

# Perfect Competition

## Source

<http://www2.gsu.edu/~ecorlcx/Colander-ch11-PerfectCompetition.ppt>

# Perfect Competition

- The concept of competition is used in two ways in economics:
  - Competition as a process is an **emulation among firms.**
  - Competition as the perfectly competitive **market structure.**

# Competition as a Process

- Competition involves one firm trying to take away market share from another firm.
- As a process, competition pervades/overrun the economy.

# Competition as a Market Structure

It is possible to imagine something that does not exist – a perfectly competitive market in which the invisible hand works unimpeded.

# Competition as a Market Structure

- Competition is the end result of the competitive process under highly restrictive assumptions.
  - A perfectly competitive market is one in which economic forces operate unimpeded.
- A *perfectly competitive market* is one in which economic forces operate unimpeded.

# A Perfectly Competitive Market

- A perfectly competitive market must meet the following requirements /conditions :
  1. Both buyers and sellers are price takers.
  2. The number of firms is large.
  3. There are no barriers to entry.
  4. The firms' products are identical.
  5. There is complete information.
  6. Firms are profit maximizes.

# The Necessary Conditions for Perfect Competition

- Both buyers and sellers are price takers.
  - A price taker is a firm or individual who takes the market price as given.
  - In most markets, households are price takers – they accept the price offered in stores.

# The Necessary Conditions for Perfect Competition

- Both buyers and sellers are price takers.
  - The retailer is not perfectly competitive.
  - A store is not a price taker but a price maker.



# The Necessary Conditions for Perfect Competition

- The number of firms is large.
  - Large means that what one firm does has no bearing on what other firms do.
  - Any one firm's output is little when compared with the total market.

# The Necessary Conditions for Perfect Competition

- There are no barriers to entry.
  - *Barriers to entry* are social, political, or economic impediments that prevent other firms from entering the market.
  - Barriers sometimes take the form of patents granted to produce a certain good.

# The Necessary Conditions for Perfect Competition

- There are no barriers to entry.
  - Technology may prevent some firms from entering the market.
  - Social forces such as bankers only lending to certain people may create barriers.

# The Necessary Conditions for Perfect Competition

- The firms' products are identical or homogenous.
  - This requirement means that each firm's output is indistinguishable from any competitor's product.

# The Necessary Conditions for Perfect Competition

- There is complete information.
  - Firms and consumers know all there is to know about the market - prices, products, and available technology.
  - Any technological advancement would be instantly known to all in the market.

# The Necessary Conditions for Perfect Competition

- Firms are profit maximizers.
  - The goal of all firms in a perfectly competitive market is profit and only profit (not social goodness).
  - Firm owners receive only profit as compensation, not salaries.

# The Definition of Supply and Perfect Competition

- If all the necessary conditions for perfect competition exist, we can talk formally about the supply of a produced good.
- This follows from the definition of supply.

# The Definition of Supply and Perfect Competition

- *Supply* is a schedule of quantities of goods that will be offered to the market at various prices.



# The Definition of Supply and Perfect Competition

- This definition requires the supplier to be a price taker (the first condition for perfect competition).
  - Since most suppliers are price makers, any analysis must be modified accordingly.

# The Definition of Supply and Perfect Competition

- Because of the definition of supply, if any of the conditions are not met, the formal definition of supply disappears.
- That the number of suppliers be large (the second condition), means that they do not have the ability to collude.

# The Definition of Supply and Perfect Competition

- Conditions 3 through 5 make it impossible for any firm to forget about the hundreds of other firms just itching to replace their supply.
- Condition 6 specifies a firm's goal - profit.

# The Definition of Supply and Perfect Competition

- Even if we cannot technically specify a supply function, supply forces are still strong and many of the insights of the competitive model can be applied to firm behavior in other market structures.

# Demand Curves for the Firm and the Industry

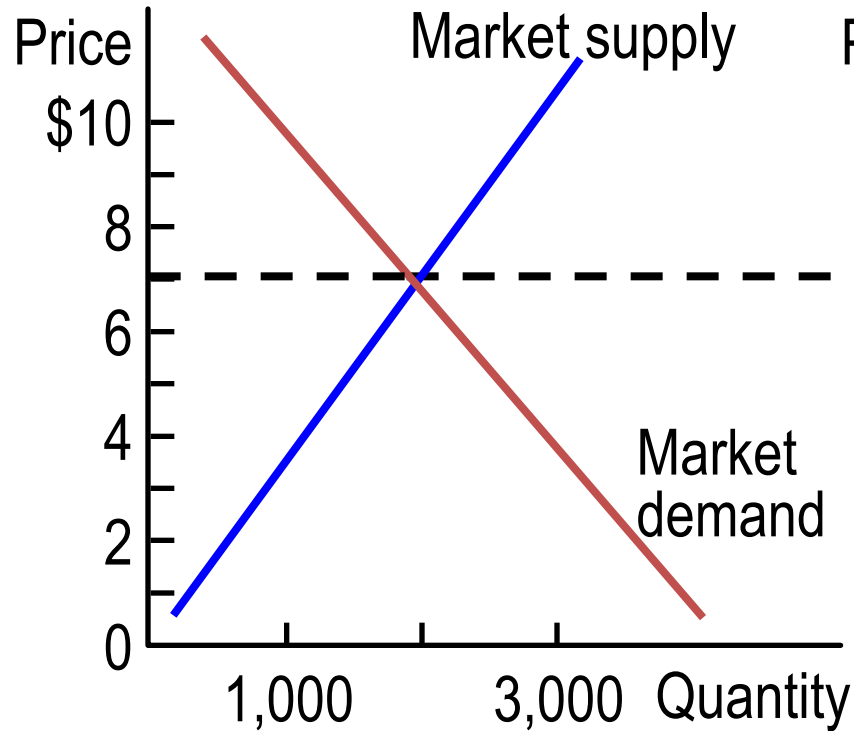
- The demand curves facing the firm is different from the industry demand curve.
- A perfectly competitive firm's demand schedule is perfectly elastic even though the demand curve for the market is downward sloping.

# Demand Curves for the Firm and the Industry

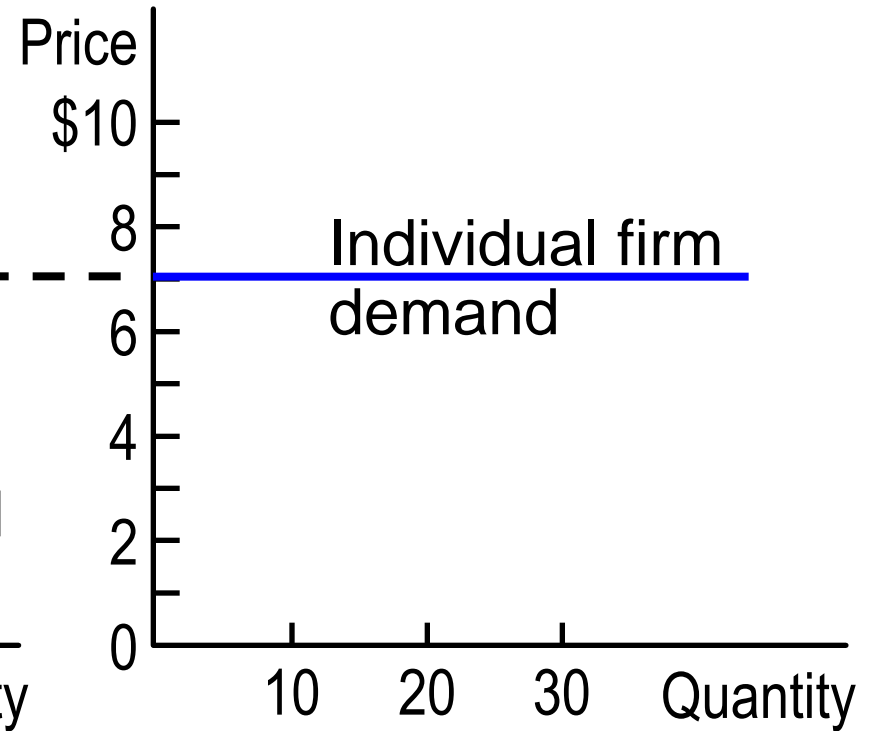
- This means that firms will increase their output in response to an increase in demand even though that will cause the price to fall thus making all firms collectively worse off.

# Market Demand Versus Individual Firm Demand Curve

## Market



## Firm



# Profit-Maximizing Level of Output

- The goal of the firm is to maximize profits.
- When it decides what quantity to produce it continually asks how changes in quantity affect profit.



# Profit-Maximizing Level of Output

- Since profit is the difference between total revenue and total cost, what happens to profit in response to a change in output is determined by marginal revenue ( $MR$ ) and marginal cost ( $MC$ ).
- A firm maximizes profit when  $MC = MR$ .

# Profit-Maximizing Level of Output

- *Marginal revenue (MR)* – the change in total revenue associated with a change in quantity.
- *Marginal cost (MC)* -- the change in total cost associated with a change in quantity.

# Marginal Revenue

- Since a perfect competitor accepts the market price as given, for a competitive firm, marginal revenue is price ( $MR = P$ ).

# Marginal Cost

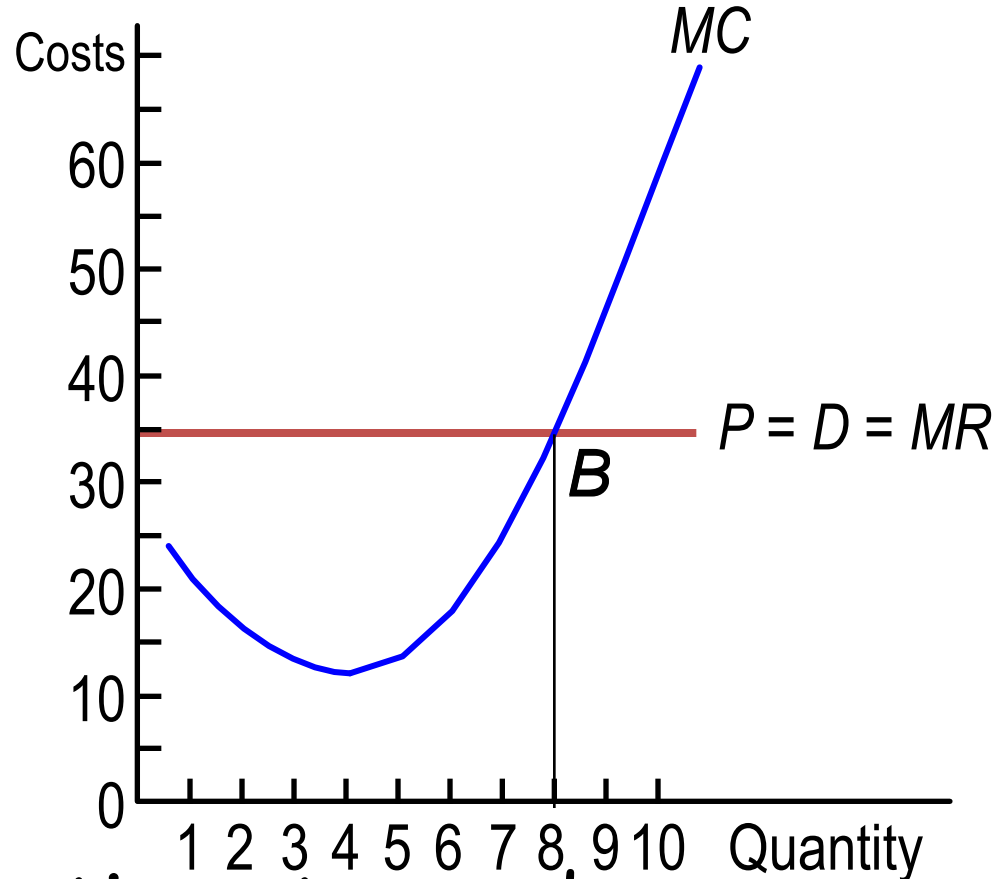
- Initially, marginal cost falls and then begins to rise.
- Marginal concepts are best defined between the numbers.

## How to Maximize Profit

- To maximize profits, a firm should produce where marginal cost equals marginal revenue.

# How to Maximize Profit

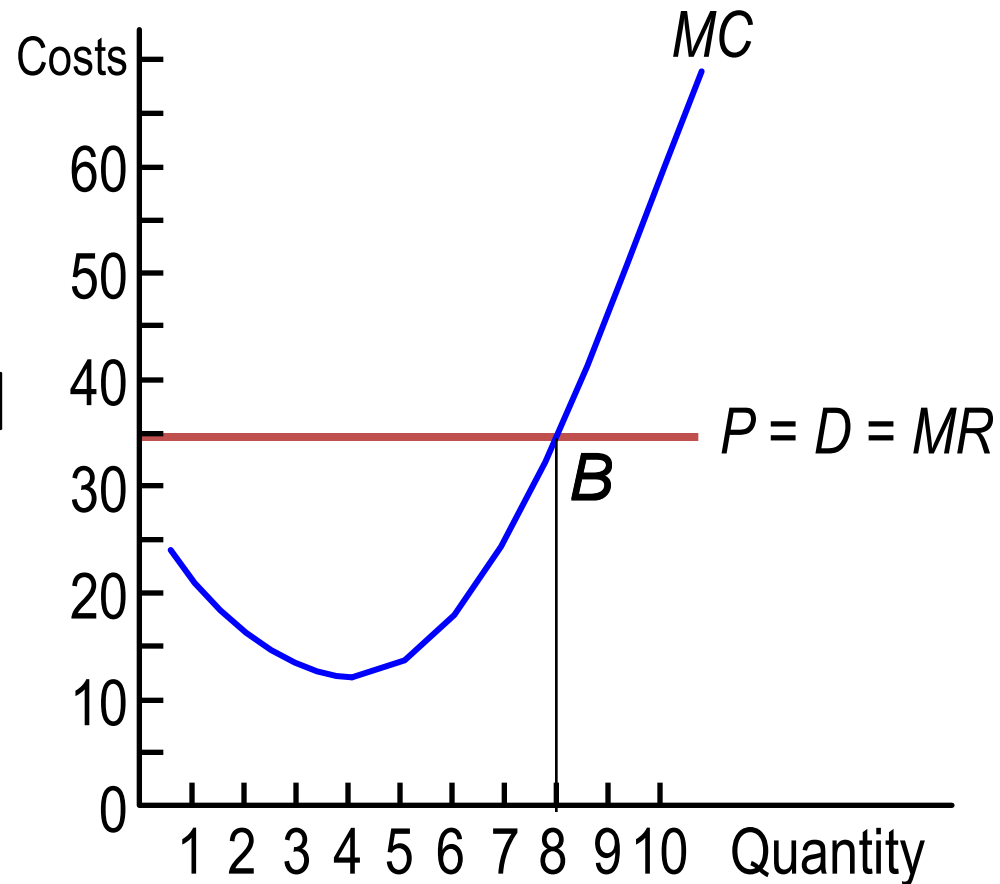
- If marginal revenue does not equal marginal cost, a firm can increase profit by changing output.



- The supplier will continue to produce as long as marginal cost is less than marginal revenue.

# How to Maximize Profit

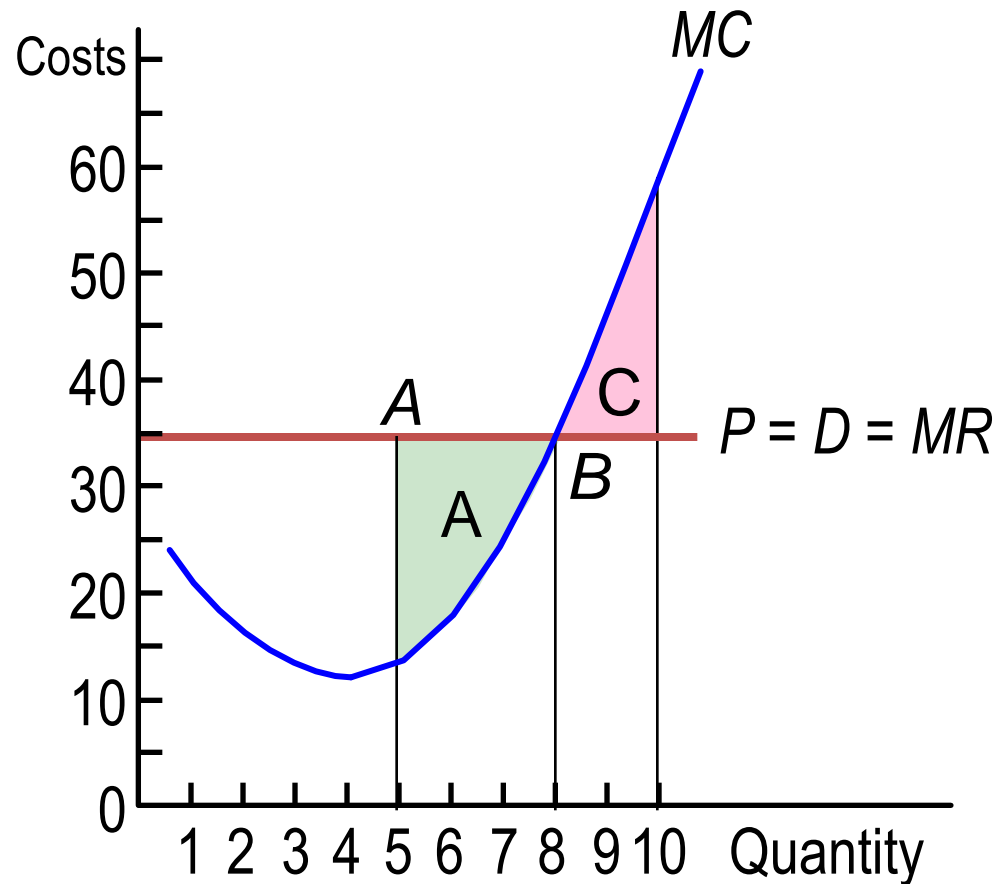
- The supplier will cut back on production if marginal cost is greater than marginal revenue.



- Thus, the profit-maximizing condition of a competitive firm is  $MC = MR = P$ .

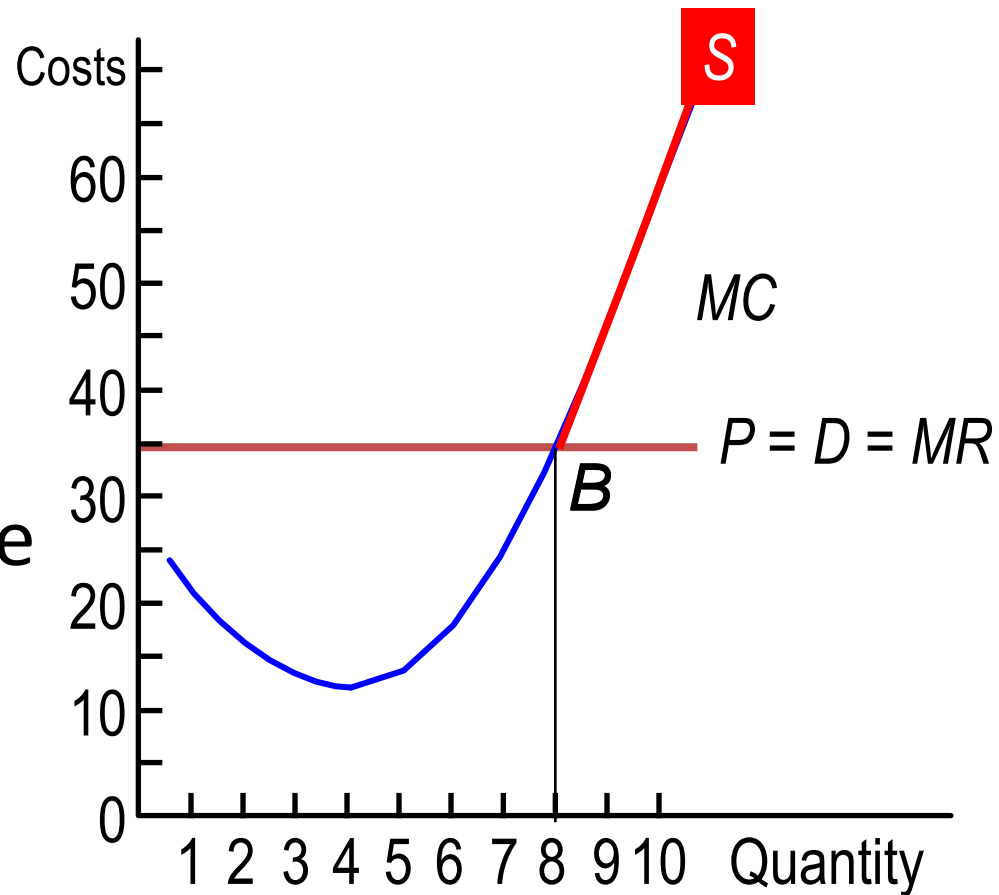
# Marginal Cost, Marginal Revenue, and Price

Price = $MR$	Quantity Produced	Marginal Cost
\$35.00	0	
35.00	1	\$28.00
35.00	2	20.00
35.00	3	16.00
35.00	4	14.00
35.00	5	12.00
35.00	6	17.00
35.00	7	22.00
35.00	8	30.00
35.00	9	40.00
35.00	10	54.00
35.00	10	68.00



# The Marginal Cost Curve Is the Supply Curve

- The marginal cost curve is the firm's supply curve above the point where price exceeds average variable cost.





# The Marginal Cost Curve Is the Supply Curve

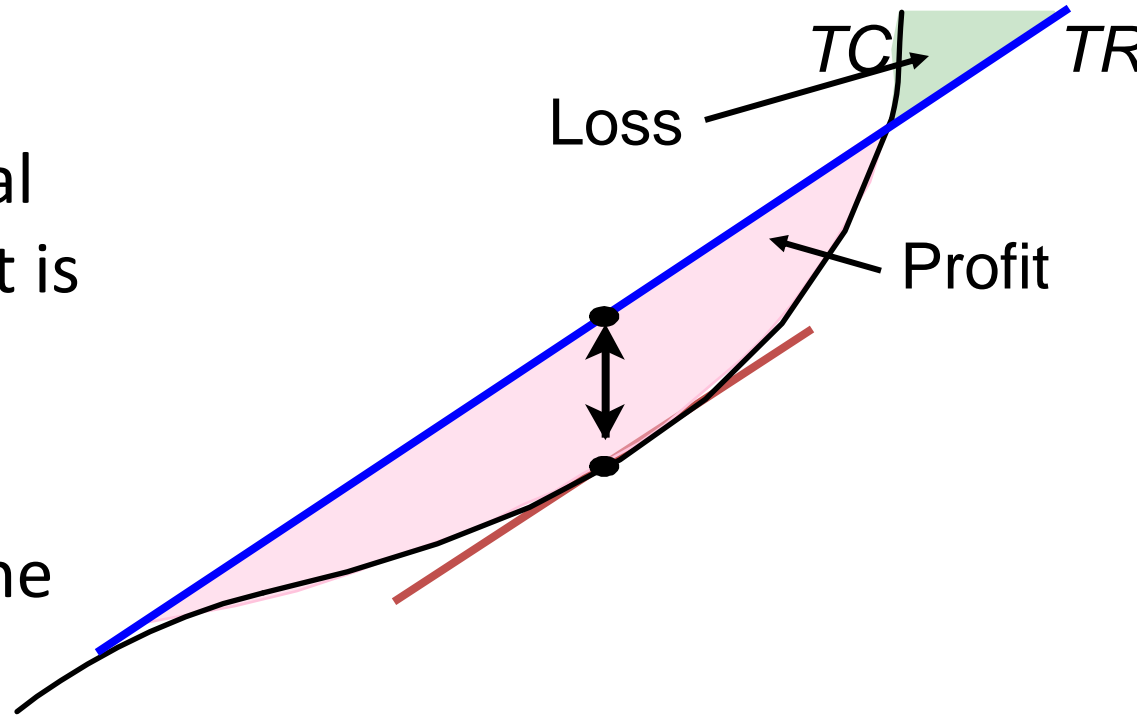
- The MC curve tells the competitive firm how much it should produce at a given price.
- The firm can do no better than producing the quantity at which marginal cost equals price which in turn equals marginal revenue.

# Firms Maximize Total Profit

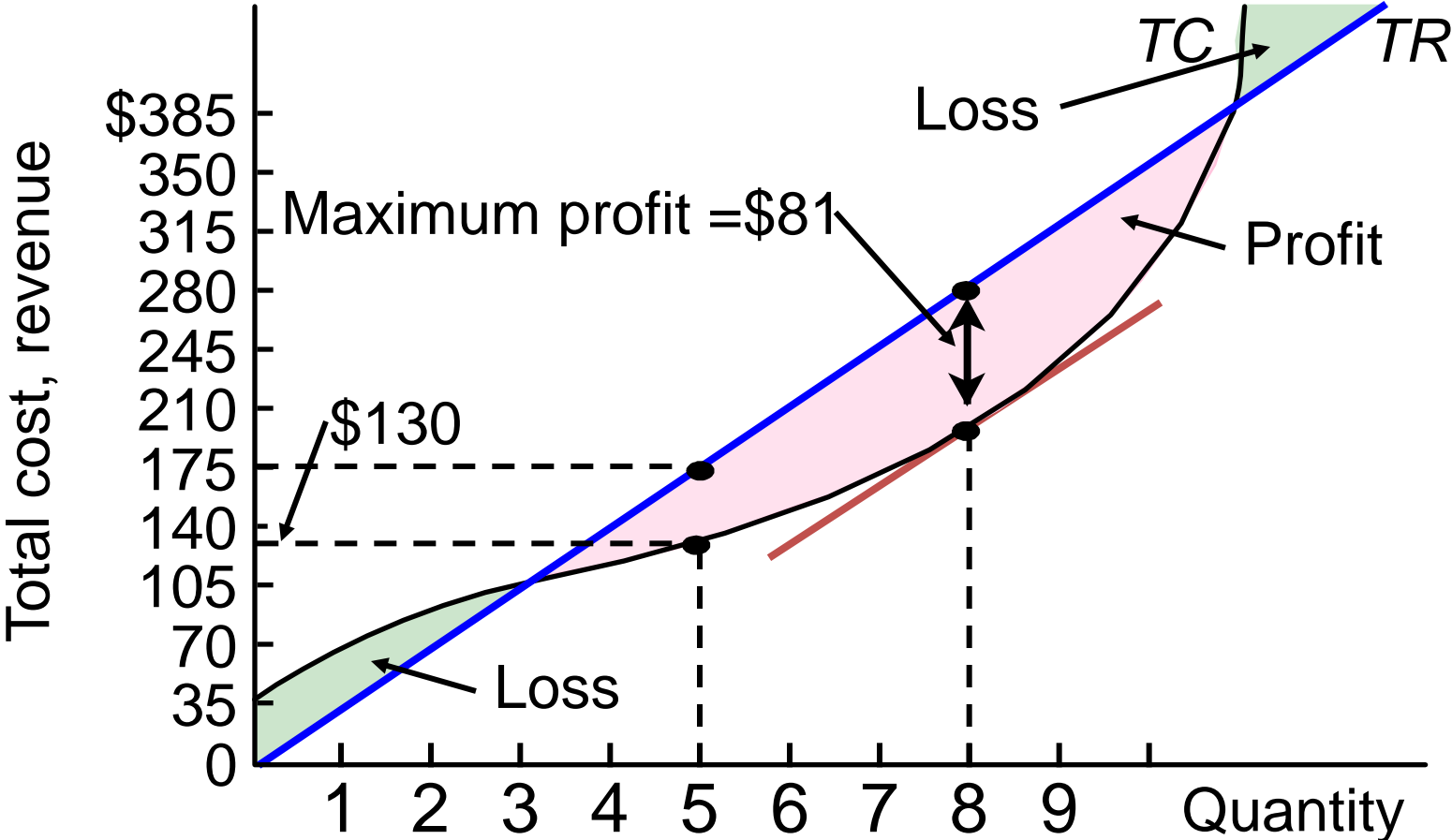
- When we speak of maximizing profit, we refer to maximizing total profit, not profit per unit.
- Firms do not care about profit per unit; as long as an increase in output will increase total profits, a profit-maximizing firm should increase output.

# Profit Maximization Using Total Revenue and Total Cost

- Profit is maximized where the vertical distance between total revenue and total cost is greatest.
- At that output,  $MR$  (the slope of the total revenue curve) and  $MC$  (the slope of the total cost curve) are equal.



# Profit Determination Using Total Cost and Revenue Curves



# Total Profit at the Profit-Maximizing Level of Output

- While the  $P = MR = MC$  condition tells us how much output a competitive firm should produce to maximize profit, it does not tell us the profit the firm makes.

# Determining Profit and Loss From a Table of Costs

- Profit can be calculated from a table of costs and revenues.
- Profit is determined by total revenue minus total cost.

# Determining Profit and Loss From a Table of Costs

- The profit-maximizing position is not necessarily a position that minimizes either average variable cost or average total cost.
  - It is only the position that maximizes total profit.

# Costs Relevant to a Firm

P = MR	Output	Total Cost	Marginal Cost	Average Total Cost	Total Revenue	Profit TR-TC
—	0	40.00	—	—	0	-40.00
35.00	1	68.00	28.00	68.00	35.00	-33.00
35.00	2	88.00	20.00	44.00	70.00	-18.00
35.00	3	104.00	16.00	34.67	105.00	1.00
35.00	4	118.00	14.00	29.50	140.00	22.00
35.00	5	130.00	12.00	26.00	175.00	45.00
35.00	6	147.00	17.00	24.50	210.00	63.00



# Costs Relevant to a Firm

P = MR	Output	Total Cost	Marginal Cost	Average Total Cost	Total Revenue	Profit TR-TC
35.00	4	118.00	14.00	29.50	140.00	22.00
35.00	5	130.00	12.00	26.00	175.00	45.00
35.00	6	147.00	17.00	24.50	210.00	63.00
35.00	7	169.00	22.00	24.14	245.00	76.00
35.00	8	199.00	30.00	24.88	280.00	81.00
35.00	9	239.00	40.00	26.56	315.00	76.00
35.00	10	293.00	54.00	29.30	350.00	57.00

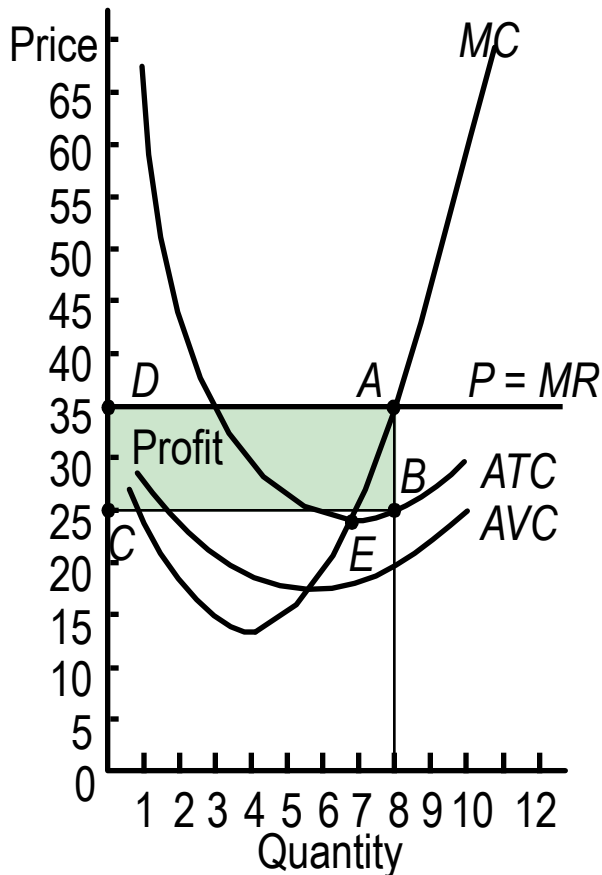
# Determining Profit and Loss From a Graph

- Find output where  $MC = MR$ .
- The intersection of  $MC = MR$  ( $P$ ) determines the quantity the firm will produce if it wishes to maximize profits.

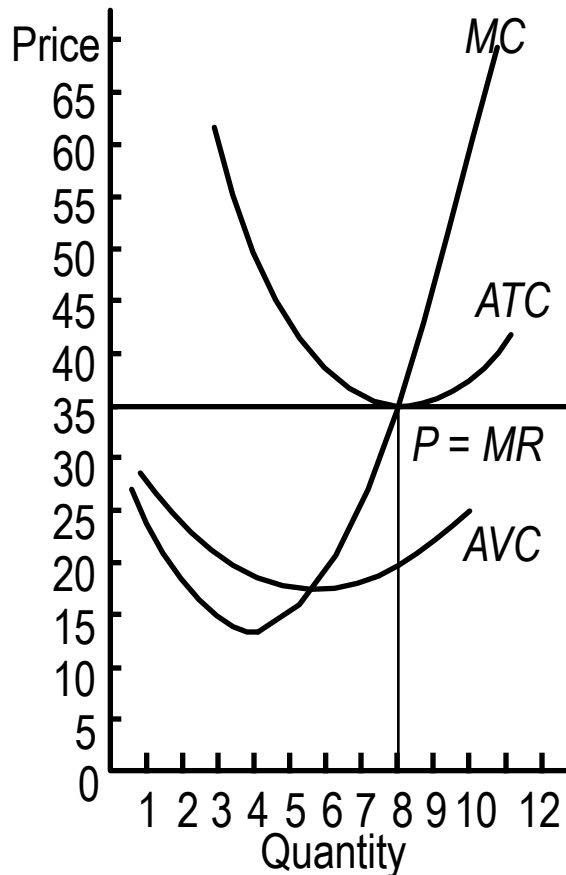
# Determining Profit and Loss From a Graph

- Find profit per unit where  $MC = MR$ .
  - To determine maximum profit, you must first determine what output the firm will choose to produce.
  - See where  $MC$  equals  $MR$ , and then drop a line down to the  $ATC$  curve.
  - This is the profit per unit.

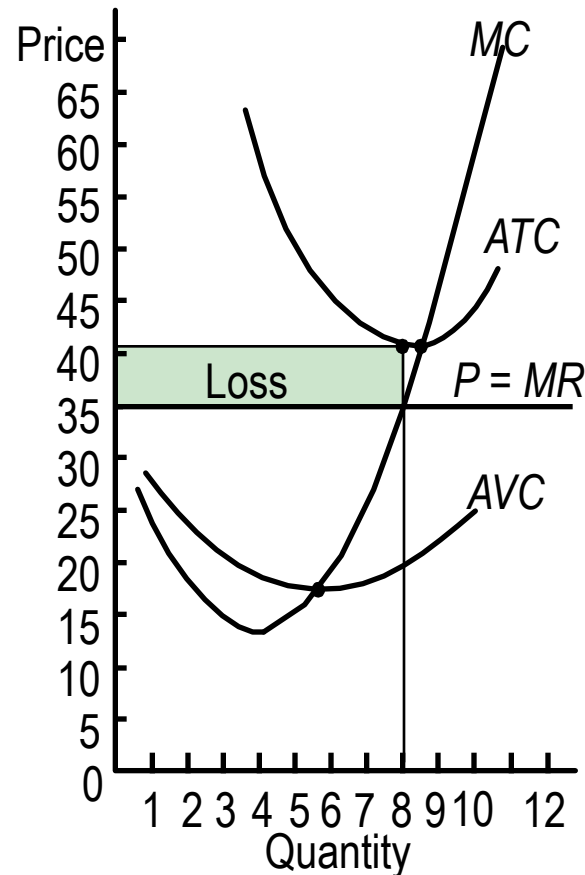
# Determining Profits Graphically



(a) Profit case



(b) Zero profit case



(c) Loss case

# Zero Profit or Loss Where $MC=MR$

- Firms can also earn zero profit or even a loss where  $MC = MR$ .
- Even though economic profit is zero, all resources, including entrepreneurs, are being paid their opportunity costs.

# Zero Profit or Loss Where $MC=MR$

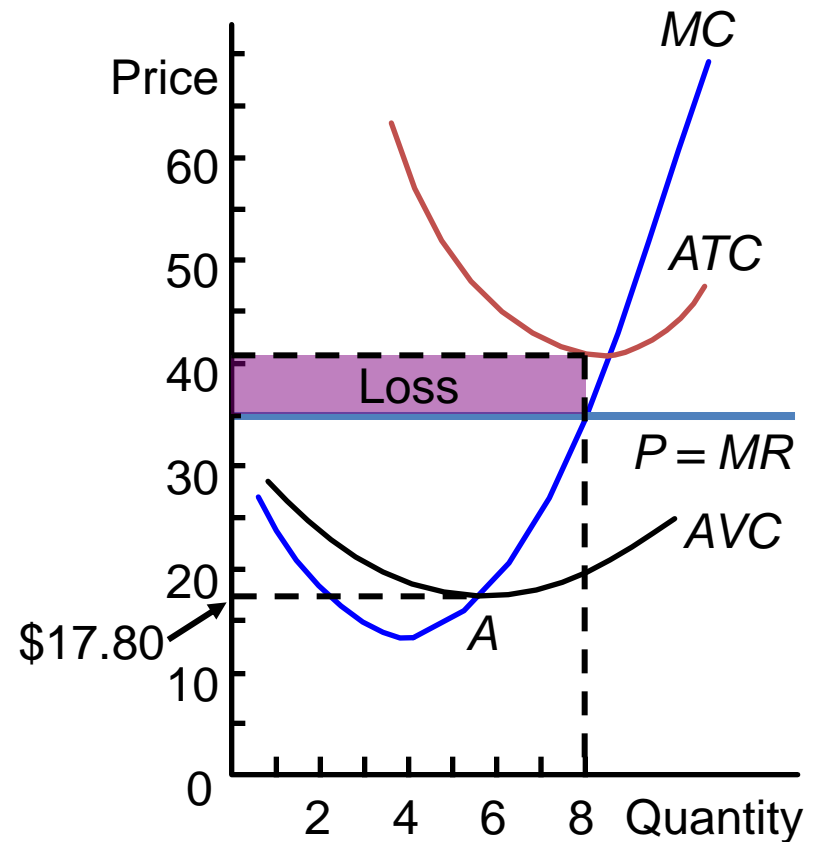
- In all three cases (profit, loss, zero profit), determining the profit-maximizing output level does not depend on fixed cost or average total cost, but only where marginal cost equals price.

# The Shutdown Point

- The firm will shut down if it cannot cover average variable costs.
  - A firm should continue to produce as long as price is greater than average variable cost.
  - Once price falls below that point it makes sense to shut down temporarily and save the variable costs.

# The Shutdown Decision

- The **shutdown point** is the point at which the firm will gain more by shutting down than it will by staying in business.
- As long as total revenue is more than total variable cost, temporarily producing at a loss is the firm's best strategy since it is taking less of a loss than it would by shutting down.





# Short-Run Market Supply and Demand

- While the firm's demand curve is perfectly elastic, the industry's is downward sloping.
- For the industry's supply curve we use a market supply curve.

# Short-Run Market Supply and Demand

- In the short run when the number of firms in the market is fixed, the market supply curve is just the horizontal sum of all the firms' marginal cost curves, taking account of any changes in input prices that might occur.

# Short-Run Market Supply and Demand

- Since all firms have identical marginal cost curves, a quick way of summing the quantities is to multiply the quantities from the marginal cost curve of a representative firm by the number of firms in the market.

# Long-Run Competitive Equilibrium

- Profits and losses are inconsistent with long-run equilibrium.
- Profits create incentives for new firms to enter, output will increase, and the price will fall until zero profits are made.
- Only zero profit will stop entry.

# Long-Run Competitive Equilibrium

- The existence of losses will cause firms to leave the industry.
  - Zero profit condition is the requirement that in the long run zero profits exist.
  - The zero profit condition defines the long-run equilibrium of a competitive industry.

# Long-Run Competitive Equilibrium

- Zero profit does not mean that the entrepreneur does not get anything for his efforts.

# Long-Run Competitive Equilibrium

- In order to stay in business the entrepreneur must receive his opportunity cost or normal profits the owners of business would have received in the next-best alternative.

# Long-Run Competitive Equilibrium

- *Normal profits* are included as a cost and are not included in economic profit. Economic profits are profits above normal profits.



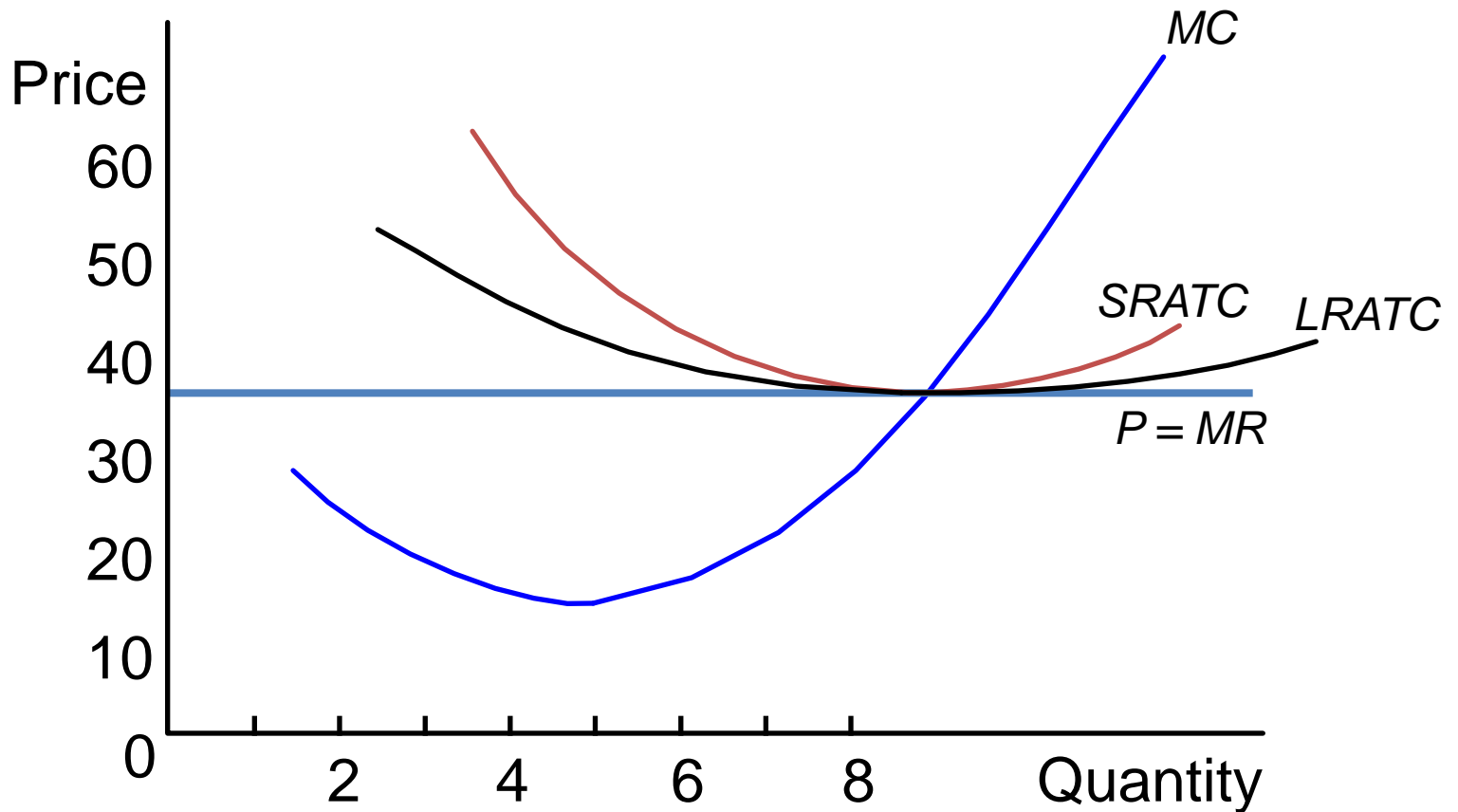
# Long-Run Competitive Equilibrium

- Even if some firm has super-efficient workers or machines that produce rent, it will not take long for competitors to match these efficiencies and drive down the price.
  - *Rent* is an income received by a specialized factor of production.

# Long-Run Competitive Equilibrium

- The zero profit condition is enormously powerful.
  - It makes the analysis of competitive markets far more applicable to the real world than can a strict application of the assumption of perfect competition.

# Long-Run Competitive Equilibrium



# Adjustment from the Long Run to the Short Run

- Industry supply and demand curves come together to lead to long-run equilibrium.

# An Increase in Demand

- An increase in demand leads to higher prices and higher profits.
- Existing firms increase output and new firms will enter the market, increasing output still more, price will fall until all profit is competed away.

# An Increase in Demand

- If the the market is a constant-cost industry, the new equilibrium will be at the original price but with a higher output.
- A market is a constant-cost industry if the long-run industry supply curve is perfectly elastic.

# An Increase in Demand

- The original firms return to their original output but since there are more firms in the market, the total market output increases.

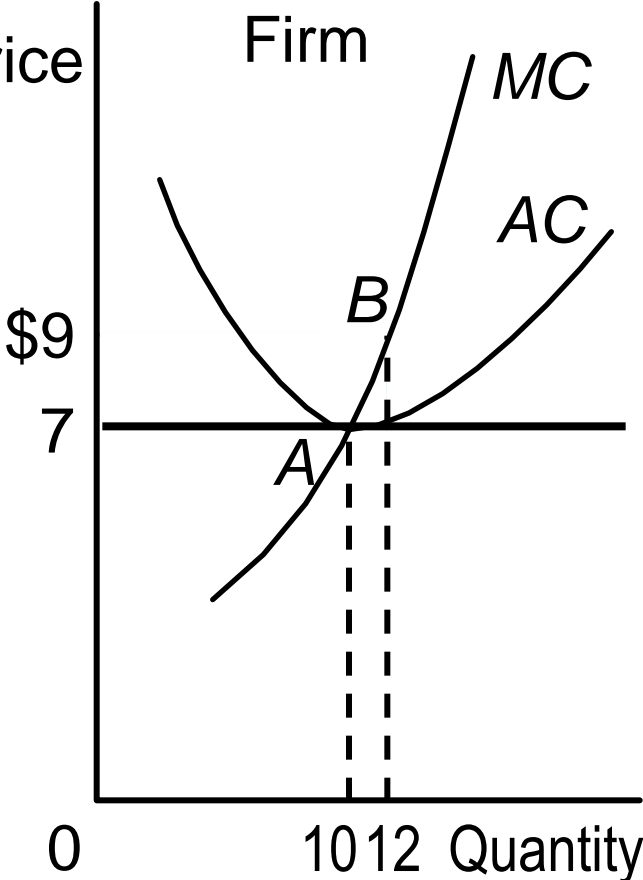
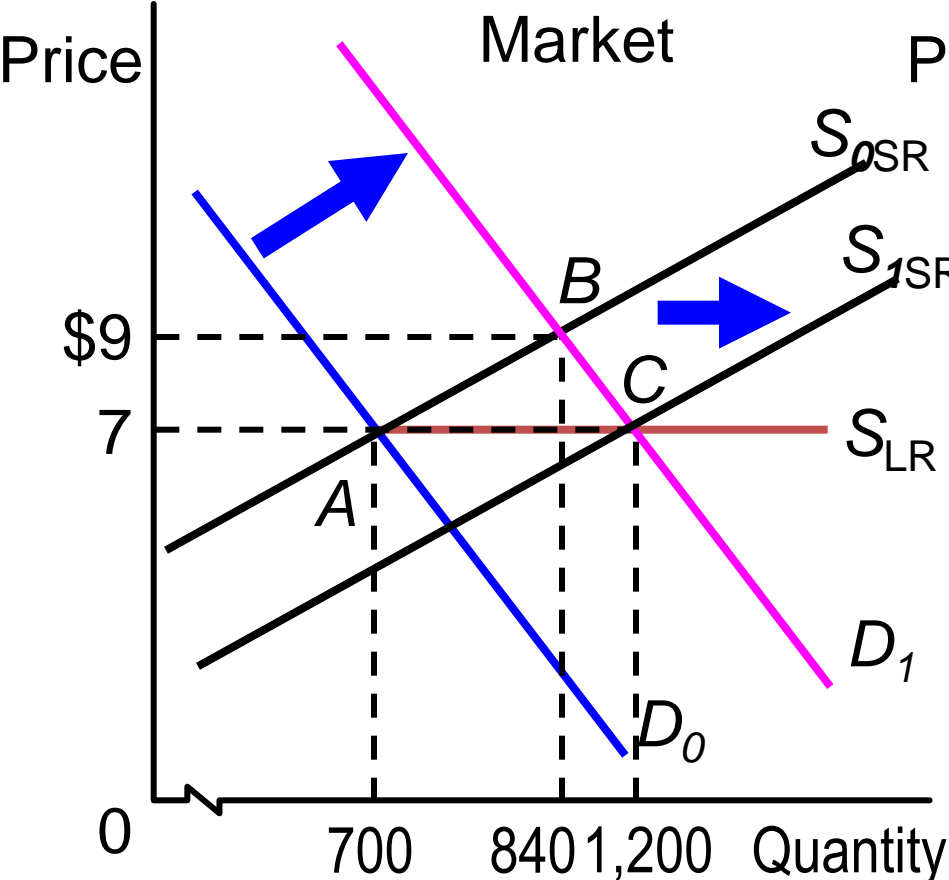
# An Increase in Demand

- In the short run, the price does more of the adjusting.

- In the long run, more of the adjustment is done by quantity.



# Market Response to an Increase in Demand



# Long-Run Market Supply

- Two other possibilities exist:
  - *Increasing-cost industry* – factor prices rise as new firms enter the market and existing firms expand capacity.
  - *Decreasing-cost industry* – factor prices fall as industry output expands.

# An Increasing-Cost Industry

- If inputs are specialized, factor prices are likely to rise when the increase in the industry-wide demand for inputs to production increases.

# An Increasing-Cost Industry

- This rise in factor costs would force costs up for each firm in the industry and increases the price at which firms earn zero profit.

# An Increasing-Cost Industry

- Therefore, in increasing-cost industries, the long-run supply curve is upward sloping.

# A Decreasing-Cost Industry

- If input prices decline when industry output expands, individual firms' marginal cost curves shift down and the long-run supply curve is downward sloping.

# A Decreasing-Cost Industry

- Input prices may decline to the zero-profit condition when output rises and when new entrants make it more cost-effective for other firms to provide services to all firms in the market.

# A Real World Example

- Owners of the Ames chain of department stores decide to close over 100 stores after experiencing two years of losses (a shutdown decision).



# A Real World Example

- Initially, Ames thought the losses were temporary.
  - Since price exceeded average variable cost, it continued to produce even though it was losing money.

# A Real World Example

- After two years of losses, its prospective changed.
  - The company moved from the short run to the long run.

# A Real World Example

- They began to think that demand was not temporarily low, but permanently low.
  - At that point they shut down those stores for which  $P < AVC$ .

# A Real World Example: A Shutdown Decision

