Macroeconomics: Principles & Applications

CHAPTER 4

Working with Supply and Demand

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Government Intervention in Markets

- Governments
  - Sometimes intervene to change the market outcome
  - Fight the market
    - Prevent the price from reaching equilibrium value
      - Price ceilings
      - Price floors

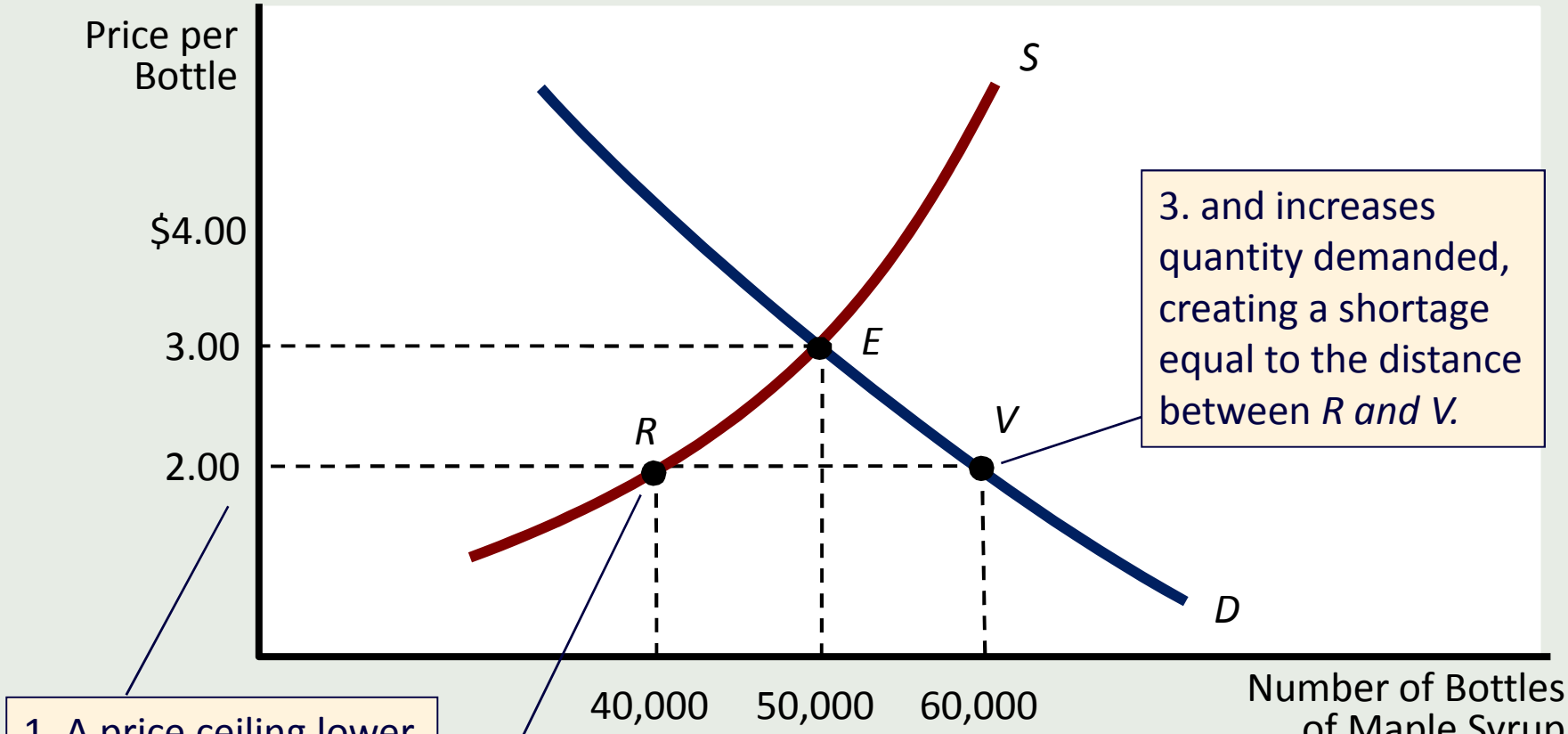
Fighting the Market: Price Ceilings

- Price ceiling
  - Government-imposed maximum price in a market
- Short side of the market
  - The smaller of quantity supplied and quantity demanded at a particular price
- When Q^D and Q^S differ
  - The short side of the market will prevail

Fighting the Market: Price Ceilings

- Shortage
  - Excess demand not eliminated by a rise in price
  - $Q^D > Q^S$
- Price ceiling
  - Creates a shortage
  - Increases the time and trouble required to buy the good
  - Price decreases
  - Opportunity cost may rise

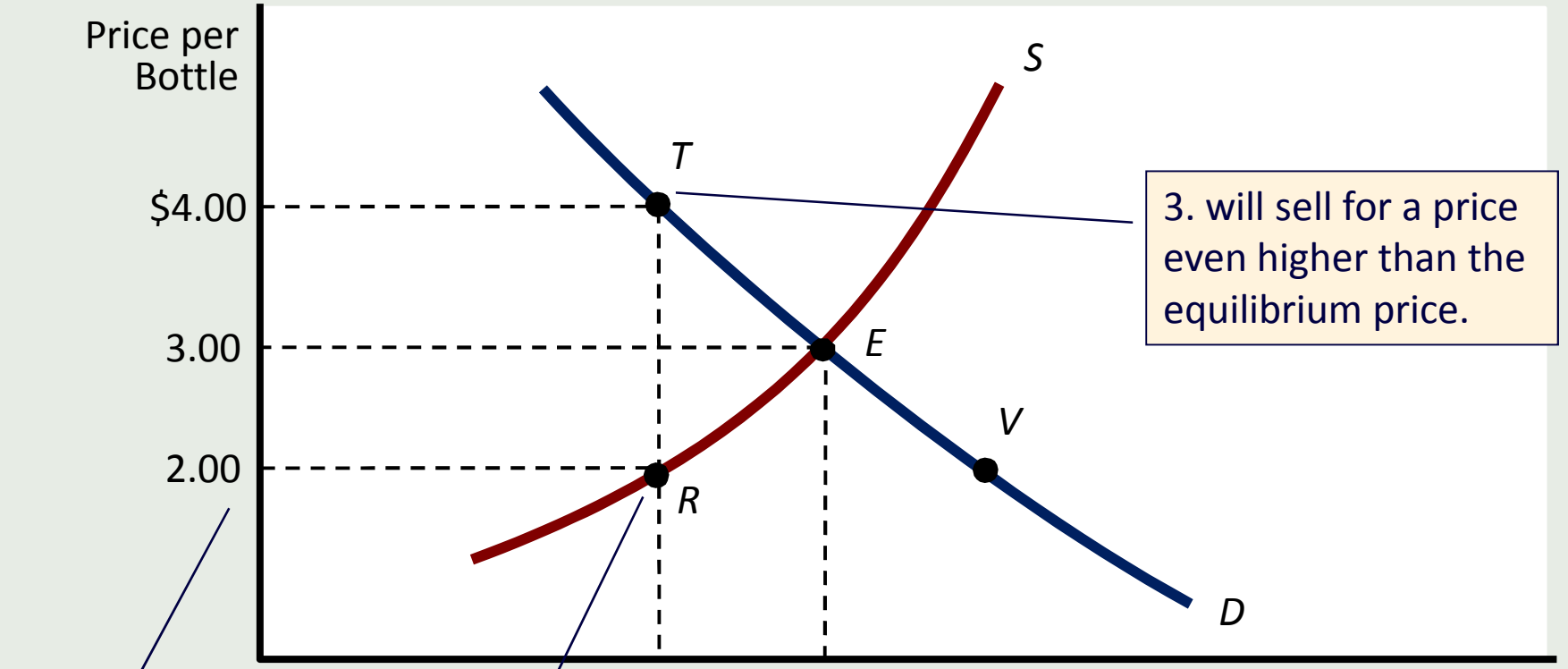
Figure 1: A price ceiling in the market for maple syrup



Fighting the Market: Price Ceilings

- Black market
  - A market in which goods are sold illegally at a price above the legal ceiling
  - Price – above equilibrium price
- Unintended consequences of price ceilings
  - Long lines
  - Black markets
  - Often, higher prices

Figure 2: A price ceiling with a black market



Fighting the Market: Price Ceilings

- Rent control
  - Price ceiling imposed in a rental housing market
  - Government-imposed maximum rents on apartments and homes
  - Purpose: to keep housing affordable
    - Especially for those with low incomes

Fighting the Market: Price Ceilings

- Problems with rent control
  - It doesn't target those with low incomes
    - Luck
  - Persistent excess demand
    - Wasted time
    - 'black market'
    - Rent – higher than rent-controlled price
  - Decrease in the quantity of apartments supplied

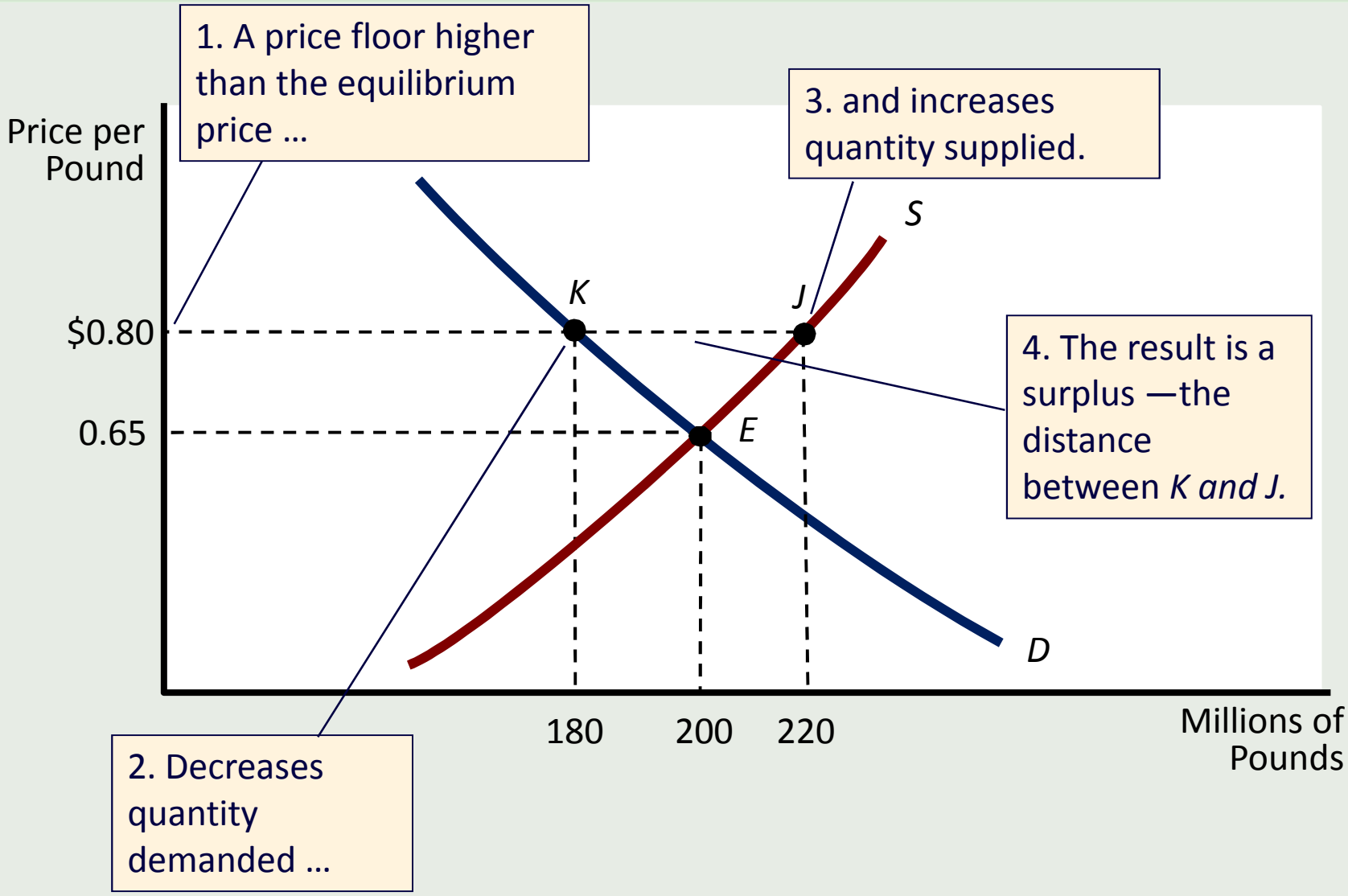
Fighting the Market: Price Floors

- Price floor
  - Government-imposed minimum price in a market
  - Purpose: to help sellers
- Price floors for agricultural goods
  - Price support programs
  - United States Department of Agriculture (USDA)
    - Programs to maintain high prices for cotton, wheat, rice, corn, tobacco, honey, milk, cheese, butter

Fighting the Market: Price Floors

- Surplus
  - Excess supply not eliminated by a fall in price
  - $Q_S > Q_D$
- Price floor
  - Surplus of a good
  - Temptation – to sell the surplus below the price floor
  - Government – purchases the surplus

Figure 3: A price floor in the market for nonfat dry milk



Fighting the Market: Price Floors

- Government - limit any excess supplies
  - Dairy market - control the production and sale
  - Government - ordered or paid farmers not to grow crops on portions of their land
  - Imposed strict limits on imports of food from abroad

Fighting the Market: Price Floors

- Critics
  - Government- spends too much money buying surplus agricultural products
  - Higher prices distort the public's buying and eating habits
  - Assistance – support all farmers
    - Many farmers - wealthy individuals or powerful corporations
    - More cost-effective if given directly to those truly in need

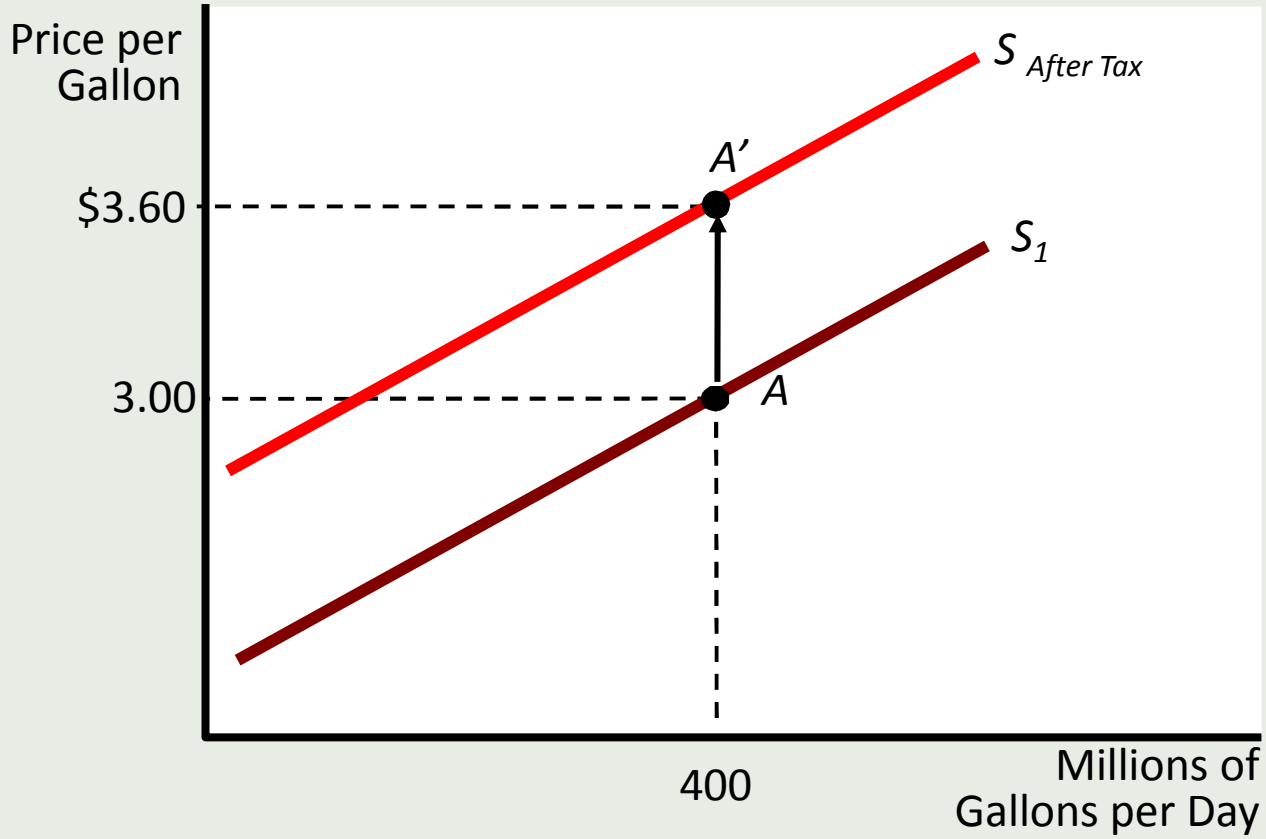
Manipulating the Market: Taxes

- Excise tax
  - A tax on a specific good or service
  - Can be collected from either sellers or buyers
- Tax incidence
  - The division of a tax payment between buyers and sellers
  - Determined by comparing the new (after tax) and old (pretax) market equilibriums

Manipulating the Market: Taxes

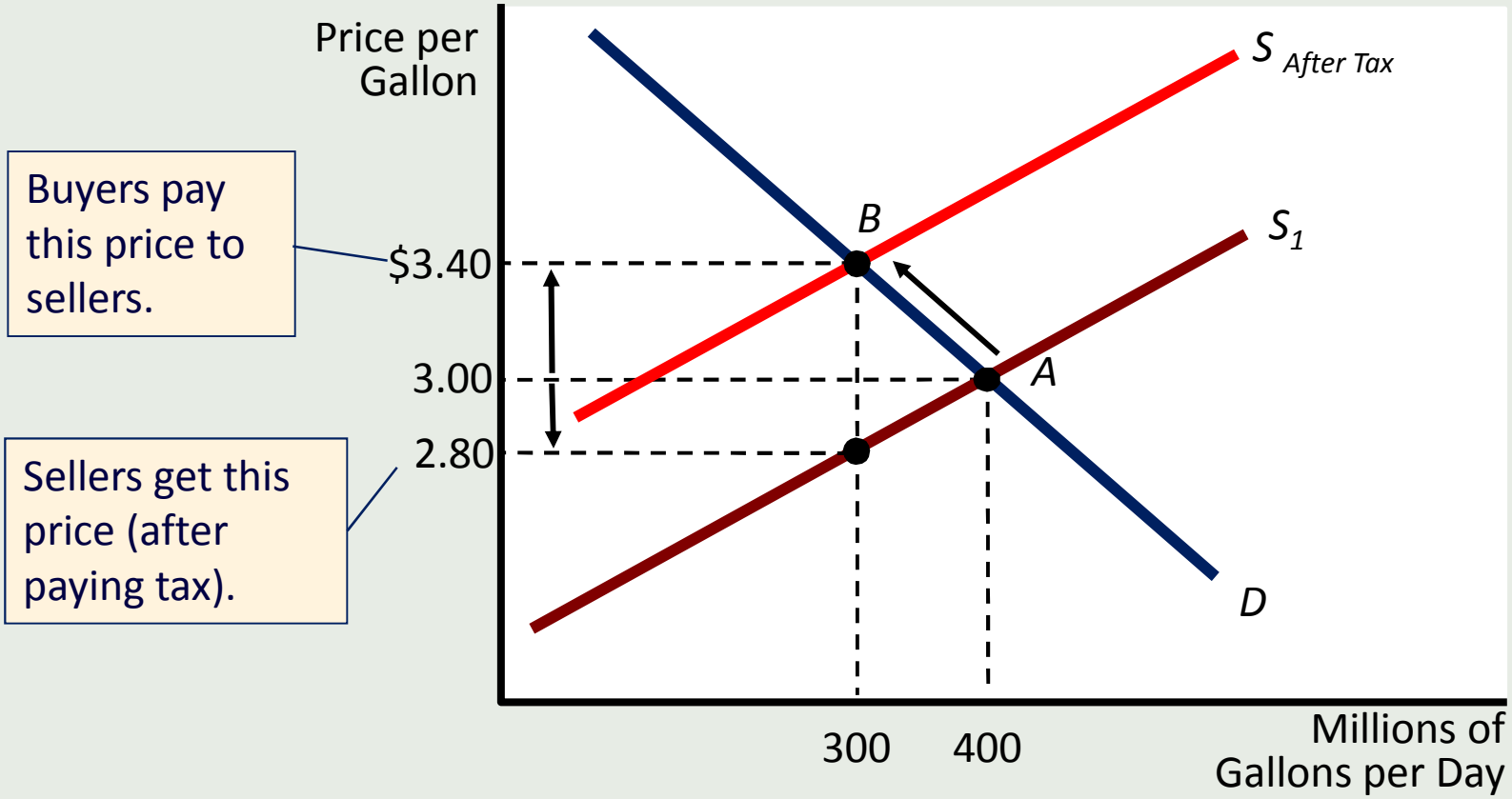
- Tax shifting
  - Some/all of a tax imposed on one side of a market
  - Ends up being paid by the other side of the market
- Excise tax on sellers
  - Shifts the supply curve upward by the amount of the tax
  - Incidence: both sides of the market
    - Buyers pay more
    - Sellers receive less

Figure 4: A tax on sellers shifts the supply curve upward



After a $0.60 per gallon tax is imposed on sellers, the price at which any given quantity would be supplied is $0.60 greater than before, so the supply curve shifts upward. For example, before the tax, 400 million gallons would be supplied at $3 per gallon (point A); after the tax, to get that same quantity supplied requires a price of $3.60 (point A').

Figure 5: The effect of an excise tax imposed on sellers

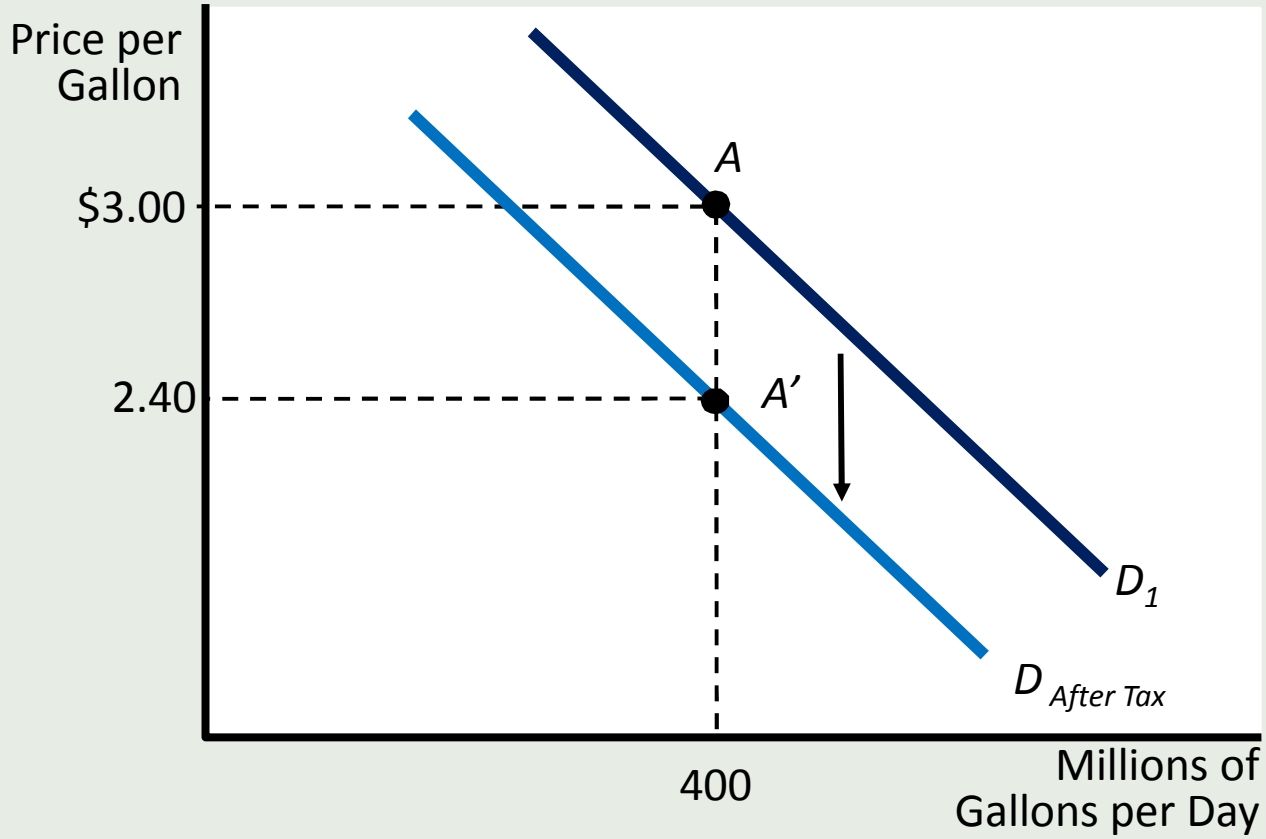


After a $0.60 excise tax is imposed on sellers, the market equilibrium moves from point A to point B, with buyers paying sellers $3.40 per gallon. But sellers get only $3.40 - $0.60 after paying the tax. Thus, the tax causes buyers to pay $0.40 more per gallon, and sellers to get $0.20 less.

Manipulating the Market: Taxes

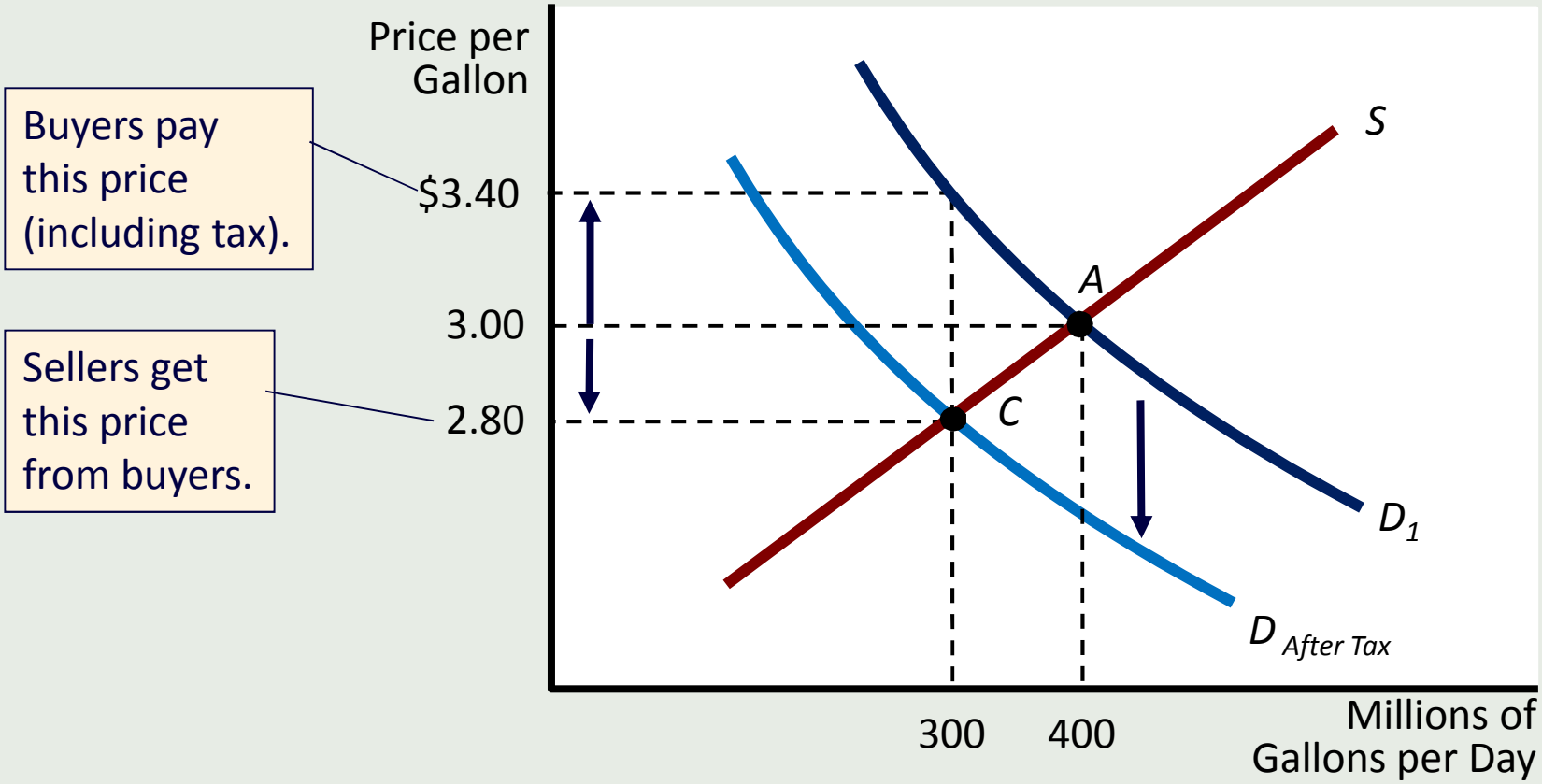
- Excise tax on buyers
  - Shifts the demand curve downward by the amount of the tax
  - Tax incidence – both sides of the market
    - Buyers pay more
    - Sellers receive less

Figure 6: A tax on buyers shifts the demand curve downward



After a $0.60 per gallon tax is imposed on buyers, the price at which any given quantity would be demanded is $0.60 less than before, so the demand curve shifts downward. For example, before the tax, 400 million gallons would be demanded at $3 per gallon (point A); after the tax, that same quantity would be demanded at a price of $2.40 (point A').

Figure 7: The effect of an excise tax imposed on buyers



After a $0.60 excise tax is imposed on buyers, the market equilibrium moves from point A to point C, with buyers paying sellers $2.80 per gallon. But buyers pay a total of $2.80 + $0.60 = $3.40 per gallon when the tax is included. Thus, the tax causes buyers to pay $0.40 more, and sellers to get $0.20 less, just as when the tax is imposed on sellers.

Manipulating the Market: Taxes

- Tax incidence
  - Distribution of tax burden between buyers and sellers
- Tax incidence
  - Is the same whether the tax is collected from buyers or sellers

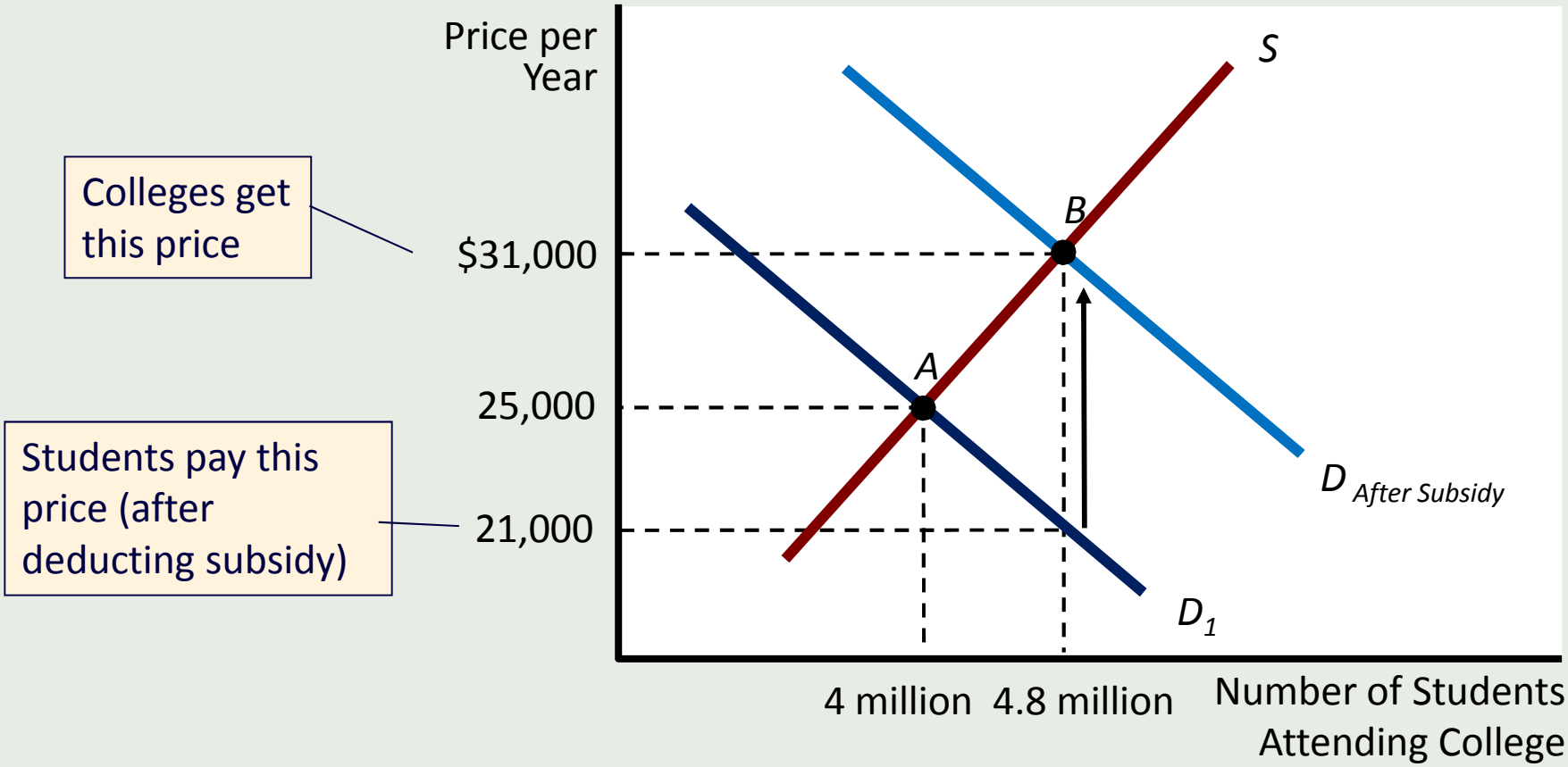
Manipulating the Market: Subsidies

- Subsidy
  - A government payment to buyers or sellers on each unit purchased or sold
    - Medical care for the poor and elderly
    - Energy-saving equipment
    - Smoking-cessation programs
    - College education

Manipulating the Market: Subsidies

- Subsidy to buyers
  - Shifts the demand curve upward by the amount of the subsidy
  - Benefits both sides of a market
    - Buyers pay less
    - Sellers receive more for each unit sold

Figure 8: A subsidy for students attending college



After a $10,000 subsidy is given to college students, the market equilibrium moves from point A to point B, with students paying colleges $31,000 per year. But students pay a total of $31,000 - $10,000 = $21,000 when their subsidy is deducted. Thus, the subsidy causes students to pay $4,000 less per year, and causes colleges to get $6,000 more per year.

Manipulating the Market: Subsidies

- Subsidy to sellers
  - Shifts the supply curve downward by the amount of the subsidy
  - Benefits both sides of a market
    - Buyers pay less
    - Sellers receive more for each unit sold
- Distribution of benefits from a subsidy
  - Are the same, regardless of whether the subsidy is paid to buyers or sellers

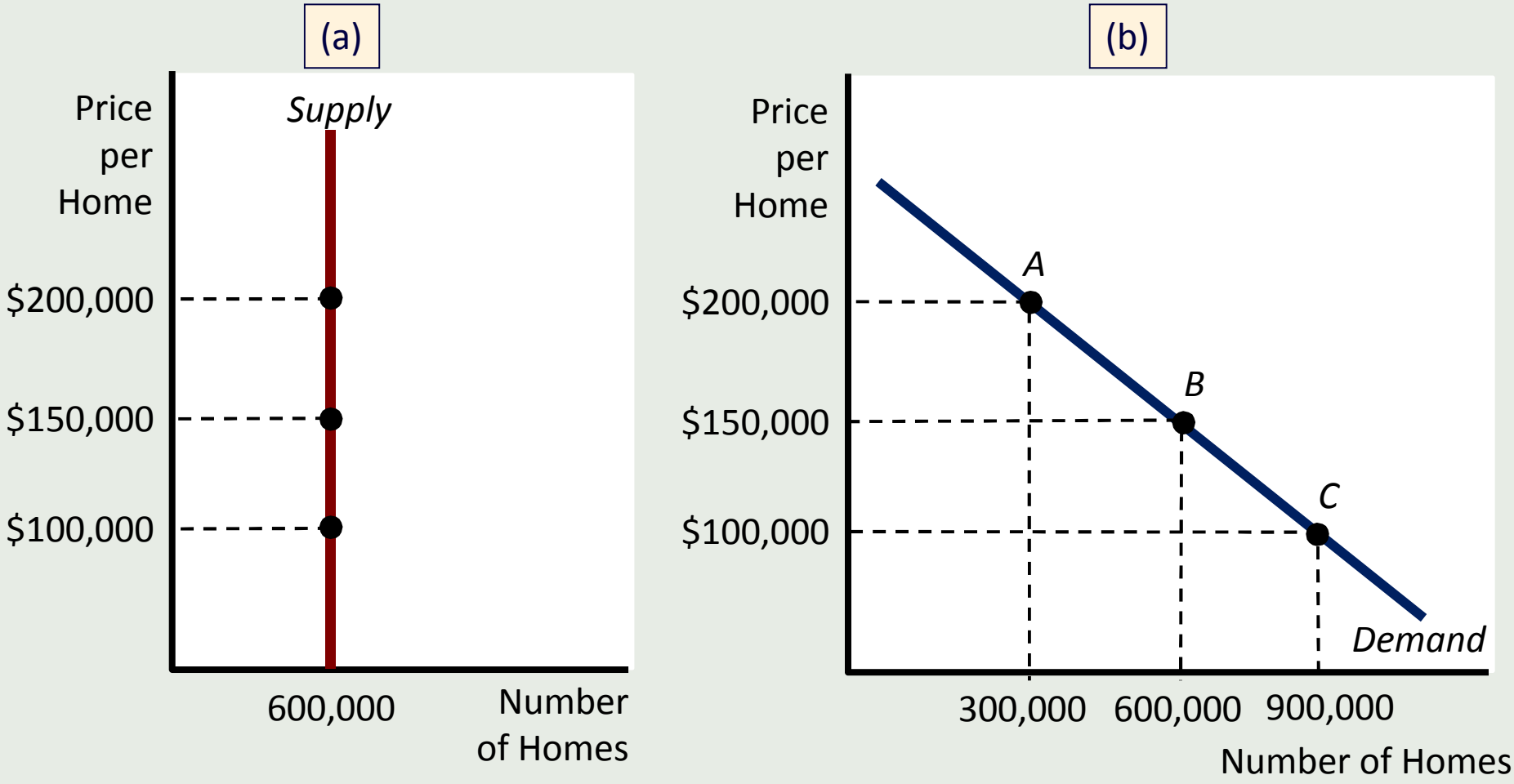
Supply and Demand in Housing Markets

- Stock variable
  - Measures a quantity in existence at a moment in time
    - Housing stock
      - Number of homes that people own at a given time
- Flow variable
  - Measures a process that takes place over a period of time
    - New home construction
    - New home purchases

Supply and Demand in Housing Markets

- Supply
  - Housing stock
  - Vertical
- Demand
  - Demand for housing stock
  - Downward sloping
  - Number of families who want to be homeowners at each price
    - Households – can own only one home

Figure 9: Supply and Demand Curves in a Housing Market



The supply curve for housing tells us the number of homes that exist at a particular time, which does not depend on the price. The demand curve tells us how many homes people in the market want to own. The lower the price, the greater the quantity of homes demanded.

Supply and Demand in Housing Markets

- Home ownership
  - An alternative to renting
- Monthly cost of owning a home
  - Maintenance, property taxes, interest
- Monthly costs for prospective owners
  - Foregone monthly interest
  - Mortgage and interest
  - Higher home prices
    - Higher cost of ownership

Supply and Demand in Housing Markets

- Mortgage
  - Loan given to a homebuyer
  - Part of the purchase price of the home
- Monthly costs for current owners
  - Foregone interest
  - Higher home prices
    - Higher cost of ownership

Supply and Demand in Housing Markets

- Monthly cost of ownership
  - Current homeowners
  - Prospective homeowners
  - Rises when home price rise
  - Falls when home prices fall
- Movement along housing demand
  - Change in price
  - Other things constant

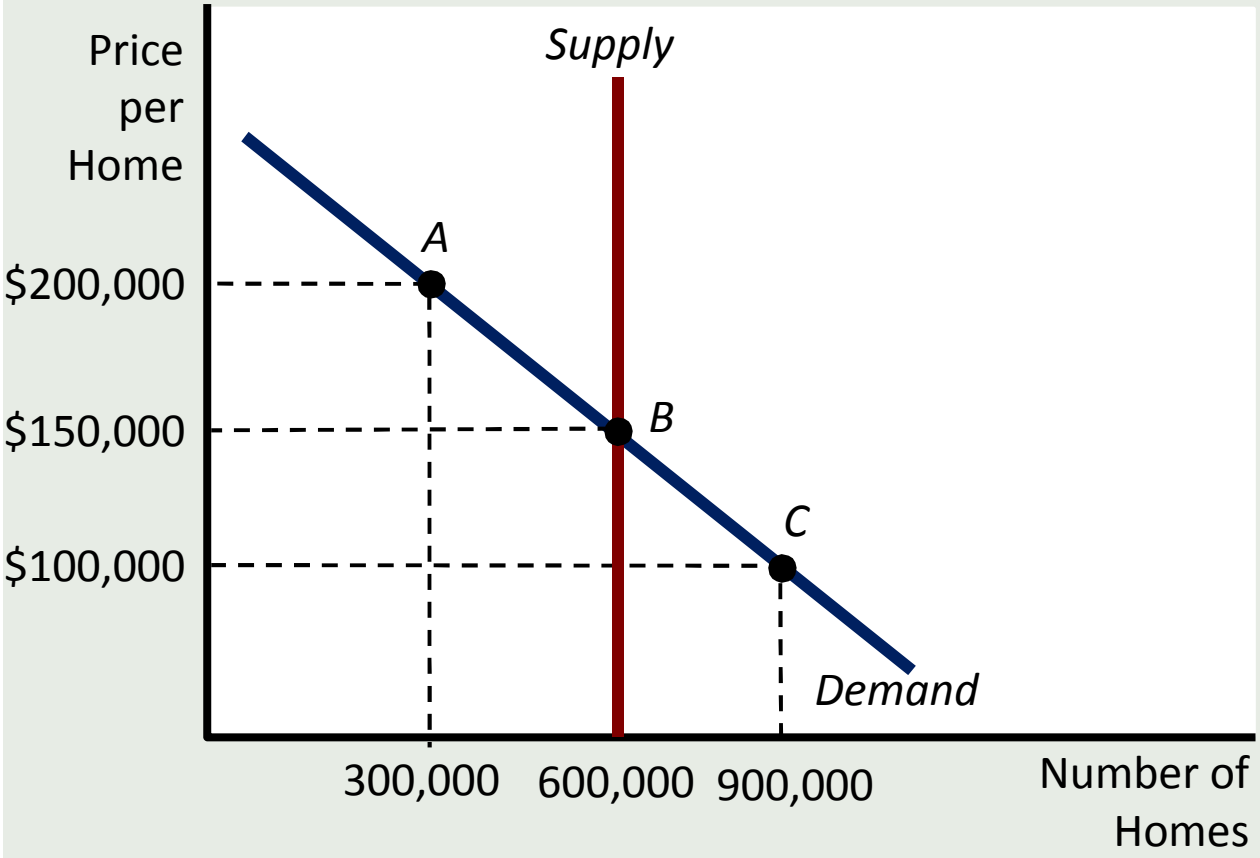
Supply and Demand in Housing Markets

- Shifts in housing demand
  - Monthly cost of renting a home
  - Interest rates in the economy
  - Tastes for homeownership
  - Average income
  - Population

Housing Market Equilibrium

- Equilibrium price
  - Quantity of homes demanded
    - Number that people want to own
  - Equals quantity supplied
    - Housing stock

Figure 10: Equilibrium in a Housing Market



The equilibrium in this market is at point B, where the price of homes is $150,000. If the price were higher—say $200,000– the number of homes people want to own (300,000 at point A) would be less than the number in existence and currently owned (600,000). Owners would try to sell, and the price would fall until all 600,000 homes were demanded.

. If the price were lower than the equilibrium price—say $100,000—the number of homes people want to own (900,000 at point C) would be less than the number in existence and currently owned (600,000). People would try to buy homes, and the price would rise until only 600,000 were demanded.

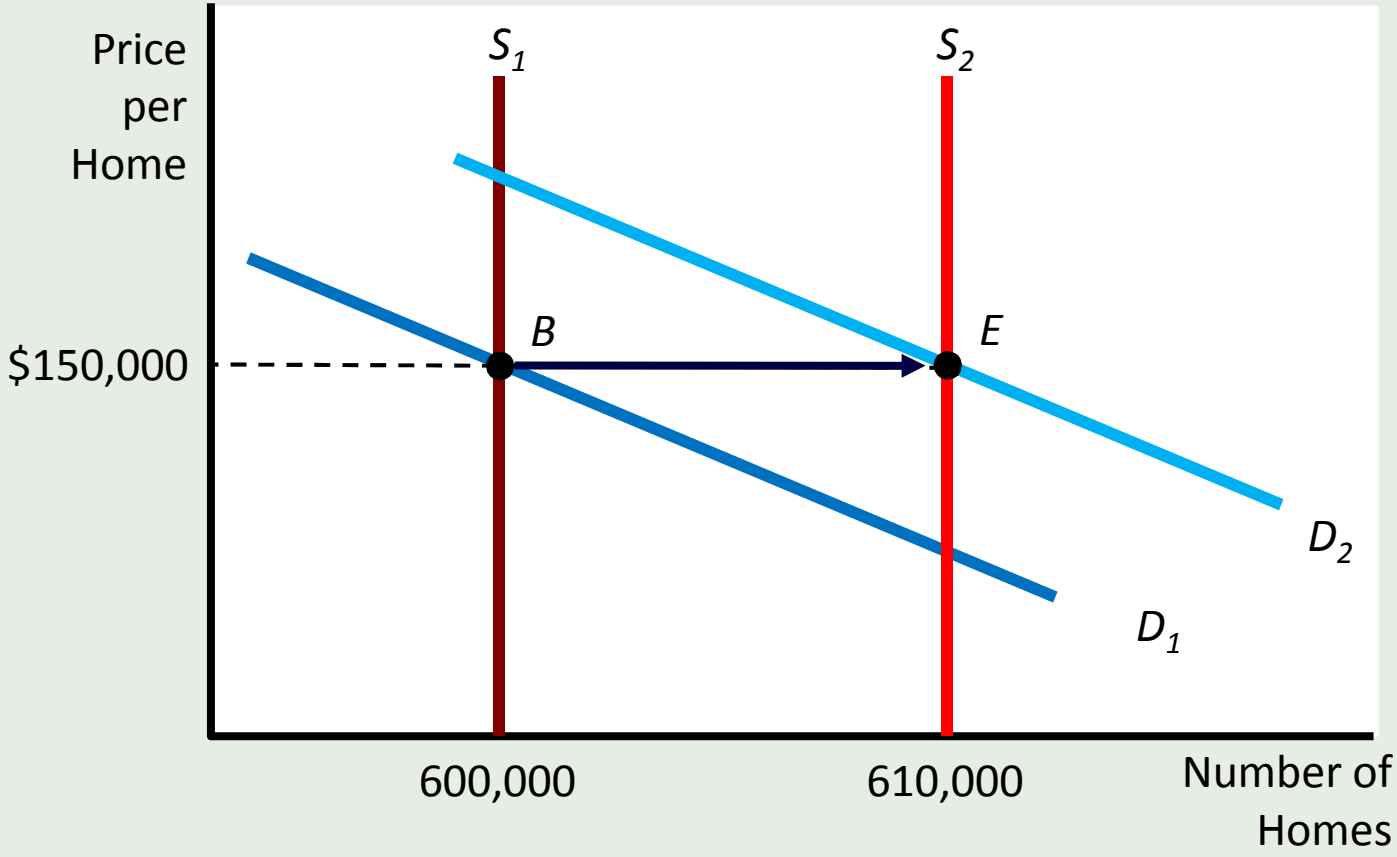
What Happens when Things Change

- Over time
  - Supply curve shifts rightward
    - As the housing stock rises (new homes are built)
  - Demand curve shifts rightward
    - Population growth, rising incomes
  - Market equilibrium will move rightward
    - Home prices - relative shifts in the supply and demand curves

What Happens when Things Change

- Equal changes in supply and demand
  - Housing stock grows at the same rate as housing demand
  - Housing prices – unchanged
  - A stable housing market

Figure 11: A Stable Housing Market

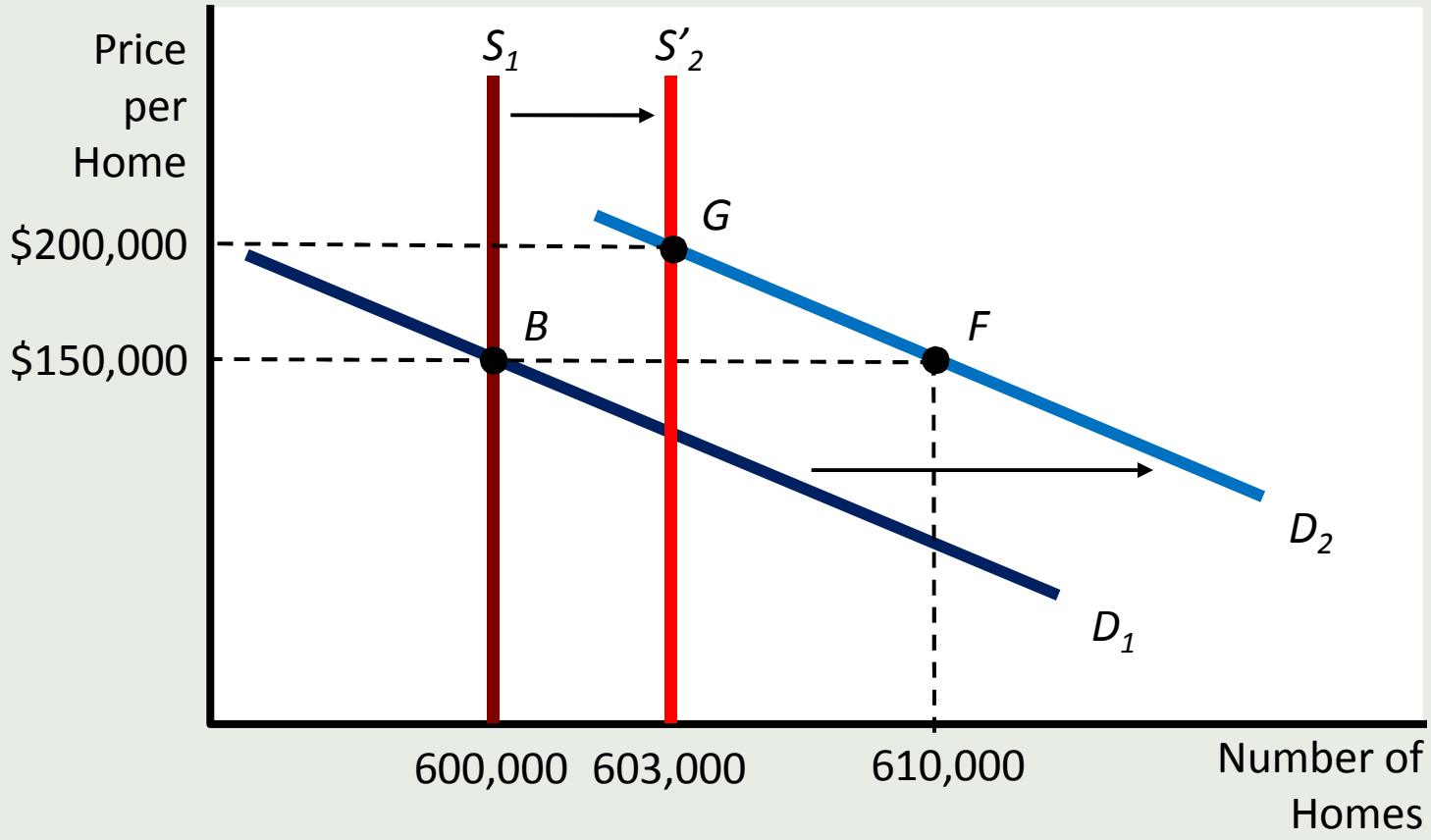


When the supply of homes increases at the same rate as demand for them, the equilibrium price remains unchanged. In the figure, the rightward shift in the supply curve (from S_1 to S_2) is equal to the rightward shift in the demand curve (from D_1 to D_2). Equilibrium moves from point B to point E, but the price remains at $150,000.

What Happens when Things Change

- Restrictions on new building
  - Slow increase in supply
  - Housing stock grows slower than demand
  - Rapidly rising prices

Figure 12: A Housing Market with Restricted Supply Growth



When supply is restricted, and cannot increase as fast as demand, housing prices rise. In the figure, the rightward shift in the supply curve (from S_1 to S_2') is less than the rightward shift in the demand curve (from D_1 to D_2). Equilibrium moves from point B to point G, and the price rises from $150,000 to $200,000

What Happens when Things Change

- Faster demand growth
  - Due to
    - Population shifts
      - Sudden influx of new residents
    - Rapid income growth
      - Booming industry in the area
    - Change in expectations about future prices
  - Rapidly rising prices

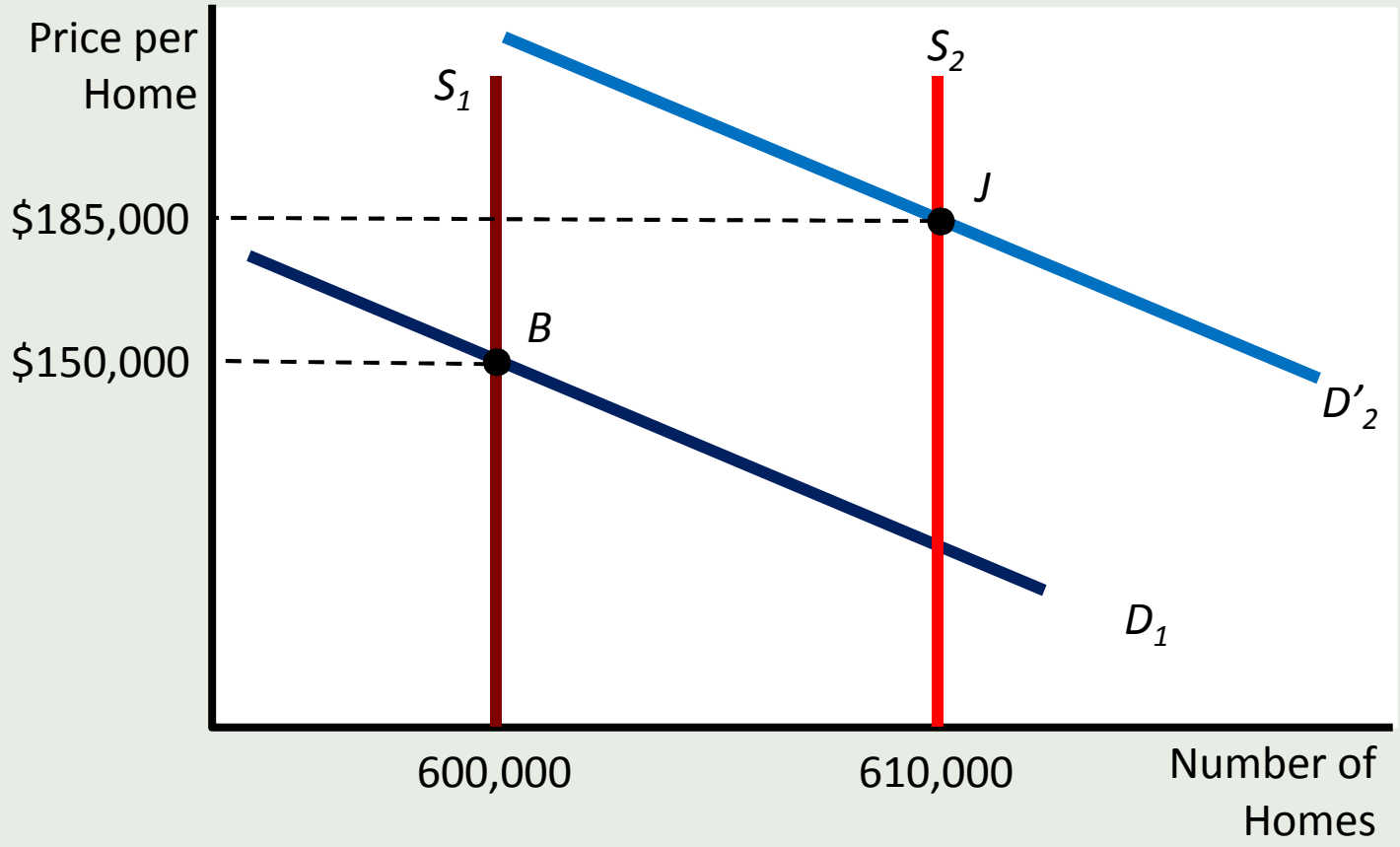
What Happens when Things Change

- House = asset
  - One of the most leveraged financial investments
  - Capital gain
    - Selling price > initial purchase price
  - Capital loss
    - Selling price < initial purchase price

What Happens when Things Change

- Expectations about future prices
  - To increase more rapidly
  - Demand curve shifts rightward –more
  - Housing stock – increases slower
  - Housing prices rise

Figure 13: Accelerating Demand Growth

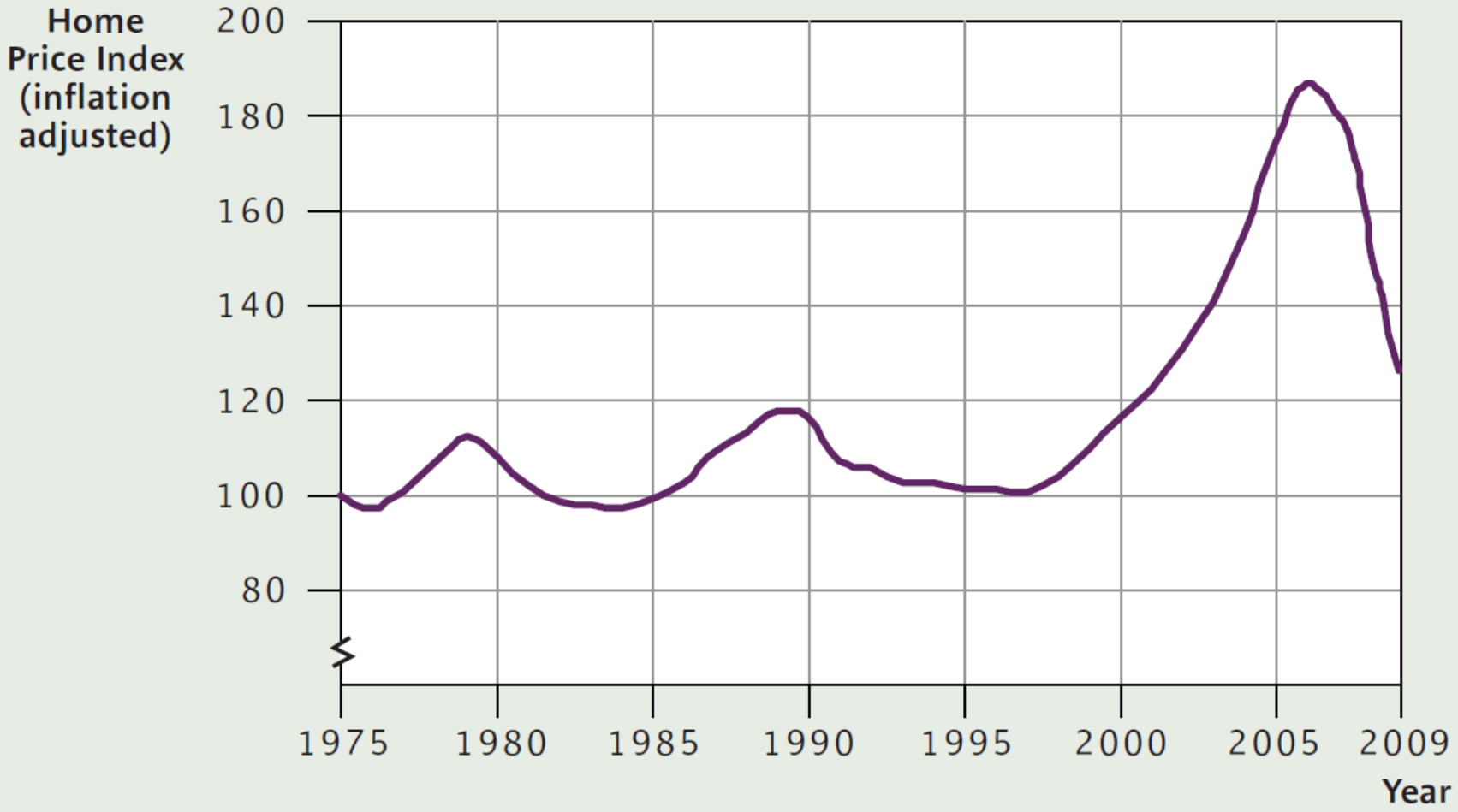


When demand begins to increase faster than previously, increases in supply usually lag behind. In the figure, the rightward shift in the supply curve (from S_1 to S_2) is less than the rightward shift in the demand curve (from D_1 to D_2'). Equilibrium moves from point B to point J, with the price rising from $150,000 to $185,000.

The housing boom of 1997-2006

- 1997 to 2006
  - Housing price index almost doubled
  - Housing 'bubble'
    - Housing boom
    - Housing bust
  - Demand increased more rapidly than supply

Figure 14: Index of Home Prices, Adjusted for Inflation



After adjusting for price changes from general inflation, the housing boom began in 1997, and home prices increased every-more rapidly until 2006. That marked the beginning of the housing bust, with prices dropping dramatically for the next few years.

Housing boom

- Economic growth
  - Higher income, Higher employment
  - Demand curve – rightward shift
- Interest rates
  - Trended downward
  - Demand curve – rightward shift

Housing boom

- Government policy
  - Encourage homeownership
    - Tax deductible mortgage interest payments
    - Purchase mortgages from banks
  - Demand curve – rightward shift

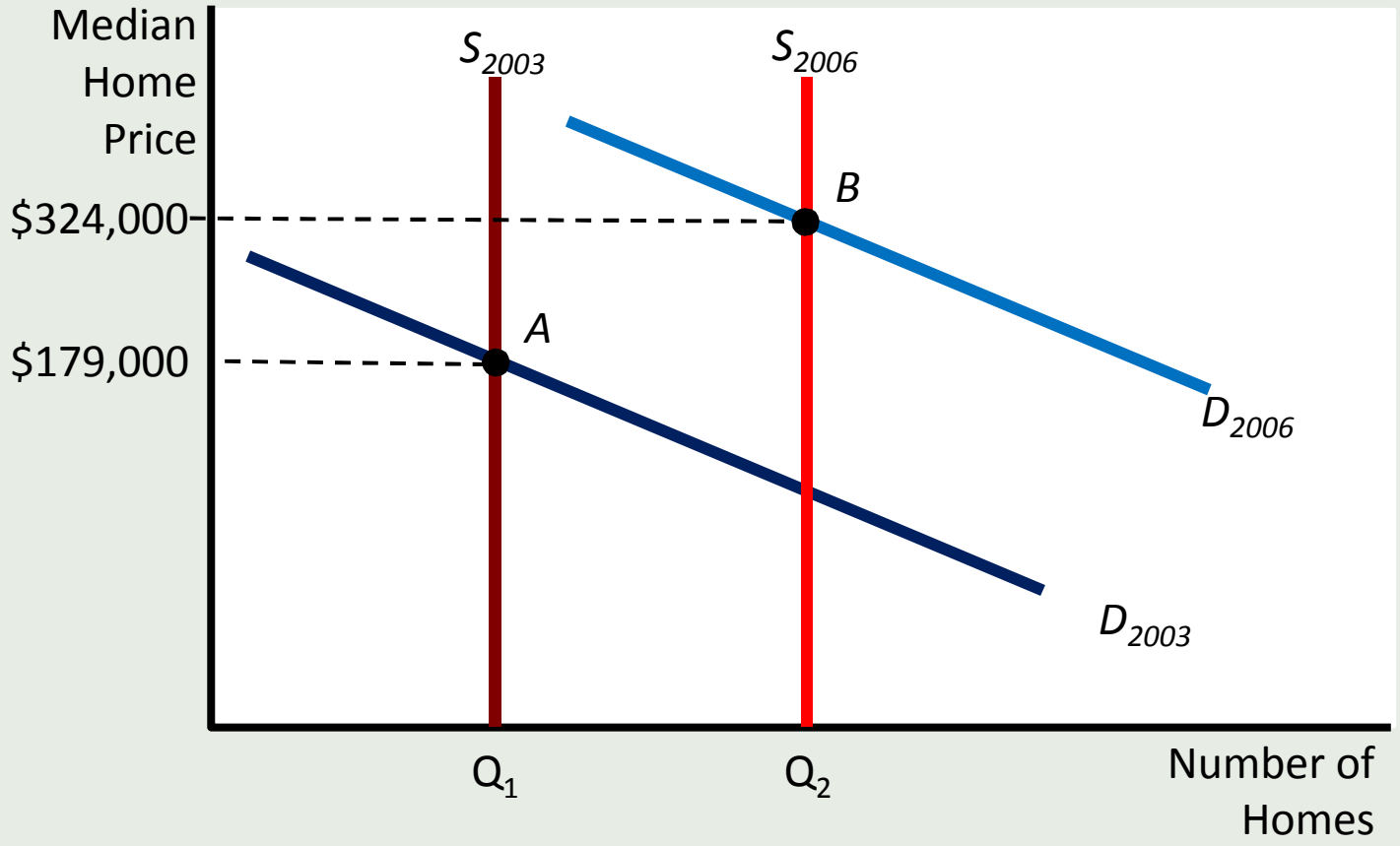
Housing boom

- Financial innovations
  - More-attractive terms for borrowers
    - Adjustable-rate mortgage
  - Mortgage lending more attractive
    - Securitization
    - Mortgage backed securities
  - Demand curve – rightward shift

Housing boom

- Deteriorating lending standards
  - Subprime loans to borrowers who previously would not have qualified
    - Low or unstable incomes
    - Bad credit histories
  - Smaller down-payments
  - Demand curve – rightward shift
- Speculation
  - Demand curve – rightward shift

Figure 15: The Housing Boom in Las Vegas



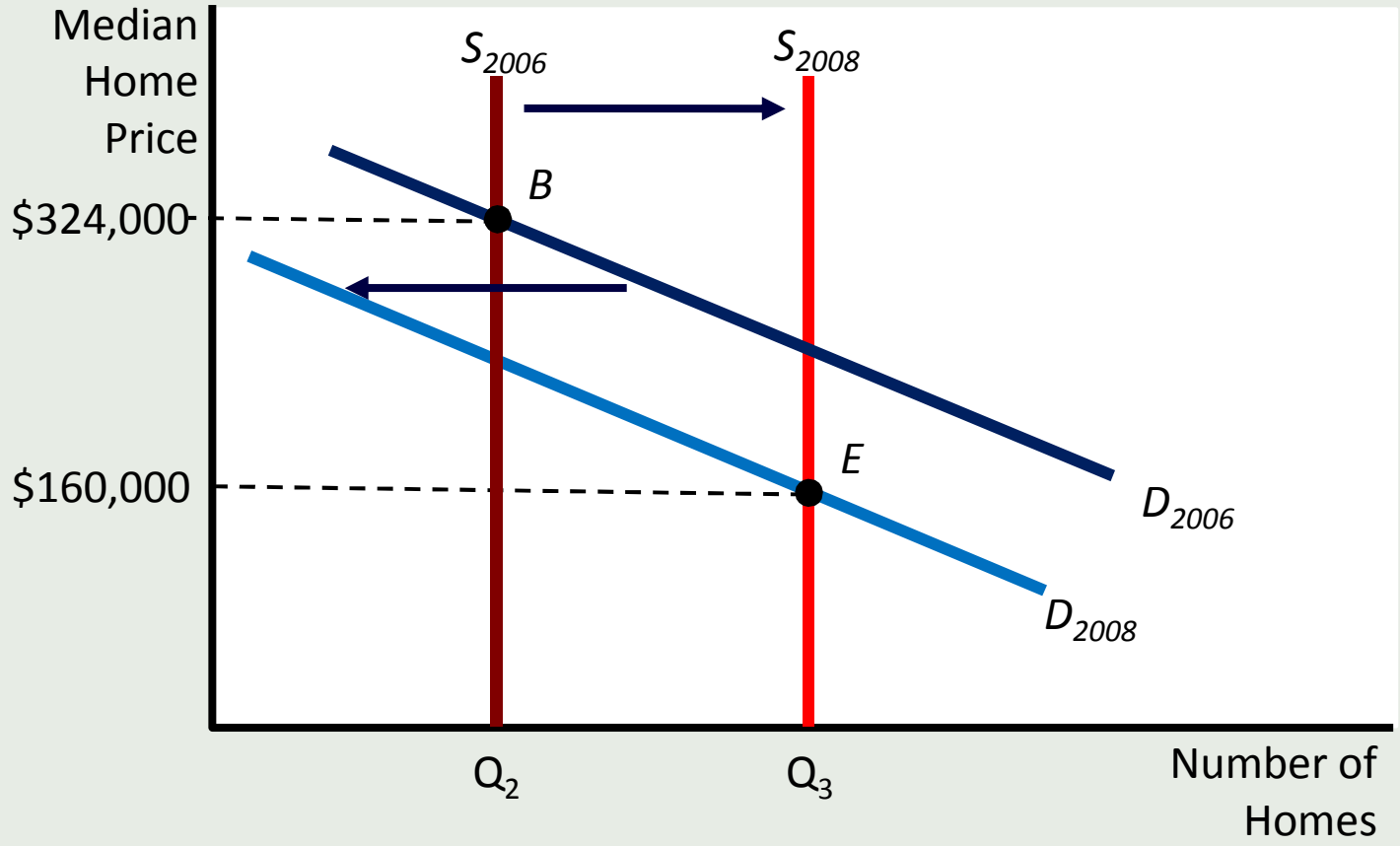
Housing bust

- Mid-2006
  - Oil and gasoline prices spiked
    - Many new homeowners were struggling to make ends meet
  - Interest rates on a large group of adjustable rate mortgages reset to higher levels
  - Disturbing rise in defaults
    - Subprime mortgages with no down payments
  - Prospect of higher default rates

Housing bust

- Mid-2006
  - Interest rates on new mortgages – rose
  - Demand curve for housing shifted leftward
    - Housing prices fell
  - Speculation
    - Demand curve shifted further leftward
    - Housing prices fell even more rapidly

Figure 16: The Housing Bust in Las Vegas



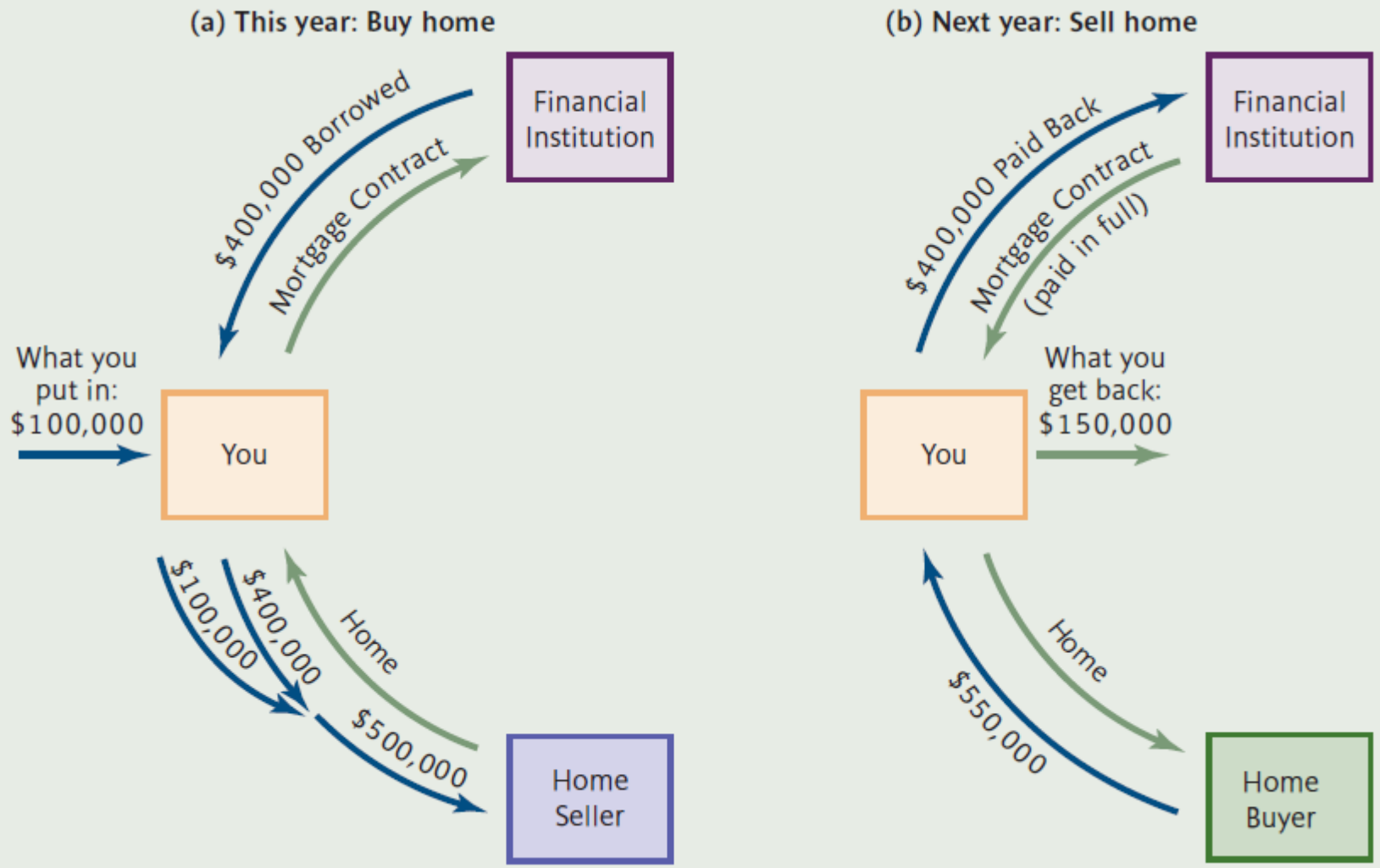
Leverage

- Without leverage
  - 10% higher housing prices
    - 10% capital gains
  - 10% lower housing prices
    - 10% capital loses

Leverage

- Leveraged financial investment
  - Using borrowed money to buy a home
  - 10% higher housing prices
    - More than 10% capital gains
  - 10% lower housing prices
    - More than 10% capital loses
- Leverage
  - Magnification of gains and losses through borrowing

Figure A1: Leverage Buying and Selling



Measuring leverage

- An owner's equity in an asset
  - Difference between the asset's value and any unpaid debts on the asset
  - Equity in Asset = Value of asset - Debt associated with asset
- Simple leverage ratio
  - Ratio of an asset's value
  - To the owner's equity in the asset

Leverage and rate of return

- Simple leverage ratio = "Rate-of-return multiplier"
- Rate of return on the (leveraged) investment
  - Rate of change in a home's price
  - Times the leverage ratio
- When asset prices rise
  - Leverage increases your rate of return dramatically
- When asset prices fall
  - Leverage increases the chance of wiping out your entire investment