

Managerial Economics & Business Strategy

Chapter 2

Market Forces: Demand and Supply



Overview

I. Market Demand Curve

- The Demand Function
- Determinants of Demand
- Consumer Surplus

II. Market Supply Curve

- The Supply Function
- Supply Shifters
- Producer Surplus

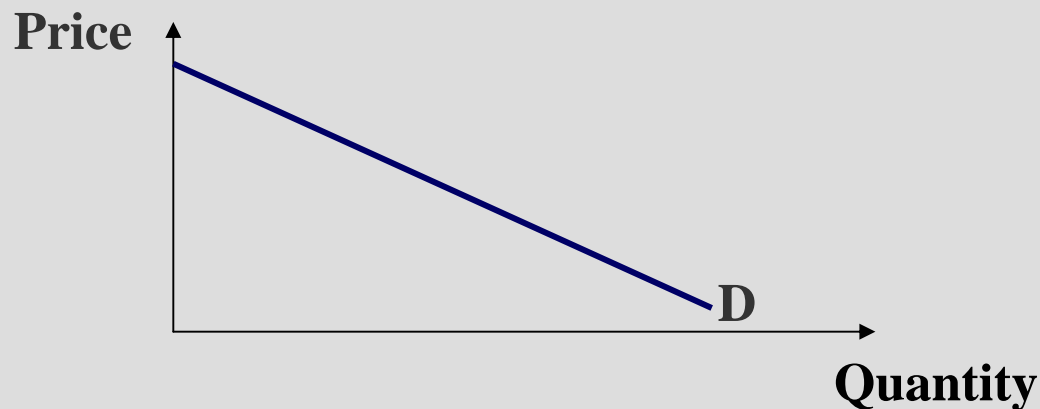
III. Market Equilibrium

IV. Price Restrictions

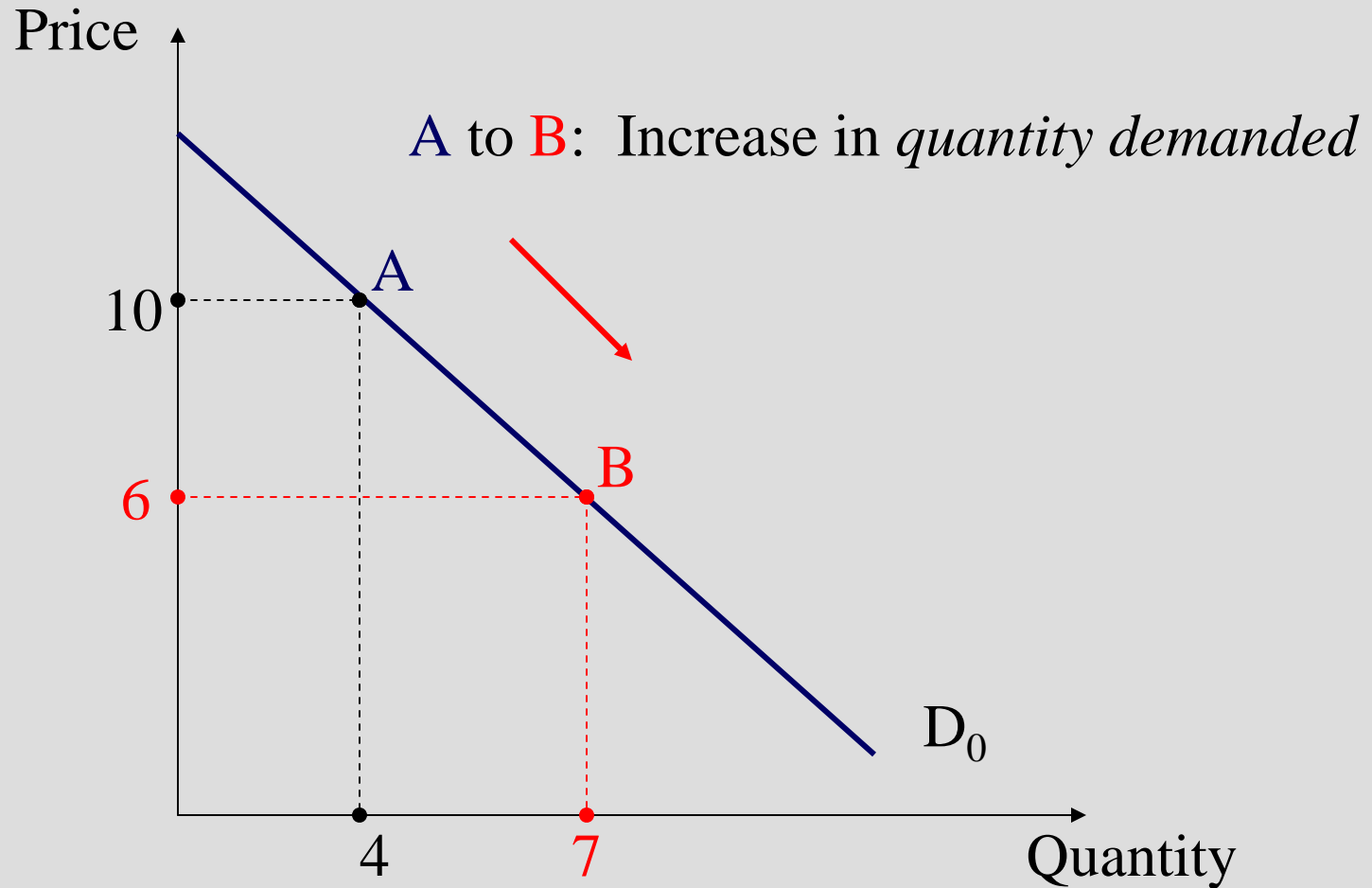
V. Comparative Statics

Market Demand Curve

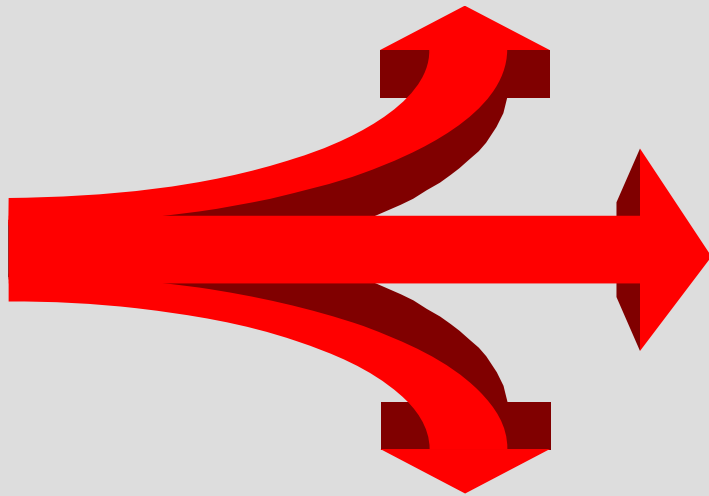
- Shows the amount of a good that will be purchased at alternative prices, holding other factors constant.
- *Law of Demand*
 - The demand curve is downward sloping.



Change in Quantity Demanded

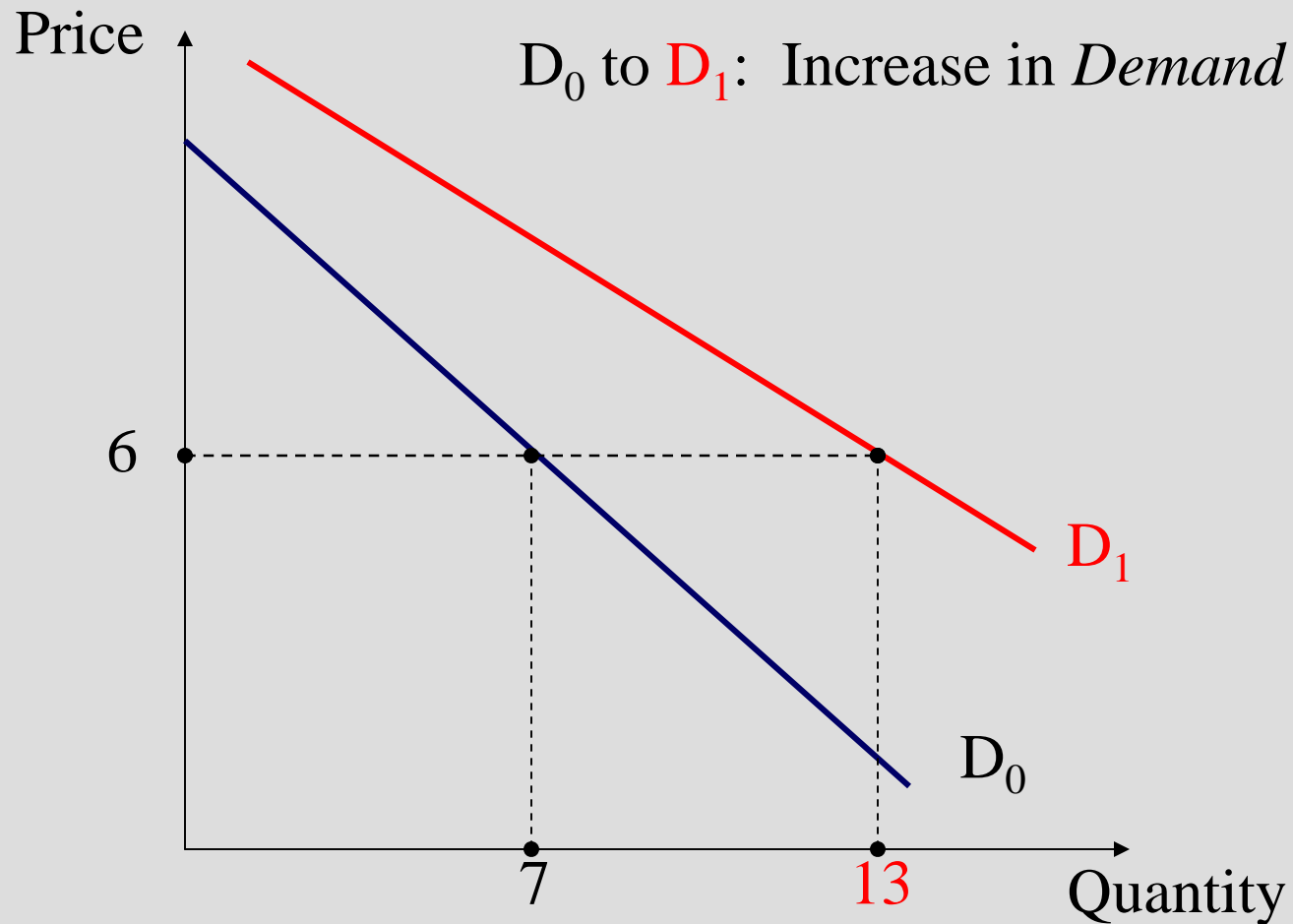


Determinants of Demand



- Income
 - Normal good
 - Inferior good
- Prices of Related Goods
 - Prices of substitutes
 - Prices of complements
- Advertising and consumer tastes
- Population
- Consumer expectations

Change in Demand



The Demand Function

- A general equation representing the demand curve

$$Q_x^d = f(P_x, P_Y, M, H,)$$

- Q_x^d = quantity demand of good X.
- P_x = price of good X.
- P_Y = price of a related good Y.
 - Substitute good.
 - Complement good.
- M = income.
 - Normal good.
 - Inferior good.
- H = any other variable affecting demand.

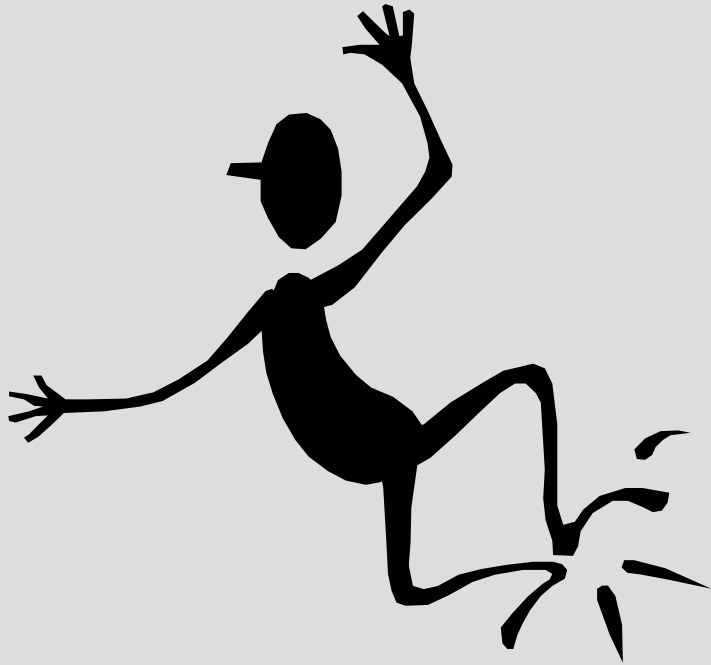
Inverse Demand Function

- Price as a function of quantity demanded.
- Example:
 - Demand Function
 - $Q_x^d = 10 - 2P_x$
 - Inverse Demand Function:
 - $2P_x = 10 - Q_x^d$
 - $P_x = 5 - 0.5Q_x^d$

Consumer Surplus:

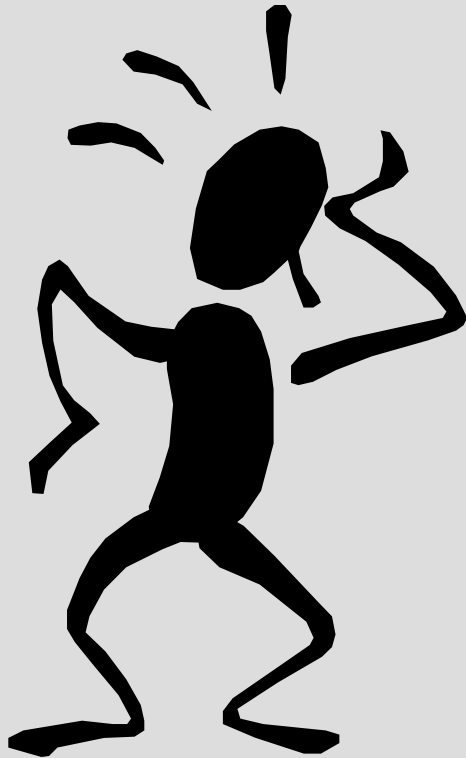
- The value consumers get from a good but do not have to pay for.

I got a great deal!



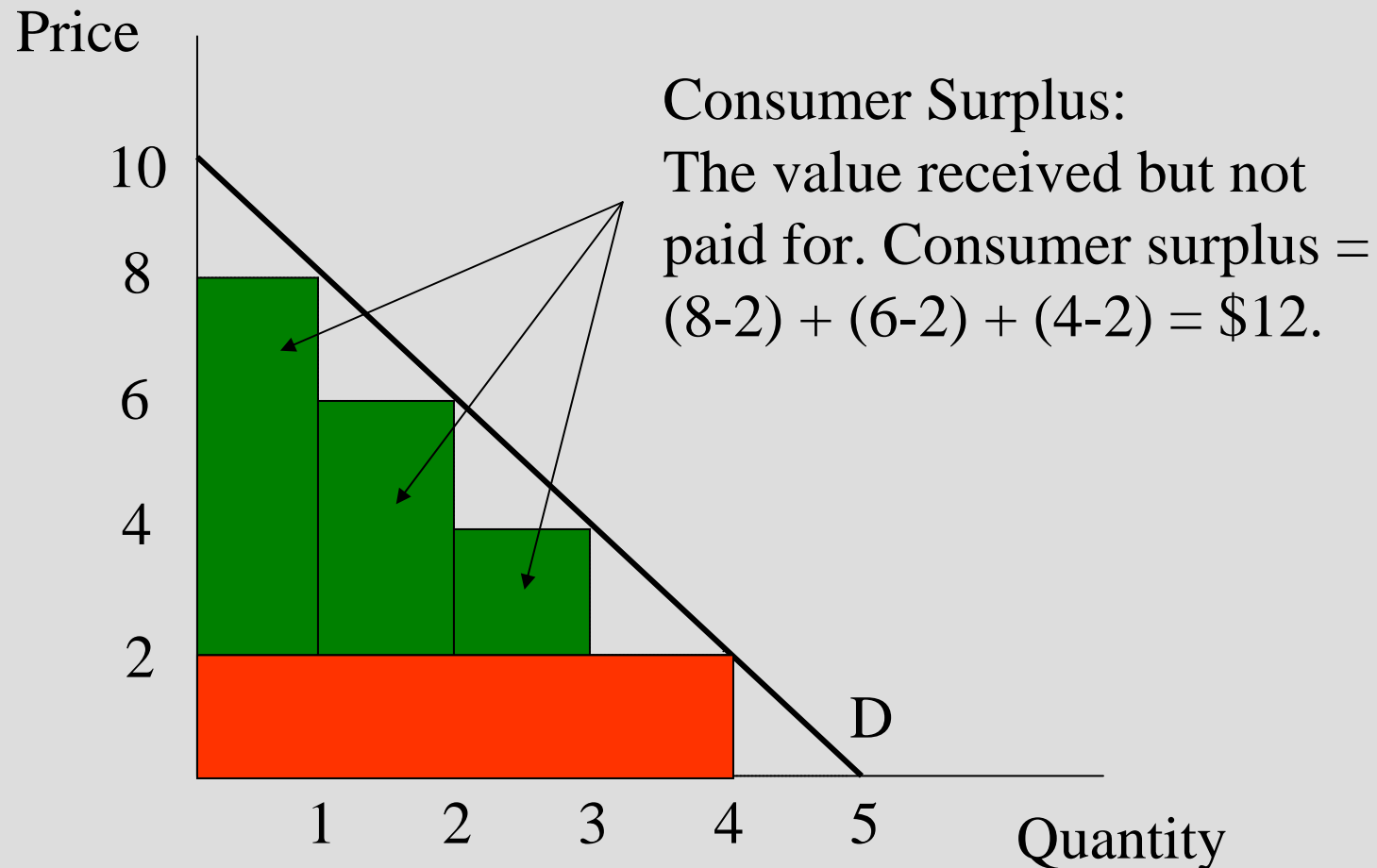
- That company offers a lot of bang for the buck!
- Dell provides good value.
- Total value greatly exceeds total amount paid.
- Consumer surplus is large.

I got a lousy deal!

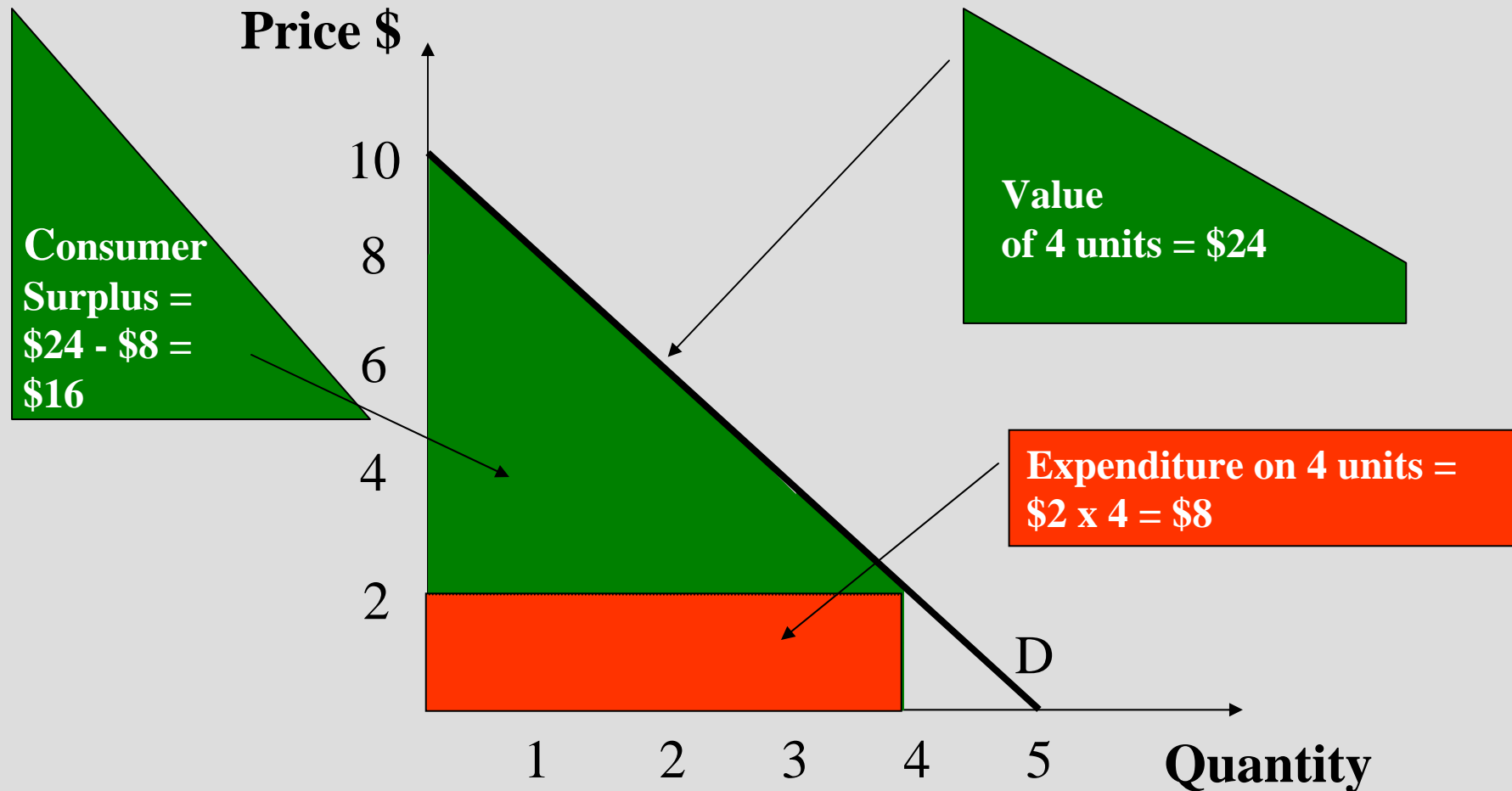


- That car dealer drives a hard bargain!
- I almost decided not to buy it!
- They tried to squeeze the very last cent from me!
- Total amount paid is close to total value.
- **Consumer surplus is low.**

Consumer Surplus: The Discrete Case

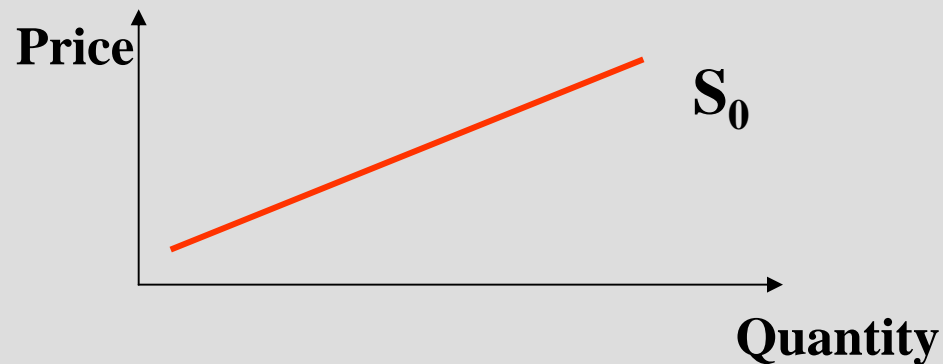


Consumer Surplus: The Continuous Case

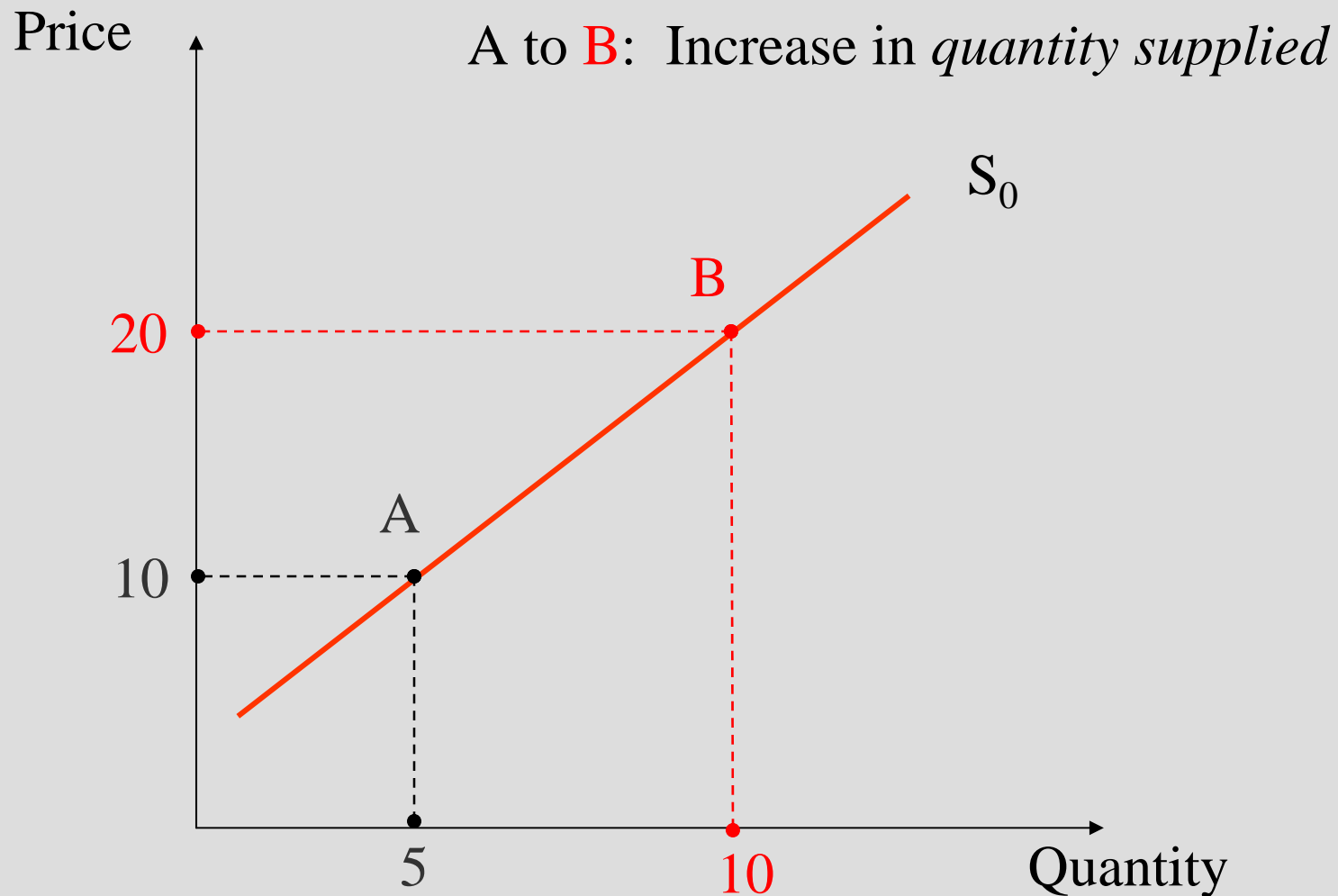


Market Supply Curve

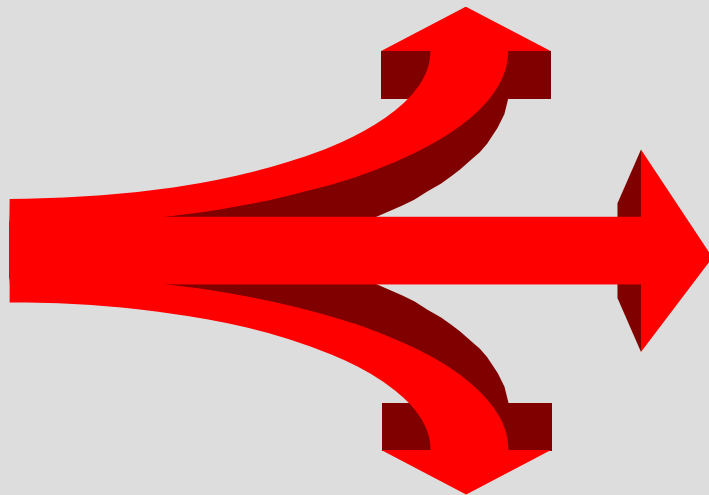
- The supply curve shows the amount of a good that will be produced at alternative prices.
- *Law of Supply*
 - The supply curve is upward sloping.



Change in Quantity Supplied



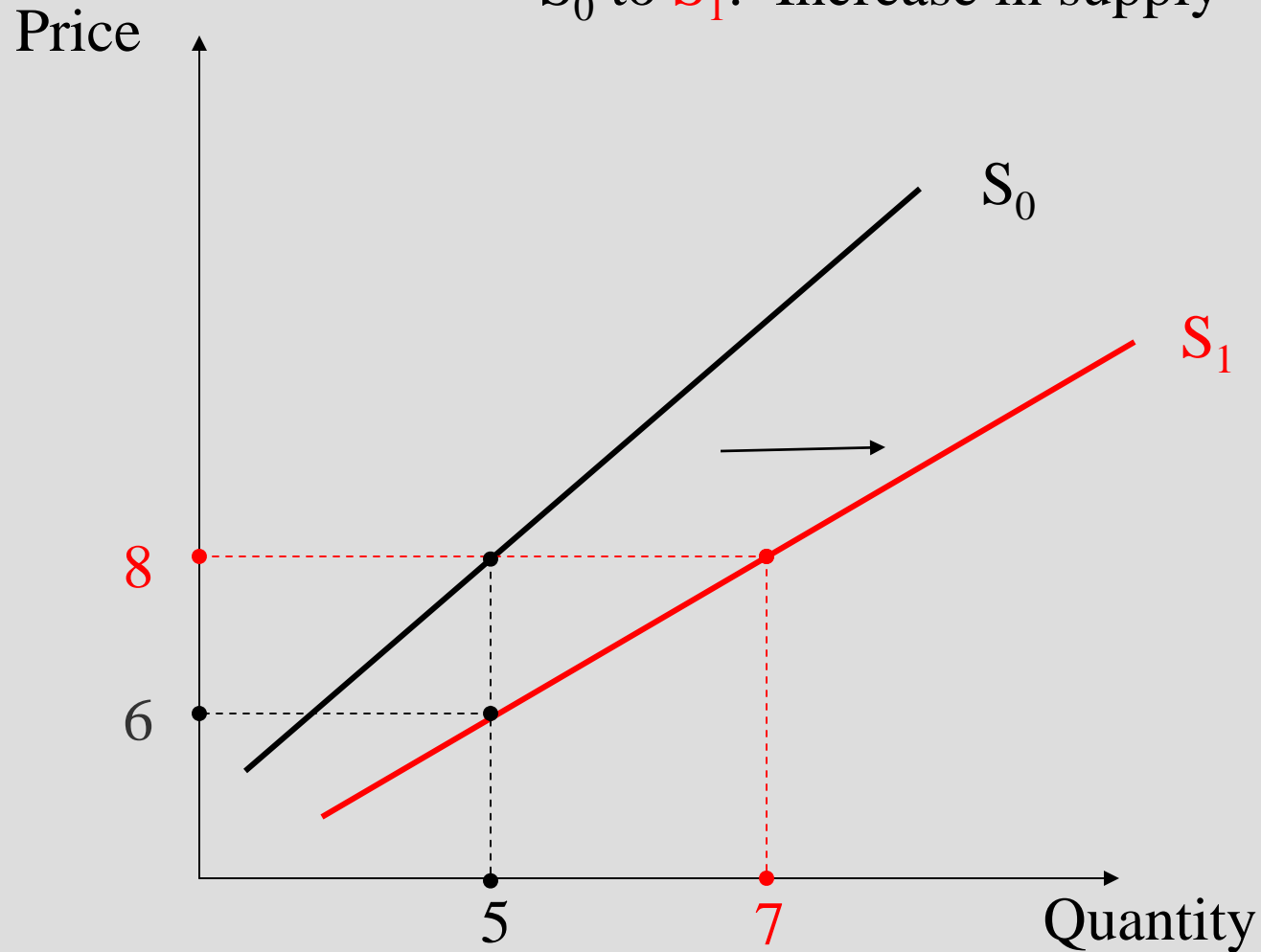
Supply Shifters



- Input prices
- Technology or government regulations
- Number of firms
 - Entry
 - Exit
- Substitutes in production
- Taxes
 - Excise tax
 - Ad valorem tax
- Producer expectations

Change in Supply

S_0 to S_1 : Increase in supply



The Supply Function

- An equation representing the supply curve:

$$Q_X^S = f(P_X, P_R, W, H,)$$

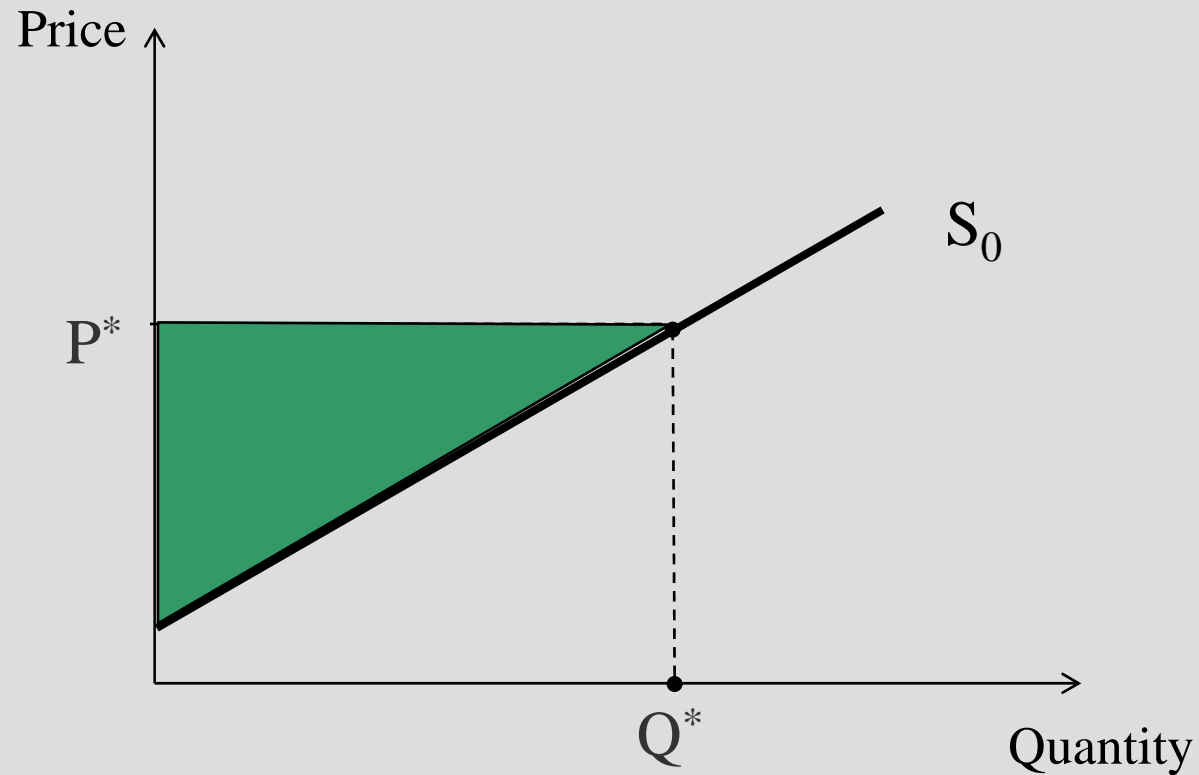
- Q_X^S = quantity supplied of good X.
- P_X = price of good X.
- P_R = price of a production substitute.
- W = price of inputs (e.g., wages).
- H = other variable affecting supply.

Inverse Supply Function

- Price as a function of quantity supplied.
- Example:
 - Supply Function
 - $Q_x^s = 10 + 2P_x$
 - Inverse Supply Function:
 - $2P_x = 10 + Q_x^s$
 - $P_x = 5 + 0.5Q_x^s$

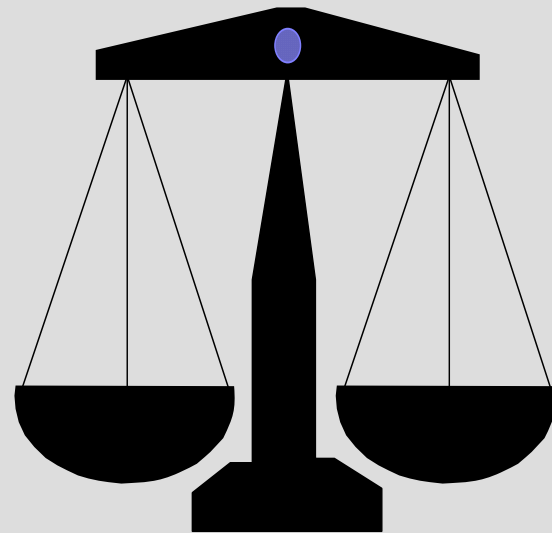
Producer Surplus

- The amount producers receive in excess of the amount necessary to induce them to produce the good.

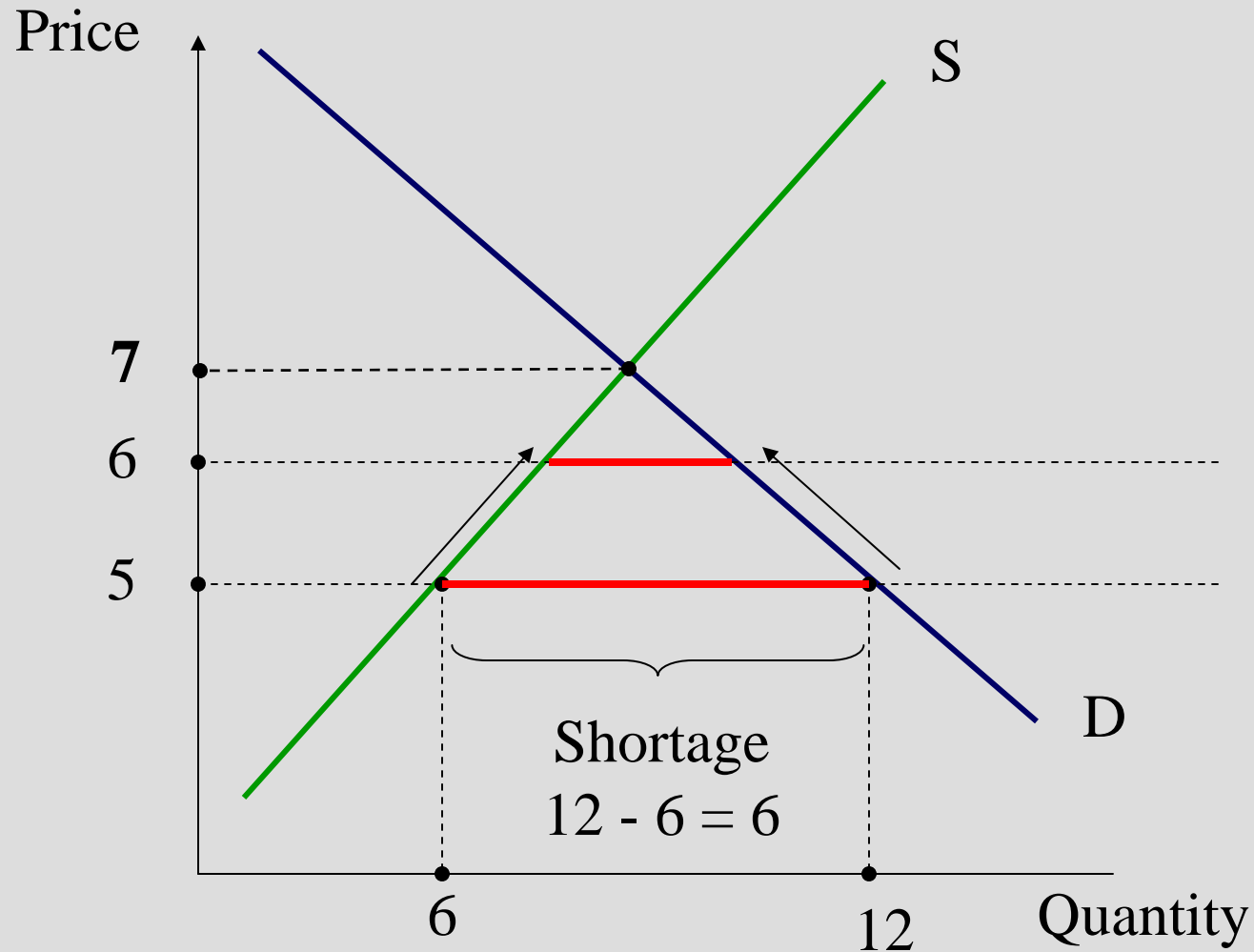


Market Equilibrium

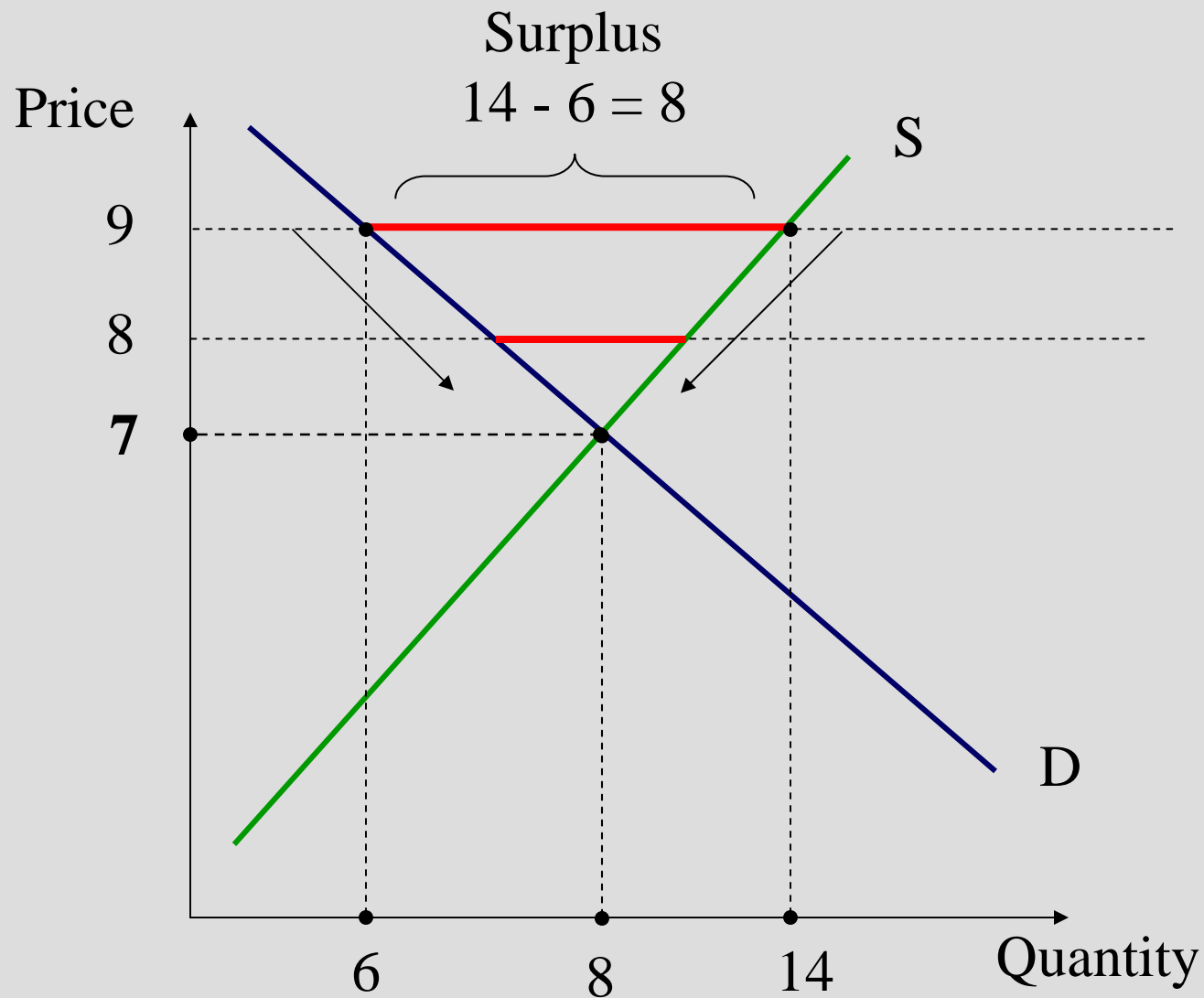
- Balancing supply and demand
 - $Q_x^S = Q_x^d$
- Steady-state



If price is too low...



If price is too high...



Price Restrictions

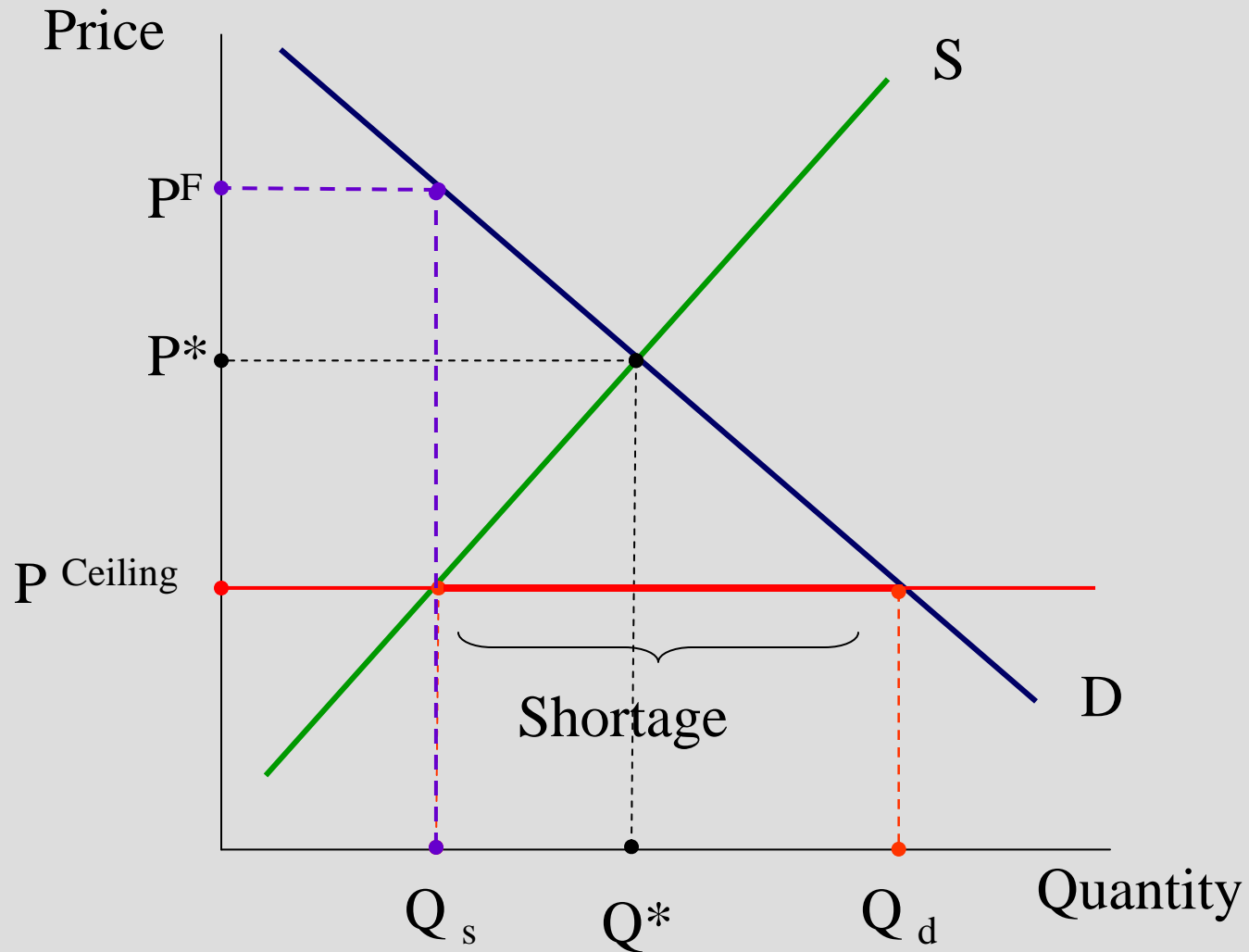
- Price Ceilings

- The *maximum* legal price that can be charged.
- Examples:
 - Gasoline prices in the 1970s.
 - Housing in New York City.

- Price Floors

- The *minimum* legal price that can be charged.
- Examples:
 - Minimum wage.
 - Agricultural price supports.

Impact of a Price Ceiling



Full Economic Price

- The dollar amount paid to a firm under a price ceiling, plus the nonpecuniary price.

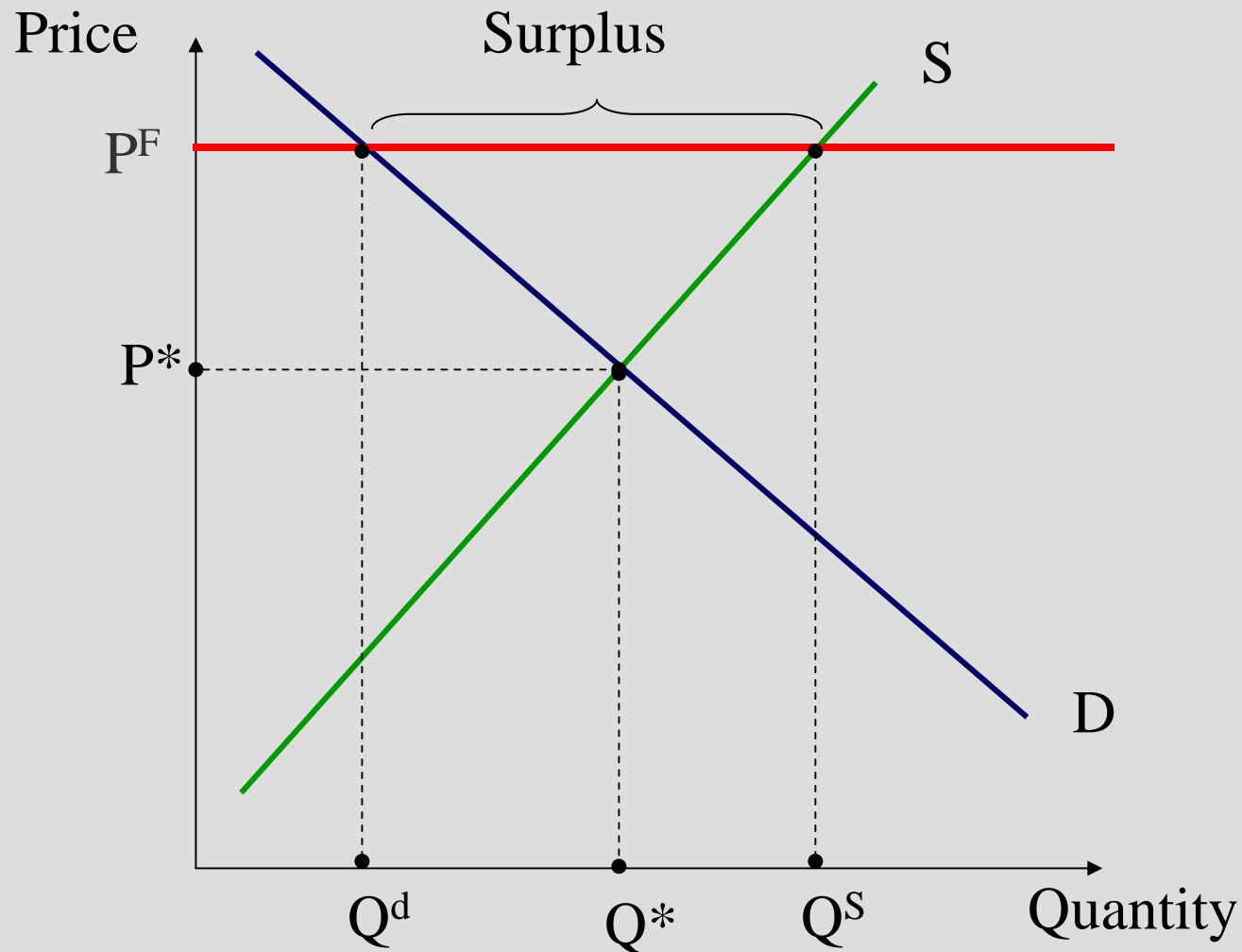
$$P^F = P^c + (P^F - P^C)$$

- P^F = full economic price
- P^C = price ceiling
- $P^F - P^C$ = nonpecuniary price

An Example from the 1970s

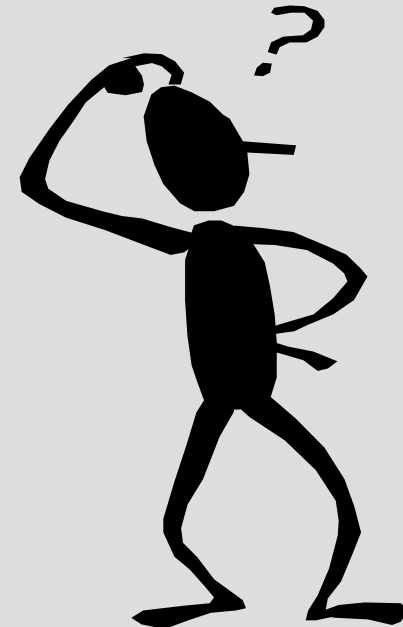
- Ceiling price of gasoline: \$1.
- 3 hours in line to buy 15 gallons of gasoline
 - Opportunity cost: \$5/hr.
 - Total value of time spent in line: $3 \times \$5 = \15 .
 - Non-pecuniary price per gallon: $\$15/15 = \1 .
- Full economic price of a gallon of gasoline:
 $\$1 + \$1 = 2$.

Impact of a Price Floor



Comparative Static Analysis

- How do the equilibrium price and quantity change when a determinant of supply and/or demand change?



Applications of Demand and Supply Analysis

- Event: The *WSJ* reports that the prices of PC components are expected to fall by 5-8 percent over the next six months.
- Scenario 1: You manage a small firm that manufactures PCs.
- Scenario 2: You manage a small software company.

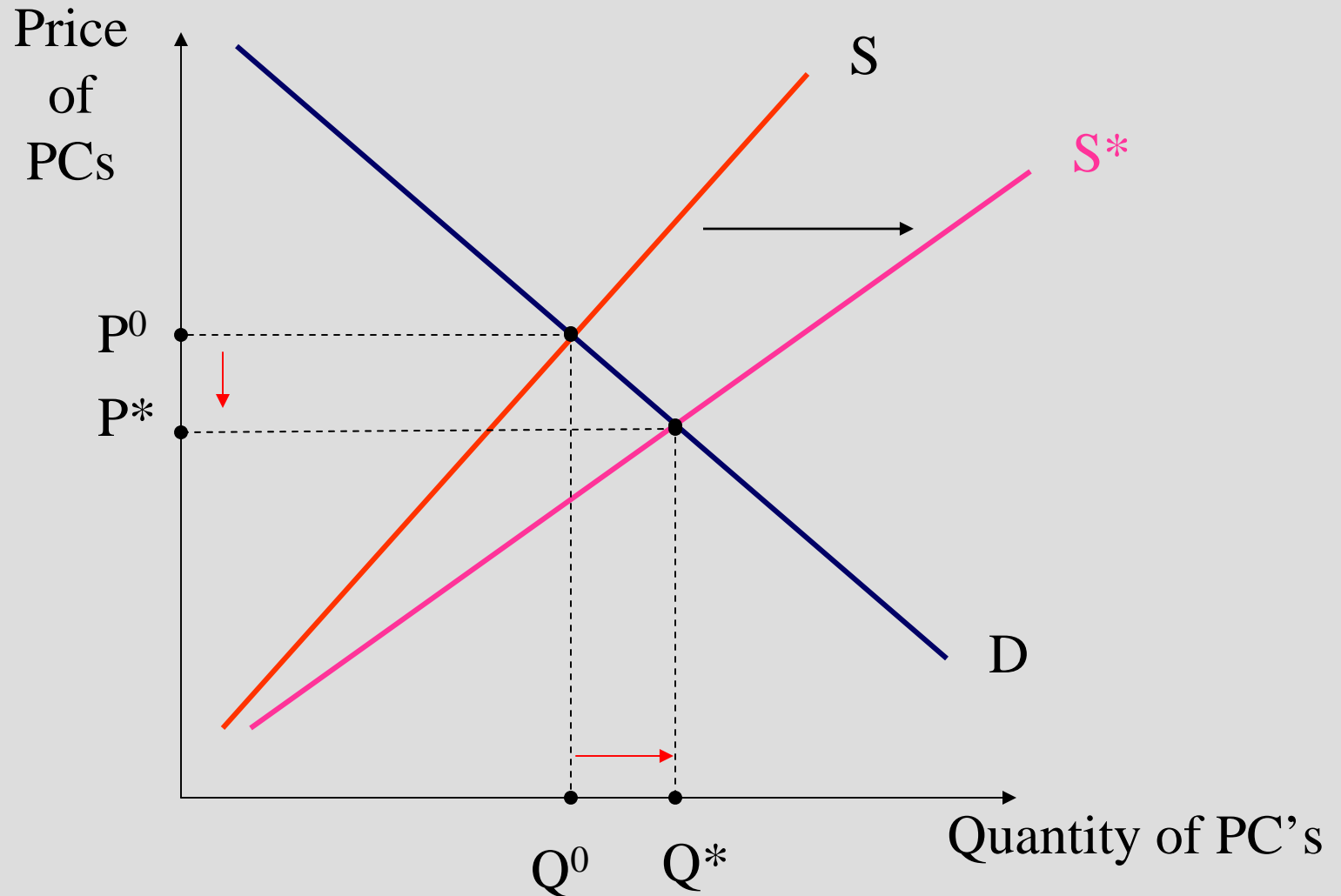
Use Comparative Static Analysis to see the Big Picture!

- *Comparative static analysis* shows how the equilibrium price and quantity will change when a determinant of supply or demand changes.

Scenario 1: Implications for a Small PC Maker

- Step 1: Look for the “Big Picture.”
- Step 2: Organize an action plan (worry about details).

Big Picture: Impact of decline in component prices on PC market



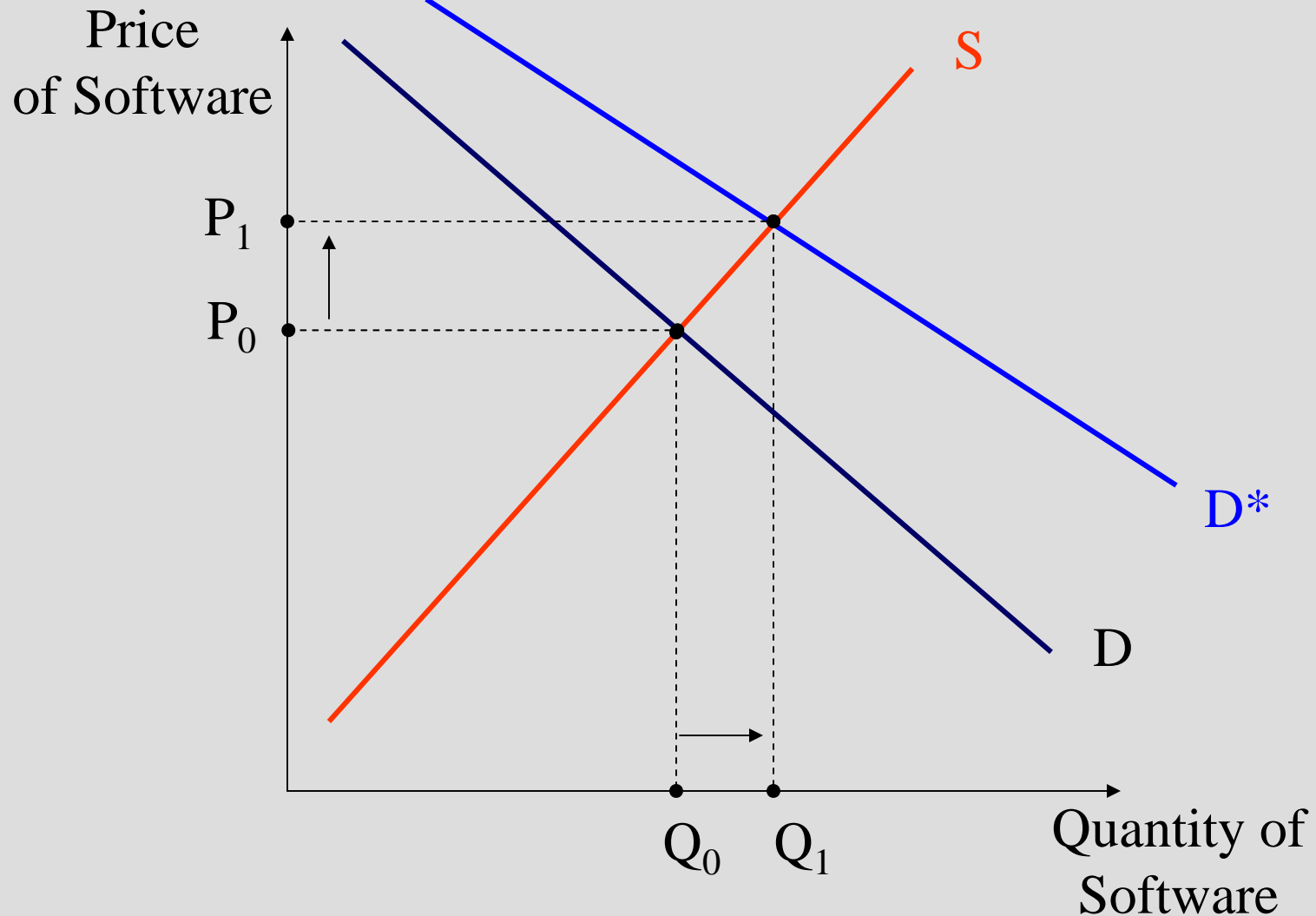
Big Picture Analysis: PC Market

- Equilibrium price of PCs will fall, and equilibrium quantity of computers sold will increase.
- Use this to organize an action plan
 - contracts/suppliers?
 - inventories?
 - human resources?
 - marketing?

Scenario 2: Software Maker

- More complicated chain of reasoning to arrive at the “Big Picture.”
- Step 1: Use analysis like that in Scenario 1 to deduce that lower component prices will lead to
 - a lower equilibrium price for computers.
 - a greater number of computers sold.
- Step 2: How will these changes affect the “Big Picture” in the software market?

Big Picture: Impact of lower PC prices on the software market



Big Picture Analysis: Software Market

- Software prices are likely to rise, and more software will be sold.
- Use this to organize an action plan.

Conclusion

- Use supply and demand analysis to
 - clarify the “big picture” (the general impact of a current event on equilibrium prices and quantities).
 - organize an action plan (needed changes in production, inventories, raw materials, human resources, marketing plans, etc.).