

Monopoly and Imperfect Competition

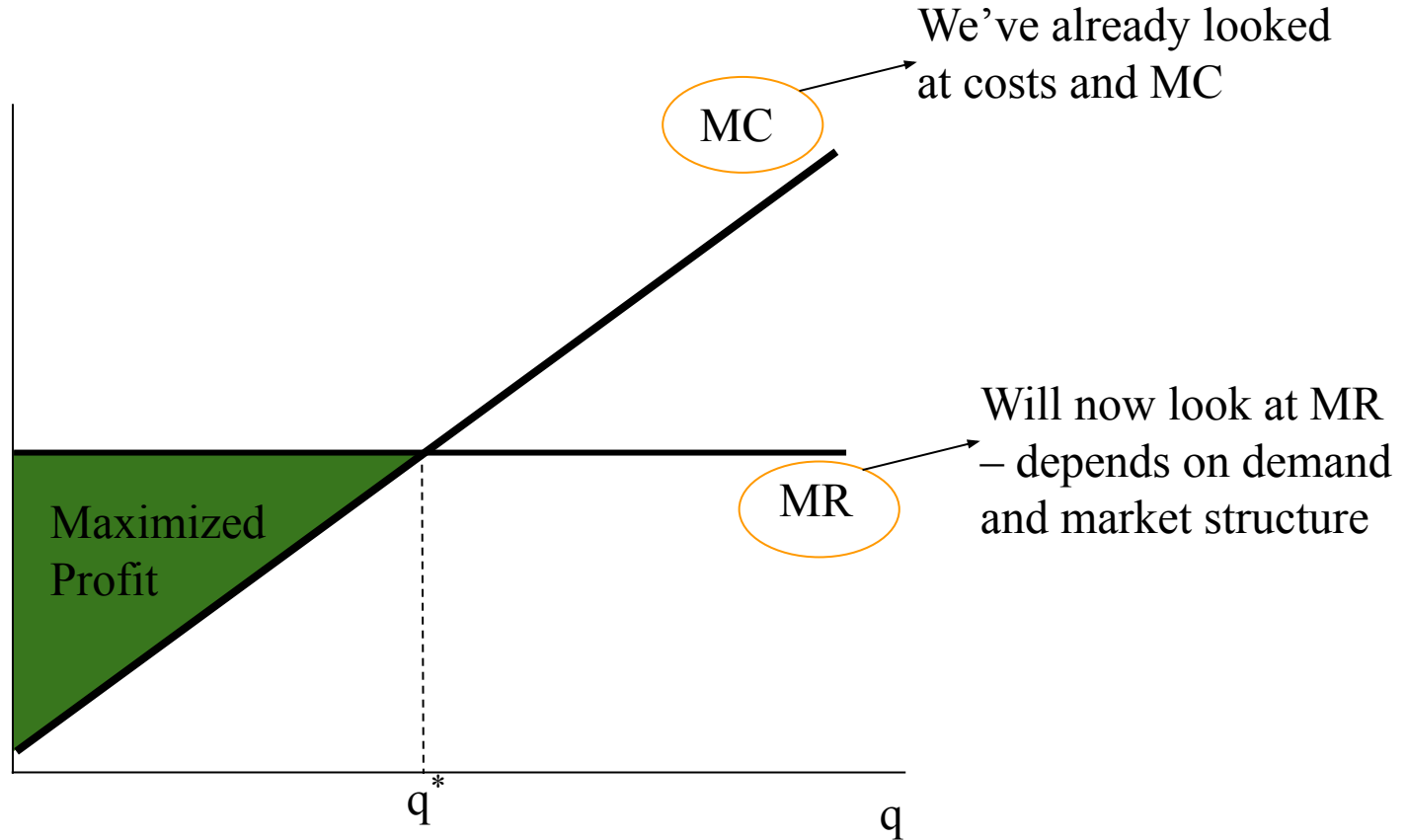
Summer 2023
Econ S-10A, Harvard University
Prof. Josh Abel

Textbook chapters 15 and 17

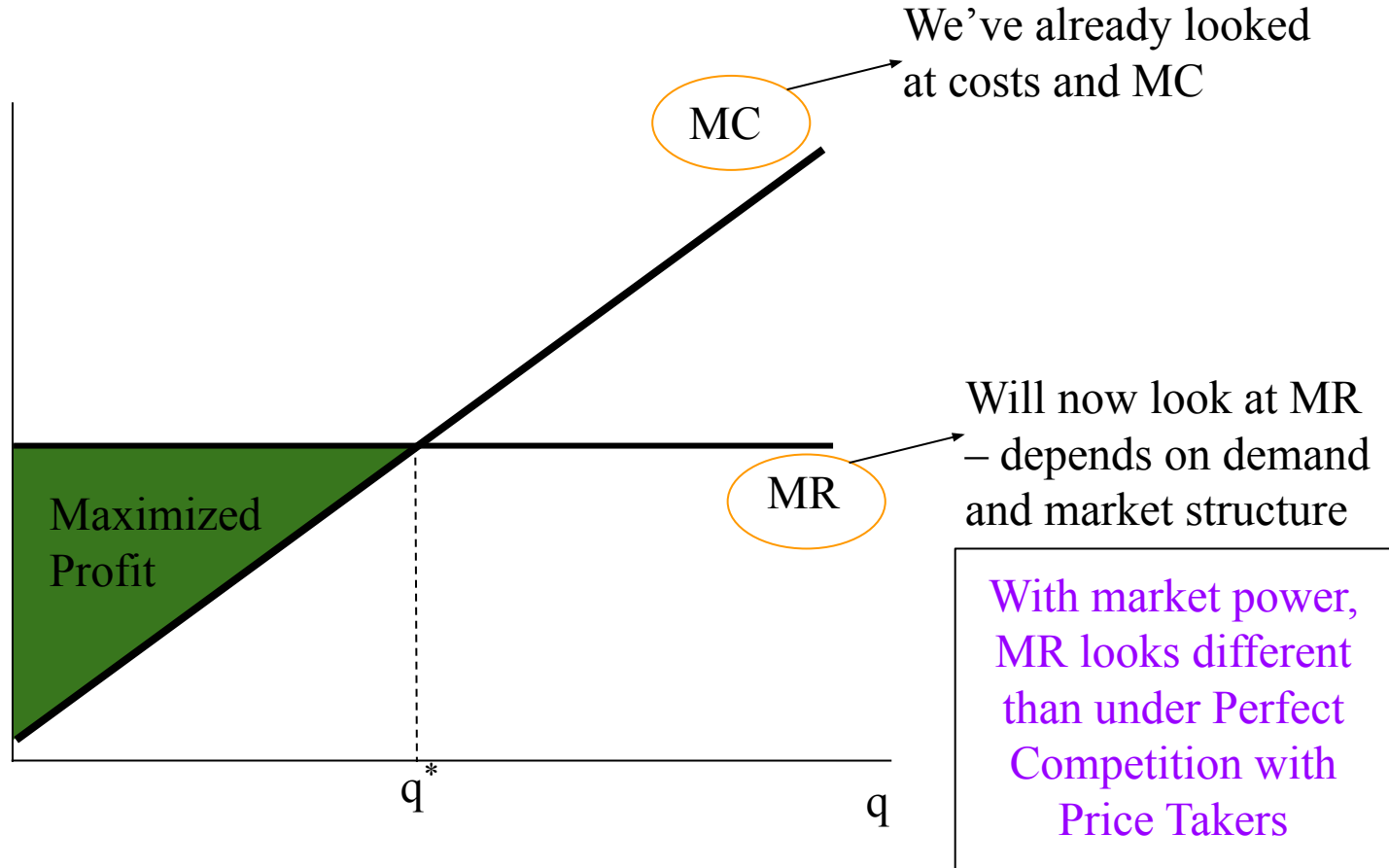
Market Power (repeated)

- Market Power describes a firm's ability to influence the market price
- Economists usually group markets into 3 categories based on Market Power
 1. Perfect Competition:
 - Many, many firms compete
 - An individual firm is very small, so there is no Market Power
 2. Monopoly:
 - One firm supplies all quantity
 - This firm sets the price – maximal Market Power
 3. Oligopoly:
 - A “small” number of firms compete
 - Each firm can influence the price but none can control it – some market power
- These markets play out in very different ways
 - Only Perfect Competition yields an efficient market (“idealized benchmark”)
 - When firms have Market Power, government intervention can be warranted

Marginal Revenue (2) (repeated)



Marginal Revenue (2) (repeated)



Monopoly

Barriers to Entry

- A Monopoly (one-firm market) may exist for a number of reasons (Barriers to Entry):
 1. Control over key resource
 - E.g. DeBeers in the diamond market
 2. Government prevention of competition
 - E.g. Patent rights for brand pharmaceuticals (think Lipitor)
 3. Network externalities (consumer value rises with size)
 - E.g. Facebook vs. MySpace
 4. Overwhelming economies of scale (ATC falls with size)
 - E.g. Amtrak for passenger rail service

Marginal Revenue for the Monopolist

- We know that any profit-maximizer should obey this:

$$MC(q) = MR(q)$$

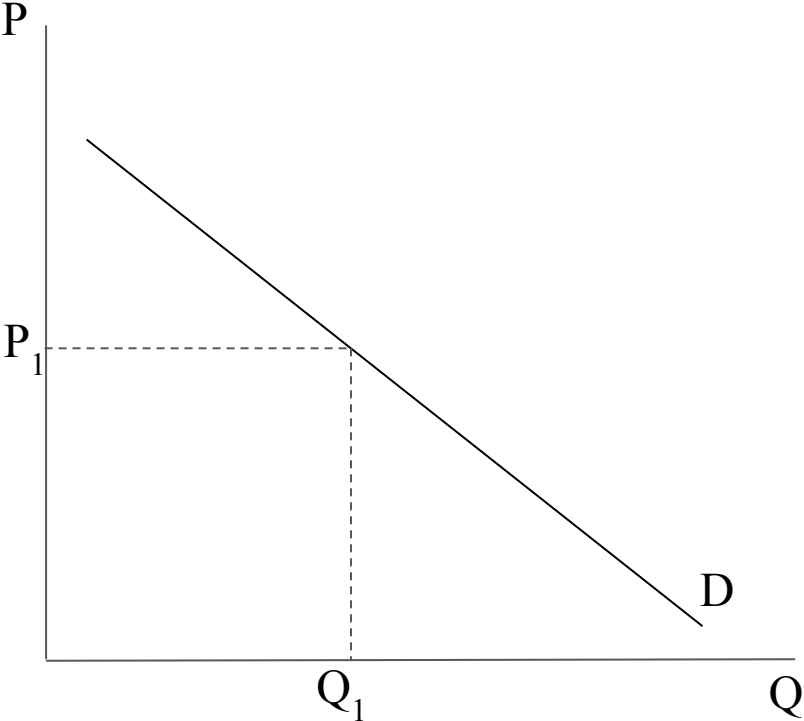
- We showed that under perfect competition, this implies:

$$MC(q) = MR(q) = P$$

- However, a monopolist is not a price taker:
 - Her market power means that as she increases q , P will fall
 - So, her individual Demand Curve is ***downward-sloping*** (not flat)
- As shown on the next slide, this implies:

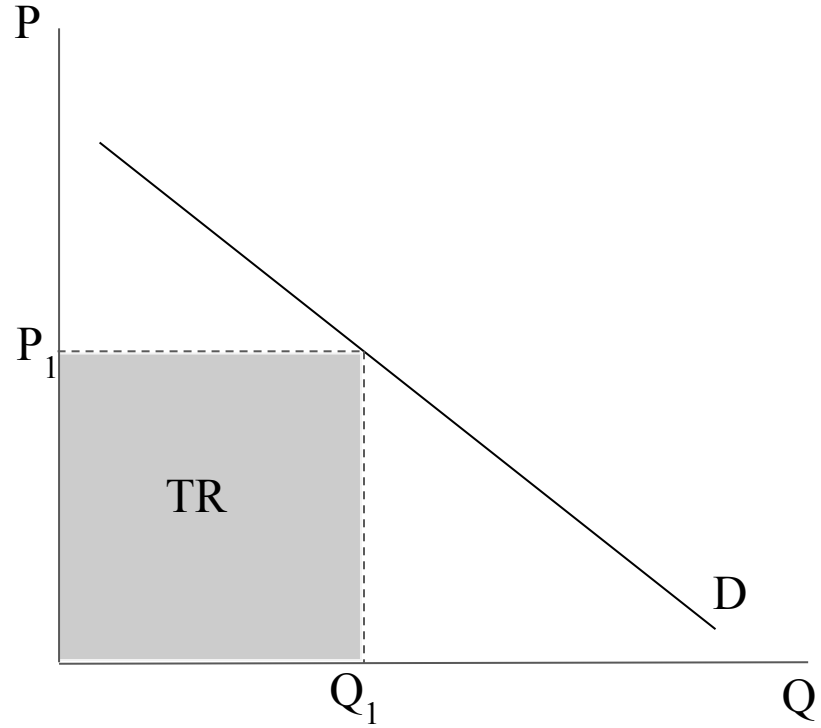
$$MC(q) = MR(q) < P(q)$$

Marginal Revenue for the Monopolist



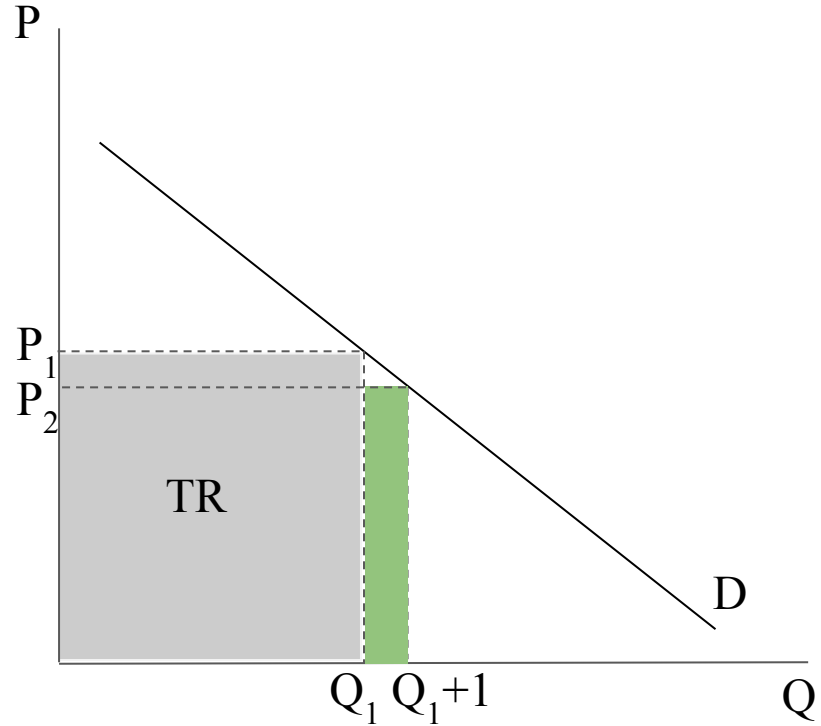
Marginal Revenue for the Monopolist

- Total revenue is $P \cdot Q$



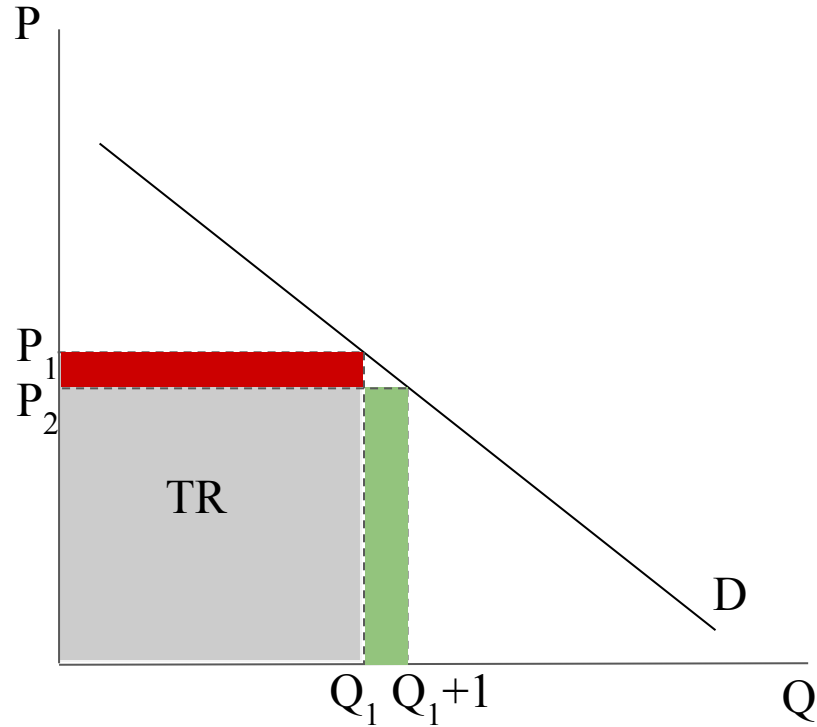
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- If she sells another unit, the customer pays P_2 for that unit, raising revenue by $1 \cdot P_2$



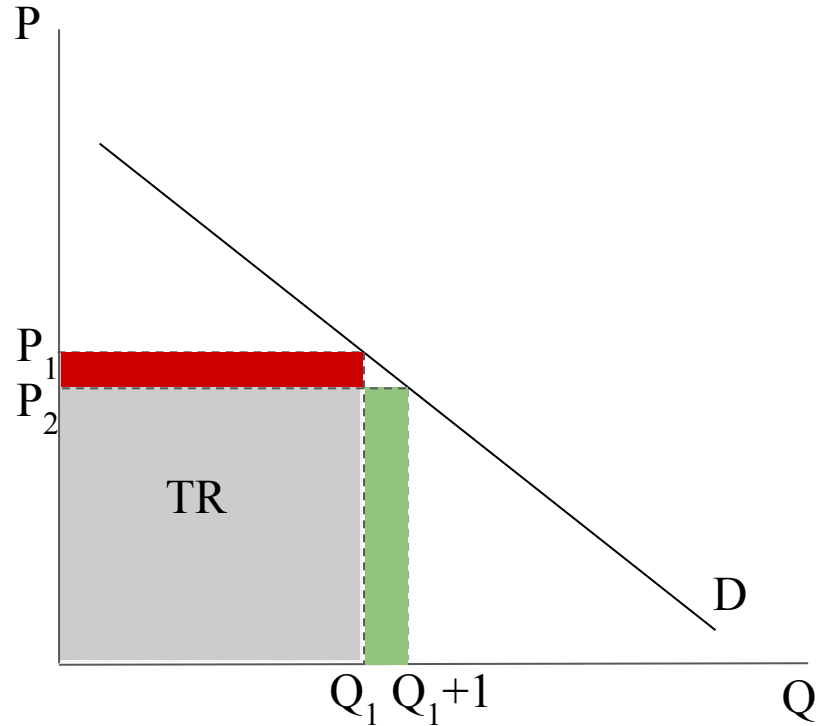
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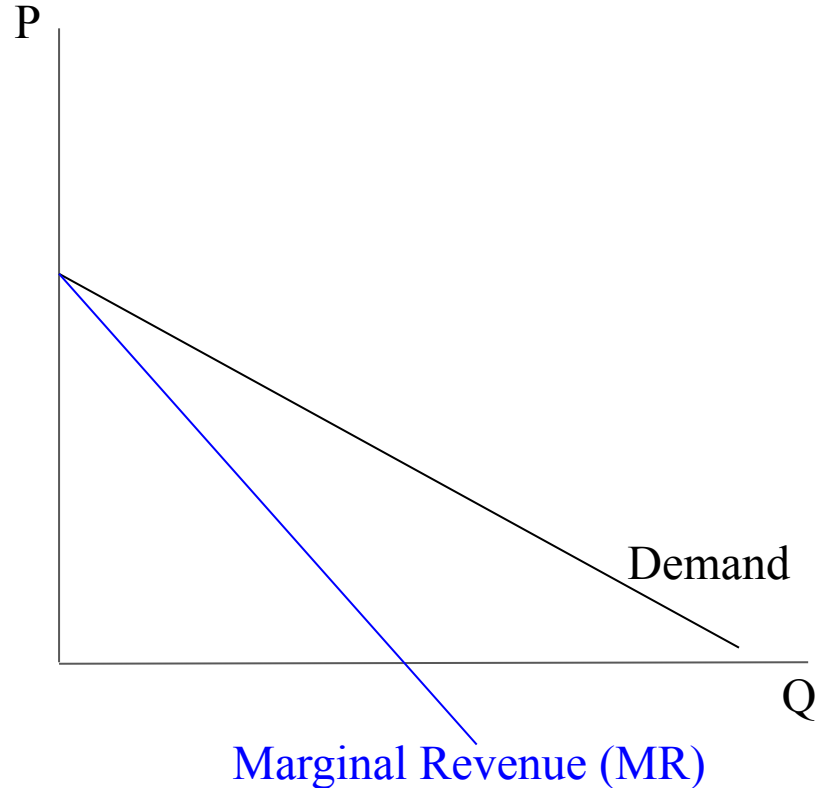
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- $\Delta TR = MR = 1 \cdot P_2 - Q_1 \cdot (P_1 - P_2) < P_2$



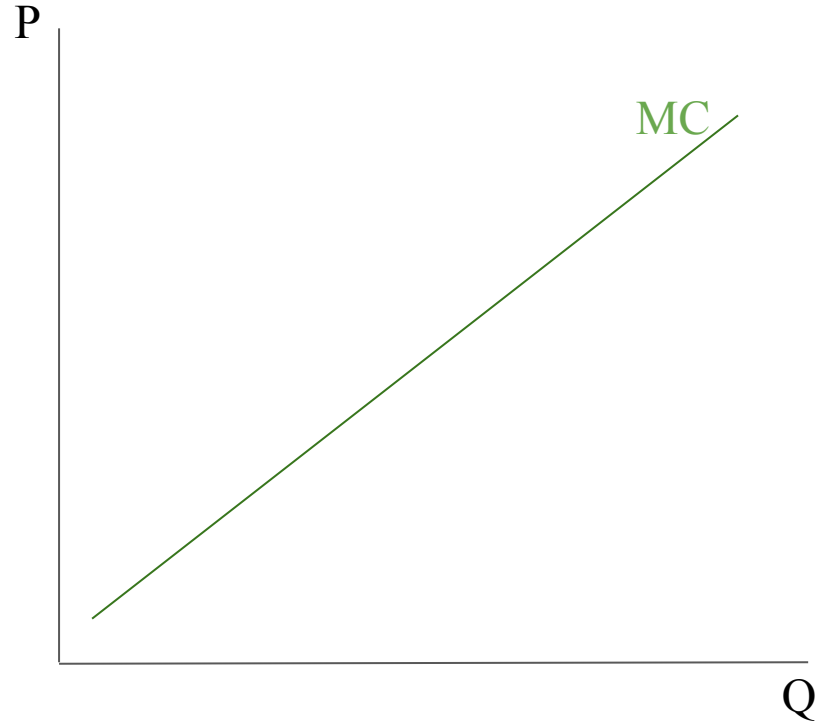
Marginal Revenue Curve

- MR Curve lies below Demand Curve ($MR < P$)
- At $Q = 0$, they are equal
 - No inframarginal units, so $MR = P$
- MR can be negative
 - Price cut causes large losses on inframarginal units, outweighs new sale
- If Demand is linear, MR has 2X the slope. E.g:
 - Demand: $P = 50 - 0.5Q$
 - $MR = 50 - Q$



Profit Maximization for Monopolist: Setup

- Monopolist has an MC curve just like any other firm



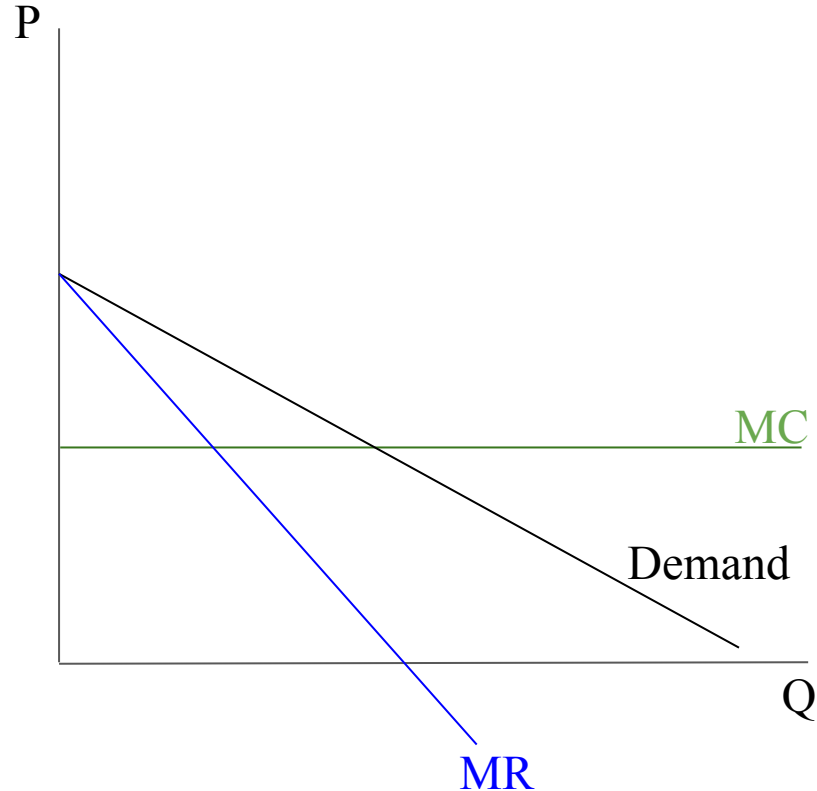
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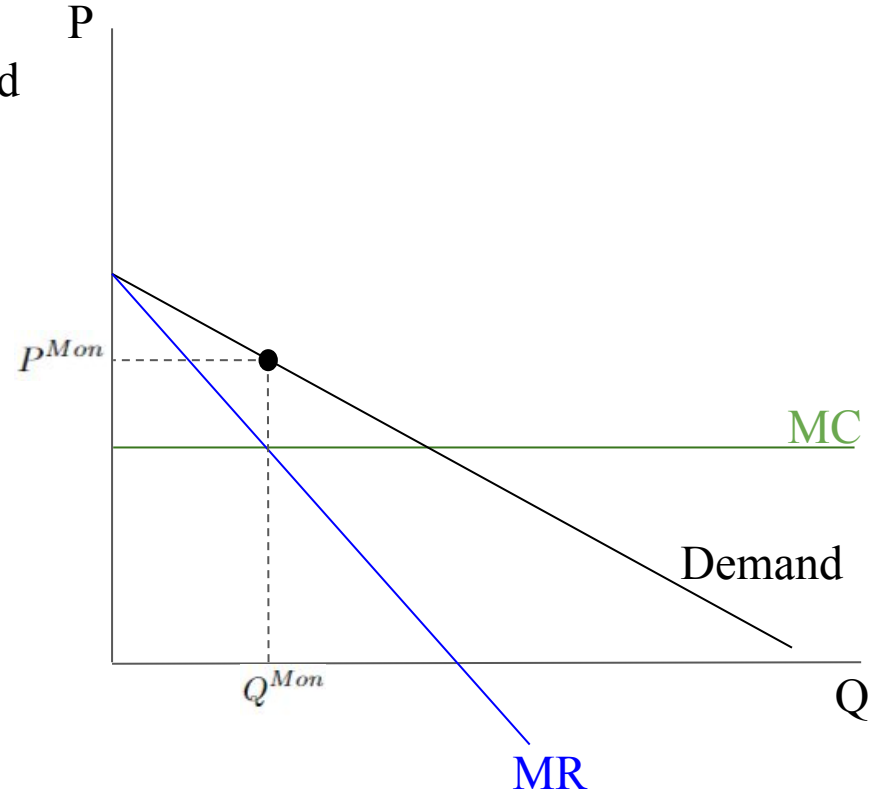
Profit Maximization for Monopolist: Setup

- Monopolist has an MC curve just like any other firm – for simplicity, let's assume it's constant
- Unlike perfectly competitive firm, monopolist has downward-sloping demand...
- which means MR is below the Demand curve
 - Lowering the price lowers revenue on inframarginal units



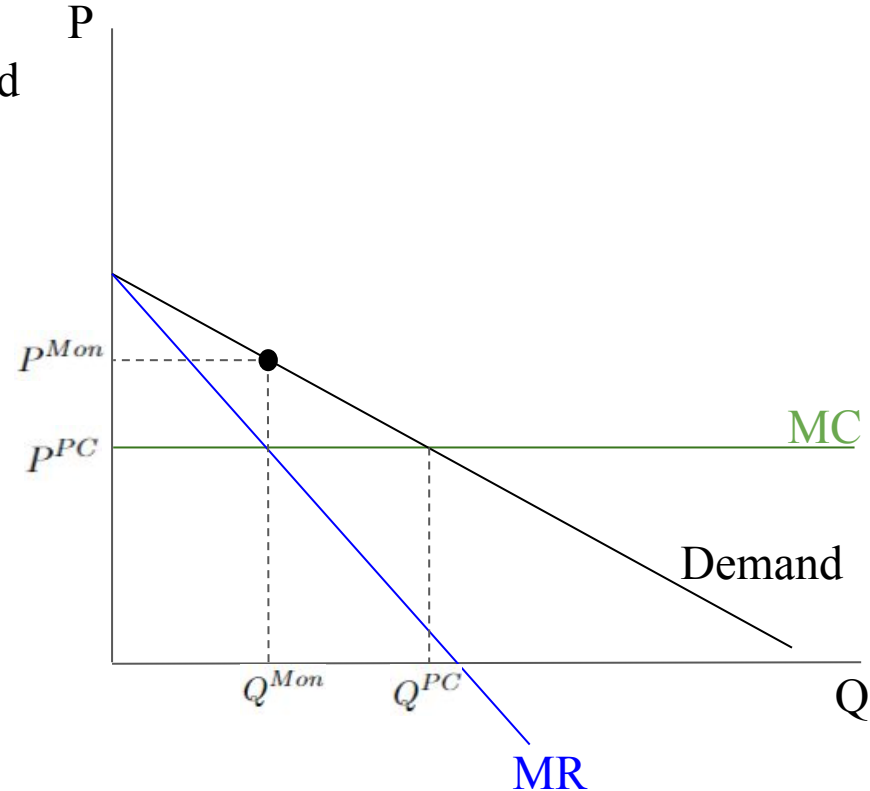
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- Sets price to generate that Q , based on demand curve
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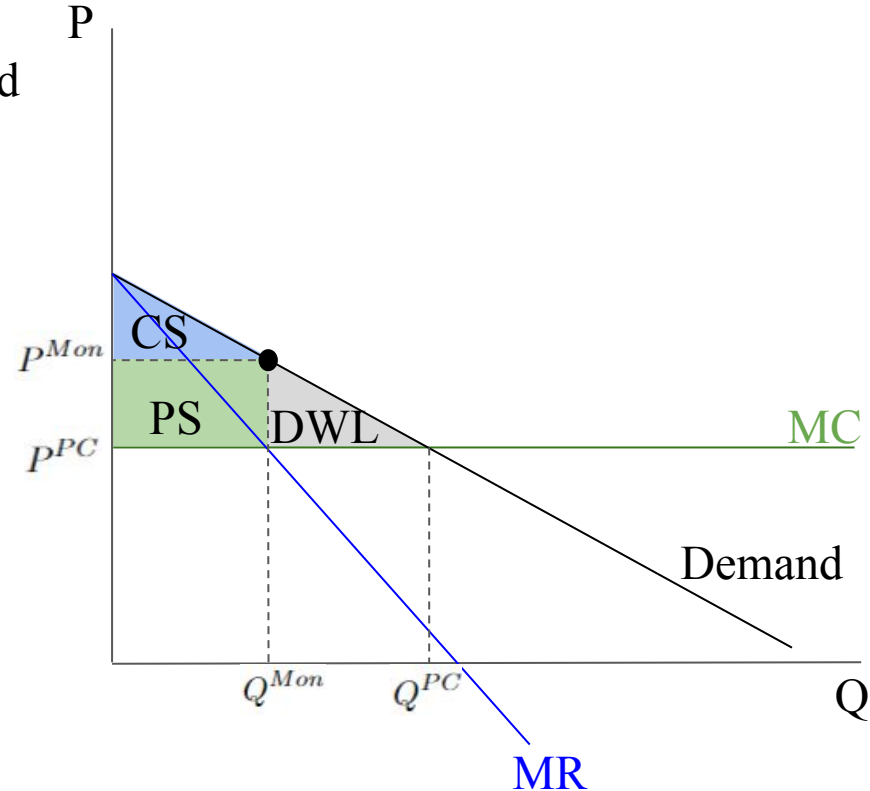
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 - P is higher and Q is lower
 - Monopolist restricts quantity in order to keep the price high
 - Loses some customers so she can gouge others



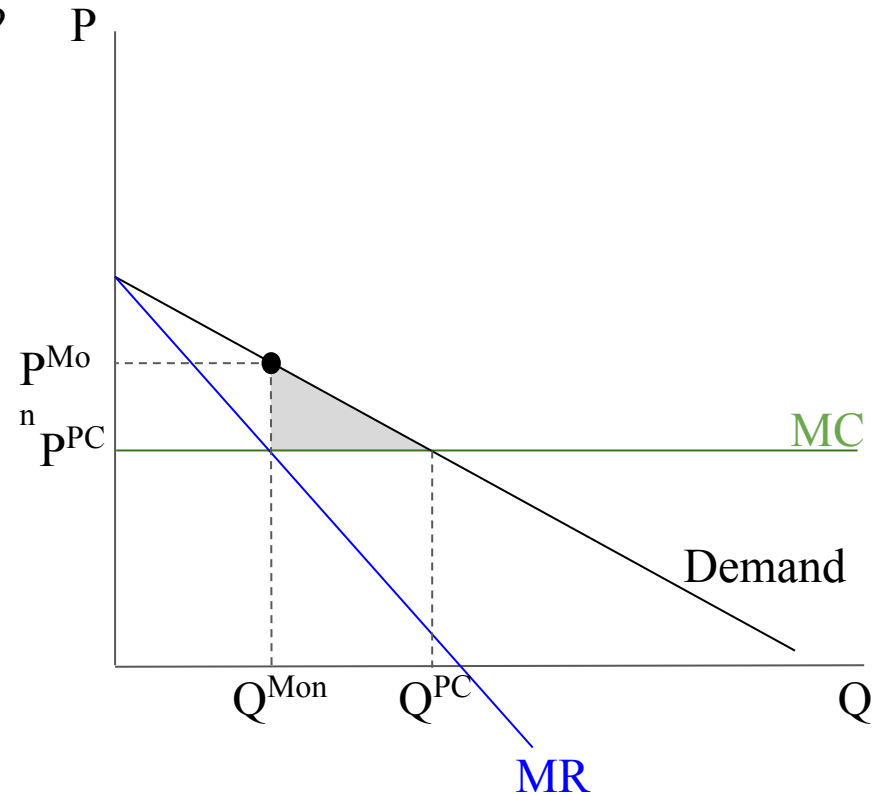
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- ***Monopoly outcome is inefficient*** because the missing units were valued above cost



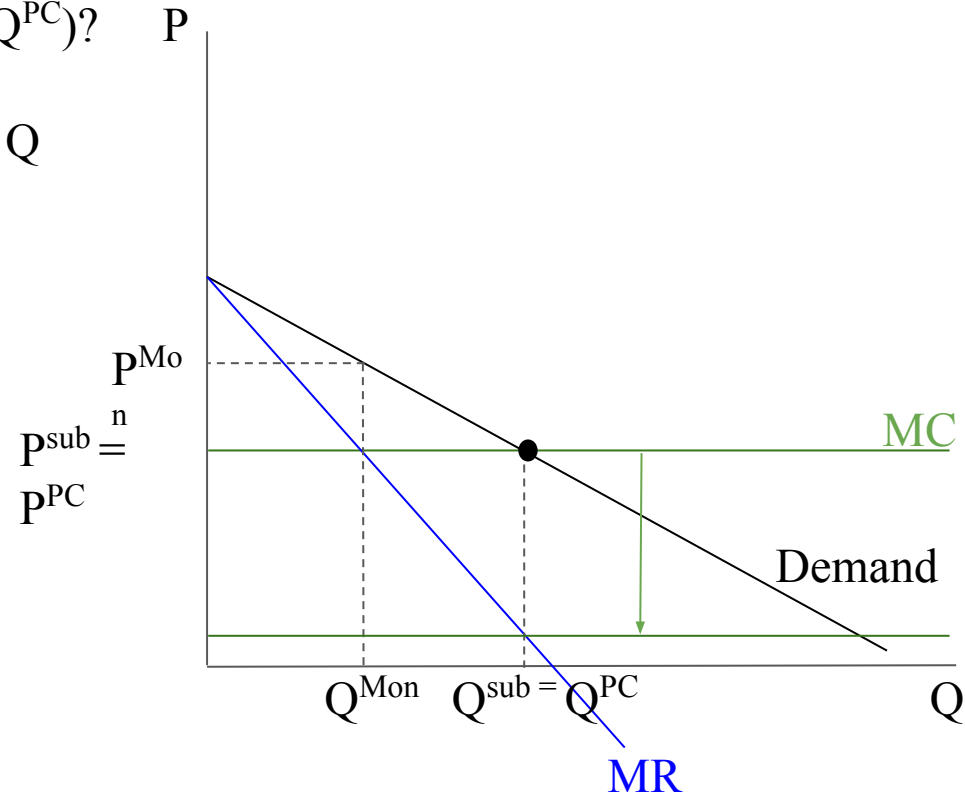
Correcting Monopolies

- Can the government get us to efficiency (Q^{PC})?



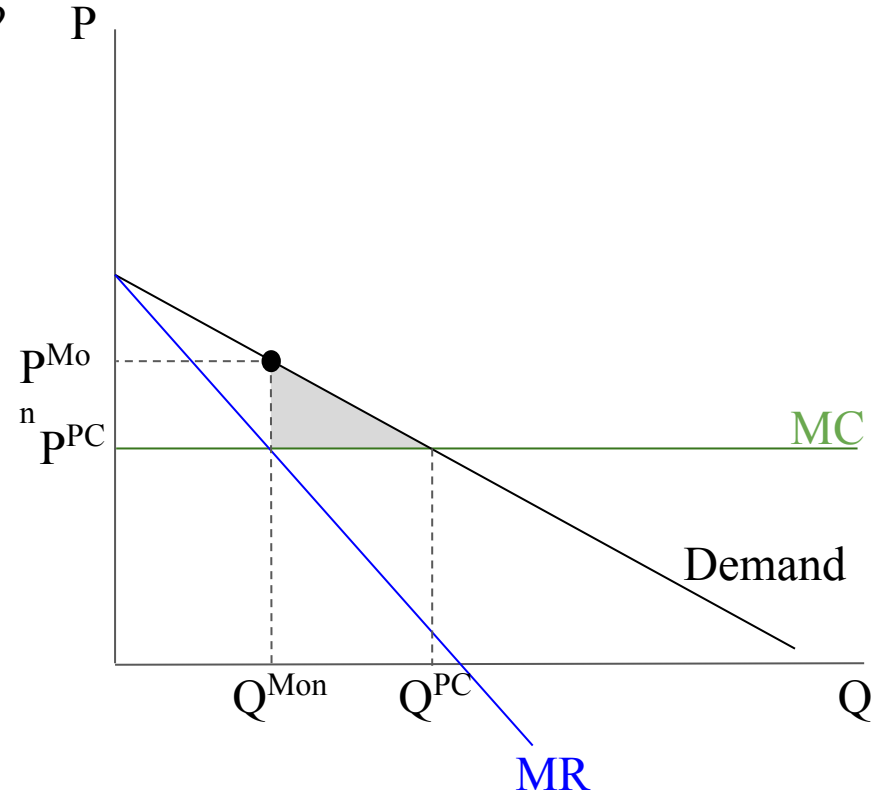
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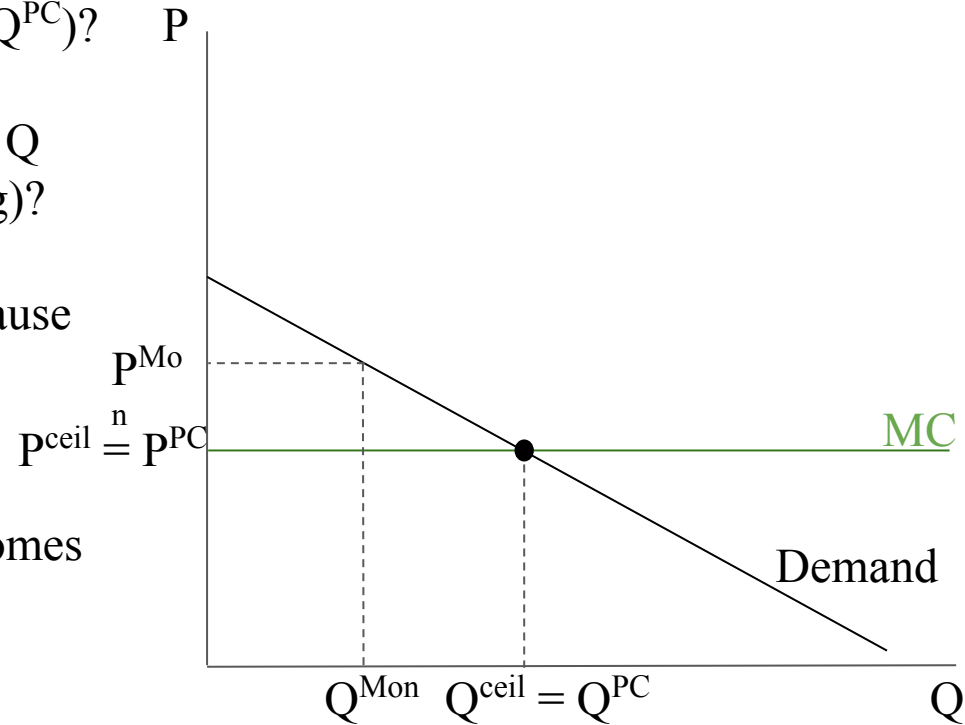
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- Can the government get us to efficiency (Q^{PC})?
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- Will price controls work (e.g. price ceiling)?



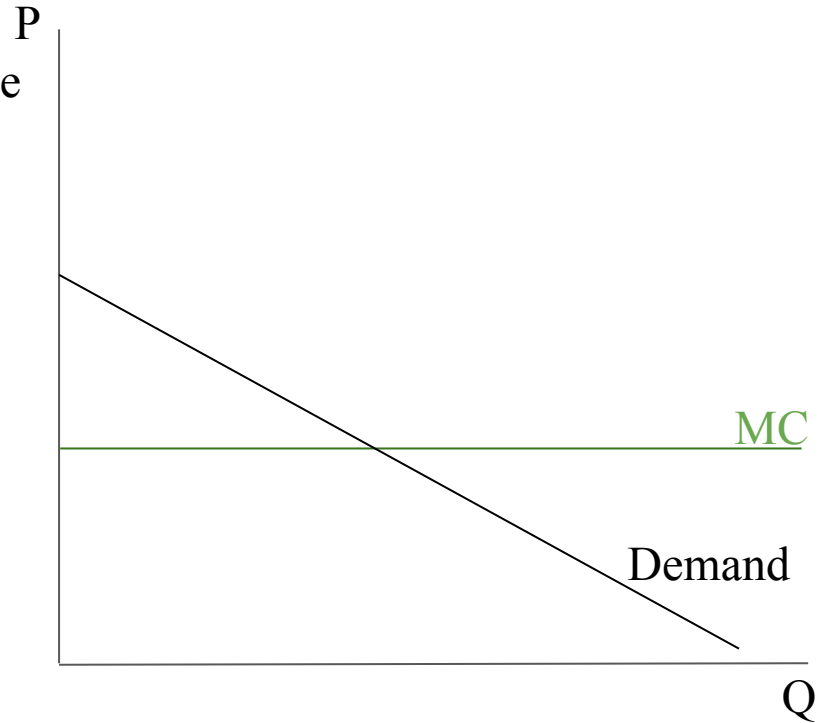
Correcting Monopolies

- Can the government get us to efficiency (Q^{PC})?
- A subsidy will work
 - Lower her “costs,” encourage higher Q
- Will price controls work (e.g. price ceiling)?
 - Yes.
 - No incentive to restrict quantity, because she cannot inflate price!
 - Charges highest price she can
- Market power is a market failure
 - Policy has a role for improving outcomes



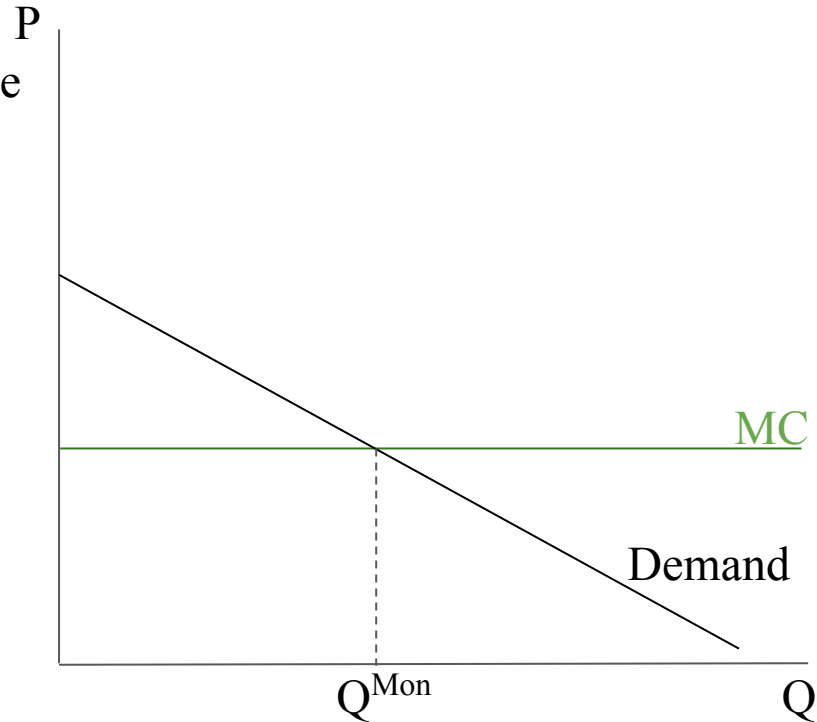
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- Suppose the monopolist knew everyone's WTP and could charge different price to different people
 - That practice is Price Discrimination
- How much quantity will she produce?



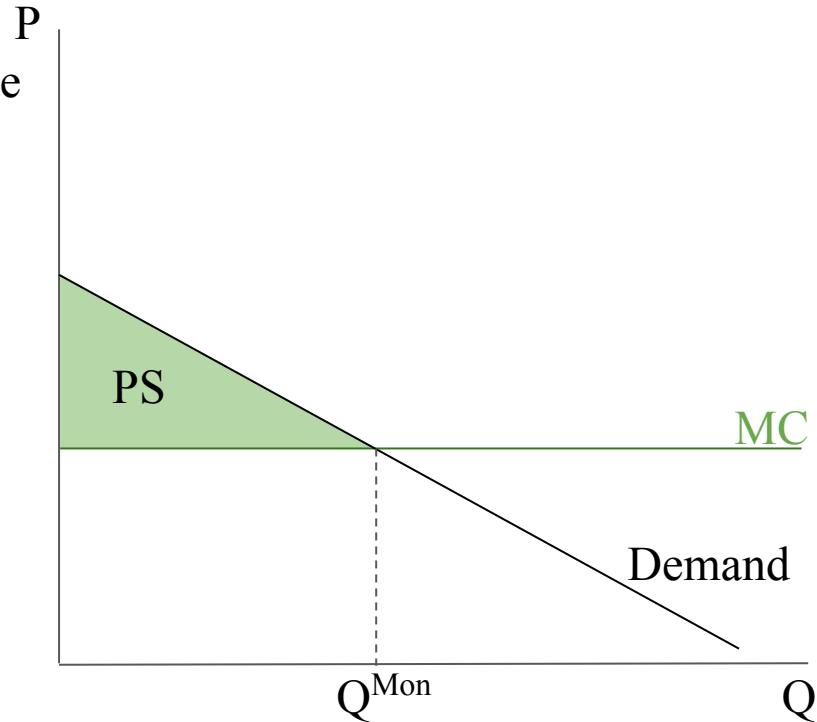
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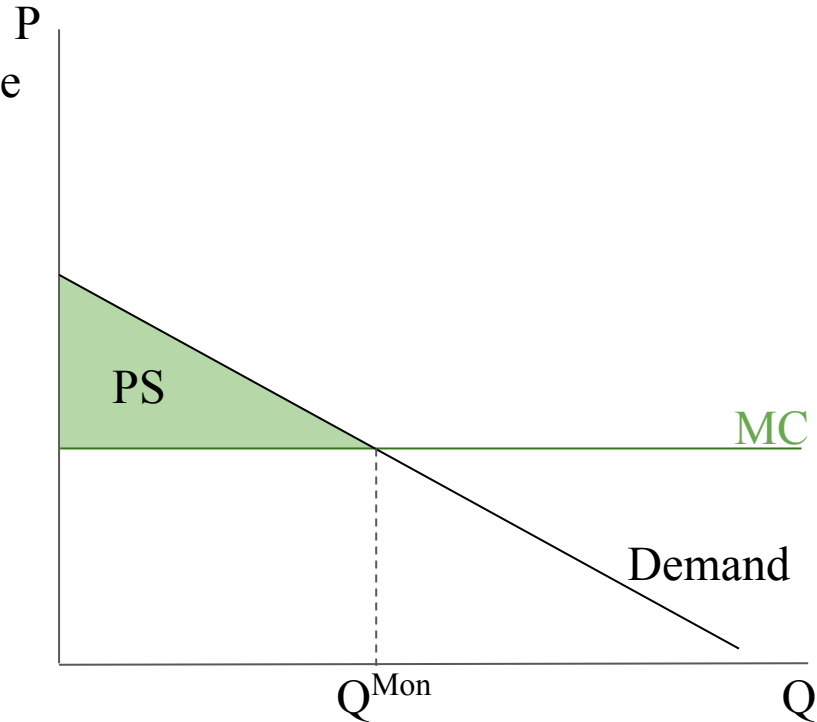
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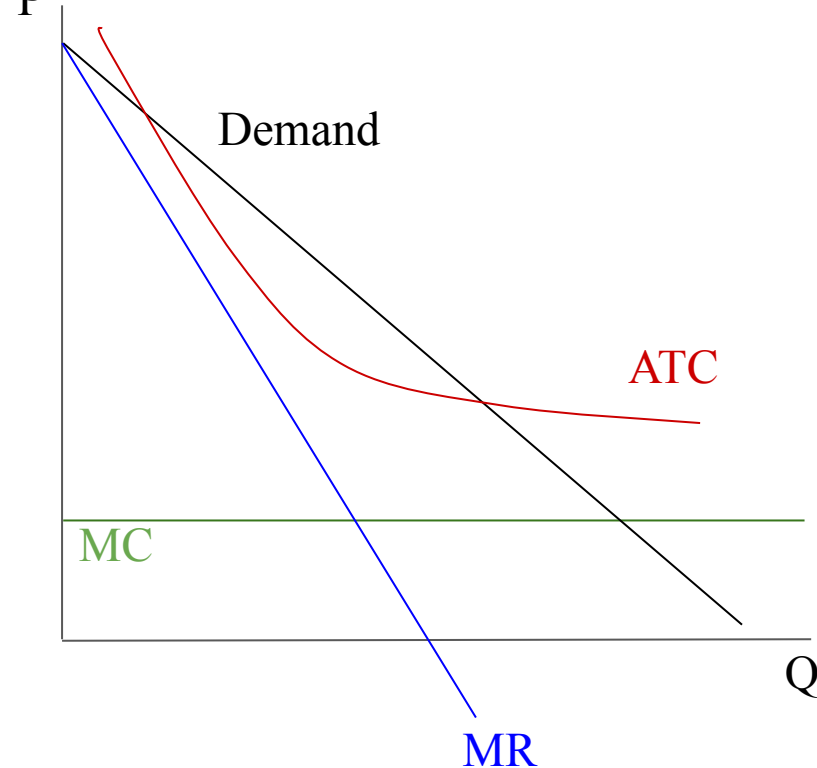
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- Is this good?
 - Depends what you care about
 - “Efficiency” is only one criterion



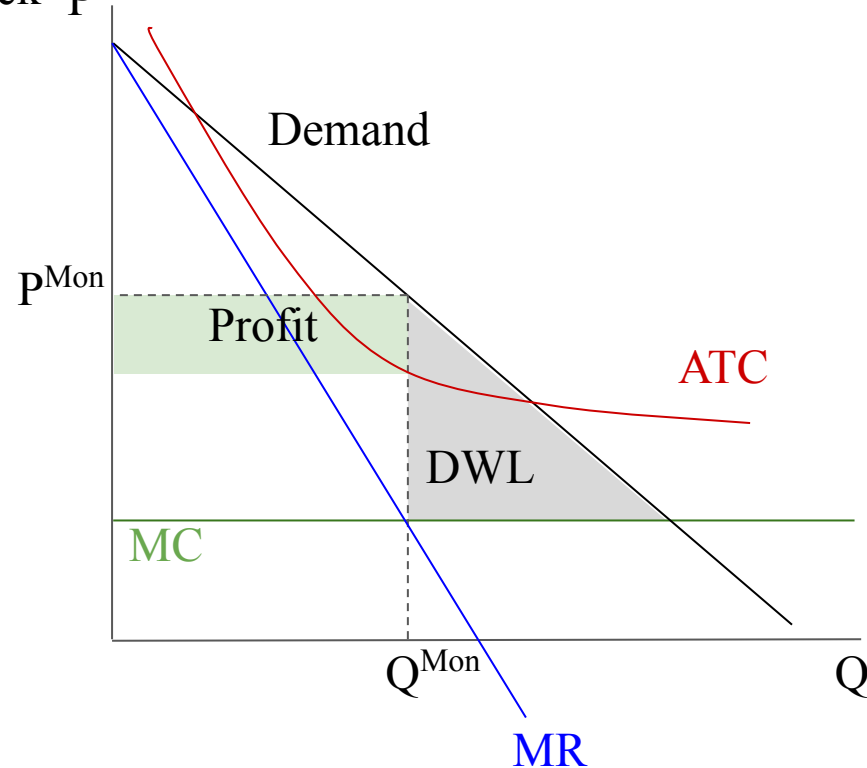
Natural Monopolies

- Consider an industry with huge fixed costs
 - E.g. railroads, with millions of miles of track
- This is called a Natural Monopoly
 - Wouldn't want competitors to lay down additional sets of tracks



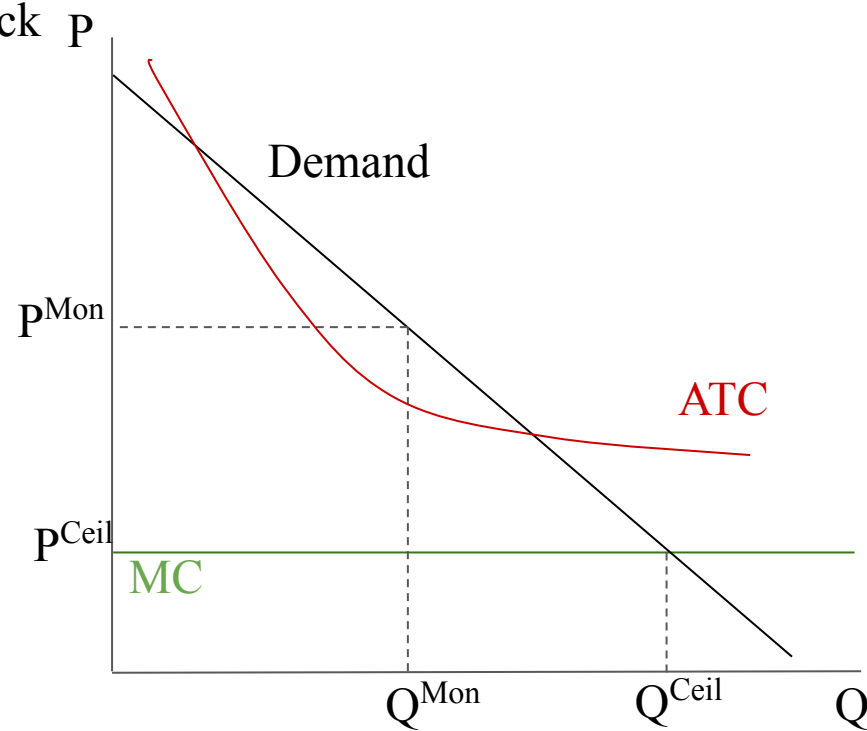
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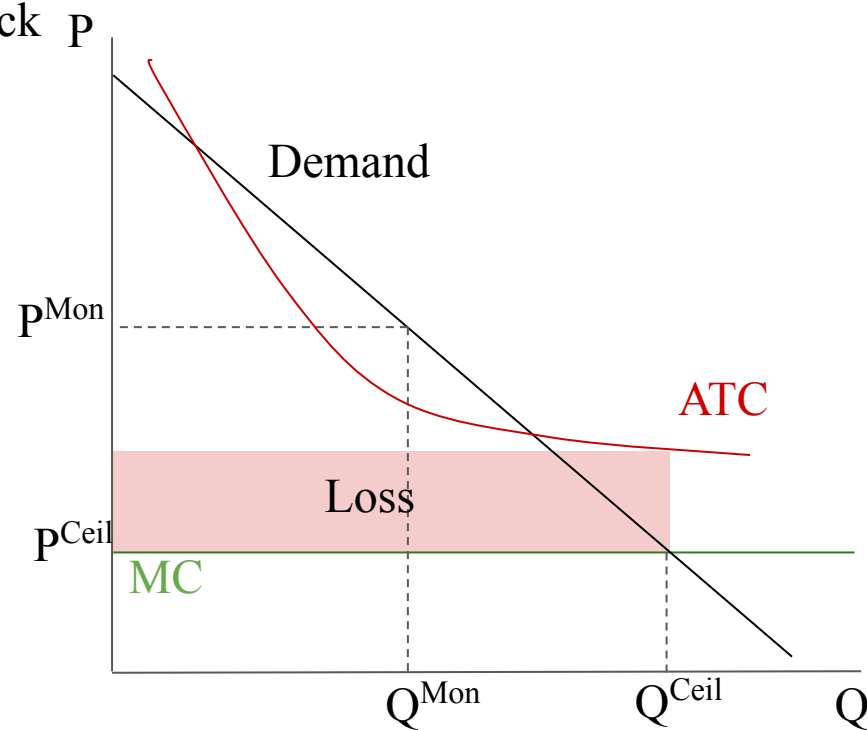
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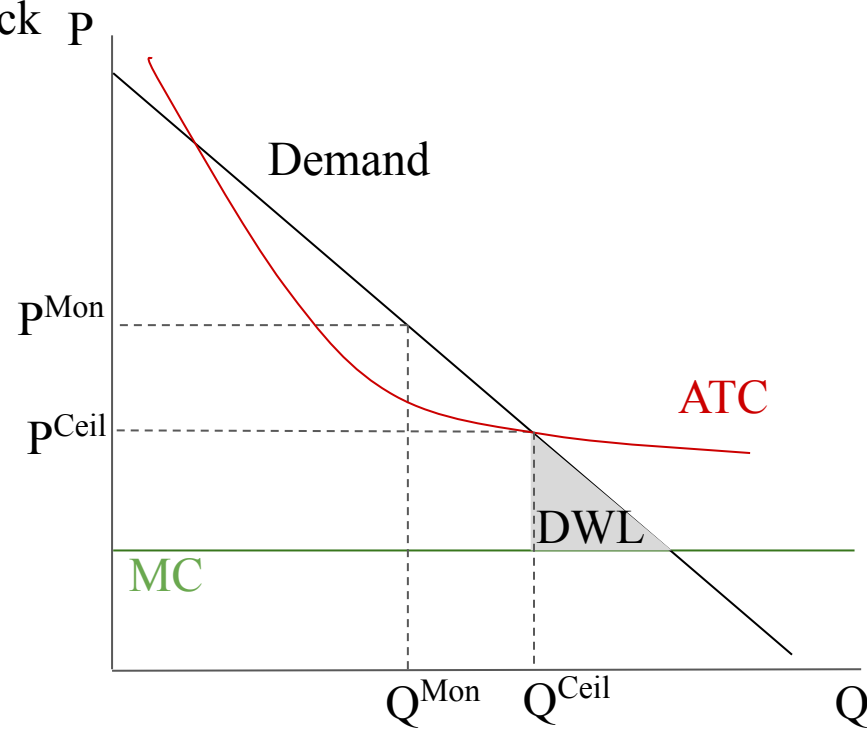
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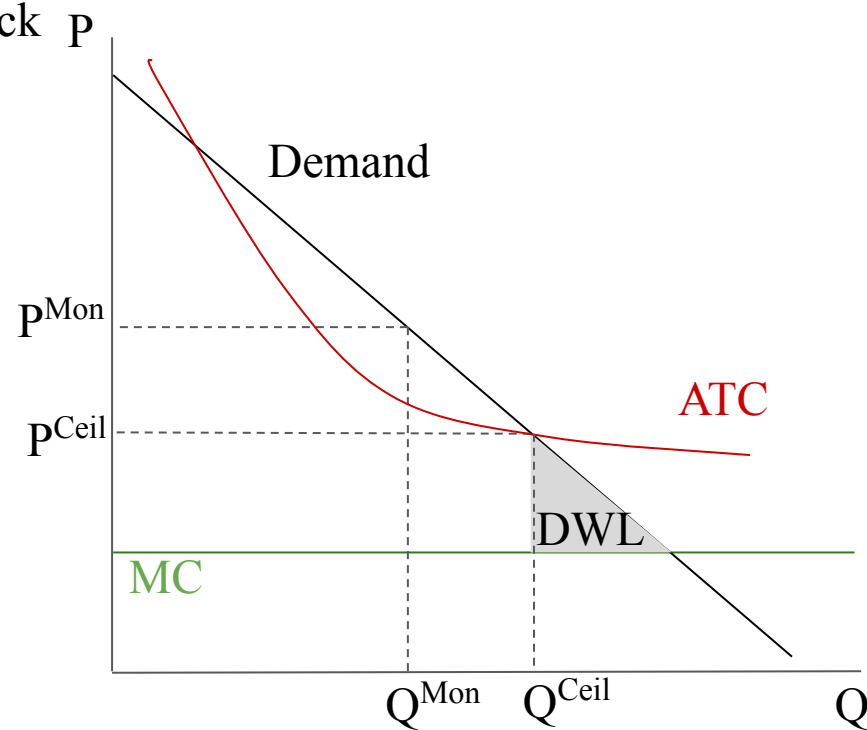
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- Should we set a price ceiling to get efficiency?
 - Selling at MC will run the company out of business – price ceiling fails
- Could set ceiling higher, like ATC
- Could also:
 - Use subsidy, as discussed before
 - Or nationalize the industry



Patents

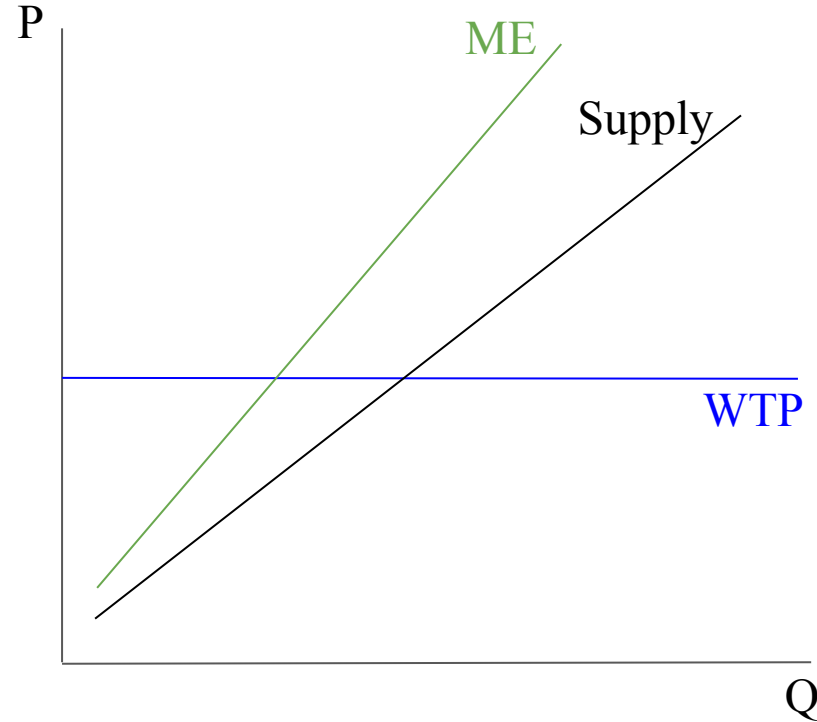
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Patents

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- We have seen how monopolies are inefficient; is Patent Protection a bad policy?
- Monopoly is statically inefficient, but may be “dynamically efficient”
 - Encourages innovation
 - If you spend billions to create a new drug, others cannot copy you immediately
 - We tolerate some inefficiency in the short-run to get longer-run benefits
 - Some products would not exist in the first place without Patent Protection

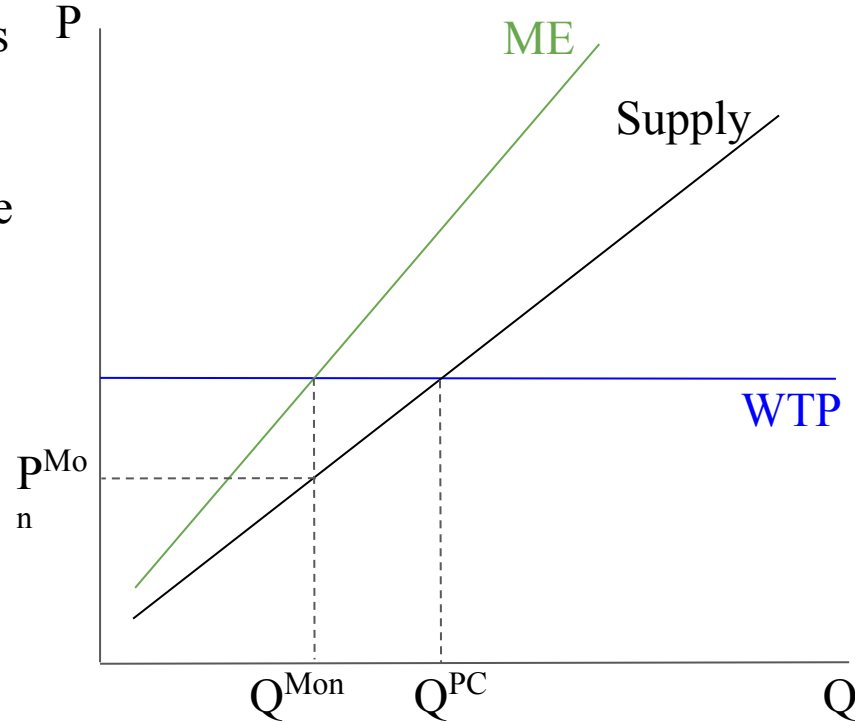
Monopsony

- Monopsony: market with a single **buyer**
 - E.g. only factory in the town hiring workers
- The monopsonist faces an upward-sloping Supply Curve
 - Must pay a higher wage to hire more people
- Marginal Expenditure Curve lies above Supply
 - Don't just pay new worker; previous workers get paid more, too



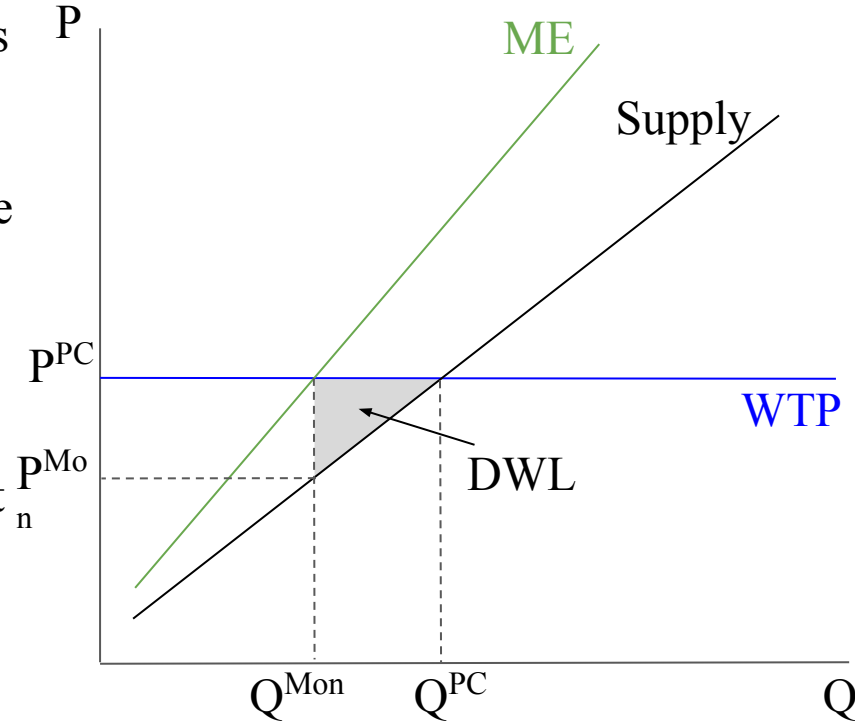
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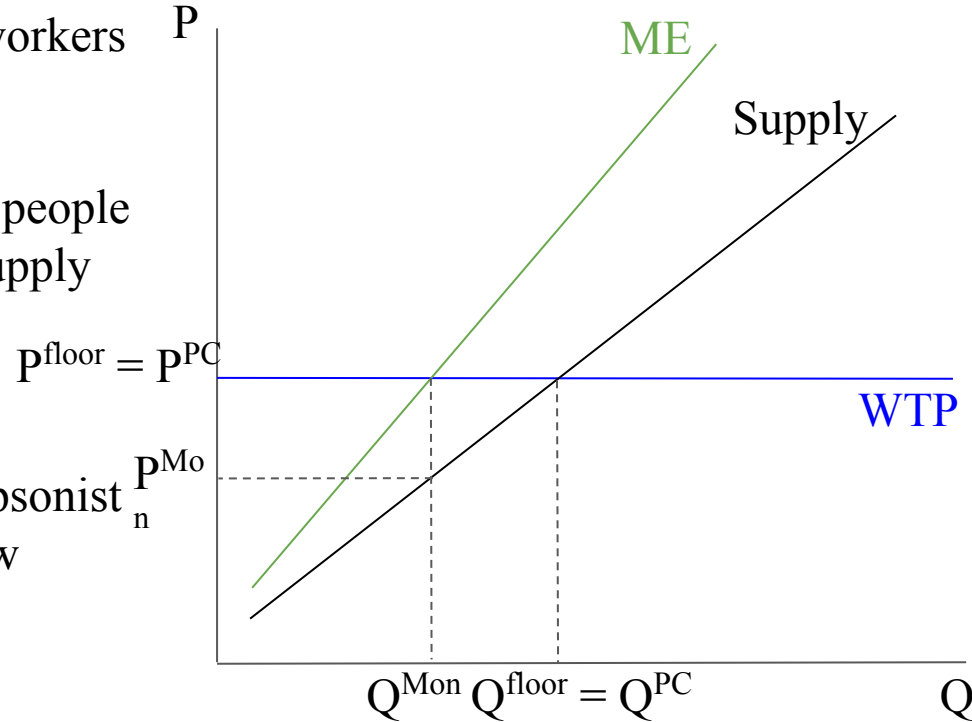
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 - As with monopoly, this is inefficient



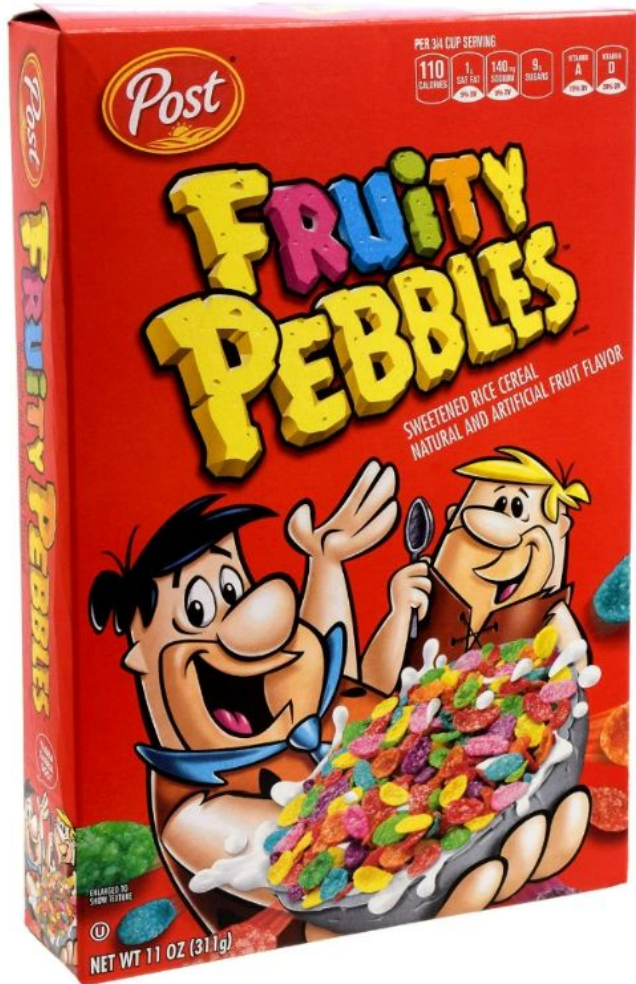
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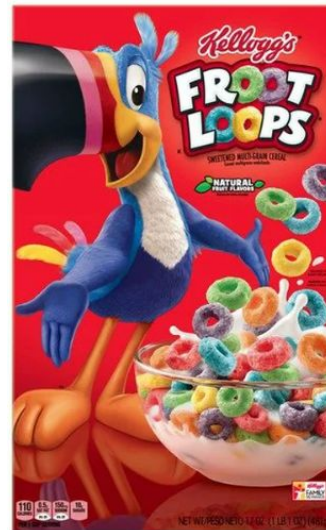
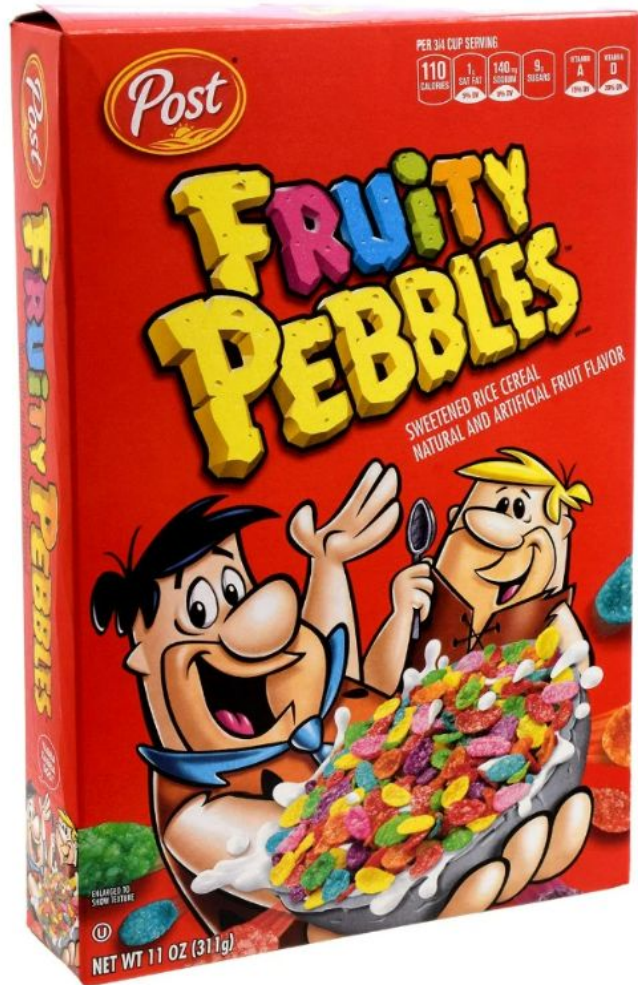
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- Minimum wage (i.e. price floor) increases efficiency!



Monopolistic Competition

- Many markets have components of both monopoly and competition
- Consider items at a supermarket
 - Fruity Pebbles is manufactured exclusively by Post





Monopolistic Competition

- Many markets have components of both monopoly and competition
- Consider items at a supermarket
 - Fruity Pebbles is manufactured exclusively by Post
 - There are many close substitutes
 - So while Post has market power, it faces competitive discipline because customer can easily substitute to very similar products
- In monopolistic competition, firms have downward-sloping Demand Curves
 - Generates some inefficiency, with $P > MC$
 - But typically economists think the demand curves facing these firms are quite flat – similar to perfect competition, little inefficiency

Oligopoly

Oligopoly Introduction

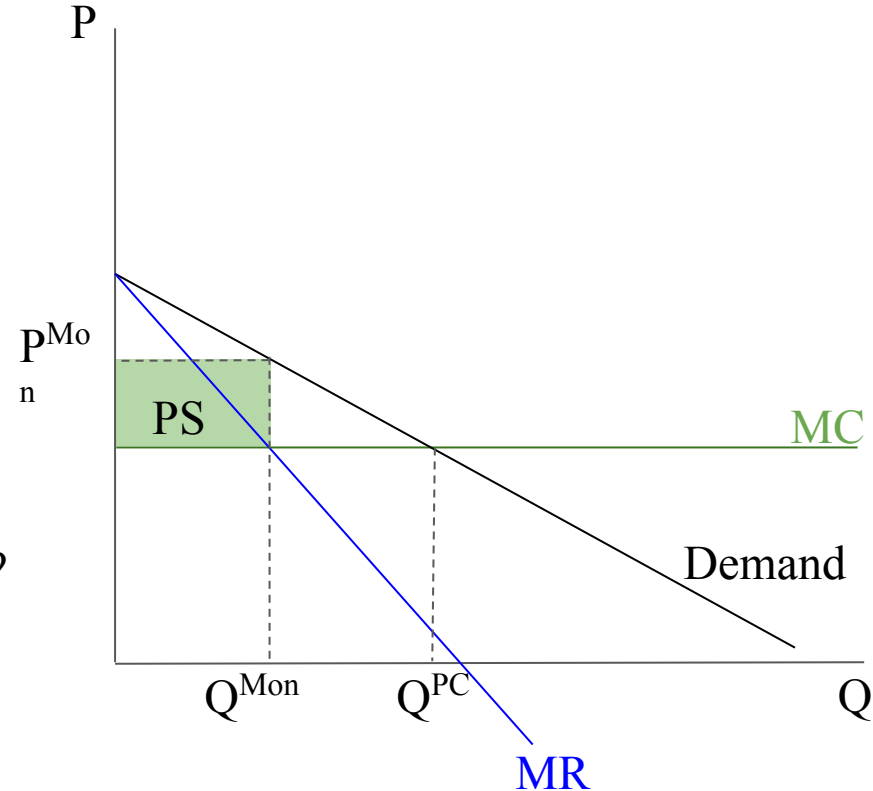
- We have studied markets with:
 - 1 firm (Monopoly)
 - “Many” firms (Perfect Competition)
- Oligopoly refers to a market with a small number of firms greater than 1
- In terms of outcomes, Oligopoly typically lies between Monopoly and Perfect Competition

Strategic Incentives in Oligopoly

- In Perfect Competition, firms have no market power: Price Takers
- Monopolist has total market power: can choose price
- Oligopolist affects the price (unlike PC) but does not determine it (unlike Monopoly)
- This introduces “strategy”
 - My action affects you...
 - And yours affects me.
 - So I need to respond to what I think you will do...
 - Knowing that you are thinking about what I’ll do...
 - And so on.
- This makes Oligopoly far more complex to analyze
 - A thorough job requires “Game Theory”
 - We will just scratch the surface

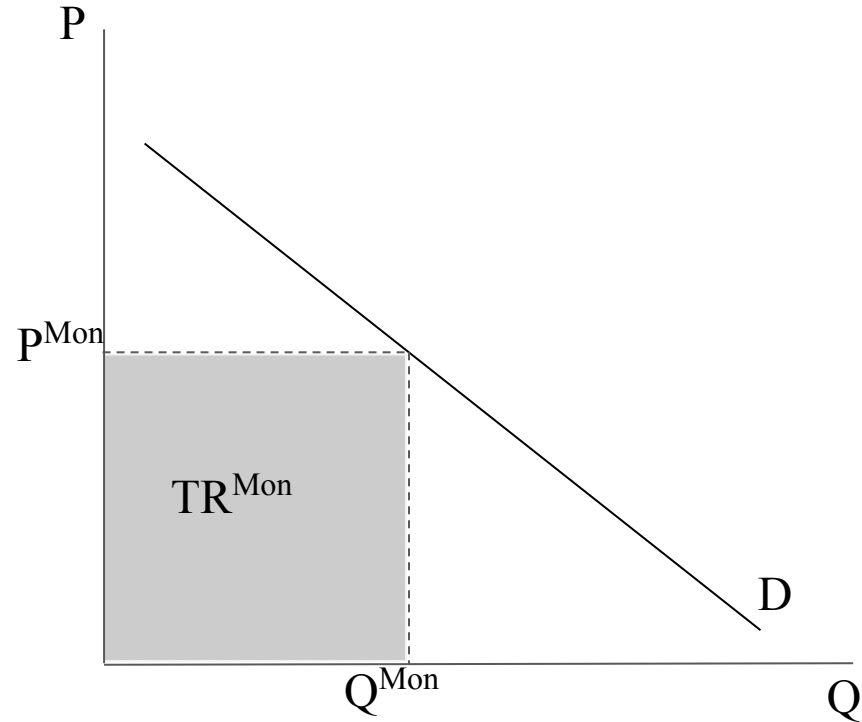
Perfect Competition and Monopoly as Benchmarks

- Consider an industry with downward-sloping Demand and constant Marginal Cost
- Perfect Competition:
 - $Q^{PC} = Q^{Eff}$
 - $P^{PC} = MC$
 - $PS = 0$
- Monopoly:
 - $Q^{Mon} < Q^{Eff}$
 - $P^{Mon} > MC$
 - $PS > 0$
- What if there are 2 firms (Duopolists)?
 - Can they achieve the Monopoly outcome?



Marginal Revenue for an Oligopolist

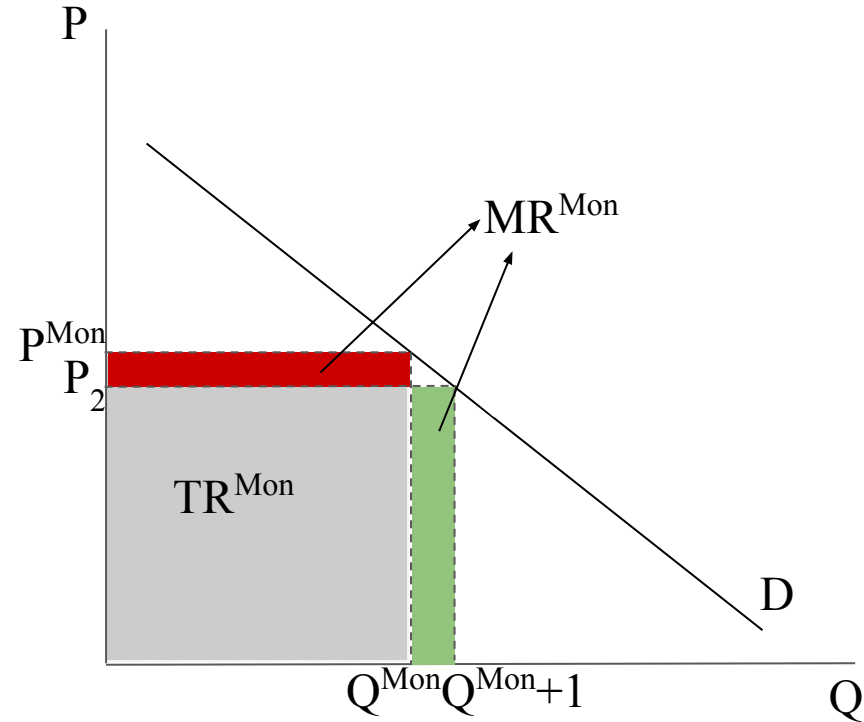
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- Duopolist #1 considers selling 1 extra unit:
 - Market revenue changes by:

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 - We know $MR^{\text{Mon}} = MC$
 - So overall profit does not change

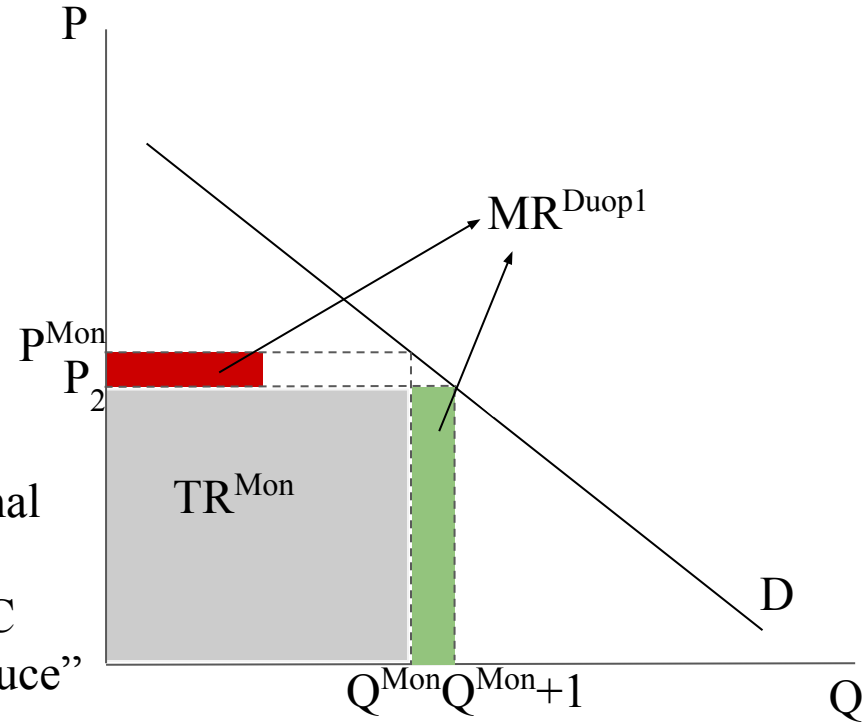


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$$MR^{\text{Mon}} = 1 * P_2 - Q^{\text{Mon}} * (P^{\text{Mon}} - P_2)$$
 - We know $MR^{\text{Mon}} = MC$
 - So overall profit does not change
- But duopolist #1’s profit increases!
 - Gets all the gain of selling the extra unit
 - But only half the losses on the inframarginal units
- So Duopolist #1 would “cheat” and “over-produce”

$$MR^{\text{Duop1}} = 1 * P_2 - Q^{\text{Mon}} * (P^{\text{Mon}} - P_2) / 2 > MC$$
 - So would Duopolist #2



Oligopoly Outcomes

- Oligopolists have incentive to restrict quantity, just like Monopolists do
 - “I can keep the price high by restricting quantity!”
- But the previous slide showed that Oligopolists are not as good at exploiting Market Power as Monopolists are
 - They have incentives to over-produce, introducing an element of competition
 - “When I restrict quantity to keep price high, you get some of the benefit, so I won’t do it as much as if I were a Monopolist.”
- Profit is higher for the Monopolist than the (combined) Oligopolists.
 - They want to agree to sell the monopolist’s quantity, but they can’t trust each other!
 - If one restricts its quantity as they agreed, the other can take advantage by selling more
 - Lower overall profits is the price they pay for this inability to commit

A Taste of Game Theory

		Boeing	
		Low q	High q
Airbus	Low q	50, 50	10, 80
	High q	80, 10	20, 20

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- Joint profits are maximized when both produce low quantities

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- Joining profits are maximized when both produce low quantities
- Equilibrium: both produce high quantities

Cartels

- Cartel: a group of Oligopolists who have implemented the Monopolist's quantity/price/profit
- Despite incentive to “cheat,” some Cartels thrive (e.g. OPEC)
- Some conditions that make it easier to form a Cartel are:
 1. Small number of competitors (makes the agreement easier to manage)
 2. Repeated interactions (“If you cheat me this round, I’ll punish you next round.”)
 3. Transparent market (“I can’t punish you for cheating if I can’t see what you did.”)
- Cartels are essentially universally illegal, so antitrust enforcers are on the lookout for industries with the above characteristics where firms may be colluding

Policy Towards Oligopoly

- Antitrust enforcement tries to keep an Oligopoly from basically becoming a Monopoly
- Oligopoly itself isn't great though – quantity is restricted and inefficiently low
- The same types of remedies from the Monopoly section can be tried on Oligopolies
 1. Subsidies
 2. Price Ceilings
 3. Nationalization