Lecture 13: Supply in a Competitive Market
Supply in a Not Competitive Market: Market Power

November 18, 2025

Course Administration

1. Next two weeks
   - Next week: Happy Thanksgiving!
   - Then final lecture 14: Market power, externalities
2. Final exam December 16
   - Review Thursday December 11, 6 to 7:30, MPA 305
   - Previous final exam posted at bottom of lectures tab
   - Midterm answers posted
3. Post-class office hours
   - December 8, regular times
   - December 12, 11:30 to 1:30
   - Three no-shows this week – please cancel if you cannot come
4. Any questions?

Next Week: Ripped from the Headlines

Send article by Wednesday midnight.

Afternoon

Finder	Presenter
Leo	Miguel
Hannah	Grace

Evening

Finder	Presenter
Mark	Iris

This Week: Ripped from the Headlines

Afternoon

Finder	Presenter
Olivia	Natalia

Evening

Finder	Presenter
Daija	Aiyana

Today

- Finish Chapter 8: Power of competitive markets [afternoon only]
  - Perfect competition in the long run
- Chapter 9: When markets aren't competitive
  1. Why markets may not be competitive
  2. Marginal revenue with market power
  3. How firms with market power maximize profits
  4. How firms with market power react to market changes
  5. Winners and losers from market power
  6. Government options in the face of marker power

Perfect Competition in the Long Run

What Makes the Long Run Different?

- All costs are variable
- Firms enter
- Firms exit

Entry in the Long Run

- Free entry $\equiv$ when firms can easily enter the market
  - No legal barriers
  - No technical barriers

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  - $\pi = P * Q - LATC * Q = Q * (P - LATC)$

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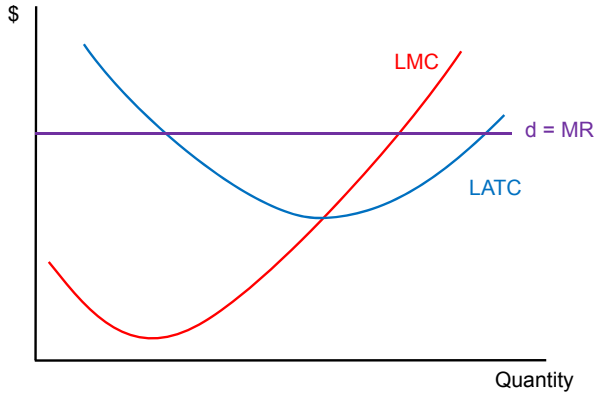
- When $\pi > 0$, we anticipate entry by new firms, until $\pi = 0$
- Long-run competitive equilibrium $\equiv$ point at which $P = LATC$, and there are no gains to entry for additional firms

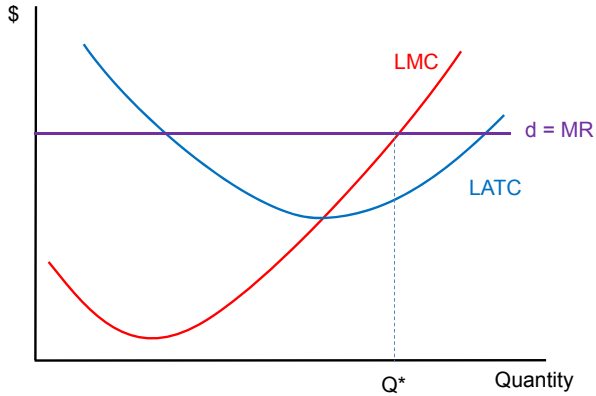
Profits and Entry

What is the long-run profit-maximizing Q?



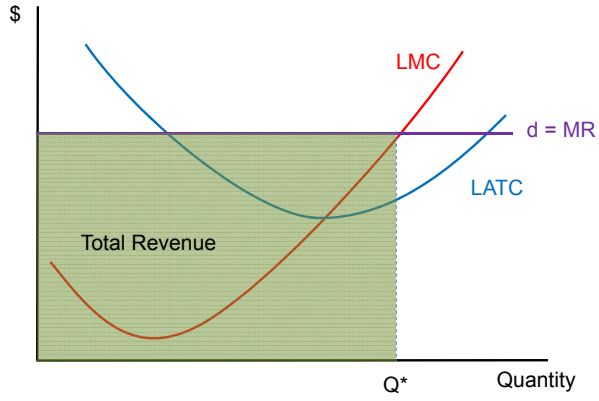
Profits and Entry

And where are total revenues?



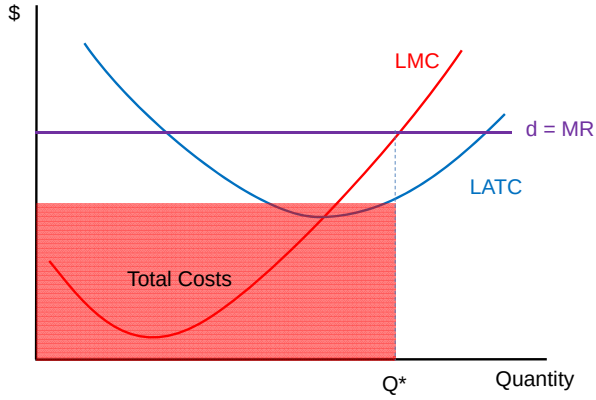
Profits and Entry

Total costs?



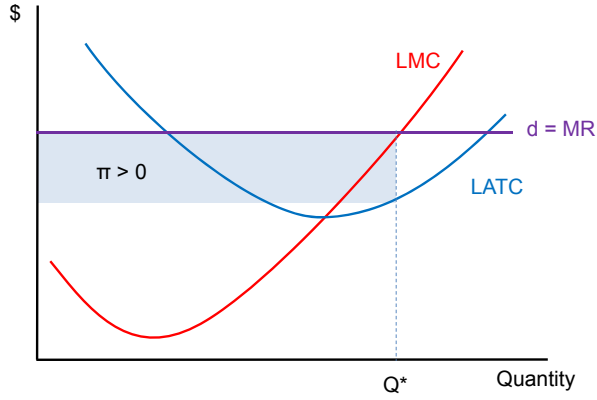
Profits and Entry

Where is profit?



Profits and Entry

Positive profits: Stay in business



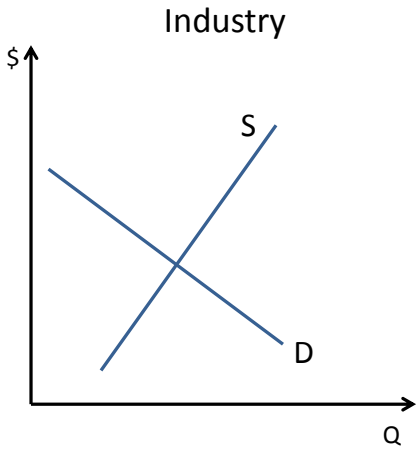
If economic profit exists, what should other firms do?

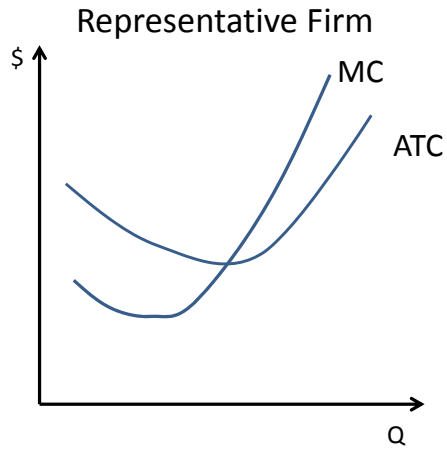
Long-Run Exit

- Free exit $\equiv$ ability of firm to exit an industry without legal or technical barriers
- When should a firm exit the market? When $P < LATC$

What Happens When Demand Increases?

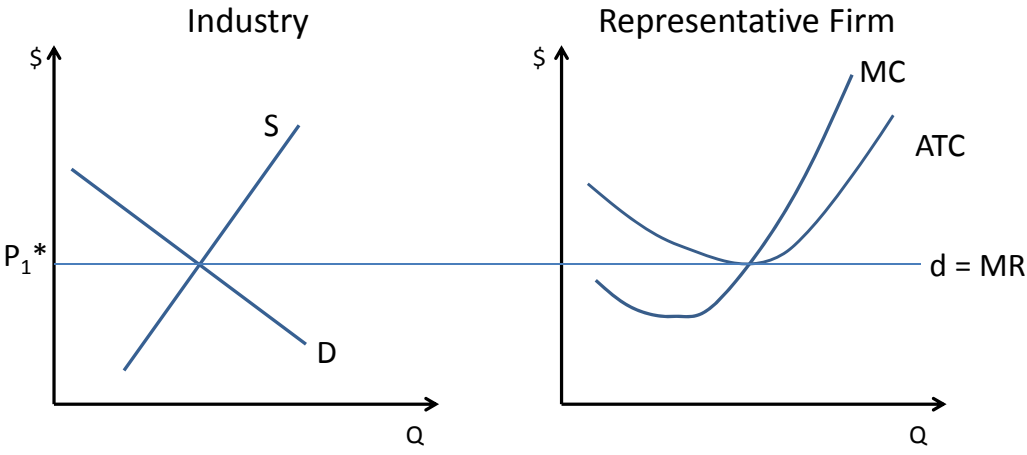
Original Equilibrium





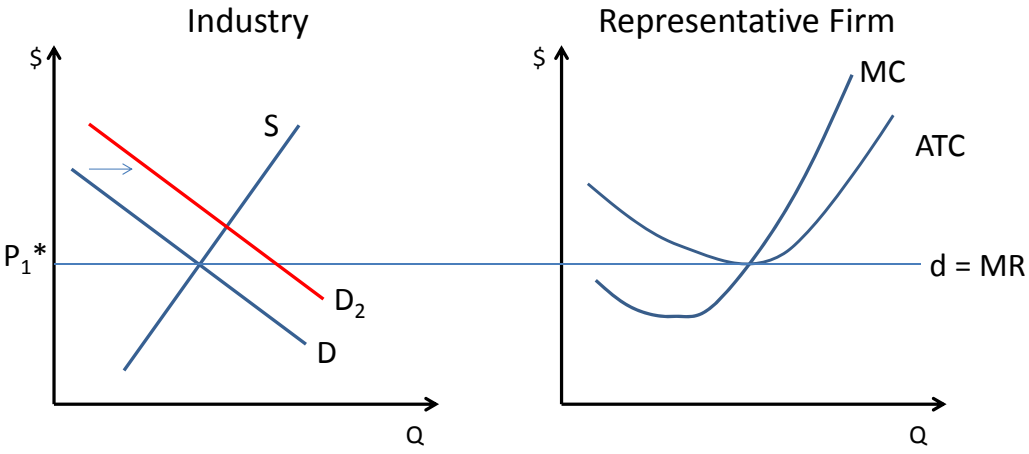
What Happens When Demand Increases?

Note Zero Profits



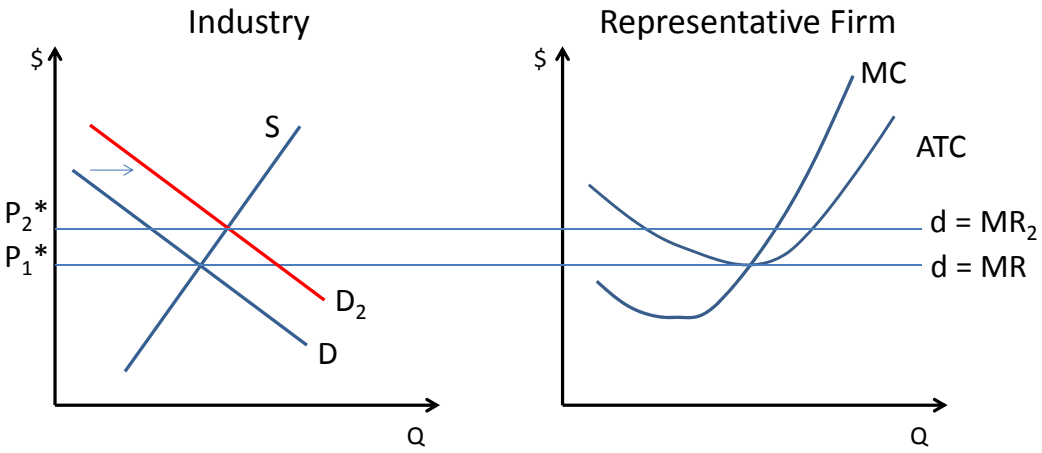
What Happens When Demand Increases?

Demand Increases. New *MR*?



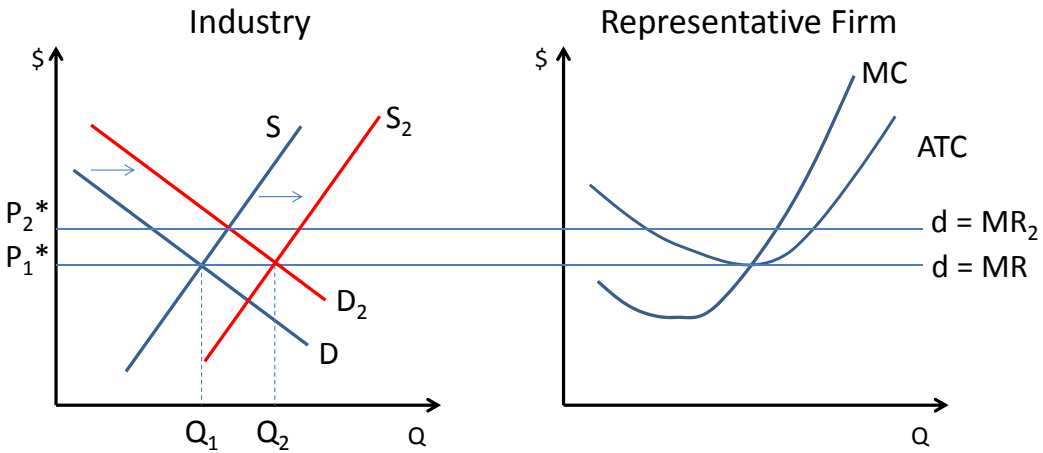
What Happens When Demand Increases?

What happens to profits? What happens to entry?



What Happens When Demand Increases?

Supply Increases to Offset Change in Demand



Finding the Long-Run Supply Curve

Recap: Suppose demand increases. What happens

- in the short run to prices?

Finding the Long-Run Supply Curve

Recap: Suppose demand increases. What happens

- in the short run to prices? increase
- in the long run to firm entry?

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$\rightarrow$ the long-run supply curve is perfectly elastic

Finding the Long-Run Supply Curve

Suppose costs fall. What happens

- in the short run to prices?

Finding the Long-Run Supply Curve

Suppose costs fall. What happens

- in the short run to prices? decrease
- in the short run to firm profits?

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- in the short run to prices? decrease
- in the short run to firm profits? possibly increase, if lower costs not passed to consumers
- in the long run to firm entry?

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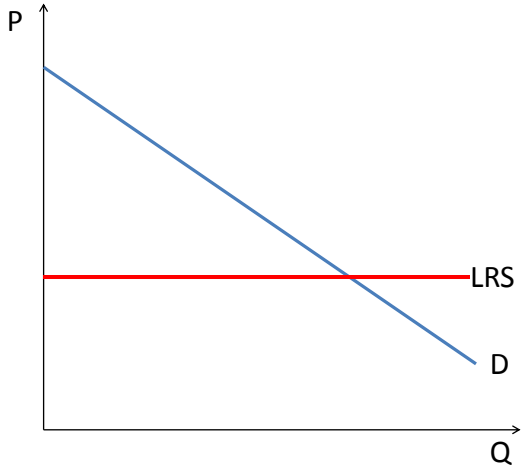
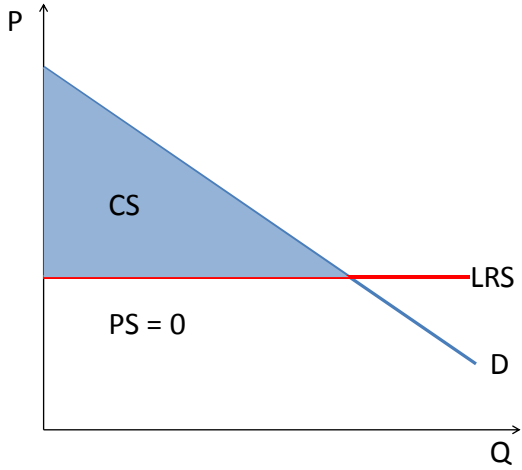
Producer and Consumer Surplus in Perfect Competition

Where are Consumer and Producer Surplus?

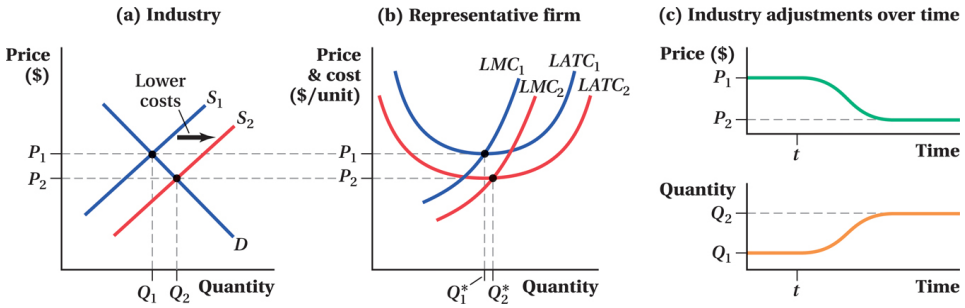


Producer and Consumer Surplus in Perfect Competition

It Stinks for Producers, and Is Good for Consumers



When Costs Fall



In Sum, In the Long Run

- Firms can enter
- Firms can exit
- Profits are zero
- $P = LATC$
- Supply is perfectly elastic

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If supply is perfectly elastic, do producers have surplus?

In Sum, In the Long Run

- Firms can enter
- Firms can exit
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If supply is perfectly elastic, do producers have surplus? **No**

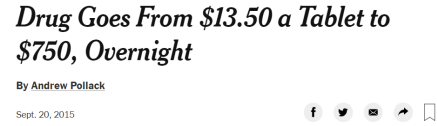
Big Idea: What Does Perfect Competition Get You?

- Products sold at marginal cost
- Everyone who wants the product at market price can buy it
- Consumer surplus high
- Consumer demand drives firm decisions
- Social welfare – producer plus consumer surplus – maximized

Why Is Competition Important?

Martin Shkreli, CEO, Turing Pharmaceuticals

- business plan is to buy out-of-patent medications
- increase prices
- Dataprim is an AIDS drug
- "But what Shkreli recognized was that, even with a generic drug, regulatory barriers and a lack of competition can make big price hikes possible. " *New Yorker*, October 5, 2015
- lots of media chat about antitrust response



Drug Goes From $13.50 a Tablet to $750, Overnight

By Andrew Pollack

Sept. 20, 2015

From *New York Times*

While the Antitrust Wheels of Government are Grinding Along

HEALTHCARE FINANCE

FOR PAYERS | R

REIMBURSEMENT | REVENUE CYCLE MANAGEMENT | STRATEGIC PLANNING | CAPITAL FINANCE | SUPPLY CHAIN

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Daraprim competitor to market $1 pill after Turing chief Martin Shkreli hikes price

Shkreli has said the price hike was not the result of corporate greed

What If We Don't Have Perfect Competition?

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Sources of Market Power

Why Study Market Power?

- Most markets are imperfect to some degree
- Economists believe there is a role for government in easing market imperfections
- Today
  - How does limited competition impact consumption and production?
  - What is government's role in improving competition?

What is Market Power?

- Market power $\equiv$ when a firm has the ability to influence the market price
- Monopoly $\equiv$ market served only by one firm
- Monopolist $\equiv$ sole supplier and price setter of good on the market

Where Does Market Power Come From?

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Barriers to entry

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Inhibitions to entry include

1. "Natural" monopolies
2. Switching costs
3. Product Differentiation
4. Absolute Cost Advantages
5. Government barriers to entry

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Absence of these barriers keeps prices at costs in competitive markets

1. Natural Monopolies

- An industry in which average total cost always decreases as Q increases
  - Note that this also implies decreasing marginal cost
- This means that it is efficient for one firm to produce the entire industry output

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- An industry in which average total cost always decreases as Q increases
  - Note that this also implies decreasing marginal cost
- This means that it is efficient for one firm to produce the entire industry output
- And there is a rationale for government to regulate the monopoly

2. Switching Costs and Market Power

- Switching costs $\equiv$ cost to consumer in switching between products – examples?
- Network goods have particularly high switching costs
- Network good $\equiv$ good for which value to consumer increases with number of other consumers of the product

3. Product Differentiation and 4. Cost Advantage

Product differentiation

- Imperfect substitutability across varieties of a product
- Observable if you are willing to pay a little more for a particular variant

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Absolute Cost Advantage

- Firm owns something or has a technology that makes it have lower costs relative to competitors
- Examples?

5. Government Regulation as a Barrier to Entry

- We've already given examples that limit entry – reprise?

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- Remember, over the long run, high profits are a temptation to entry, perhaps in a slightly altered form

5. Government Regulation as a Barrier to Entry

- We've already given examples that limit entry – reprise?
  - patent rights
  - occupational licensing
  - education requirements
- Remember, over the long run, high profits are a temptation to entry, perhaps in a slightly altered form
- Don't conclude that barriers to entry are always bad
- Do compare cost of barriers to benefits

Market Power and Marginal Revenue

Neither Perfect Competition Nor a Monopoly

- We say a firm has market power if it faces a downward sloping demand curve
  - Recollect – what did a demand curve look like to a perfectly competitive firm?

Neither Perfect Competition Nor a Monopoly

- We say a firm has market power if it faces a downward sloping demand curve
  - Recollect – what did a demand curve look like to a perfectly competitive firm?
- Firms in these types of markets face downward-sloping demand curves
  - Oligopoly $\equiv$ an industry with few firms – examples?
  - Monopolistic competition $\equiv$ many firms selling differentiated products
  - Monopoly

Marginal Revenue: Perfect Competition and Not

Perfect Competition

- What is marginal revenue?

Marginal Revenue: Perfect Competition and Not

Perfect Competition

- What is marginal revenue?
- If the firm perceives the demand curve as constant, then $MR = P$

Marginal Revenue: Perfect Competition and Not

Perfect Competition

- What is marginal revenue?
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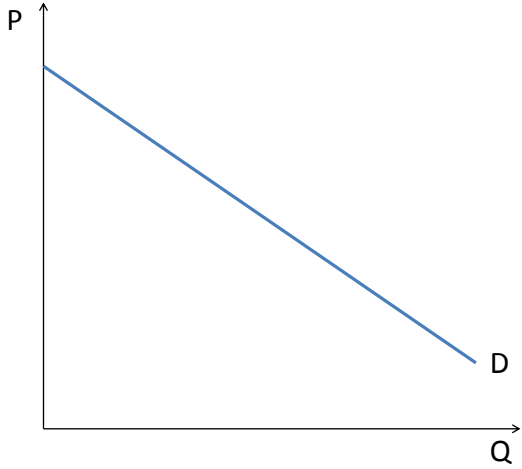
Market Power

- We assume that the firm has to charge the same price for all units of the good
- As before, marginal revenue is the additional revenue from an additional unit of output sold
- However, selling an additional unit of output now requires lowering the price on all units of output

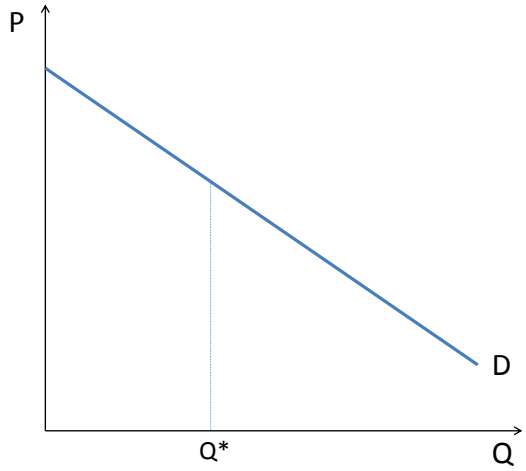
Market Power and Marginal Revenue in Pictures

Demand as Perceived by the Firm



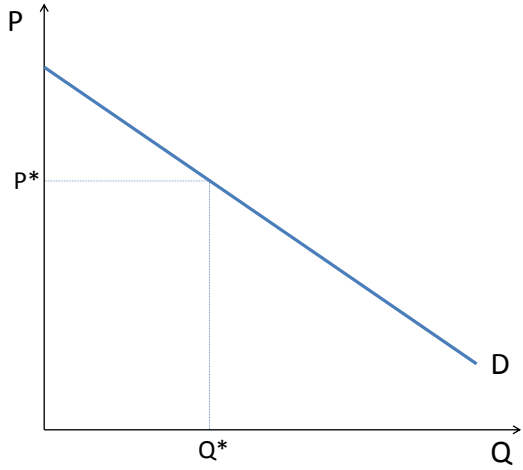
Market Power and Marginal Revenue in Pictures

Can Think of Firm Choosing Either P or Q



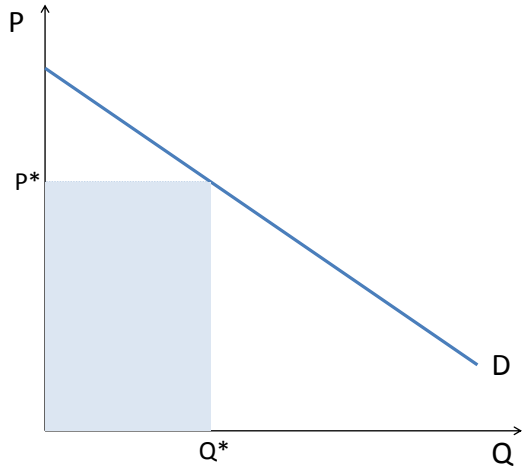
Market Power and Marginal Revenue in Pictures

What is Revenue?



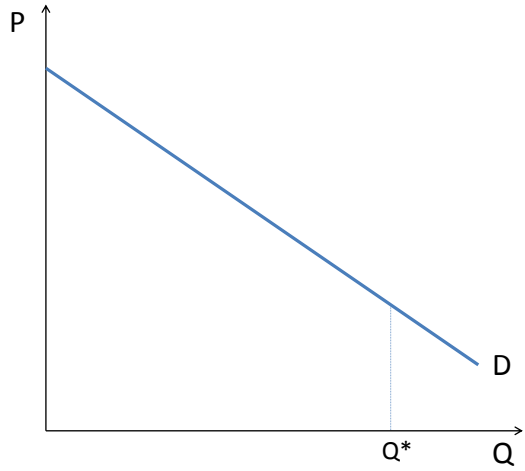
Market Power and Marginal Revenue in Pictures

Revenue



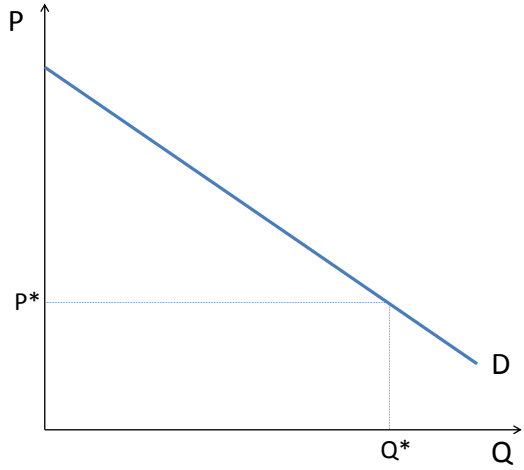
Market Power and Marginal Revenue in Pictures

Choose a Different Q



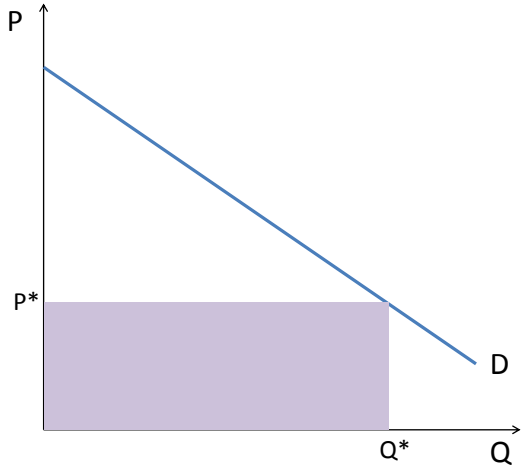
Market Power and Marginal Revenue in Pictures

Yields a Different P



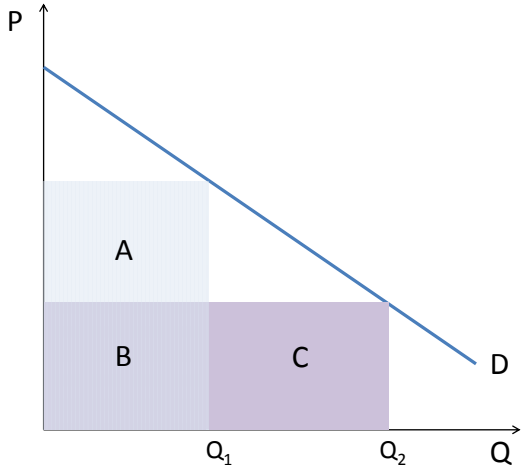
Market Power and Marginal Revenue in Pictures

Different Revenue



Market Power and Marginal Revenue in Pictures

Compare Gains and Losses From Change in Production



Market Power and Marginal Revenue in Algebra

Define

$$MR = P + \frac{\Delta P}{\Delta Q} Q = \left(\frac{\partial TR}{\partial Q} \right)$$

- We know that $\frac{\Delta P}{\Delta Q}$ is the slope of the demand curve, and that's negative
- Thus, MR decreases as Q increases

Market Power and Marginal Revenue in Algebra

For a linear demand curve,

- Consider an inverse demand curve of form $P = a + bQ$ (note similarity to $y = b + mx$)
- We can rewrite MR as

$$\begin{aligned} MR &= P + \frac{\Delta P}{\Delta Q} Q \\ &= (a + bQ) + bQ \\ &= a + 2bQ \end{aligned}$$

Market Power and Marginal Revenue in Algebra

For a linear demand curve,

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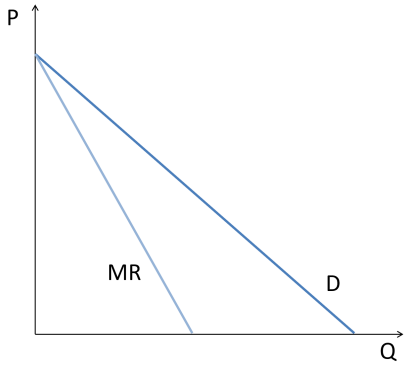
$$\begin{aligned} MR &= P + \frac{\Delta P}{\Delta Q} Q \\ &= (a + bQ) + bQ \\ &= a + 2bQ \end{aligned}$$

- The intercept is the same as the inverse demand curve, but the slope is twice as steep
- Memorize this formula

Note: This is slightly different notation with signs than in the textbook; I find it clearer. Remember that b is negative, so the MR slope will always be negative.

Figure: Demand Curve and Marginal Revenue Curve



When demand is linear, MR curve has

- same P intercept
- slope twice as steep
- Q intercept half of the demand curve

Profit Maximization and Market Power

Profit Maximization

What does a competitive firm set equal for profit maximization?

Profit Maximization

What does a competitive firm set equal for profit maximization?

- $MR = MC$, and we know that $MR = P$

Profit Maximization

What does a competitive firm set equal for profit maximization?

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What does a firm with market power set equal for profit maximization?

- $MR = MC$

Profit Maximization

What does a competitive firm set equal for profit maximization?

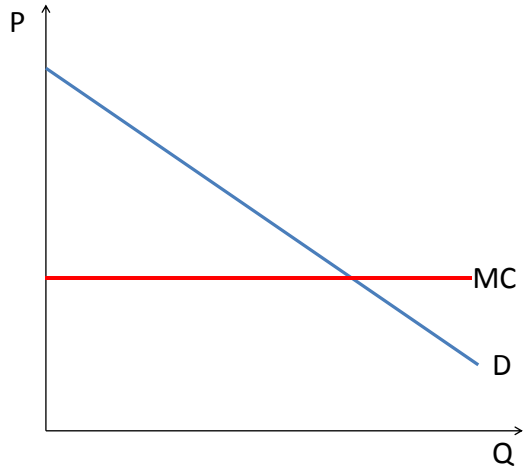
- $MR = MC$, and we know that $MR = P$

What does a firm with market power set equal for profit maximization?

- $MR = MC$
- But MR is more complicated
- And $MR \neq P$ (in general)

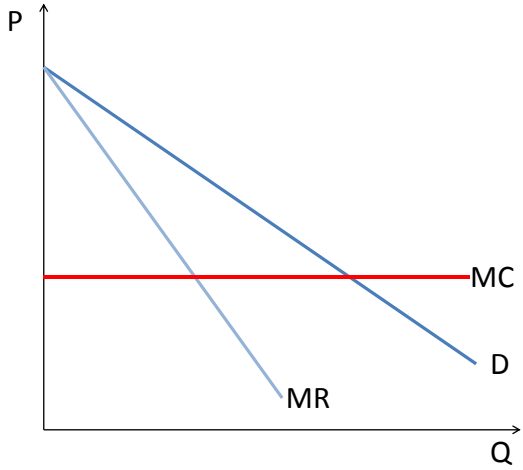
Maximizing π with Market Power: Constant *MC*

Where is *MR*?



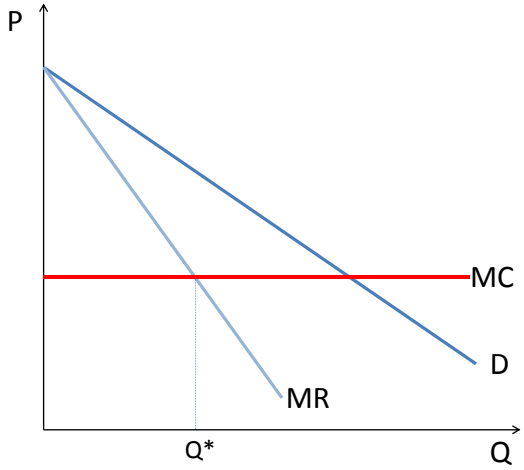
Maximizing π with Market Power: Constant *MC*

What is Profit Maximizing *Q*?



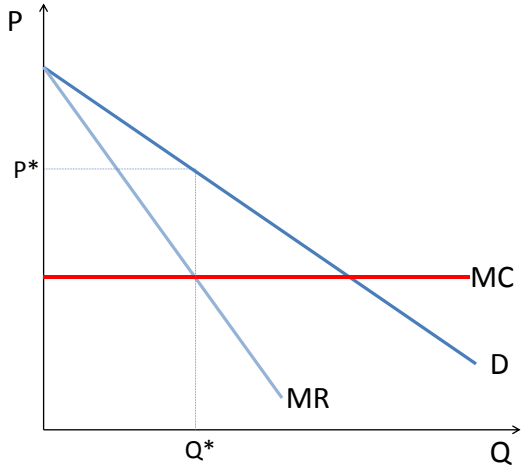
Maximizing π with Market Power: Constant *MC*

What is Profit Maximizing *P*?



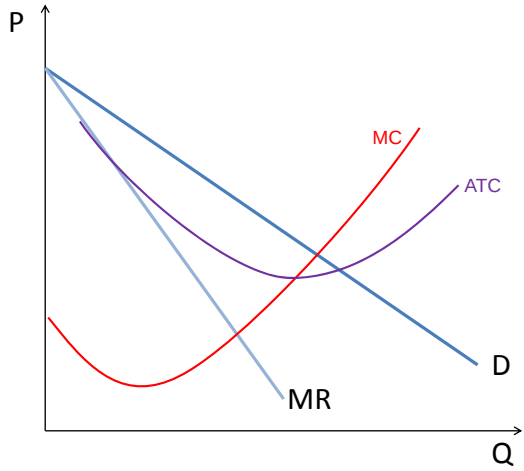
Maximizing π with Market Power: Constant *MC*

Can See Revenues, but Not Costs



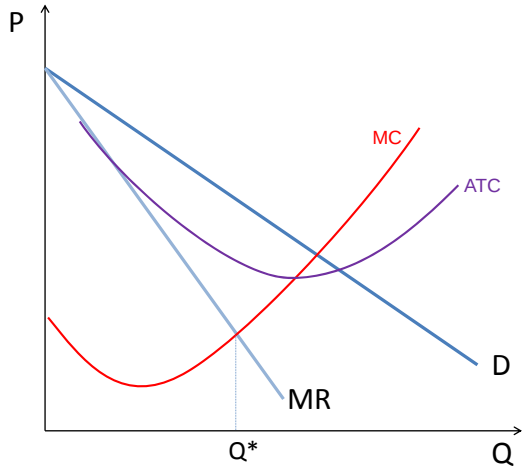
Maximizing π with Market Power: Increasing *MC*

Where is Profit Maximizing *Q*?



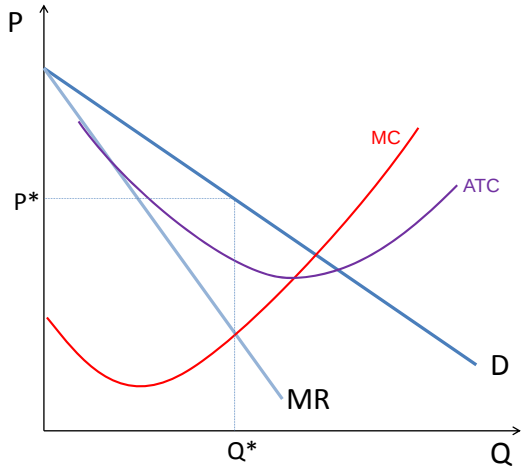
Maximizing π with Market Power: Increasing *MC*

What is Profit Maximizing *P*?



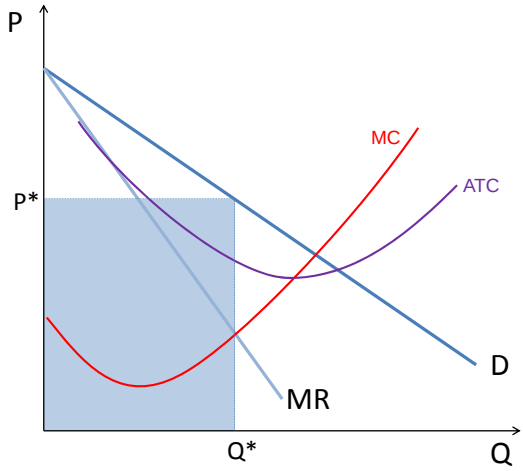
Maximizing π with Market Power: Increasing *MC*

What is Total Revenue?



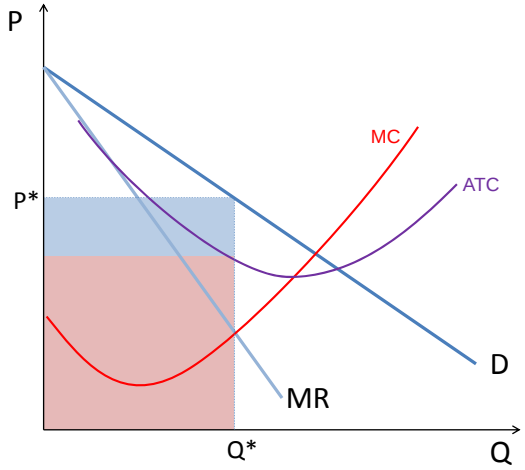
Maximizing π with Market Power: Increasing *MC*

What are Total Costs?



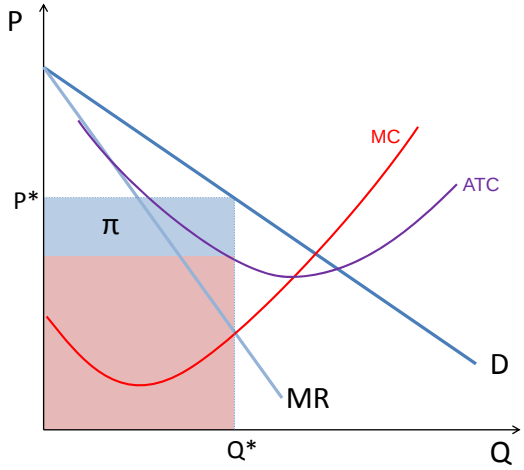
Maximizing π with Market Power: Increasing *MC*

What is Profit?



Maximizing π with Market Power: Increasing *MC*

Market Power Yields Profits!



Profit Maximization with Market Power in Math

Profits are maximized at Q^* such that $MR = MC$. What are Q^* and P^*?
Use these three steps:

1. Find MR
   - If you have a linear demand curve, you can find $MR = a + 2bQ$
   - where b is the slope of the **inverse** demand curve
   - a is the y-intercept
   - Remember that the inverse demand curve is $P = f(Q)$
2. Find profit-maximizing Q by setting $MR = MC$
3. Find profit-maximizing price by putting Q^* in demand curve

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Do not confuse MC curve with true supply curve, which is independent of demand.

Try it Yourself: Roofer Market Power

Suppose the local roofing company has market power and faces the demand curve $Q = 200 - P/10$, where Q is the number of roof jobs, and P is in dollars. The marginal cost for the firm is $MC = 200 + 16Q$.

1. What is marginal revenue?
2. What is the profit maximizing output?
3. Price?

And at home, if we don't have time, you can try...

4. If the firm's demand changes to $Q = 3500/3 - P/12$, what is the new marginal revenue?
5. Profit maximizing output?
6. Price?

1. Find marginal revenue
   The problem gives $Q = f(P)$. We need $P = f(Q)$.
   Re-write the demand curve as the inverse demand curve:

$$Q = 200 - P/10$$
$$P/10 = 200 - Q$$
$$P = 2000 - 10Q$$

   Use the formula to find $MR = a - 2bQ = 2000 - 2(10)Q = 2000 - 20Q$.
   (Or calculus way $MR = \frac{\partial PQ}{\partial Q} = \frac{\partial 2000Q - 10Q^2}{\partial Q} = 2000 - 20Q$.)

2. Find profit maximizing Q
   $MR = MC$. We know $MC = 200 + 16Q$. Set $MR = MC$.

$$\begin{aligned} 2000 - 20Q &= 200 + 16Q \\ 1800 &= 36Q \\ Q^* &= 50 \end{aligned}$$

3. Find profit maximizing price
   Plug Q^* into the demand curve. $P^* = 2000 - 10(50) = 2000 - 500 = 1500$.

4. Firm's demand changes, new MR? Find inverse demand curve:

$$\begin{aligned} Q &= 3500/3 - P/12 \\ P/12 &= 3500/3 - Q \\ P &= 14000 - 12Q \end{aligned}$$

$MR = 14000 - 24Q$

5. Firm's demand declines, new Q^*?

$$\begin{aligned} MR &= MC \\ 14000 - 24Q &= 200 + 16Q \\ 13800 &= 40Q \\ 345 &= Q^* \end{aligned}$$

End of Answer

6. New profit maximizing price? Plug into new demand curve
   $P^* = 14000 - 12(345) = 14000 - 4140 = 9860$

Recap of Today

- Perfect competition [afternoon only]
  - Perfect competition in the long run
- Market Power
  - Sources of market power
  - Market power and marginal revenue

Next Class

- Turn in Problem Set 12
- Complete Chapter 9
- Externalities – will update readings tonight or tomorrow AM