

# 1.3 – Review of Economics & Efficiency

ECON 315 • Economics of the Law • Spring 2021

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# Outline



## Efficiency

Common Law Tradition vs. Civil Law Tradition

Legal Institutions in the U.S.

The Legal Process: A Summary

# The Two Major Models of Economics as a “Science”



## Optimization

- Agents have **objectives** they value
- Agents face **constraints**
- Make **tradeoffs** to maximize objectives within constraints

## Equilibrium

- Agents **compete** with others over **scarce** resources
- Agents **adjust** behaviors based on prices
- **Stable outcomes** when adjustments stop

# Modeling Individual Choice



- The **consumer's utility maximization problem:**
  1. **Choose:** < a consumption bundle >
  2. **In order to maximize:** < utility >
  3. **Subject to:** < income and market prices >



# Modeling Firm's Choice



- 1<sup>st</sup> Stage: **firm's profit maximization problem:**

1. **Choose:** <output>

2. **In order to maximize:** <profits>

- 2<sup>nd</sup> Stage: **firm's cost minimization problem:**

1. **Choose:** <inputs>

2. **In order to minimize:** <cost>

3. **Subject to:** <producing the optimal output>



# What Does "Efficiency" Mean?



- Regular sense of the word:
- Achieving a **specified goal** with as **few resources as possible**
- **Examples:**
  - driving
  - carrying groceries
  - producing pencils

# Problem: What Goal for Society?



- We will ruminate more on this next class
- **Society, government, law, etc. has no single, universally agreed-upon goal**
- “Society” is not a choosing agent



# Social Problems



- **Problem 1:** Resources are scarce, and have multiple, rivalrous uses
- **Problem 2:** Different people have different subjective valuations for uses of resources

# The Origins of Exchange I



- Why do we trade?
- Resources are in the wrong place!
- People have *better* uses of resources than they are currently being used!



# The Origins of Exchange II



- *Why* are resources in the wrong place?
- **We have the same stuff but different preferences**



# The Origins of Exchange III



- *Why* are resources in the wrong place?
- **We have different stuff and different preferences**

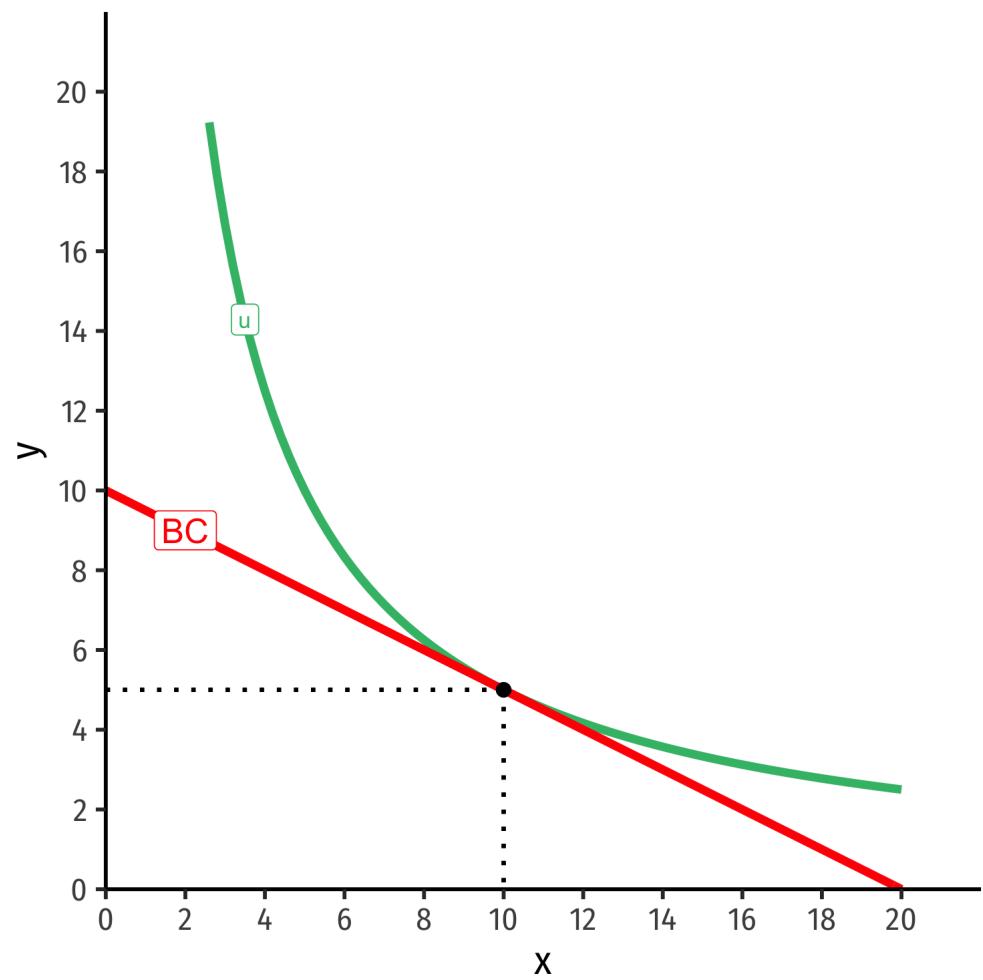


# Economic Efficiency: First Pass



**Economic efficiency:** degree to which as many people as possible get as much as possible of what they want

- degree of **preference satisfaction**
- How do we measure this?
  - Expanding budget set  $\implies$  satisfying more goals
  - Income is a main constraint  $\implies$  maximize incomes
  - GDP per capita: market value of what is produced  $\iff$  incomes



# The Economic Point of View



- Preferences are **subjective**
  - **Egalitarianism:** Nobody's preferences are dismissed
- **Higher incomes + freedom of choice = greater preference satisfaction**
- Harder to directly evaluate outcomes, better to look at basic processes/mechanisms (especially exchange)



# Exchange, Markets, and Efficiency

# Social Problems that Markets Solve Well

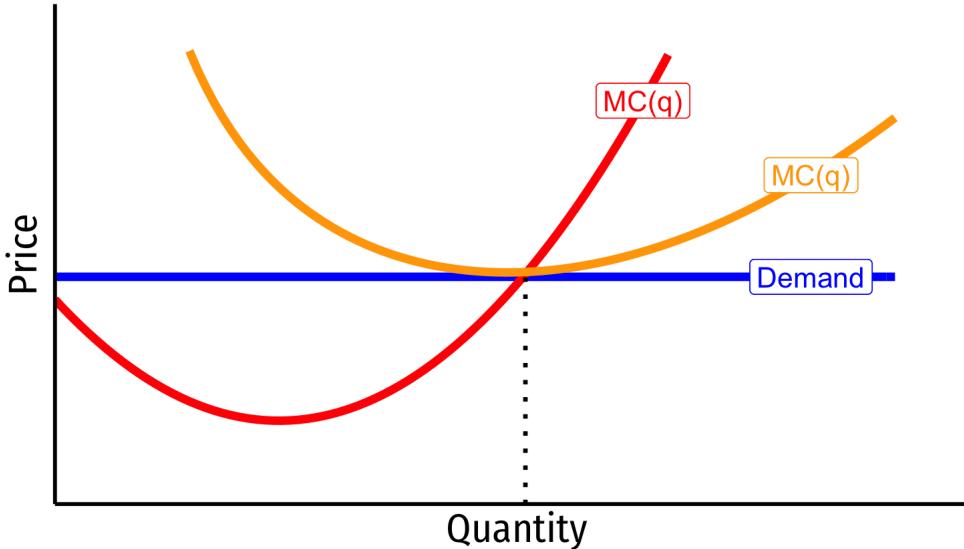


- **Solution:** Prices in a functioning market accurately measure **opportunity cost** of using resources in a particular way
- **The price of a resource is the amount someone else is willing to pay to acquire it from its current use/owner**

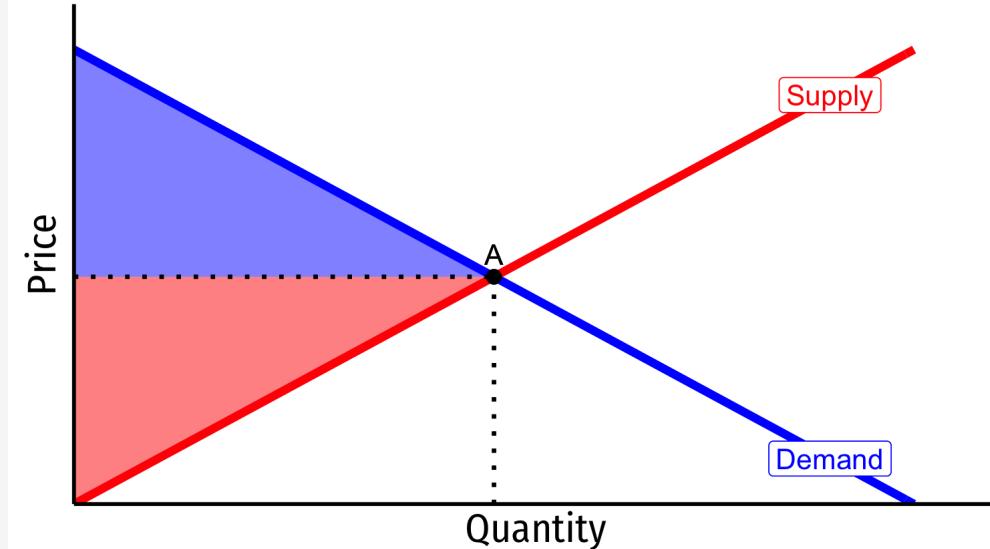
# Perfectly Competitive Market



Representative Firm

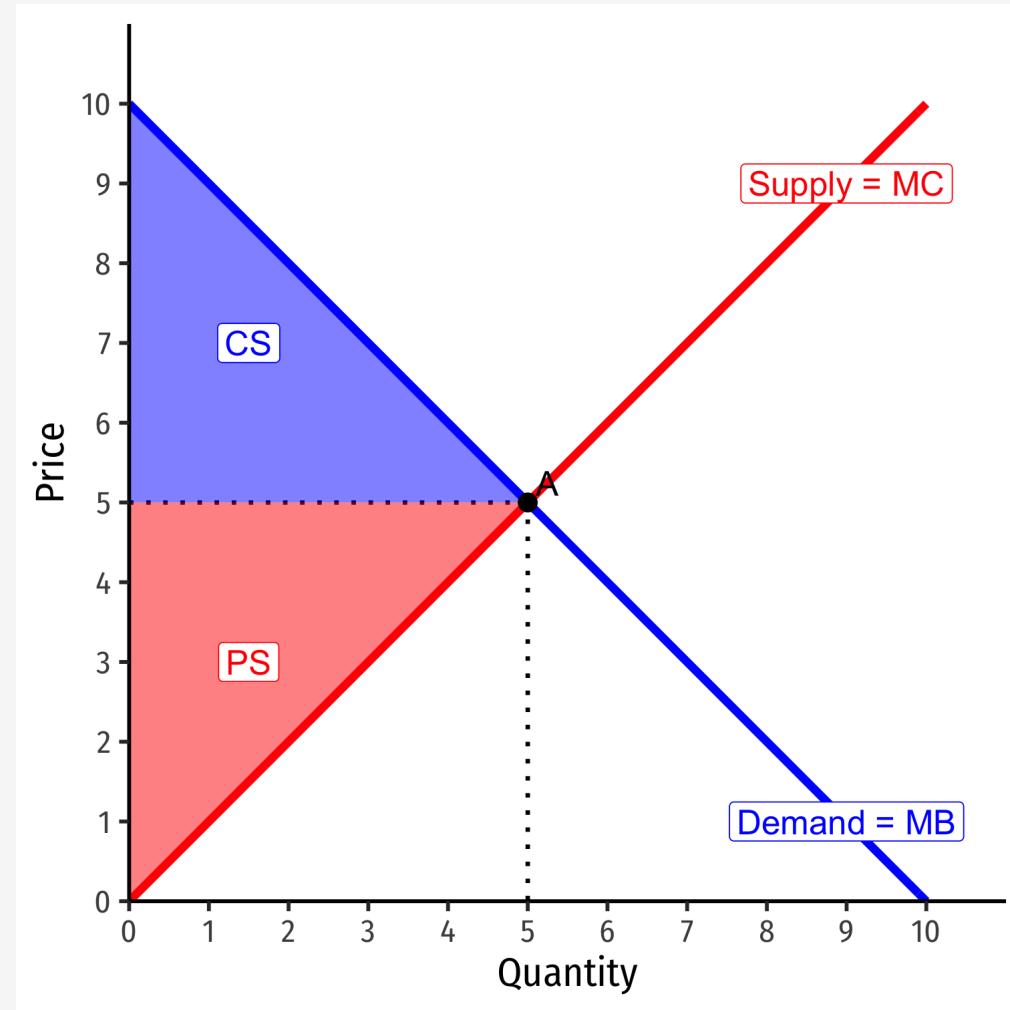


Industry



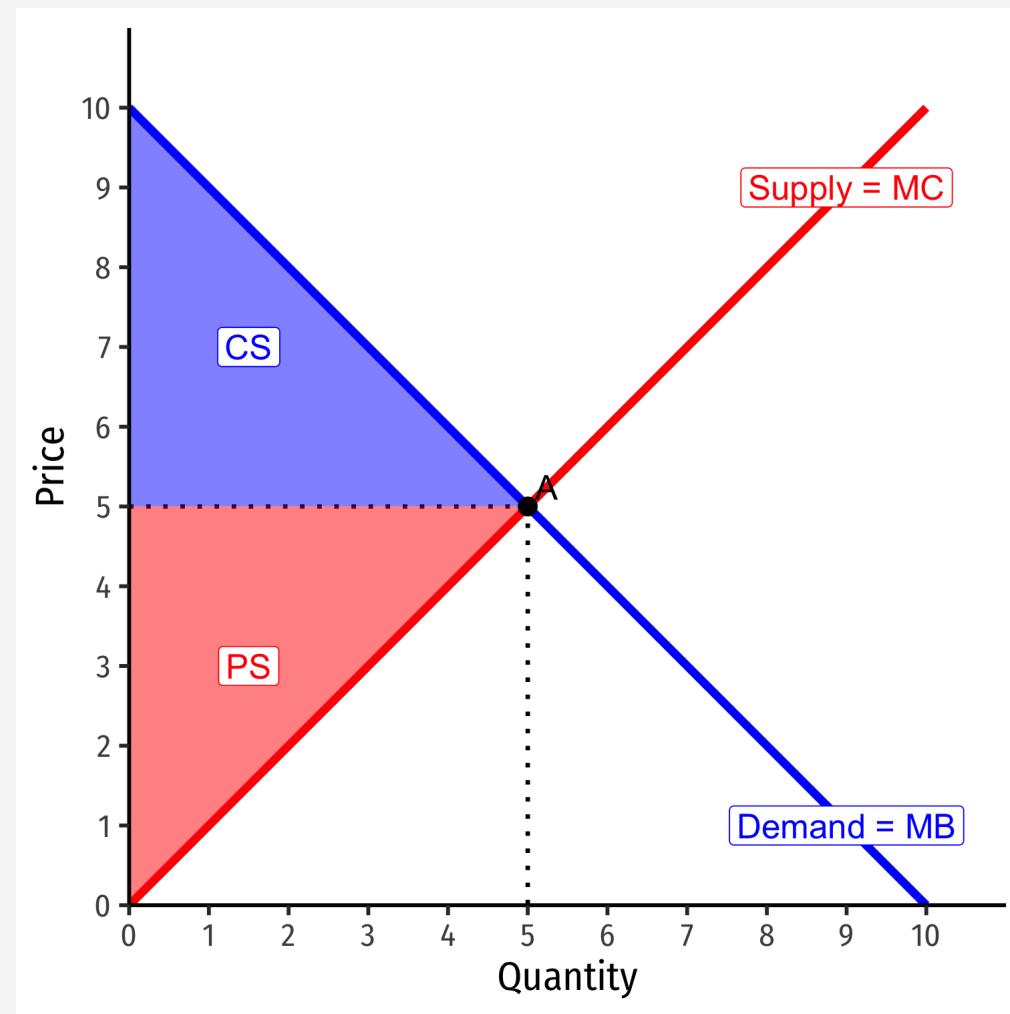
- In a **competitive market** in **long run equilibrium**:
  - **Economic profit** is driven to \$0; resources (factors of production) optimally allocated
  - **Allocatively efficient**:  $p = MC(q)$ , maximized CS + PS
  - **Productively efficient**:  $p = AC(q)_{min}$  (otherwise firms would enter/exit)

# Allocative Efficiency in Competitive Equilibrium I



- **Allocative efficiency:** resources are allocated to highest-valued uses
  - Goods are produced up to the point where **marginal benefit = marginal costs**

# Allocative Efficiency in Competitive Equilibrium II

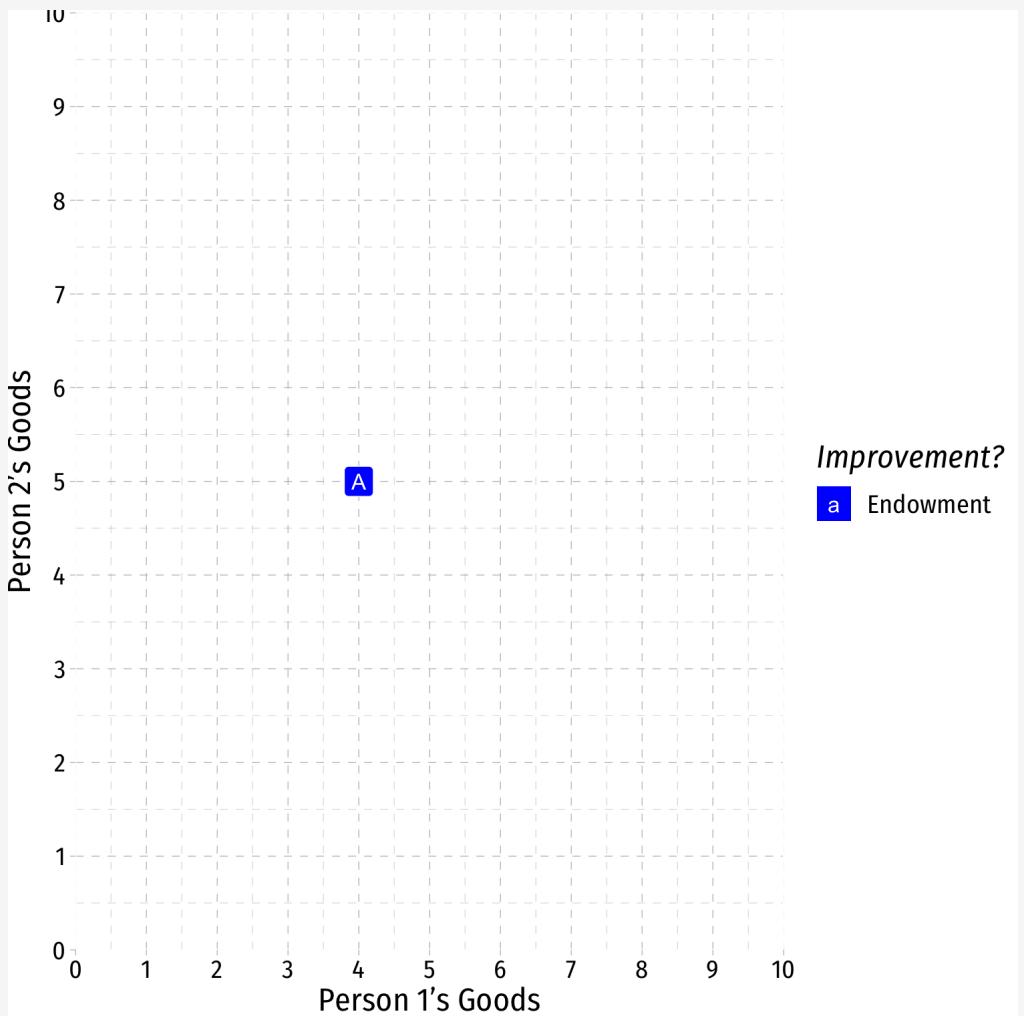


- **Economic surplus** = Consumer surplus + Producer surplus
- Maximized in competitive equilibrium
- Resources flow away from those who value them the lowest (min WTA) to those that value them the highest (max WTP)
  - creating PS and CS
- **The social value of resources is maximized by allocating them to their highest valued uses!**

# Markets and Pareto Efficiency



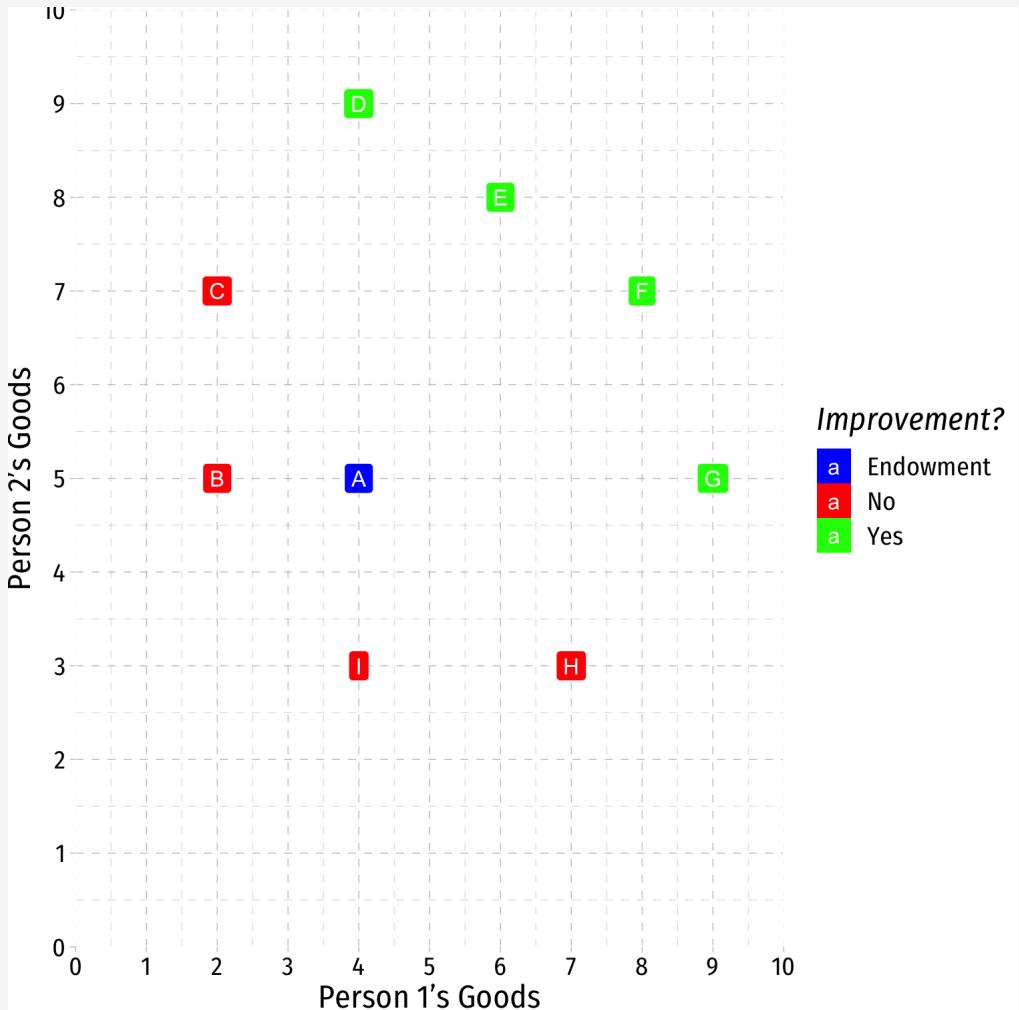
- Suppose we start from some initial allocation (**A**)



# Markets and Pareto Efficiency



- Suppose we start from some initial allocation (**A**)
- **Pareto Improvement**: at least one party is better off, and no party is worse off
  - D, E, F, G are improvements
  - B, C, H, I are not

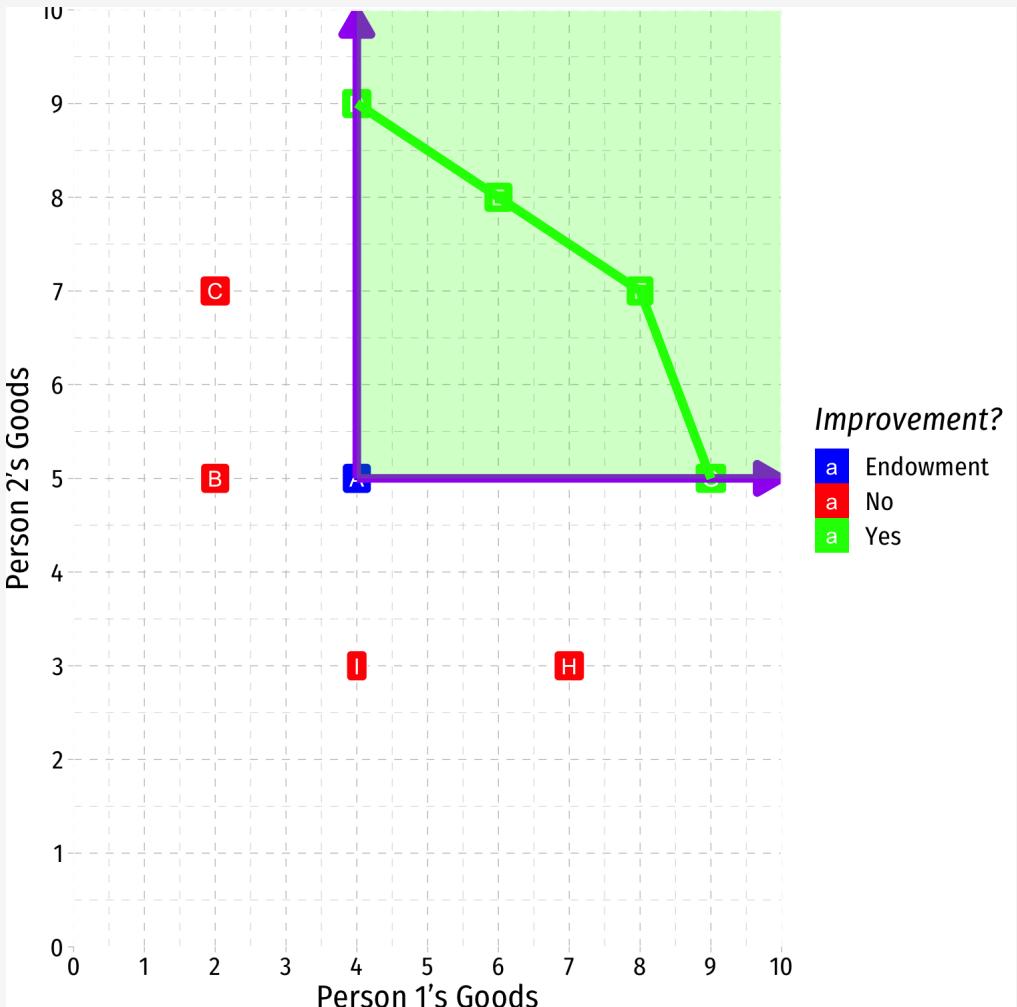


# Markets and Pareto Efficiency



- Suppose we start from some initial allocation (**A**)
- **Pareto Improvement**: at least one party is better off, and no party is worse off
  - **D, E, F, G** are improvements
  - **B, C, H, I** are not
- **Pareto optimal/efficient**: no possible Pareto improvements
  - Set of Pareto efficient points often called the **Pareto frontier**<sup>†</sup>
  - Many possible efficient points!

<sup>†</sup>I'm simplifying...for full details, see [class 1.8 appendix](#) about applying consumer theory!



# Markets and Pareto Efficiency



- Voluntary exchange in markets is a **Pareto improvement**
- *In equilibrium*, markets are **Pareto efficient**: there are no more possible Pareto improvements
  - all gains from trade exhausted,  $q_S = q_D$ , no pressure for change
- Note Pareto efficiency contains a normative claim about **equity**
  - It might be possible to improve the *total welfare of society*
  - But if this comes *at the expense of even 1 individual*, it's not a Pareto improvement!



# Markets and Pareto Efficiency



- Pareto efficiency is conceptual gold standard: allow all welfare-improving exchanges so long as nobody gets harmed
- In practice: Pareto efficiency is a *first best* solution
  - only takes one holdout to disapprove to violate Pareto efficiency



# Markets and Kaldor-Hicks Efficiency



- **Kaldor-Hicks Improvement:** an action improves efficiency its generates more social gains than losses
  - those made better off could in principle compensate those made worse off
- **Kaldor-Hicks efficiency:** no potential Kaldor-Hicks improvements exist
- Keeps intuitive appeal of Pareto but more practical
  - Every Pareto improvement is a KH-improvement (but not the other way around!)

# Pareto vs. Kaldor-Hicks Efficiency



- Example: “eminent domain”
- The “takings clause” of the 5<sup>th</sup> Amendment to the U.S. Constitution:

“No person shall...be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation.”
- What is a “public use”? What is “just compensation”?
- Kelo v. City of New London, 545 U.S. 469 (2005)



# Welfare Economics



- The **1st Fundamental Welfare Theorem**: markets in competitive equilibrium maximize allocative efficiency of resources and are Pareto efficient
  - initial endowments does not affect efficiency but does affect final distribution
- The **2nd Fundamental Welfare Theorem**: any desired Pareto efficient distribution can be achieved with a lump-sum tax & transfer scheme, and then allowing markets to work freely
  - allows a targetted (re)-distribution to be achieved without sacrificing efficiency

# Welfare Economics



- **Markets are great when:**
  1. They are **Competitive**: many buyers and many sellers
  2. They each **equilibrium (prices are free to adjust)**: absence of transactions costs or policies *preventing prices from adjusting* to meet supply and demand
  3. **There are no externalities<sup>†</sup>** are present: costs and benefits are fully internalized by the parties to transactions
- If any of these conditions are not met, we have **market failure**
  - May be a role for governments, other institutions, or entrepreneurs to fix

<sup>†</sup> Or public goods, or asymmetric information. But in essence, I am treating these as special cases of more common externalities.

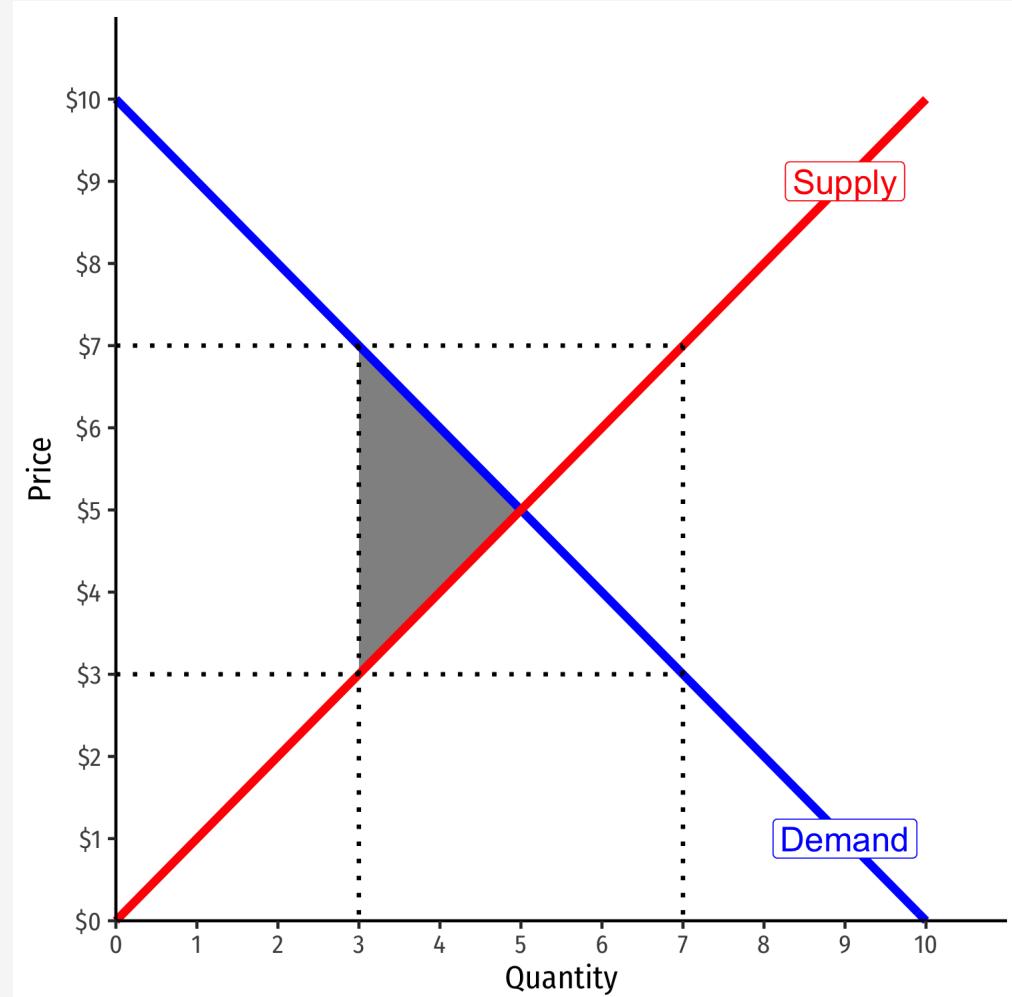


# Problem: Transaction Costs

# Dis-equilibrated Markets



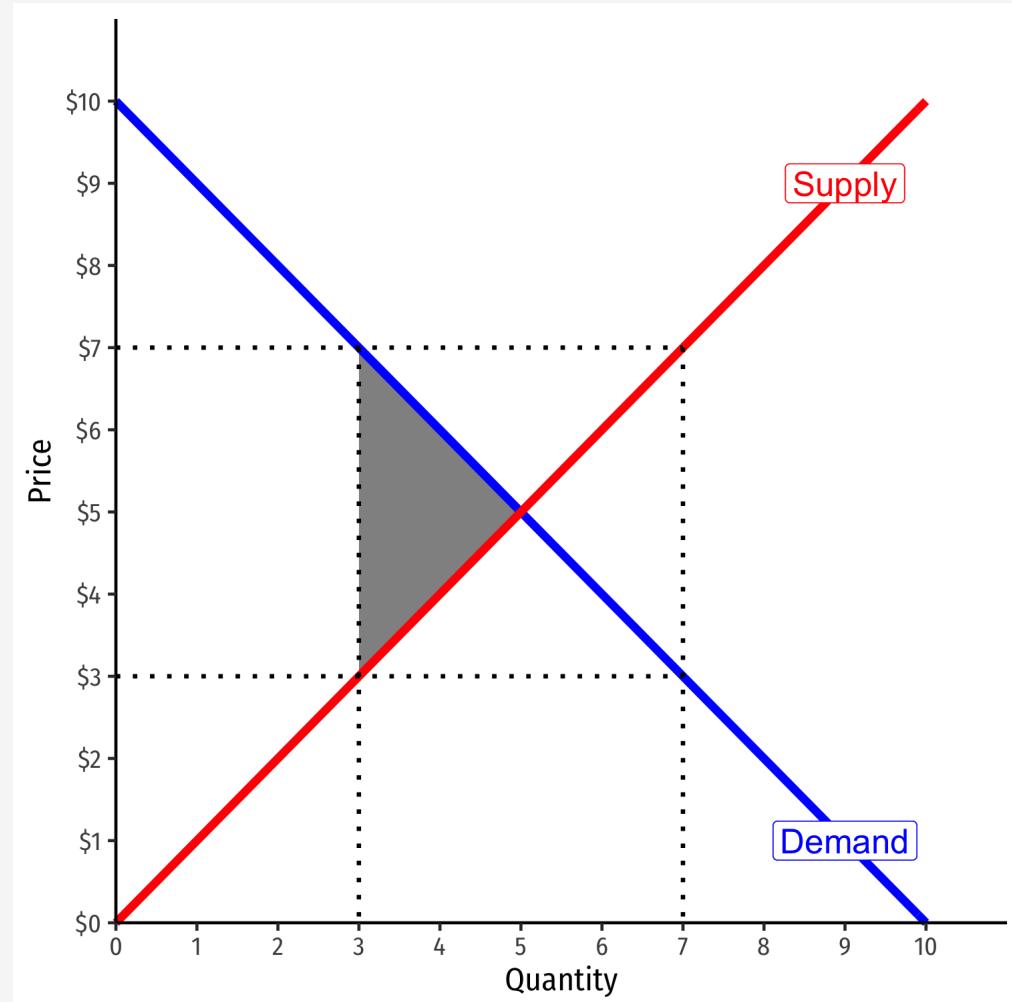
- To *reach* equilibrium, market prices need to be able to adjust
  - Shortage: price needs to rise
  - Surplus: price needs to fall
- There are ***unrealized gains from trade*** that exist in disequilibrium (shaded)
  - Buyers & sellers both can be made better off if they can adjust the price



# Dis-equilibrated Markets



- If market prices are *prevented* from adjusting, shortage/surplus becomes *permanent*
- Lost **CS** and/or **PS**: **Deadweight loss (DWL)**
  - **inefficiency** created by (permanent) diseq.
- Various government policies can prevent markets from equilibrating & create DWL:
  - **Price regulations** (price ceiling like rent control, price floor like minimum wage)
  - **Taxes, subsidies, tariffs, quotas**<sup>†</sup>
  - These should have been covered in Principles

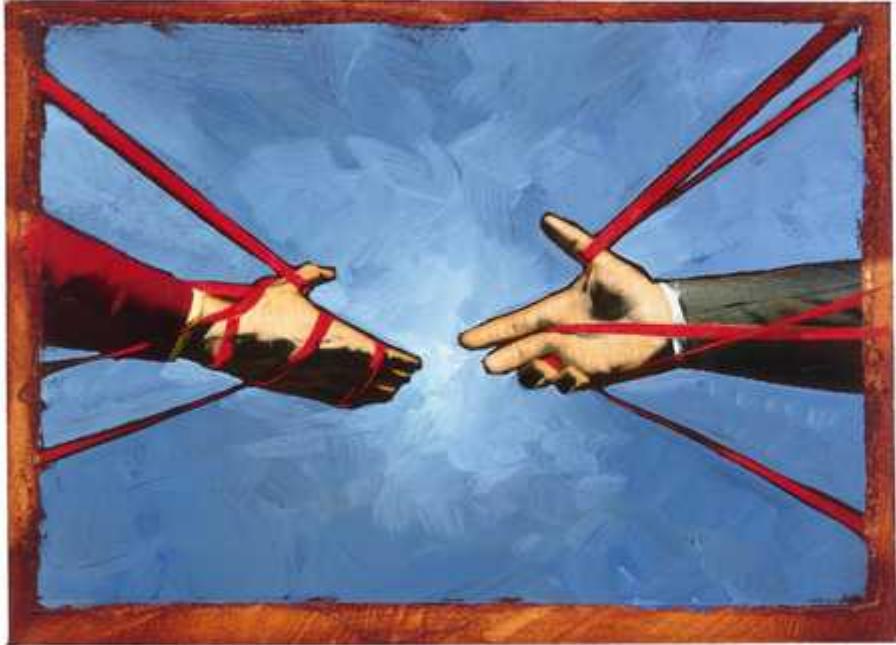


<sup>†</sup> Some may be necessary (taxes fund government), but create market inefficiencies.

# Transaction Costs and Exchange I



- **Transaction costs:**
  - **Search costs:** cost of finding trading partners
  - **Bargaining costs:** cost of reaching an agreement
  - **Enforcement costs:** **trust** between parties, cost of upholding agreement, dealing with unforeseen contingencies, punishing defection, using police and courts



# Transaction Costs and Exchange II



- With high transaction costs, resources *cannot* be traded
- Resources *cannot* be switched to higher-valued uses
- If others value goods higher than their current owners, resources are *inefficiently* allocated!





# Problem: Collective Action

# Generalizing: Collective Action Problems



- **Collective action problem:** situation where an individual's interest and a group's interest may conflict
- Benefits (or costs) of outcome are **nonrival** and flow to *all members* of the group
- Decisions & costs need to be incurred by individuals
- **Individual preferences** need to aggregate into a **single decision/outcome**



# Collective Action Problem: Examples I



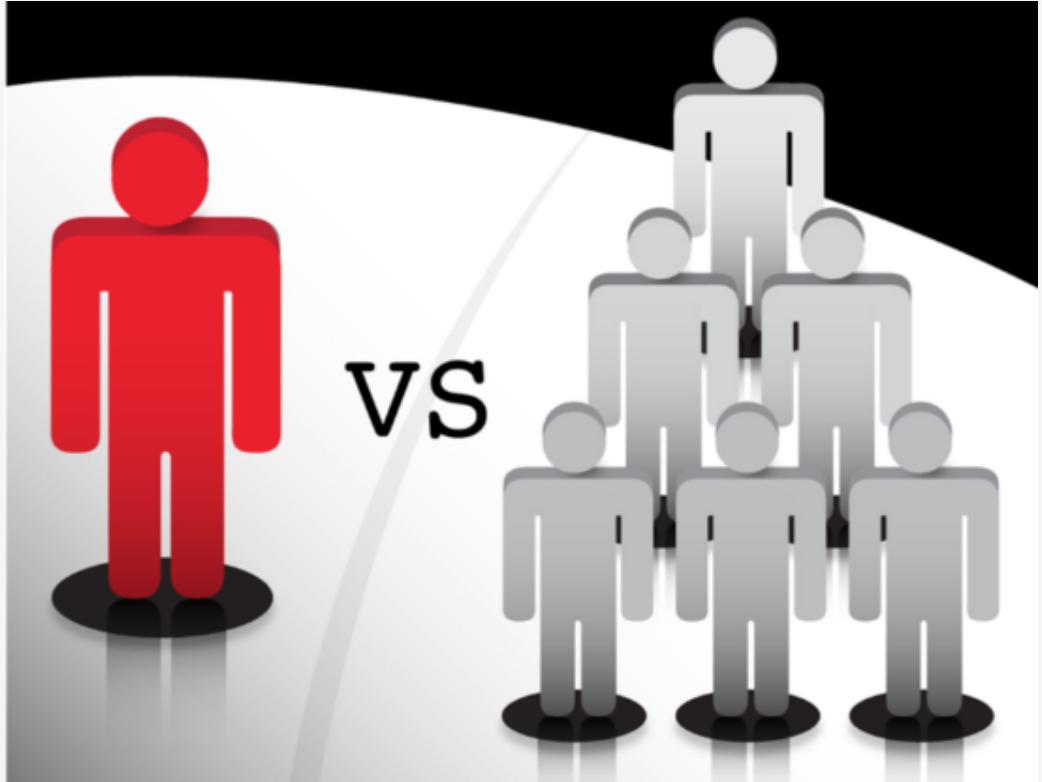
# Collective Action Problem: Examples II



# Collective Action Costs I



- Groups may share a **common interest**
- But **composed of individuals with their own preferences**
  - Individuals bear the personal cost of contributing
  - Individuals gain a small share of the benefits of group action
- Additionally, **cost of bargaining** to get a group to agree on decision





# Problem: Public Goods

# A Classic Economic Problem



- **Public Good:** a good that is **non-rival** and **non-excludable**
- **Rivalry:** one use of a resource removes it from other uses
- **Excludability:** ability or right to prevent others from using it (ownership)

# The Free Rider Problem



- Individual bears a **private cost to contribute**, but only gets a **small fraction of the (dispersed) benefit** of a good
- If individuals can gain **access** to the good (nonexcludable) **without paying**, may lead to...
- **Free riding**: individuals consume the good without paying for it



# Examples?



# Market Failure from Public Goods



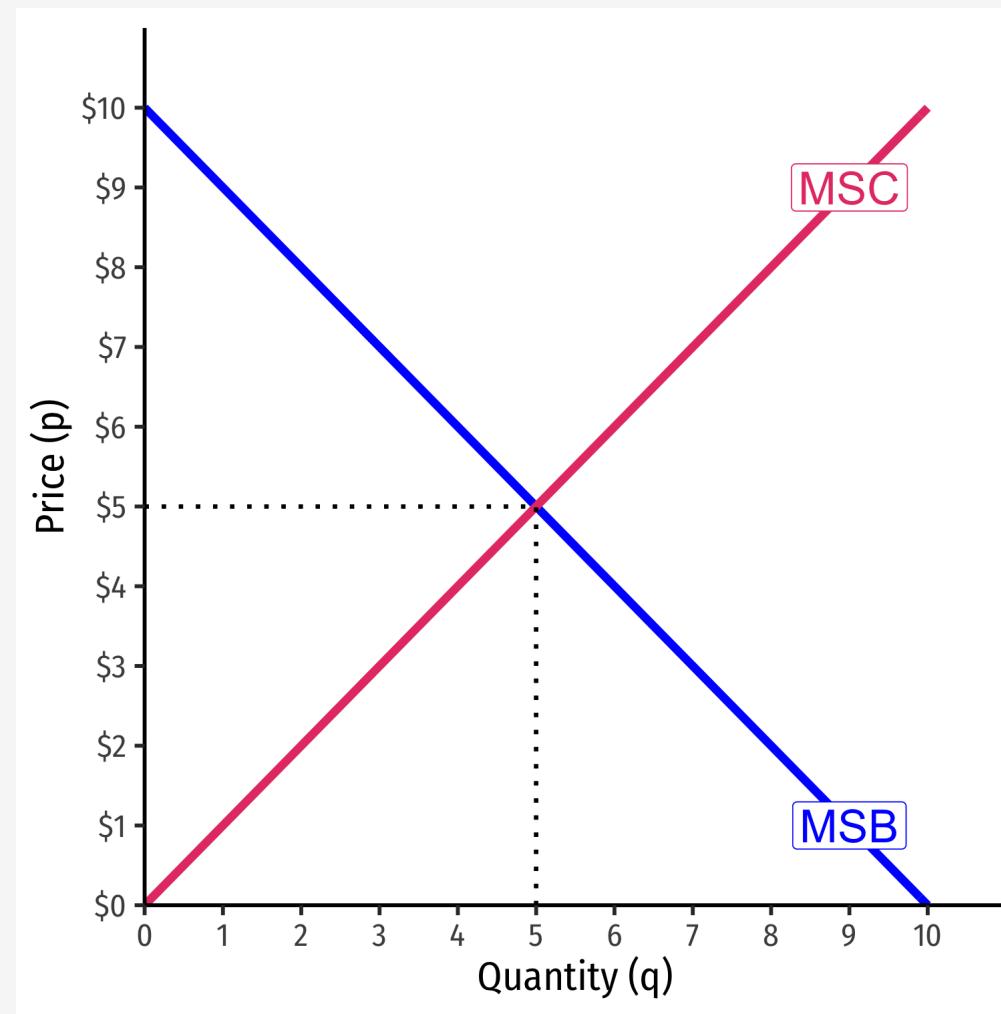
- No incentive for people to contribute and pay for the good
- If enough people obtain the benefits without incurring the costs...
- **Not profitable** for private market actors to supply it





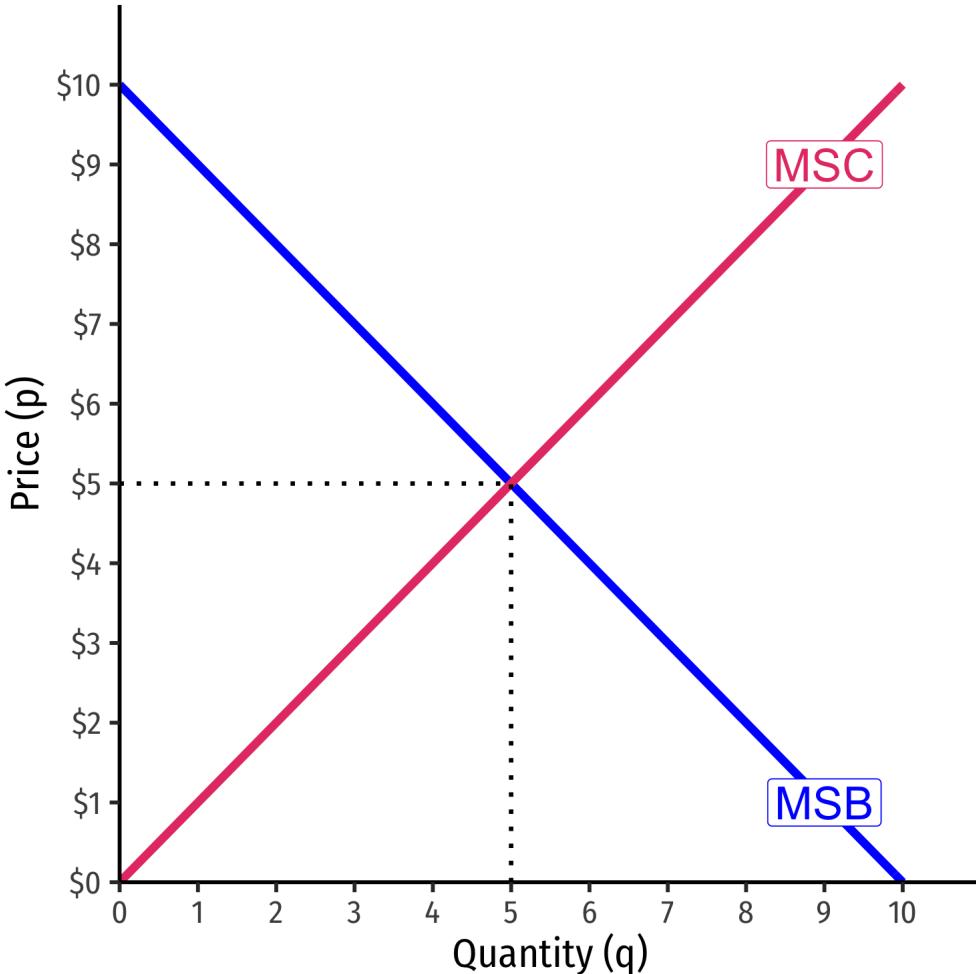
# Problem: Externalities

# Supply and Demand: Social Costs & Benefits



- **Demand: marginal social benefit (MSB)**
  - value to consumers of consuming output
- **Supply: marginal social cost (MSC)**
  - opportunity cost of pulling resources out of other uses
- **Equilibrium:  $MSB = MSC$** 
  - using resources efficiently, no *better* alternative uses

# Supply and Demand: Social Costs & Benefits



- **Price system** mitigates costs and benefits of people's actions
- People using scarce resources must **account for consequences**:
  - Pay to pull scarce resources out of other uses in society
  - Compensated for producing something valuable for others

# Externality



- **Externality**: an action that incurs a cost or a benefit not compensated via prices
- Often interpreted as an action that affects (benefits or harms) a third party not privy to the action



# Externality



- The real problem is that it is **external** to the price system!
- People base decisions off of their preferences and opportunity costs of resources for society (captured in prices)
- Prices properly negotiate the opportunity costs and provide information to people
- But without price, decisions do not **internalize** those effects!



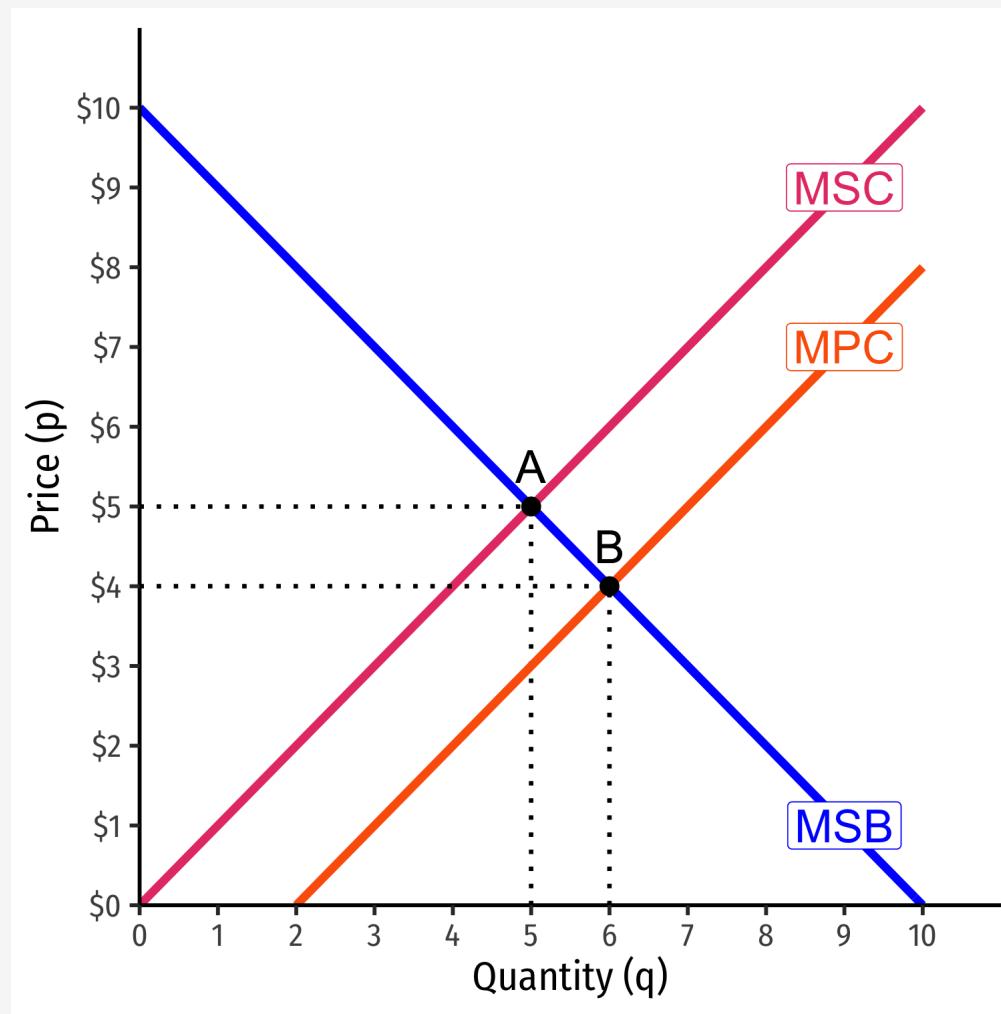
# Pigouvian Solutions



A.C. Pigou

- 1920, *The Economics of Welfare*
- Principle of "**payment in accordance with product**"
- People should pay average externality of their actions
  - Markets make you do this automatically
  - If markets fail, policy can force the market to work again
- **Problem with externality is that there is a missing price!**

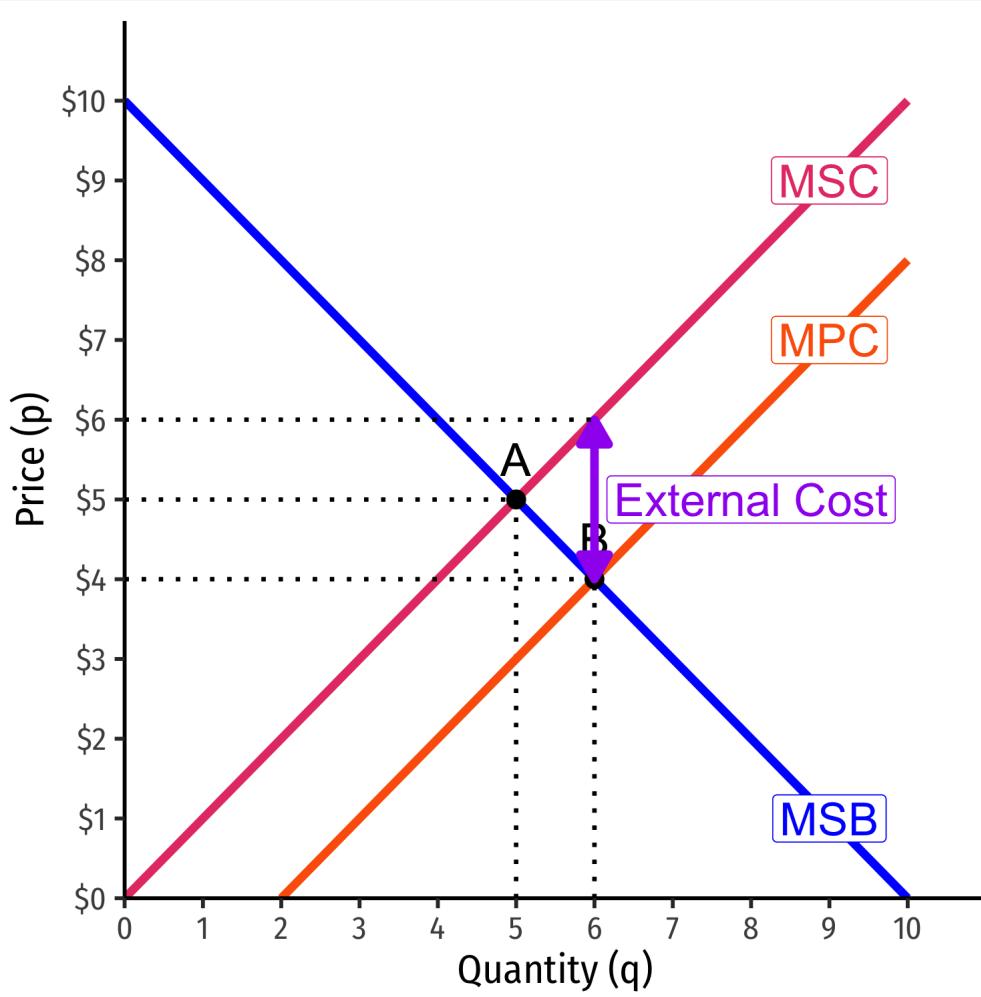
# Negative Externality



**Marginal Private Cost** to producer is less than **Marginal Social Cost** to society

**Market Equilibrium (B)** too much  $q$  at too low  $p$  compared to **Social Optimum (A)**

# Negative Externality

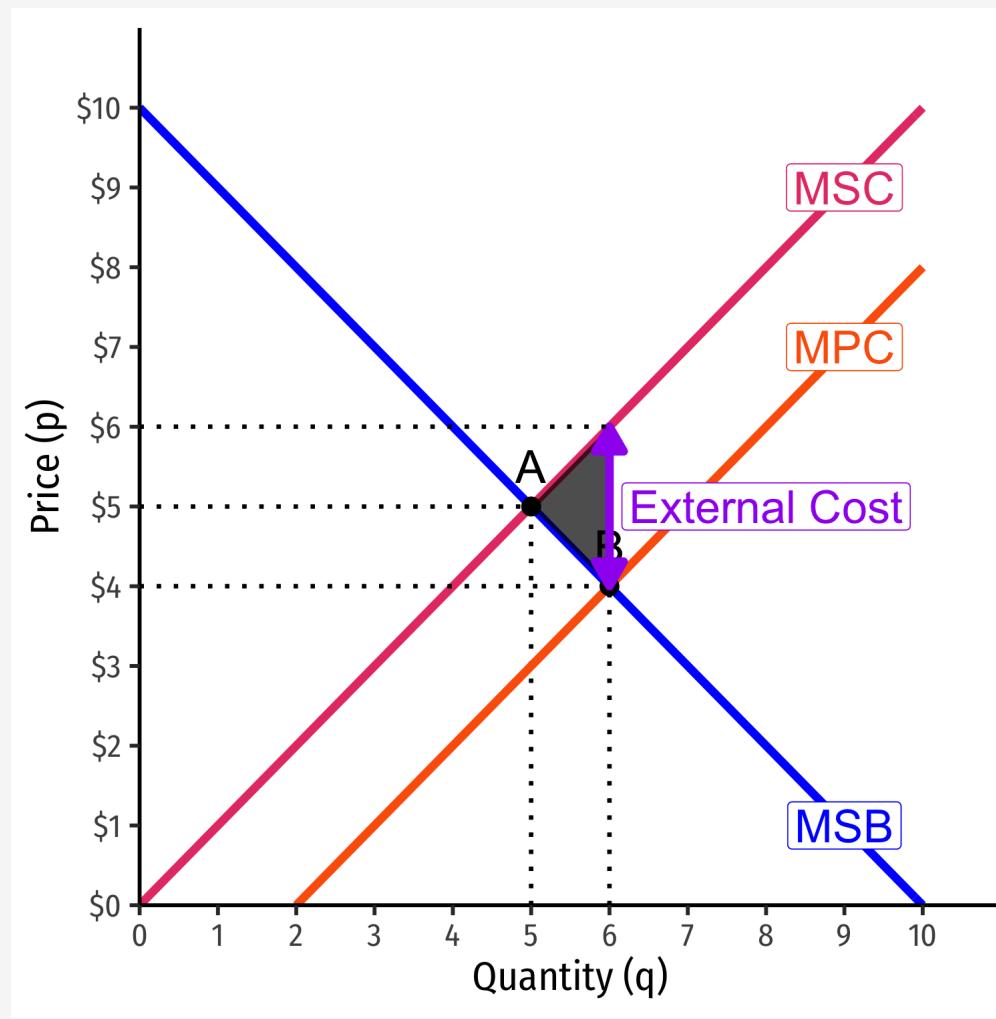


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- Overproduction due to external cost

# Negative Externality



**Marginal Private Cost** to producer is less than **Marginal Social Cost** to society

**Market Equilibrium (B)** too much  $q$  at too low  $p$  compared to **Social Optimum (A)**

- Overproduction due to external cost
- A **deadweight loss** from overproduction

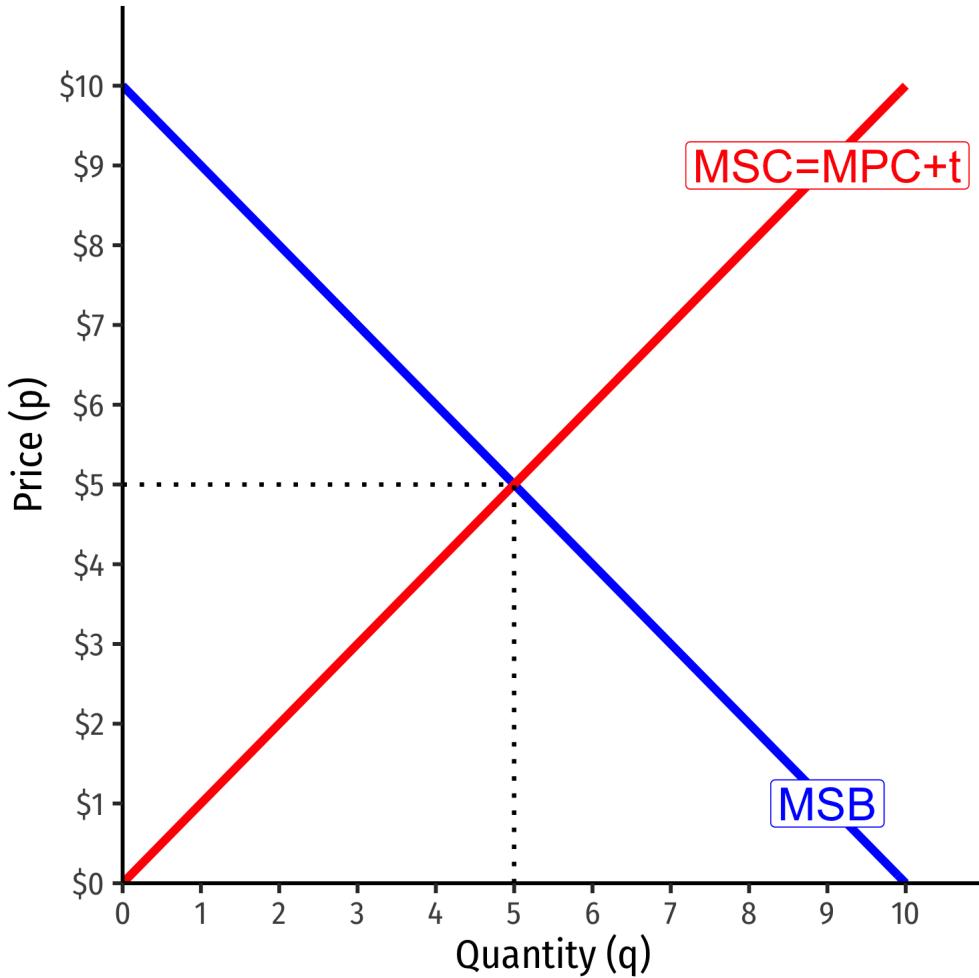
# Negative Externality: Pigouvian Solution



A.C. Pigou

- Policy solutions to externalities should **focus on the missing price**
  - Narrowly tailor policy to create or modify price
- "Pigouvian" tax or subsidy

# Negative Externality: Pigouvian Solution



- Set a specific tax

$$t = MSC - MPC$$

- Eliminates the DWL
- Internalizes the externality into the price system
- Producers (and consumers) now consider the true cost to society
  - $MPC$  (with tax) =  $MSC$

# Another Classic Economic Problem



- **Tragedy of the commons:** multiple people have unrestricted access to the same **rivalrous** resource
- **Rivalry:** one use of a resource removes it from other uses

Hardin, Garrett, 1968, "The Tragedy of the Commons," *Science* 162(3859):1243-1248

# Another Classic Economic Problem



- Cannot exclude others
- No responsibility over outcome
- Incentive to **overexploit** and **deplete** resource (before others do)
- A negative externality on others

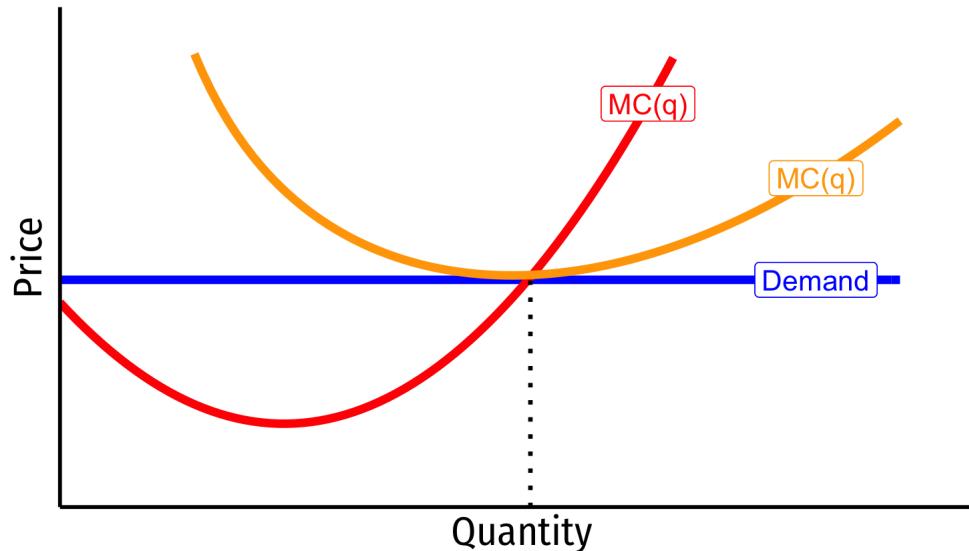


# Problem: Market Power

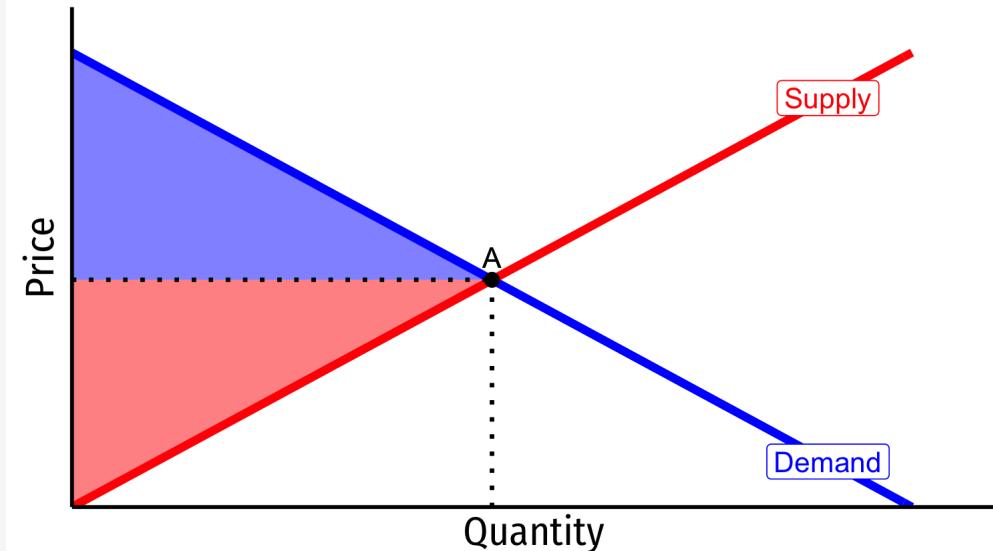
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Representative Firm

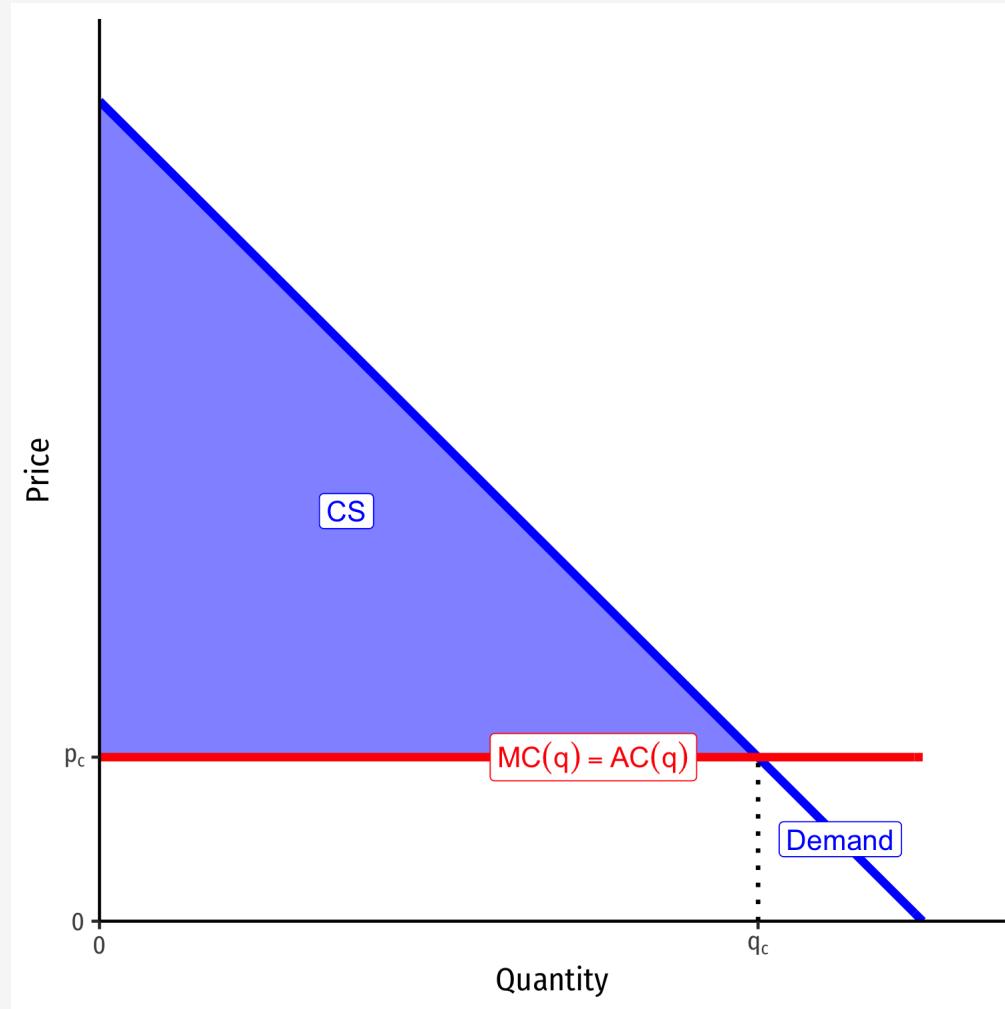


Industry



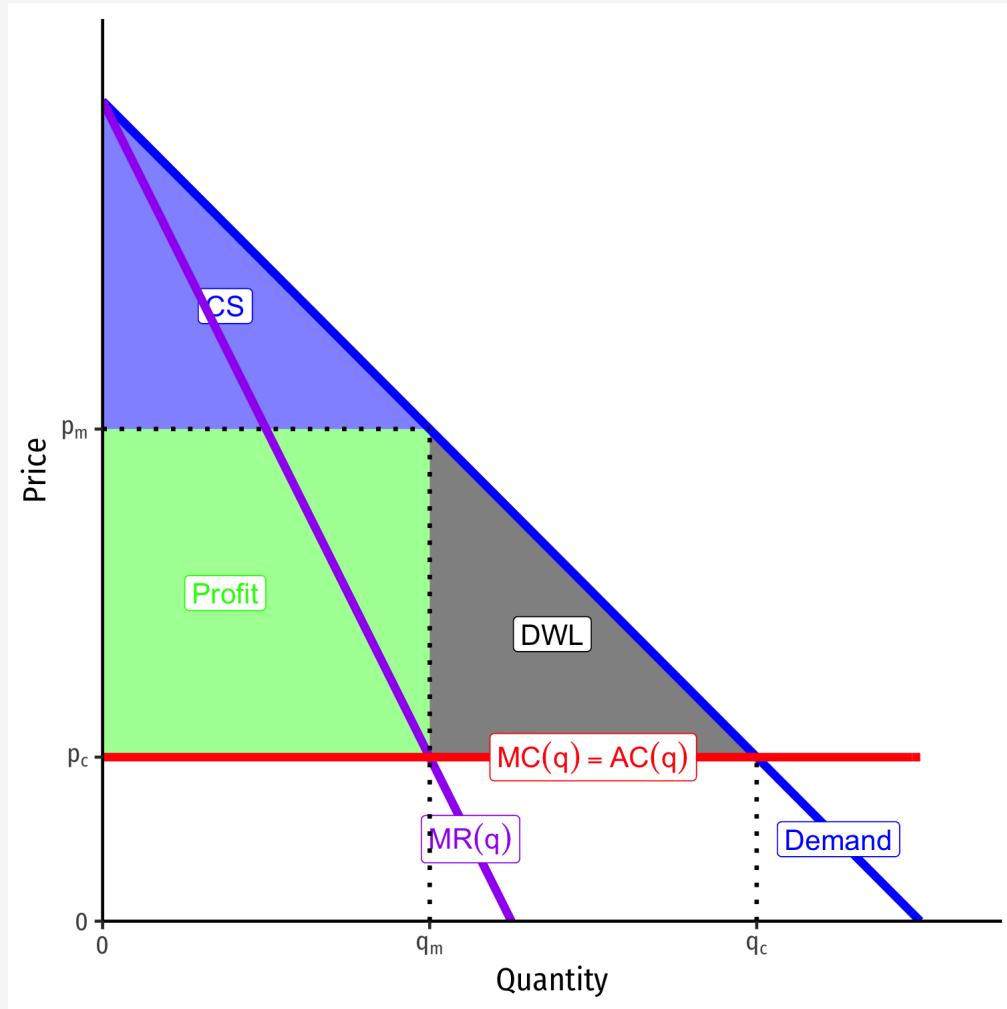
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# Market Power



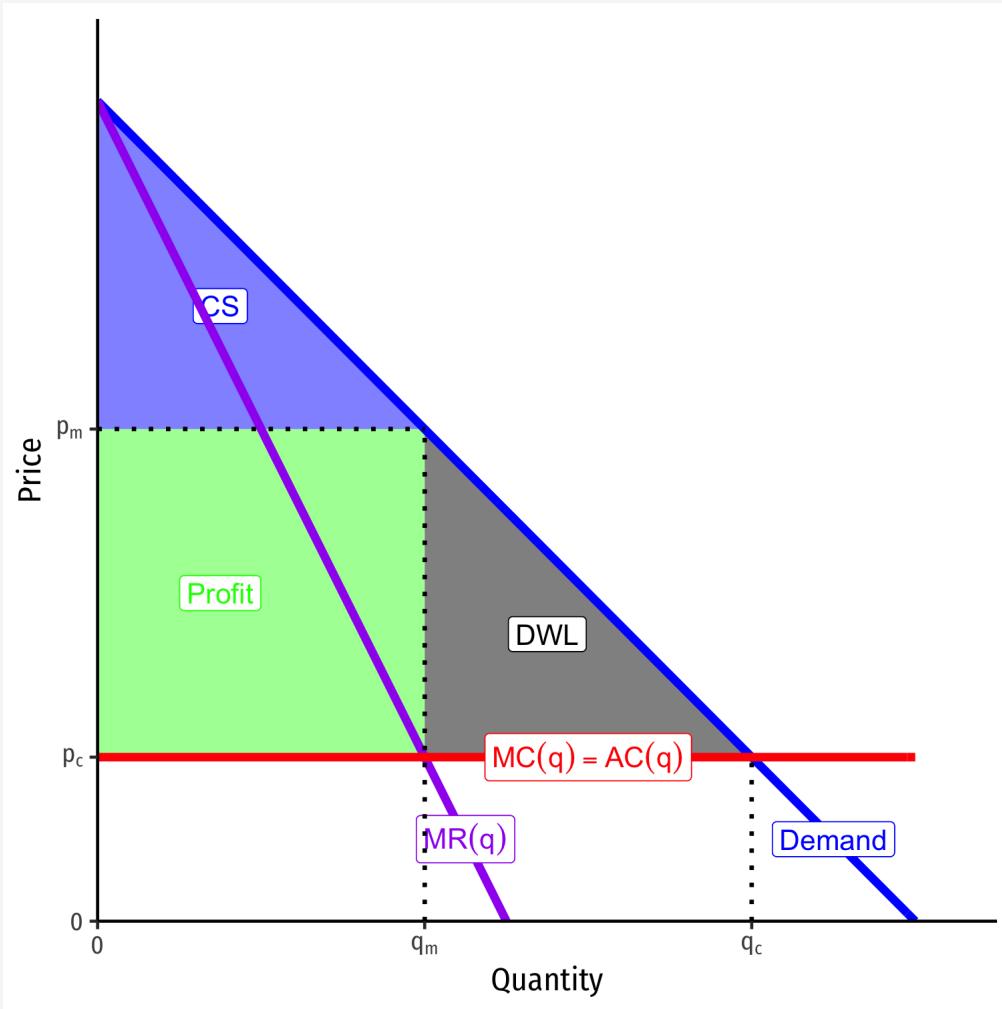
- Consider a market with some simplified cost assumptions:
  - No fixed costs, constant variable costs
  - implies  $MC(q) = AC(q)$
- If this was a *competitive* market, firms would set  $p_c = MC(q)$  and (collectively), industry would produce  $q_c$ 
  - Consumer surplus maximized

# Market Power



- A **monopolist** faces the *entire* market demand and sets  $(q_m, p_m)$ :
  - Sets  $MR(q) = MC(q)$  at  $q_m$
  - Raises price to maximum consumers are WTP (Demand):  $p_m$
- **Restricts output and raises price**, compared to competitive market
- Earns **monopoly profits** ( $p > AC$ )
- Loss of **consumer surplus**

# Market Power



- **Deadweight loss** of surplus destroyed from lost gains from trade
  - Consumers willing to buy more than  $q_m$ , if the monopolist would lower prices!
  - Monopolist *would* benefit by accepting lower prices to sell more, but this would yield *less* than maximum profits