$
- ▶  $PS = D+E$
- ▶ no welfare loss
- ▶ market is efficient, as  $p=MC$

## Perfect Price Discrimination

## Monopoly without Price Discrimination



- ▶ equilibrium at  $e_s$ ,  $MR=MC$
- ▶  $CS = A$
- ▶  $PS = B+D$
- ▶ welfare loss:  $C+E$
- ▶ market inefficient, as  $p_s > MC_s$



- ▶  $MR_d \equiv D$
- ▶  $CS = 0$
- ▶  $PS = A+B+C+D+E$
- ▶ no welfare loss
- ▶ market efficient, as  $p_c = MC_c$  for the last unit

# Price Discrimination

## first degree

Each consumer pays his an individualized price, his marginal willingness to pay.  
 First degree price discrimination is also called perfect price discrimination.

## second degree

The price depends on the quantity bought.  
 Second degree price discrimination is also called quantity discrimination.

## third degree

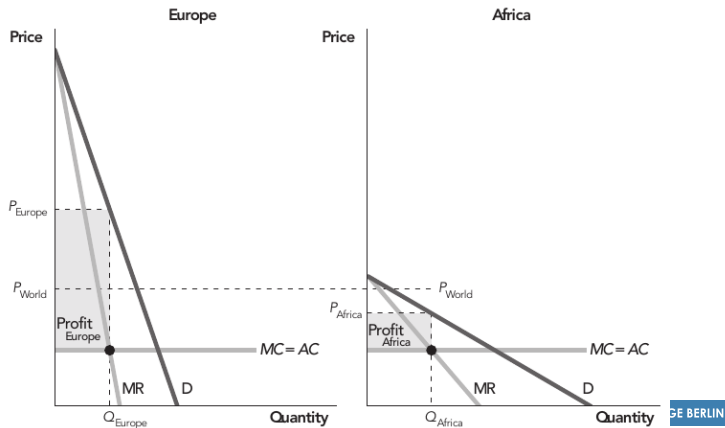
The price depends on the consumer group the buyer belongs to; each member of the consumer group pays the same price, different groups may pay different prices.

# 3rd Degree Price Discrimination

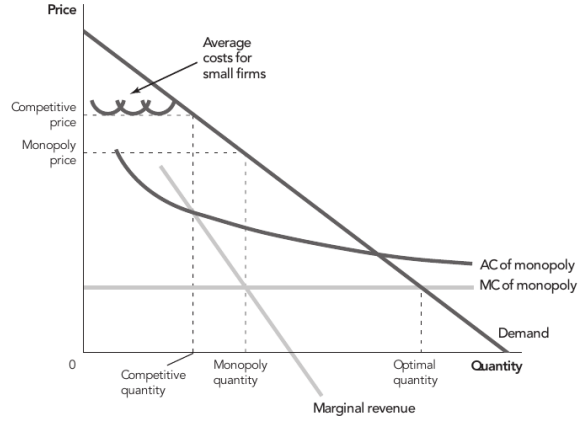
- ▶ Firms do not know the individual willingness to pay; they may know, however, the WTP of whole consumer groups, or at least their relative ranking
- ▶ Ex. airplane travel
  - ▶ Some consumer are willing to pay a higher price, they have a lower price elasticity of demand
    - ▶ Business traveler have a relatively inelastic demand
    - ▶ Holiday traveler have an elastic demand
  - ▶ cheap tickets: long time between booking and travel, stay over the weekend, no refund
  - ▶ most expensive category: no constraints

# 3rd Degree Price Discrimination

- ▶ Who pays more?
- ▶ The price is higher in the market with the lower elasticity

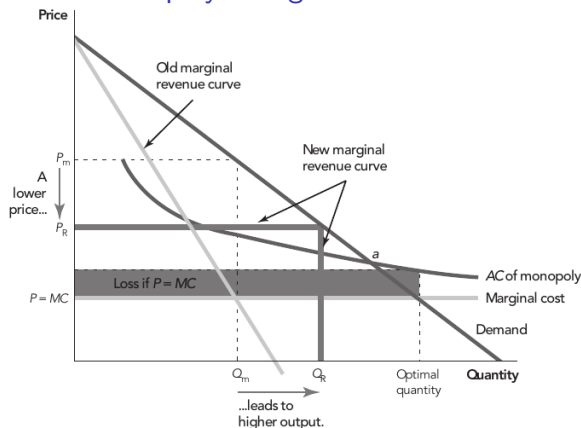


# A Natural Monopoly



A natural monopolist produces  $Q_M$  and charges  $P_M$ , therefore earning a profit

# A Natural Monopoly – Regulated



If there is government regulation and a competitive solution where  $P = MC$  is required, the monopolist produces  $Q^*$  and charges  $P_{MC}$ , therefore earning a loss

# Normative Views of Monopoly

- ▶ Monopolies are unjust because they restrict freedom to enter business
- ▶ Monopolies transfer income from "deserving" consumers to "undeserving" monopolists
- ▶ Monopolies cause potential monopolists to waste resources trying to get monopolies
  - ▶ Rent-seeking activities
  - ▶ Monopolies may be created by corrupt politicians. In these cases, self-interest is channeled toward social destruction through poor institutions, instead of toward social prosperity through good institutions.

## Government Policy and Monopoly: AIDS Drugs

- ▶ A few companies have patents for AIDS drugs that enable them to charge high prices because demand is inelastic

Are there any benefits of monopolies (that accrue not only to the monopolist)?

### Policy Options

- ▶ Government regulation where price = marginal cost benefits society, but discourages research
- ▶ Government purchase of the patents and allowing anyone to produce the drugs so their price = marginal cost. This may be expensive for taxpayers but still better for society as prices could be driven down – eliminating the deadweight loss in the respective market without eliminating the incentive to innovate.

Read “Cash for answers”

<http://timharford.com/2008/01/cash-for-answers/>