LECTURE 10: Asymmetric Information, Externalities and Public Goods

- Why Markets Fail
- Markets with Asymmetric Information
- Externalities
- Public Goods

Markets Failure 시장실패

- Market Power
  - Those with market power choose the price and quantity
  - Less output is sold than in competitive markets
  - Inefficiency
  - Can have market power as producers or as inputs

Why Markets Fail

- Incomplete Information
  - Consumers must have accurate information about market prices or production quality for markets to operate efficiency
  - Lack of information can change supply
    - Buy products with no value
    - Don't buy enough of products with value
  - Some markets may never develop

Why Markets Fail

- Market power or monopoly 시장지배 또는 독점
- Externalities 외부성
  - Market prices do not always reflect the activities of either producers or consumers
  - Consumption or production has indirect effect on other consumption or production not reflected in market prices
  - May be impossible to get insurance because suppliers of insurance lack information

Why Markets Fail

- Public Goods 공공재
  - Nonexclusive, nonrival good that can be made available cheaply but which, once available, is difficult to prevent others from consuming
  - Company thinking about researching a new technology if can't get patent
    - Once it's made pubic, others can duplicate it

Markets with Asymmetric Information 비대칭정보

- Quality Uncertainty and the Market for Lemons
- Market Signaling
- Moral Hazard
- The Principal-Agent Problem
- Managerial Incentives in an Integrated Firm
- Asymmetric Information in Labor Markets: Efficiency Wage Theory

Quality Uncertainty and the Market for Lemons

- Asymmetric information is a situation in which a buyer and a seller possess different information about a transaction
  - The lack of complete information when purchasing a used car increases the risk of the purchase and lowers the value of the car.
  - Markets for insurance, financial credit and employment are also characterized by asymmetric information about product quality

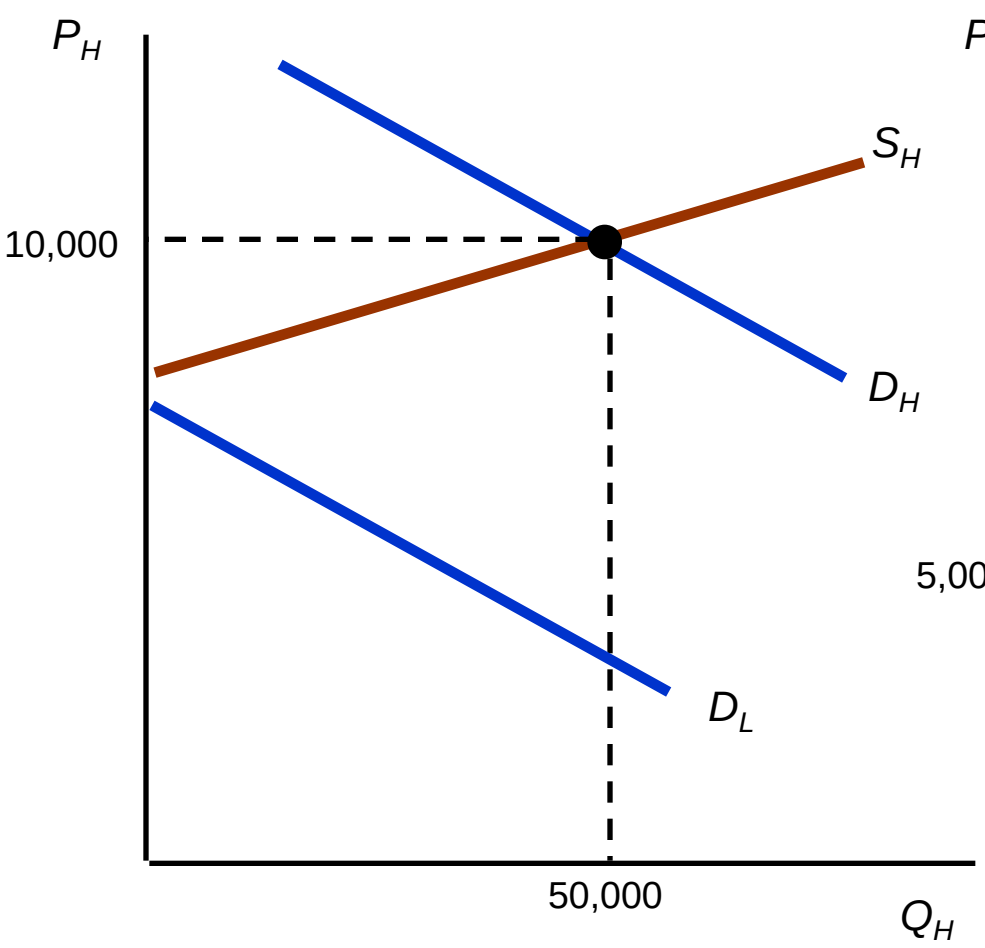
The Market for Used Cars

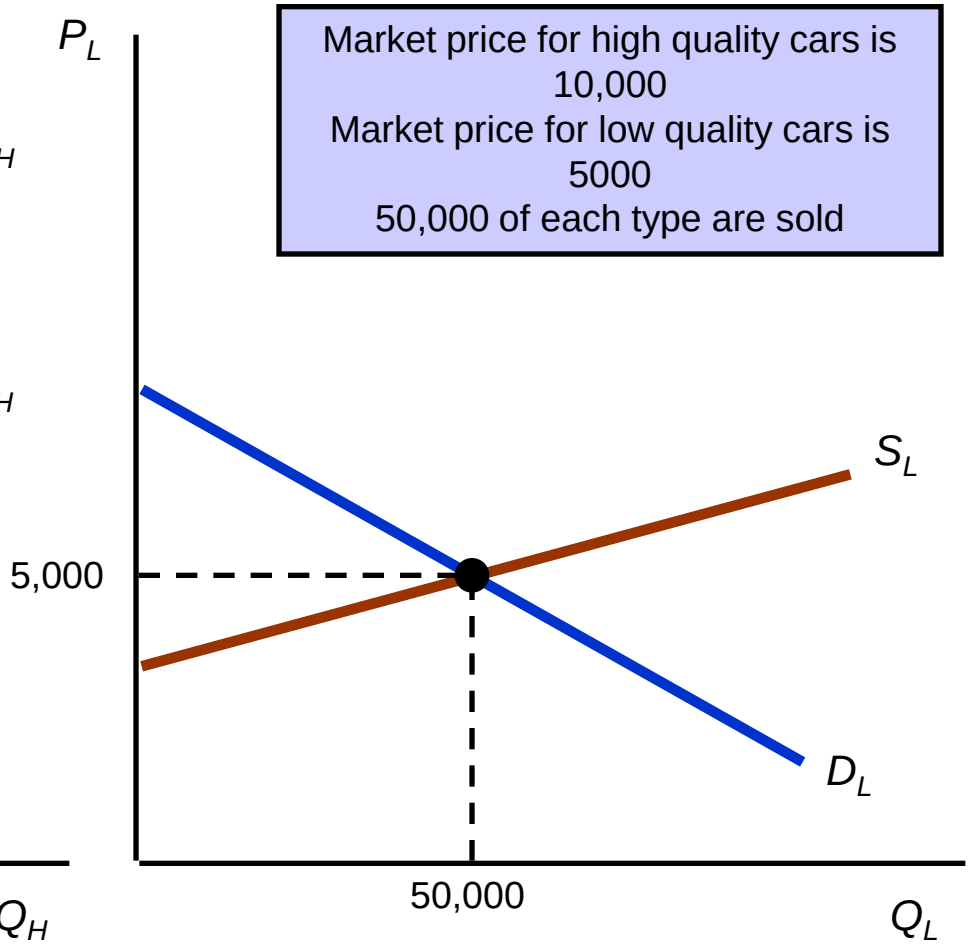
- Assume
  - Two kinds of cars – high quality and low quality
  - Buyers and sellers can distinguish between the cars
  - There will be two markets – one for high quality and one for low quality

The Market for Used Cars

- High quality market
  - S_H is supply and D_H is demand for high quality
- Low quality market
  - S_L is supply and D_L is demand for low quality
- SH is higher than SL because owners of high quality cars need more money to sell them
- DH is higher than DL because people are willing to pay more for higher quality

The Lemons Problem

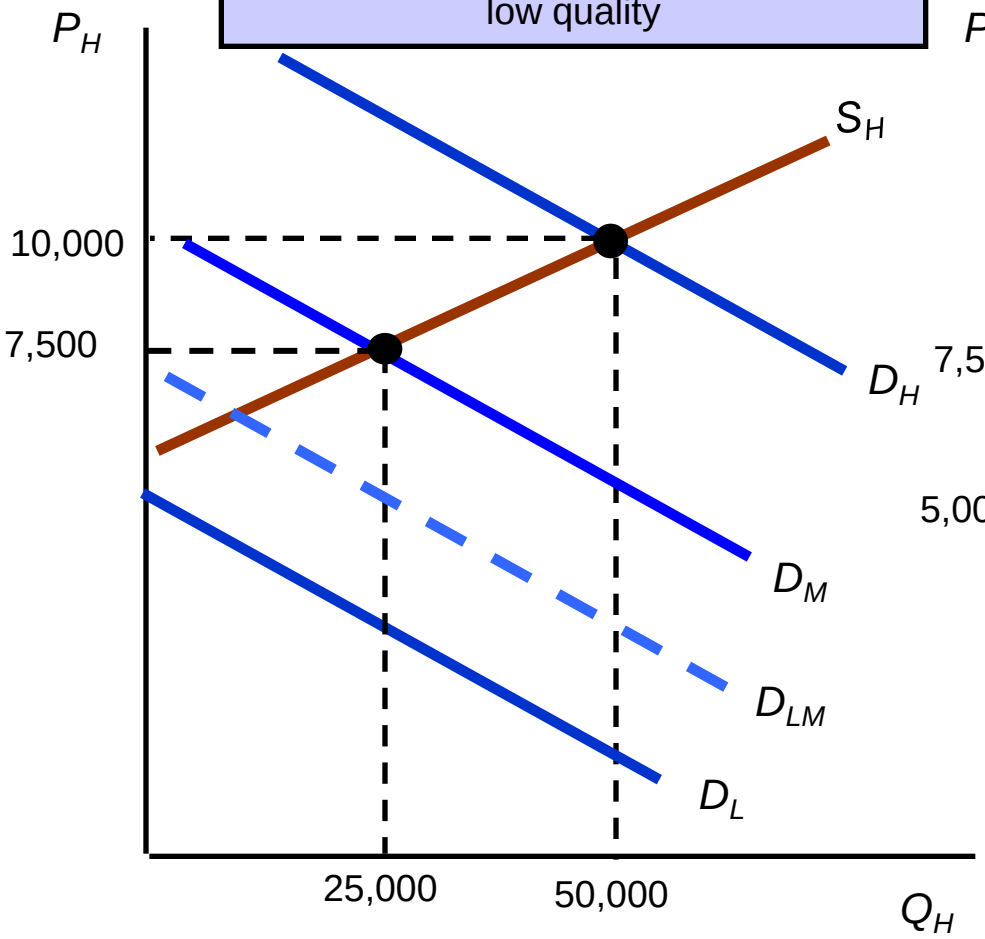




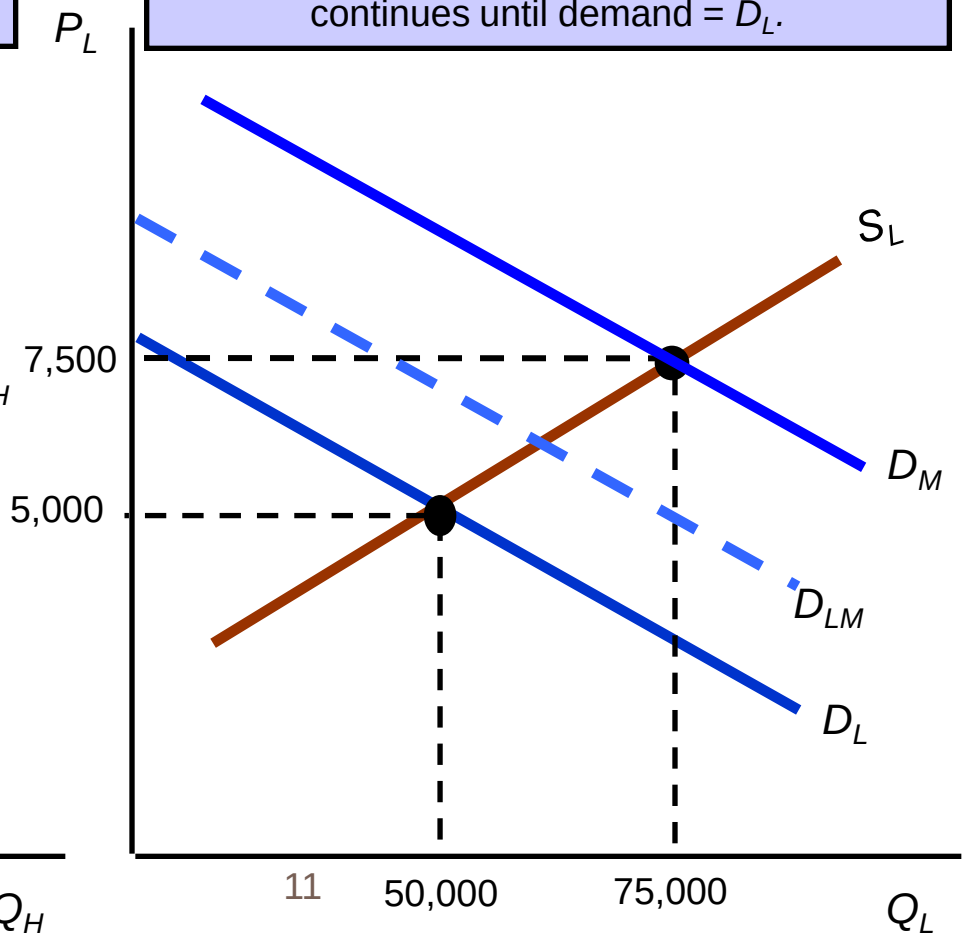
Market price for high quality cars is 10,000
Market price for low quality cars is 5000
50,000 of each type are sold

The Lemons Problem

Medium quality cars sell for 7500 selling 25,000 high quality and 75,000 low quality



The increase in Q_L reduces expectations and demand to D_{LM}. The adjustment process continues until demand = D_L.



The Market for Used Cars

- With asymmetric information:
  - Low quality goods drive high quality goods out of the market- the lemons problem.
  - The market has failed to produce mutually beneficial trade.
  - Too many low and too few high quality cars are on the market.
  - Adverse selection occurs; the only cars on the market will be low quality cars.

Market for Insurance

- Older individuals have difficulty purchasing health insurance at almost any price
- They know more about their health than the insurance company
- Because unhealthy people are more likely to want insurance, proportion of unhealthy people in the pool of insured people rises
- Price of insurance rises so healthy people with low risk drop out – proportion of unhealthy people rises increasing price more

Market for Insurance

- If auto insurance companies are targeting a certain population – males under 25
- They know some of the males have low probability of getting in an accident and some have a high probability
- If can't distinguish among insured, it will base premium on the average experience
- Some with low risk will choose not to insure and with raises the accident probability and rates

Market for Insurance

- A possible solution to this problem is to pool risks
  - Health insurance – government takes on role as with Medicare program
    - Problem of adverse selection is eliminated
  - Insurance companies will try to avoid risk by offering group health insurance policies at places of employment and thereby spreading risk over a large pool

Market for Insurance

- The Market for Credit
  - Asymmetric information creates the potential that only high risk borrowers will seek loans.
  - Can end up with lemon problem again
  - However, banks and credit agencies use credit histories to gauge risk of borrowers

Importance of Reputation and Standardization

- Asymmetric Information and Daily Market Decisions
  - Retail sales – return policies
  - Antiques, art, rare coins – real or counterfeit
  - Home repairs – unique information
  - Restaurants – kitchen status

Implications of Asymmetric Information

- How can these producers provide high-quality goods when asymmetric information will drive out high-quality goods through adverse selection.
  - Reputation
    - You hear about restaurants or stores that have good or bad service and quality
  - Standardization
    - Chains that keep production the same everywhere – McDonalds, Olive Garden

Implications of Asymmetric Information

- You look forward to a Big Mac when traveling, even if you would not typically buy one at home, because you know what to expect.
- Holiday Inn once advertised "No Surprises" to address the issue of adverse selection.

Lemons in Major League Baseball

- Rules in baseball changed so that after 6 years a player could resign with their team or become a free agent and try to sign with another team
- Free agents create a secondhand market in baseball players
  - If a lemons market exists, free agents should be less reliable (disabled) than renewed contracts.

Player Disability

	Days on Disabled List per Season		
	Pre Contract	**Post Contract**	**Percent Change**
All Players	4.73	12.55	165.4
Renewed Players	4.76	9.68	103.4
Free Agents	4.67	17.23	268.9

Lemons in Major League Baseball

- Findings
  - Days on the disabled list increase for both free agents and renewed players.
  - Free agents have a significantly higher disability rate than renewed players.
  - This indicates a lemons market.

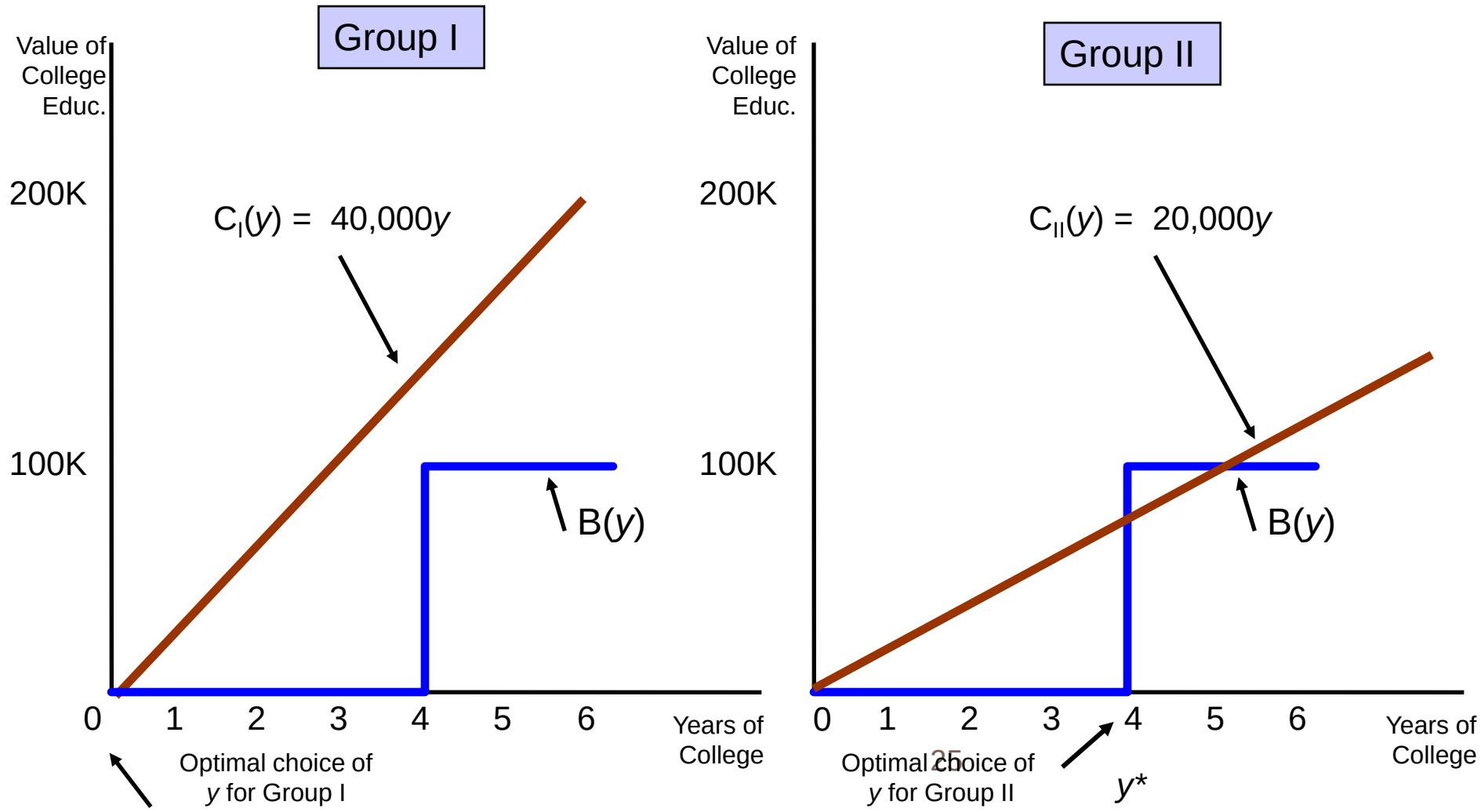
Market Signaling

- The process of sellers using signals to convey information to buyers about the product's quality.
- For example, how do workers let employers know they are productive so they will be hired?

Market Signaling

- Weak signal could be dressing well
  - Is weak because even unproductive employees can dress well
- Strong Signal
  - To be effective, a signal must be easier for high quality sellers to give than low quality sellers.
  - Example
    - Highly productive workers signal with educational attainment level.

Signaling


Group I
Value of College Educ.
200K
100K
$C_I(y) = 40{,}000y$
B(y)
0
1
2
3
4
5
6
Years of College
Optimal choice of y for Group I
Group II
Value of College Educ.
200K
100K
$C_{II}(y) = 20{,}000y$
B(y)
0
1
2
3
4
5
6
Years of College
Optimal choice of y for Group II
y*

Signaling

- Education does increase productivity and provides a useful signal about individual work habits even if education does not change productivity.

Signaling

- Education does increase productivity and provides a useful signal about individual work habits even if education does not change productivity.

Market Signaling

- Guarantees and Warranties
  - Signaling to identify high quality and dependability
  - Effective decision tool because the cost of warranties to low-quality producers is too high

Moral Hazard

- Moral hazard occurs when the insured party whose actions are unobserved can affect the probability or magnitude of a payment associated with an event.
  - If my home is insured, I might be less likely to lock my doors or install a security system
  - Individual may change behavior because of insurance – moral hazard

Moral Hazard

- Determining the Premium for Fire Insurance
  - Warehouse worth 100,000
  - Probability of a fire:
    - .005 with a 50 fire prevention program
    - .01 without the program
  - If the insurance company cannot monitor to see if the program was run, how do they determine premiums?

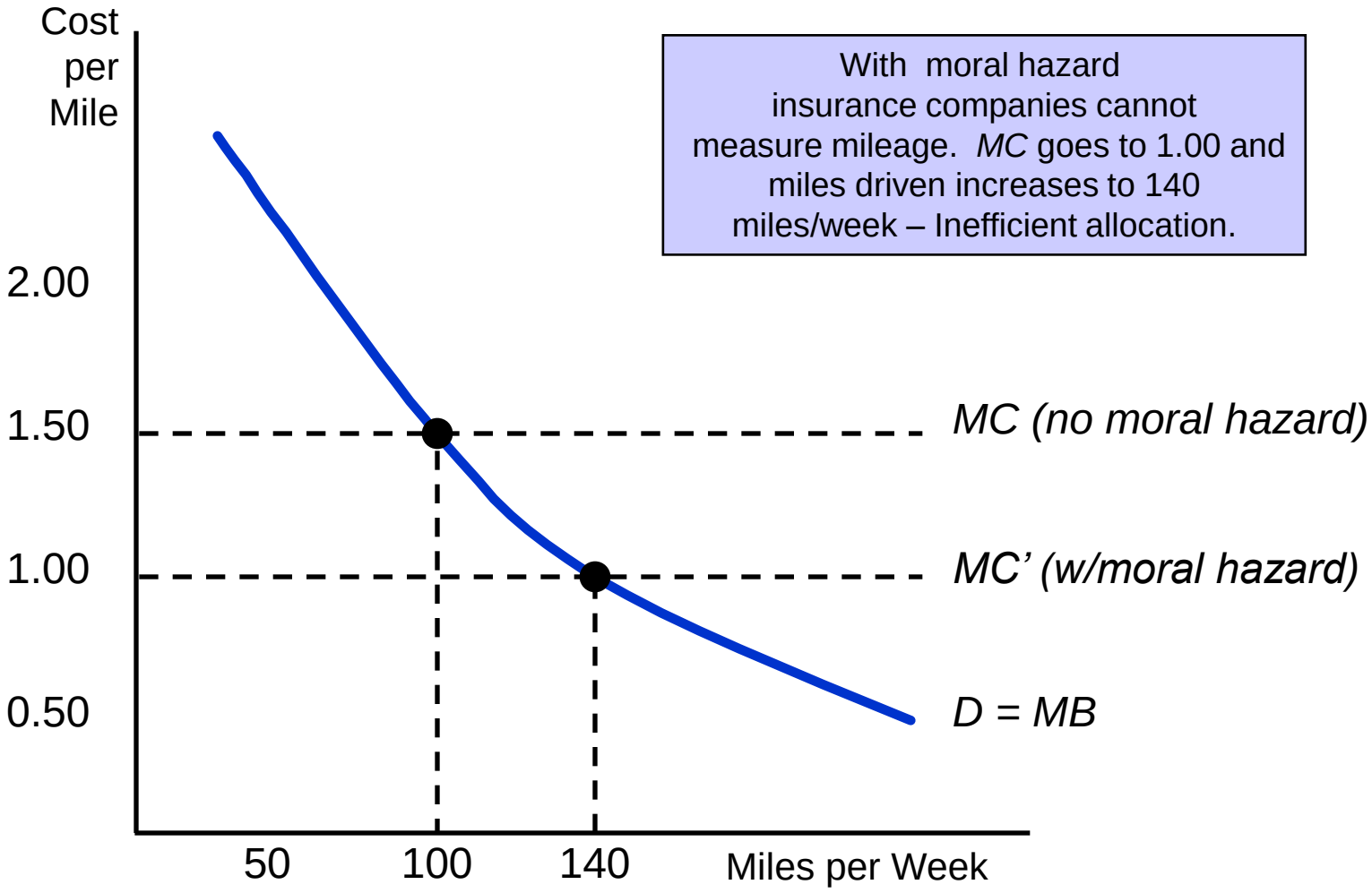
Moral Hazard

- With the program the premium is:
  - .005 x 100,000 = 500
- Once insured owners purchase the insurance, the owners no longer have an incentive to run the program, therefore the probability of loss is .01
- 500 premium will lead to a loss because the expected loss is now 1,000 (.01 x 100,000)

Moral Hazard

- Moral hazard is not only a problem for insurance companies, but it alters the ability of markets to allocate resources efficiently.
- Consider the demand (MB) of driving
  - If there is no moral hazard, marginal cost of driving is MC
  - Increasing miles will increase insurance premium and the total cost of driving

The Effects of Moral Hazard



Reducing Moral Hazard – Warranties of Animal Health

- Scenario
  - Livestock buyers want disease free animals.
  - Asymmetric information exists
  - Many states require warranties (or insurance), to be bought by sellers,
    - Promise not to sell, and to pay for all costs arising from, diseased animals
  - Buyers and sellers no longer have an incentive to reduce disease (moral hazard).

The Principal – Agent Problem

- Owners cannot completely monitor their employees – employees are better informed than owners
- This creates a principal-agent problem which arises when agents pursue their own goals, rather than the goals of the principal.

The Principal – Agent Problem

- Company owners are principals.
- Workers and managers are agents.
- Owners do not have complete knowledge.
- Employees may pursue their own goals even at a cost of reduce profits.

The Principal – Agent Problem

- The Principal – Agent Problem in Private Enterprises
  - Only 16 of 100 largest corporations have individual family or financial institution ownership exceeding 10%.
  - Most large firms are controlled by management.
  - Monitoring management is costly (asymmetric information).

The Principal – Agent Problem – Private Enterprises

- Managers may pursue their own objectives.
  - Growth and larger market share to increase cash flow and therefore perks to the manager
  - Utility from job from profit and from respect of peers, power to control corporation, fringe benefits, long job tenure, etc.

The Principal – Agent Problem – Private Enterprises

- Limitations to managers' ability to deviate from objective of owners
  - Stockholders can oust managers
  - Takeover attempts if firm is poorly managed
  - Market for managers who maximize profits – those that perform get paid more so incentive to act for the firm

The Principal – Agent Problem – Private Enterprises

- The problem of limited stockholder control shows up in executive compensation
  - *Business Week* showed that average CEO earned 13.1 million and has continued to increase at a double-digit rate
  - For 10 public companies led by highest paid CEOs, there was negative correlation between CEO pay and company performance

The Principal – Agent Problem – Public Enterprises

- Observations
  - Managers' goals may deviate from the agencies goal (size)
  - Oversight is difficult (asymmetric information)
  - Market forces are lacking

The Principal – Agent Problem

- Limitations to Management Power
  - Managers choose a public service position
  - Managerial job market
  - Legislative and agency oversight (GAO & OMB)
  - Competition among agencies

Incentives in the Principal-Agent Framework

- Designing a reward system to align the principal and agent's goals--an example
  - Watch manufacturer
  - Uses labor and machinery
  - Owners goal is to maximize profit
  - Machine repairperson can influence reliability of machines and profits

Incentives in the Principal-Agent Framework

- Designing a reward system to align the principal and agent's goals--an example
  - Revenue also depends, in part, on the quality of parts and the reliability of labor.
  - High monitoring cost makes it difficult to assess the repair-person's work

Incentives in the Principal-Agent Framework

- Small manufacturer uses labor and machinery to produce watches
- Goal to maximize profits
- High monitoring costs keep owners from measuring the effort of the repairperson directly

The Revenue from Making Watches

	Poor Luck	**Good Luck**
Low Effort (a = 0)	10,000	20,000
High Effort (a = 1)	20,000	40,000

C18. Externalities and Public Goods
Topics to be Discussed

- Externalities
- Ways of Correcting Market Failure
- Externalities and Property Rights
- Common Property Resources
- Public Goods
- Private Preferences for Public Goods

Externalities

- Externalities arise between producers, between consumers or between producers and consumers
- Externalities are the effects of production and consumption activities not directly reflected in the market
  - They can be negative or positive

Externalities

- Positive
  - Action by one party benefits another party
    - Homeowner plants a beautiful garden where all the neighbors benefit from it
    - Homeowner did not take their benefits into account when deciding to plant
- Negative
  - Action by one party imposes a cost on another party
    - Plant dumps waste in a river affecting those downstream
    - The firm has not incentive to account for the external costs that it imposes on those downstream

Ways of Correcting Market Failure

- Firms can be encouraged to reduce emissions to the efficient level in three ways
  1. Emissions standards
  2. Emissions fees
  3. Transferable emissions permits

Externalities and Property Rights

- Property Rights
  - Legal rules describing what people or firms may do with their property
  - For example
    - If residents downstream owned the river (clean water) they control upstream emissions.

Externalities and Property Rights

- Bargaining and Economic Efficiency
  - Economic efficiency can be achieved without government intervention when the externality affects relatively few parties and when property rights are well specified.

Externalities and Property Rights

- Conclusion: Coase Theorem
  - When parties can bargain without cost and to their mutual advantage, the resulting outcome will be efficient, regardless of how the property rights are specified.

Costly Bargaining – The Role of Strategic Behavior

- Bargaining requires clearly defined rules and property rights.
  - If property rights were not clear, other party might not be willing to pay as much and bargaining process would break down
  - One party might incorrectly assume the other party will eventually break down and accept less
  - Problems also arise when there are many parties affected

A Legal Solution – Suing for Damages

- In many situations involving externalities, one party is harmed (victim)
- They can recover monetary damages equal to harm suffered
- A suit for damages is different than effluent fee since the victim, not the government, is paid

A Legal Solution – Suing for Damages – Example

- Fishermen have the right to clean water
- Factory has two options
  - No filter, pay damages
    - Profit = 100 (500 - 400)
  - Filter, no damages
    - Profit = 300 (500 - 200)

A Legal Solution – Suing for Damages – Example

- Factory has the right to emit effluent
- Fishermen have three options
  - Put in treatment plant
    - Profit = 200
  - Filter and pay damages
    - Profit = 300 (500 - 200)
  - No plant, no filter
    - Profit = 100
- A suit for damages results in an efficient outcome.

The Coase Theorem at Work

- Negotiating an Efficient Solution
  - 1987 – New York garbage spill (200 tons) littered the New Jersey beaches
    - The potential cost of litigation resulted in a solution that was mutually beneficial to both parties.

Common Property Resources

- Characteristics
  - Everyone has free access.
  - Likely to be overutilized
  - Examples
    - Air and water
    - Fish and animal populations
    - Minerals

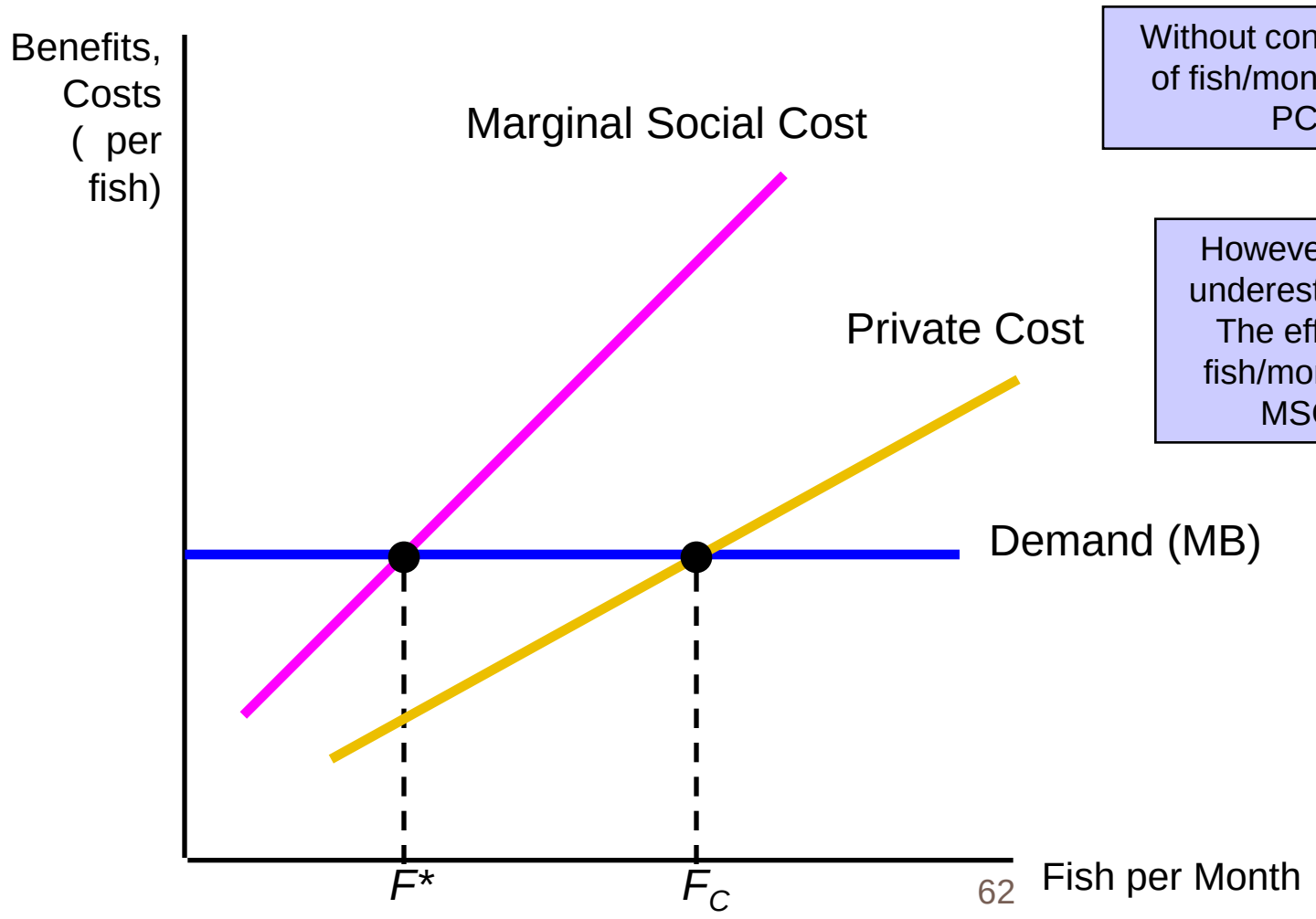
Common Property Resources

- Consider a lake where people fish
- Each fisherperson takes fish up to the point where the marginal benefit to them equals the marginal cost
- There is no reason that any one fisherperson take into account how their taking fish affects others experience

Common Property Resources

- Private cost underestimates the true cost to society
  - More fishing reduces the stock of fish
  - Less is available to others and too low of a stock will completely deplete the fish
  - Too many fish are caught

Common Property Resources



Without control the number of fish/month is F_C where PC = MB.

However, private costs underestimate true cost. The efficient level of fish/month is F^* where MSC = MB (D)

Common Property Resources

- Solution
  - Private ownership
  - Owner will set fee for sue of resource equal to the marginal cost of depleting the stock
  - Fishermen will no longer find it profitable to catch more than the efficient amount of fish
  - It is often the case that private ownership is not possible, the government steps in

Public Goods

- Characteristics
  - Nonrival
    - For any given level of production the marginal cost of providing it to an additional consumer is zero.
  - Nonexclusive
    - People cannot be excluded from consuming the good.
  - Example – use of lighthouse by a ship

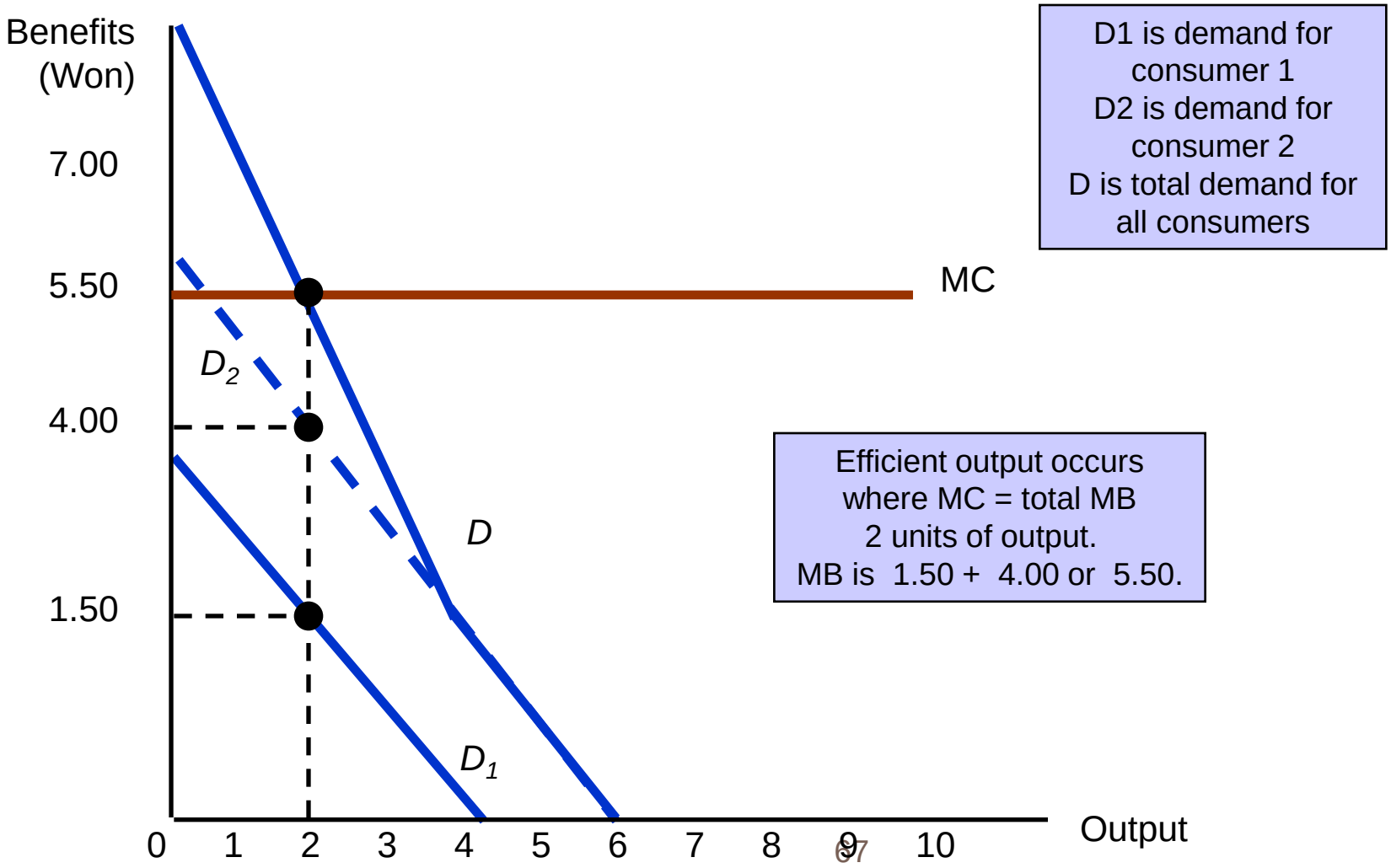
Public Goods

- Nonexclusive goods
  - Goods that people cannot be excluded from consuming, so that it is difficult or impossible to charge for their use
  - Example: fireworks, national defense

Efficiency and Pubic Goods

- Efficient level of private good is where marginal benefit equals marginal cost
- For a public good, the value of each person must be considered
  - Can add demand of all those who value good
- Must equate the sum of these marginal benefits to the marginal cost of production

Efficient Public Good Provision



Public Goods and Market Failure

- Free Riders
  - There is no way to provide some goods and services without benefiting everyone.
  - Households do not have the incentive to pay what the item is worth to them.
  - Free riders understate the value of a good or service so that they can enjoy its benefit without paying for it.

Public Goods and Market Failure

- Establishing a mosquito abatement company
  - How do you measure output?
  - Who do you charge?
  - A mosquito meter?

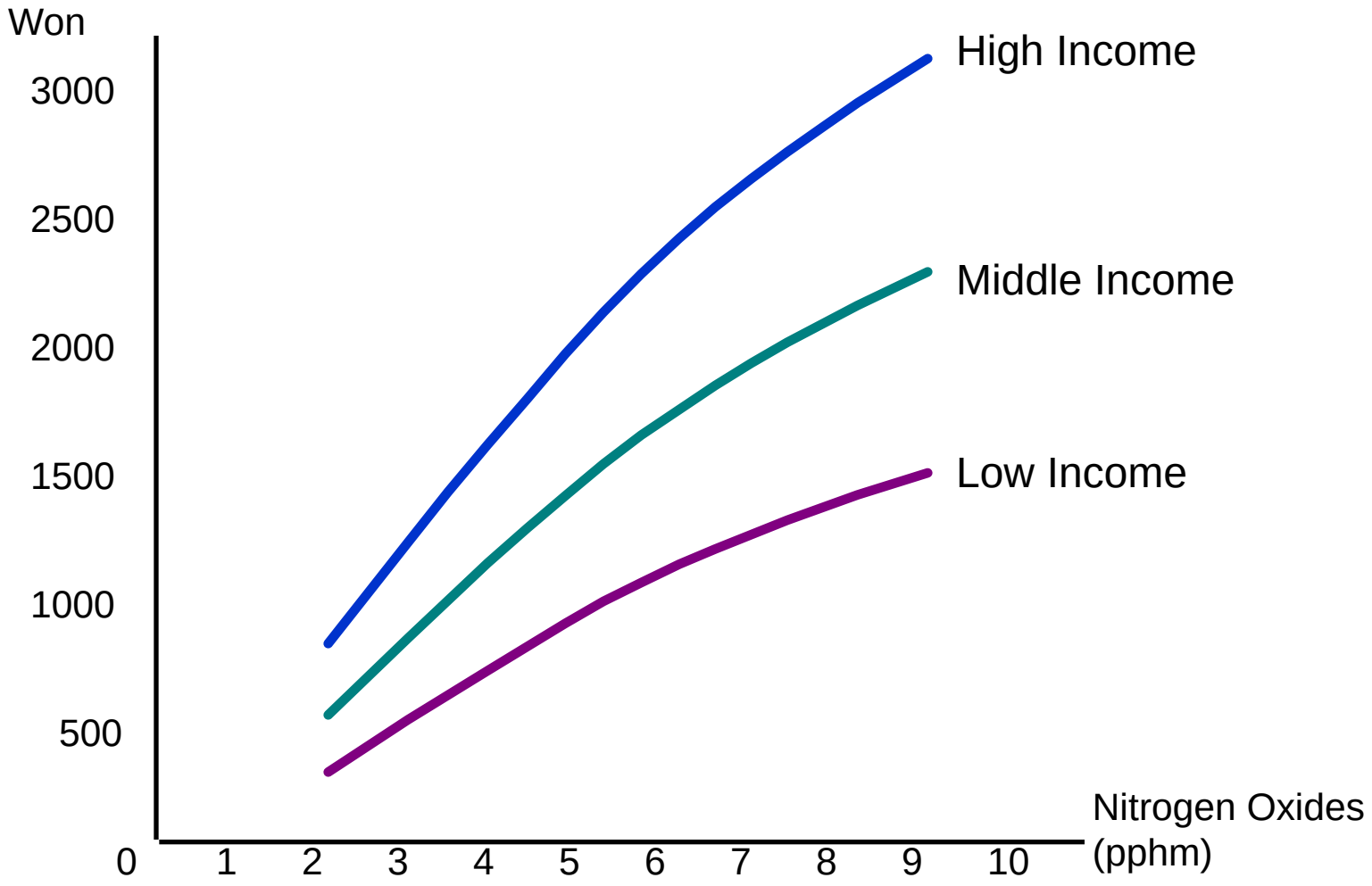
The Demand for Clean Air

- Clean Air is a public good
  - Nonexclusive and nonrival
  - No market and no observable price at which people are willing to trade clean air for other goods

The Demand for Clean Air

- Choosing where to live
  - Study in Boston correlates housing prices with the quality of air and other characteristics of the houses and their neighborhoods.

The Demand for Clean Air



The Demand for Clean Air

- Findings
  - Amount people are willing to pay for clean air increases substantially as pollution increases.
  - Higher income earners are willing to pay more (the gap between the demand curves widen)
  - National Academy of Sciences found that a 10% reduction in auto emissions yielded a benefit of 2 billion---somewhat greater than the cost.

Private Preferences for Public Goods

- Government production of a public good is advantageous because the government can assess taxes or fees to pay for it.
- Determining how much of a public good to provide when free riders exist is difficult.