Chapter 14: Firms in Competitive Markets
- What is a perfectly competitive market?
- What is marginal revenue? How is it related to total and average revenue?
- How does a competitive firm determine the quantity that maximizes profits?
- What might a competitive firm shut down in the short run? Exit the market in the long run?
- What does the market supply curve look like in the short run? In the long run?

COMPETITIVE MARKET
- 3 Characteristics:
  - Many buyers and sellers in the market
  -
  - Firms can freely enter or exit the market

- Revenue of Competitive Firm

  DEF: AVERAGE REVENUE

  DEF: MARGINAL REVENUE

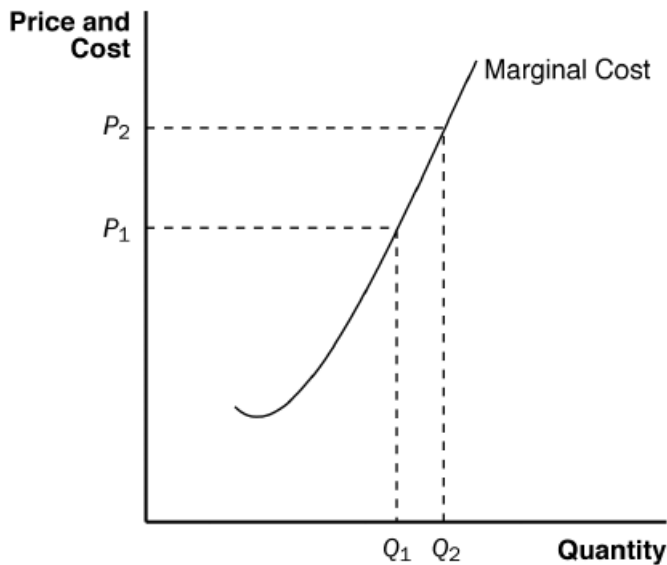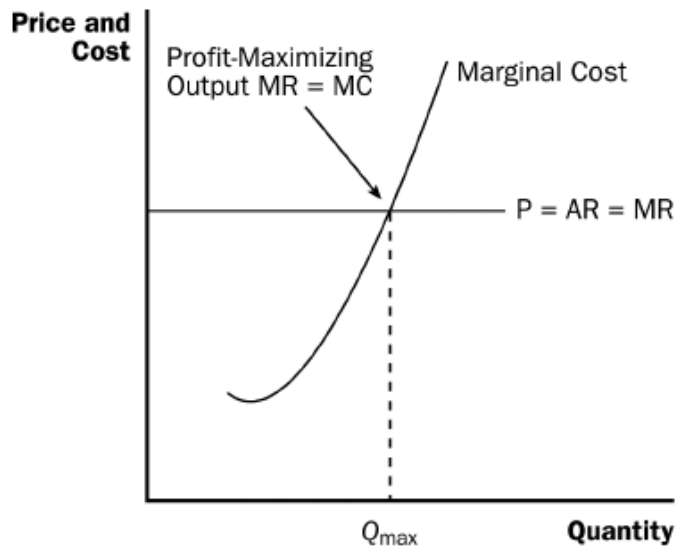| Quantity	Price (P)	TR =P*Q	Average Revenue (AR=TR/Q)	Marginal Revenue (MR=ΔTR/ΔQ)
0	$10			
1	$10			
2	$10			
3	$10			
4	$10			
5	$10			

  MR = P (only true in firms in competitive markets)

Profit Maximization & the Competitive Firm's Supply Curve

Quantity	TR =P*Q	TC	Π=TR-TC	MR (MR=ΔTR/ΔQ)	MC (ΔTC/ΔQ)	Change in Profit (MR-MC)
0	0	$5		-	-	-
1		$9				
2		$15				
3		$23				
4		$33				
5		$45				

  - Goal is to max profit.
  - Another way to determine where profit is maximized is by comparing MR to MC.
    - If MR > MC
    - If MR < MC

- Produce where MR=MC.

Price and Cost

Profit-Maximizing Output MR = MC

Marginal Cost

P = AR = MR

Q_{max} **Quantity**

Price and Cost

Marginal Cost

P_2

P_1

Q_1 Q_2 **Quantity**

MC curve is the firm's supply curve.

A. The Firm's Short Run Decision to Shut Down
- **Shutdown:**
- **Exit**:
- Distinguish between the short run and the long run
  - SR: still have to pay all fixed costs
  - LR: no costs
- In the short run, if a firm shuts down, it loses revenue and gains variable cost.
- *Firms should shut down if revenue gets from producing is less than variable costs of production.*

  Shut down if TR<VC

           Shut down if TR/Q<VC/Q   (*recall TR=P*Q*)
   Shut down if P<AVC

A firm will maximize profit:
        if price is less than AVC, produce no output
        if price is more than AVC, produce level of output where MR=MC.

If:	The Firm Will:
$P \geq AVC$	Produce output level where $MR = MC$
$P < AVC$	Shut down and produce zero output

This means that the MC curve above the AVC curve is the firm's short-run supply curve.

Price and Cost — Marginal Cost — ATC — AVC — Firm's Short-Run Supply Curve — Quantity
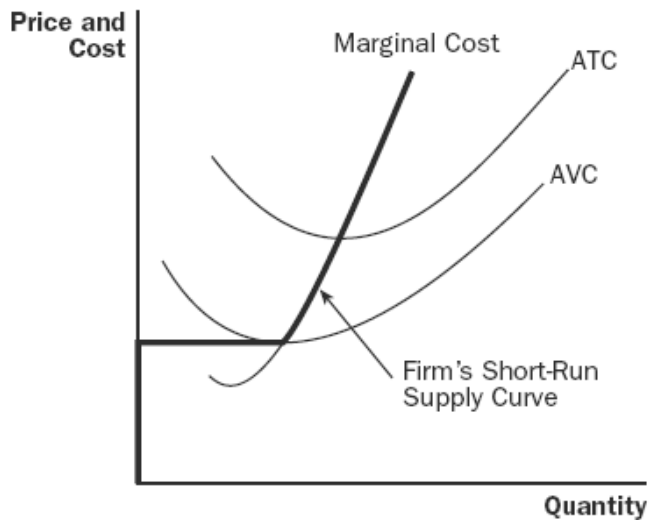
Sunk cost:

B. The Firm's LR Decision to Exit or Enter a Market

- o   If a firm chooses to exit the market, the firm will now recover not only variable costs but also fixed costs.
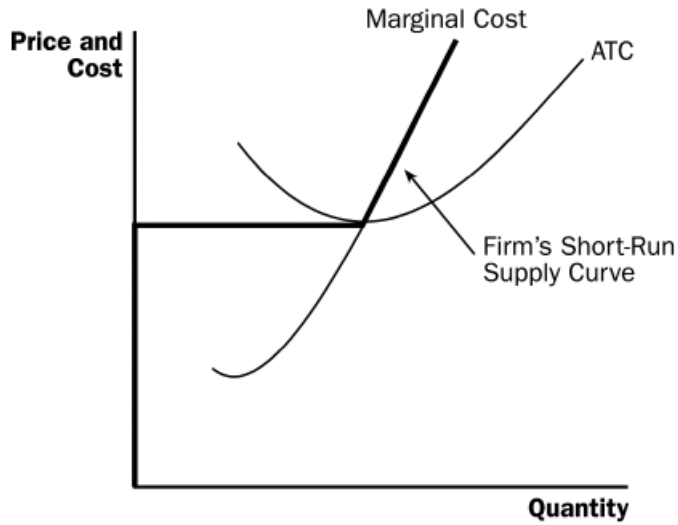- o   A firm exits if the revenue it would get from producing is less than its total costs.

        Shut down if TR<TC
        Shut down if TR/Q<TC/Q   (*recall TR=P*Q*)
        Shut down if P<ATC

- o   Competitive firm's LR Supply curve is portion of MC above ATC curve.

Marginal Cost

ATC

Price and
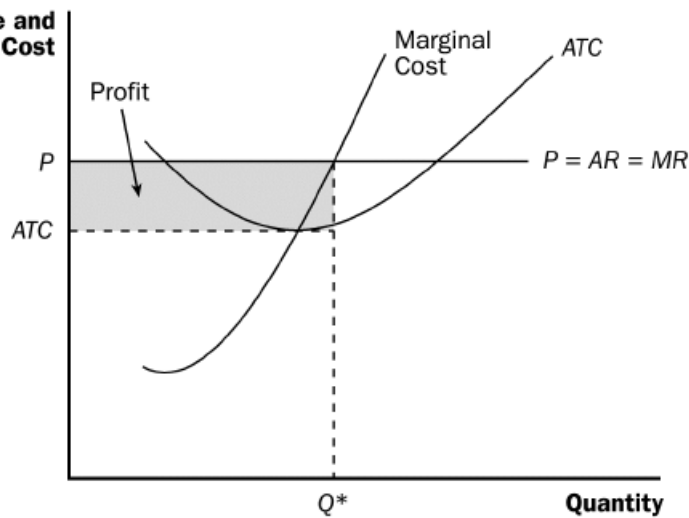Cost

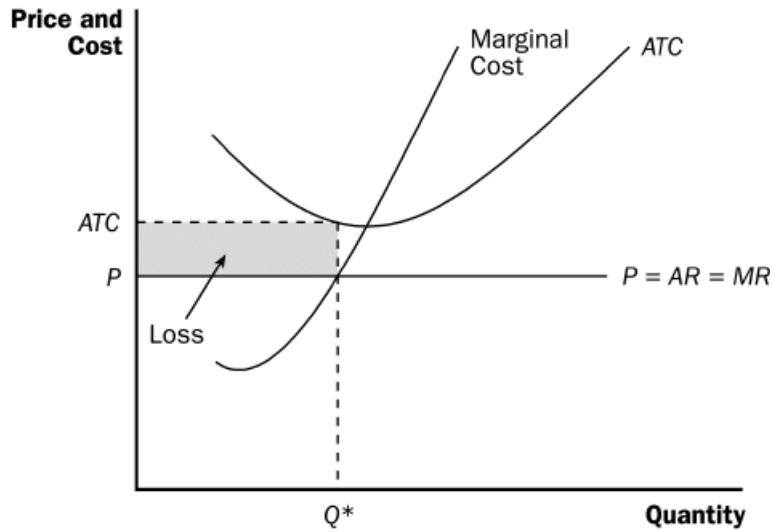Firm's Short-Run
Supply Curve

Quantity

What about entry?

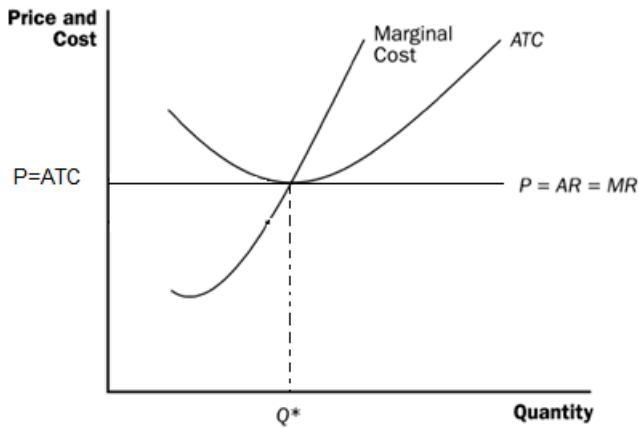| If:	The Firm Will:
$P > ATC$	Enter because economic profits are earned
$P = ATC$	Not enter or exit because economic profits are zero
$P < ATC$	Exit because economic losses are incurred

Economic Profit

PROFIT

Price and
Cost

Marginal   ATC
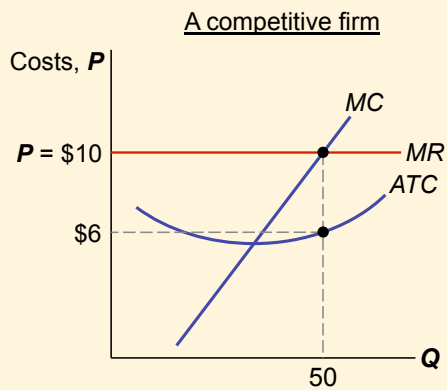Cost

Profit

P $P = AR = MR$

ATC

$Q*$ Quantity

LOSS

Price and Cost

Marginal Cost

ATC

ATC

P ————————————— P = AR = MR

Loss

Q*   **Quantity**

ZERO ECONOMIC PROFIT

Price and Cost

Marginal Cost   ATC

P=ATC ————————————— P = AR = MR

Q*   **Quantity**

Identifying a firm's profit

A competitive firm

Determine this firm's total profit.

Identify the area on the graph that represents the firm's profit.

Costs, **P**

MC

P = $10 ————————————— MR
                                    ATC

$6 - - - - - - - - - -

                              Q
                        50

ACTIVE LEARNING **3**
Identifying a firm's loss

Determine this firm's total loss, assuming $AVC < \$3$.

Identify the area on the graph that represents the firm's loss.
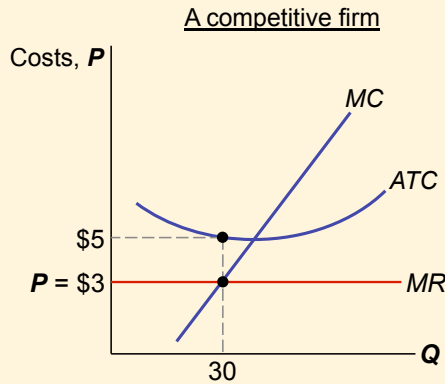
A competitive firm

Costs, **P**

MC

ATC

$5

$P = \$3$ ————————— MR

Q

30

Market Supply: Assumptions

- ▪ All existing firms and potential entrants have identical costs.
- ▪ Each firm's costs do not change as other firms enter or exit the market.
- ▪ The number of firms in the market is
    - ▪ fixed in the short run (due to fixed costs)
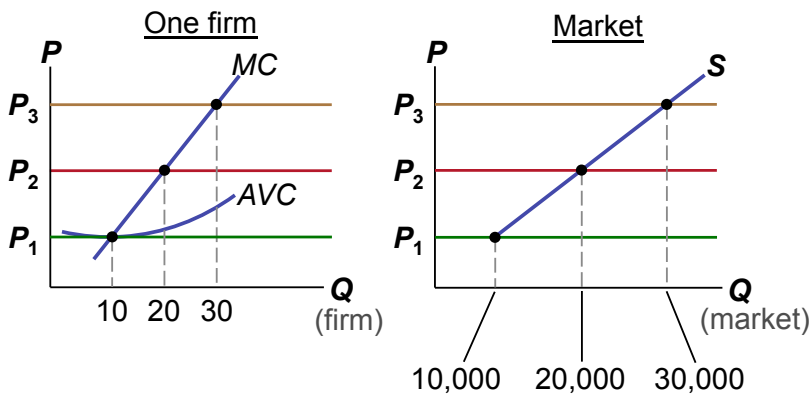   - ▪ variable in the long run (due to free entry and exit)

The Short Run: Market Supply with a Fixed Number of Firms

- o Each firms SR supply curve is its MC curve above AVC.
- o Firms are IDENTICAL, so just multiply by number of firms
- o So horizontally sum just like for demand.

The SR Market Supply Curve

Example: 1000 identical firms

At each **P**, market Q^s = 1000 x (one firm's Q^s)

One firm

P

MC

P_3

P_2

AVC

P_1

Q

10 20 30

(firm)

Market

P

S

P_3

P_2

P_1

Q

10,000   20,000   30,000

(market)

28

The Long Run: Market Supply with Entry & Exit

o All firms and all potential firms have the same cost curves (identical) since access to same technology.
o *In the long run, through this process of entry & exit, firms that remain in the market are making zero economic profit.*
o Only one price consistent with zero profit, so LR supply is horizontal at this price, perfectly elastic.
o Any price above leads to profit and entry and increase in quantity supplied.

The LR Market Supply Curve

In the long run, the typical firm earns zero profit.

The LR market supply curve is horizontal at **P** = minimum *ATC*.
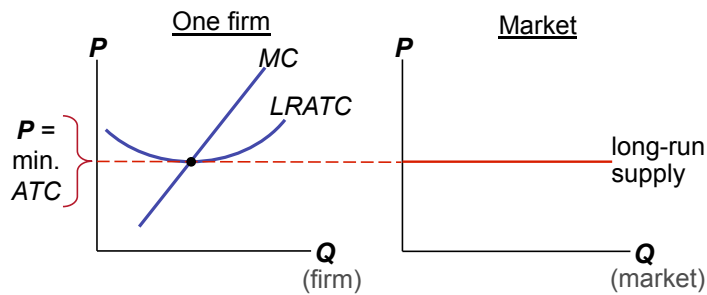
32

A Shift in Demand in the Short Run & Long Run

o Assume start in LR equilibrium.
o Now there is some exogenous shock such that demand increases
o Demand shifts up, which drives up P.
o SR profits (P>min ATC), so new firms will enter (free entry)
o S will shift out in LR
o Drives price back down to LR equilibrium.

SR & LR Effects of an Increase in Demand

…but then an increase in demand raises **P**,…

Over time, profits induce entry, shifting **S** to the right, reducing **P**…
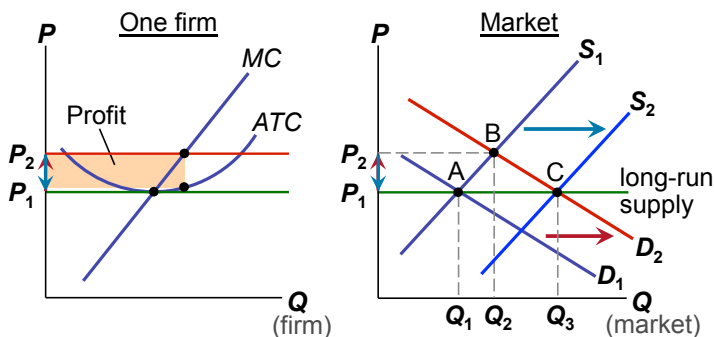
34

Suggested problems: Problems and Applications- 4, 5