

# Chapter 14: Firms in Competitive Markets

Discussion section 4

November 2023

# Outline

- We now have our tools: marginal product, marginal cost, average total cost, total profit  
...
- We will now consider firms in a *competitive marketplace* which have no *market power*
- We will figure out how firms choose output, and see a surprising equilibrium result

# Competitive market

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- Competitive market means:
  - There are a “large” number of buyers
  - Product is undifferentiated
  - All actors are price-takers
- We will add *free entry and exit*: firms can move in and out of production at 0 cost
- What do these conditions mean for a firm’s total revenue? What about for its marginal revenue?

# Average

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  - Remember:  $TR = P * Q$
- $AR = \frac{TR}{Q} = P$
- What about for its marginal revenue?

# Marginal revenue

- What do these conditions mean for a firm's total revenue?
  - Remember:  $TR = P * Q$
- $AR = \frac{TR}{Q} = P$
- What about for its marginal revenue?
  - Since the firm does not change the market price with its production decision,  $P$  is constant, thus the marginal revenue is also constant and  $MR = P$

# Profit maximization

- We know firms will choose output to maximize their profit
- How do they choose this point?

# Profit maximization

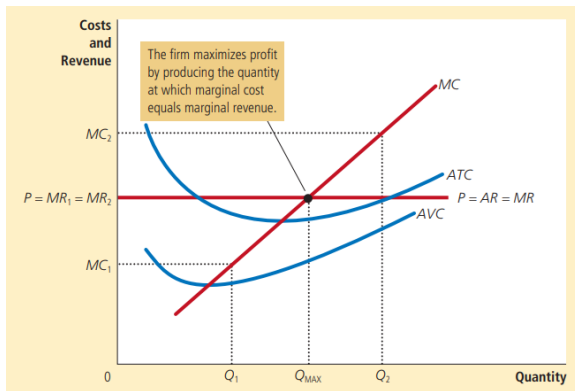
- We know firms will choose output to maximize their profit
- How do they choose this point?
  - By *thinking at the margin*
  - They will keep producing more output until an additional unit causes their profit to decrease:  
ie until *marginal profit* is 0



# Marginal profit

- Marginal profit = change in profit from a “small” change in output
  - Remember: profit = revenue - cost
  - So marginal profit = marginal revenue - marginal cost
- Marginal revenue is constant, but we saw that marginal cost is not, so marginal profit will not be either
- Producing up to 0 marginal profit means that  $MR = MC$ , which means  $P = MC$

# Optimal output



# Supply curve

- Since marginal cost determines output, the MC curve is the competitive firm's supply curve

# Market entry

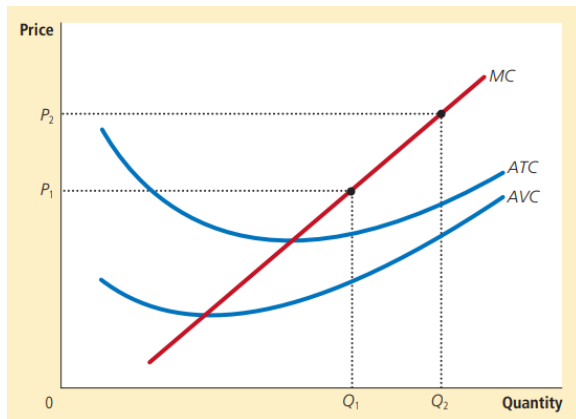
- Firms can move out of the market in two ways: *shutdown* or *exit*
  - A *shutdown* is short-term: still have to pay fixed costs (eg rent)
  - An *exit* is long-term: don't pay fixed costs
- In the short run, fixed costs are *sunk costs*
- So, what do firms consider when deciding to shutdown?

# Shutdown

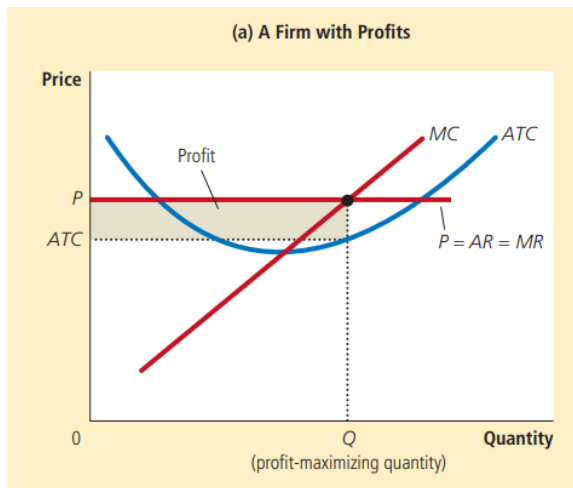
- So, what do firms consider when deciding to shutdown?
  - They consider their *variable costs*
  - So the competitive firm's short-run supply curve is the portion of its marginal-cost curve that lies above average variable cost
- What do firms consider when deciding to exit?

- What do firms consider when deciding to exit?
  - *Total* costs: shutdown if  $TR \leq TC$
- So, the long-run supply curve is the portion of the MC curve above ATC

# Supply curves



# Profit





# Entry

- The flip side is that firms will *enter* if their  $ATC < MC$
- Although the decision of an individual firm does not affect the price, “many” firms entering will expand  $Q$  and decrease  $P$ 
  - Many firms exiting, on the other hand, will decrease  $Q$  and increase  $P$
- At the end of this process, firms must be making *zero economic profits*
  - At this point,  $P = ATC$
  - All firms are operating at their “efficient scale”, the minimum of  $ATC$

# A shift in demand

- Suppose that there is a shift in demand so that demand increases:
  - What happens to the market price?
  - What happens to profits?
  - How will firms respond?

# A shift in demand

- Suppose that there is a shift in demand so that demand increases:
  - What happens to the market price? **The price increase.**
  - What happens to profits? **Profits become positive.**
  - How will firms respond? **New firms enter the market.**
- How does this effect the market?

## A shift in demand

- Increase in demand  $\rightarrow$  higher  $P \rightarrow$  positive profit  $\rightarrow$  firm entry
- How does this effect the market?
  - Firms enter the market
  - This increases supply and decreases  $P$
  - $P$  decreases until  $P = ATC$  Again
  - Equilibrium is restored

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- In the long run, the market supply curve is horizontal (perfectly elastic)
- In reality, why might curves may slope upwards?

# Long-run firm behavior

- In the long run, the market supply curve is horizontal (perfectly elastic)
- In reality, why might curves may slope upwards?
  - Inputs may be limited
  - Firms may have different costs