# 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

- 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?

# 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

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- How do they choose this point?

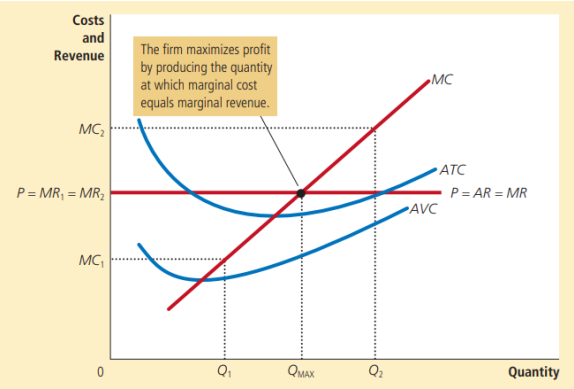
# Profit maximization

- 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 cruve 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?

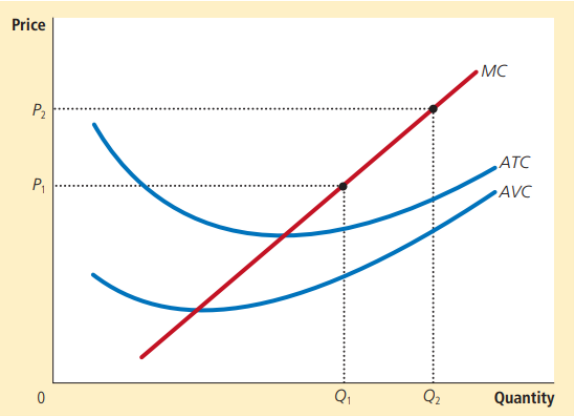
# Shutdown

- 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?

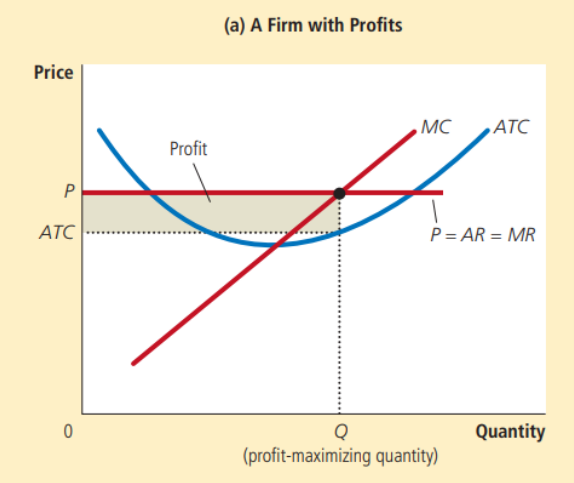
# Exit

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

# Supply curves



# Profit


(a) A Firm with Profits
Price
Profit
MC
ATC
P
ATC
P = AR = MR
0
Q
Quantity
(profit-maximizing quantity)

# 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 proccess, 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

# Long-run firm behavior

- 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