Managerial Economics & Business Strategy

Chapter 2
Market Forces: Demand and Supply

McGraw-Hill/Irwin

Overview

I. Market Demand Curve
- The Demand Function
- Determinants of Demand
- Consumer Surplus

II. Market Supply Curve
- The Supply Function
- Supply Shifters
- Producer Surplus

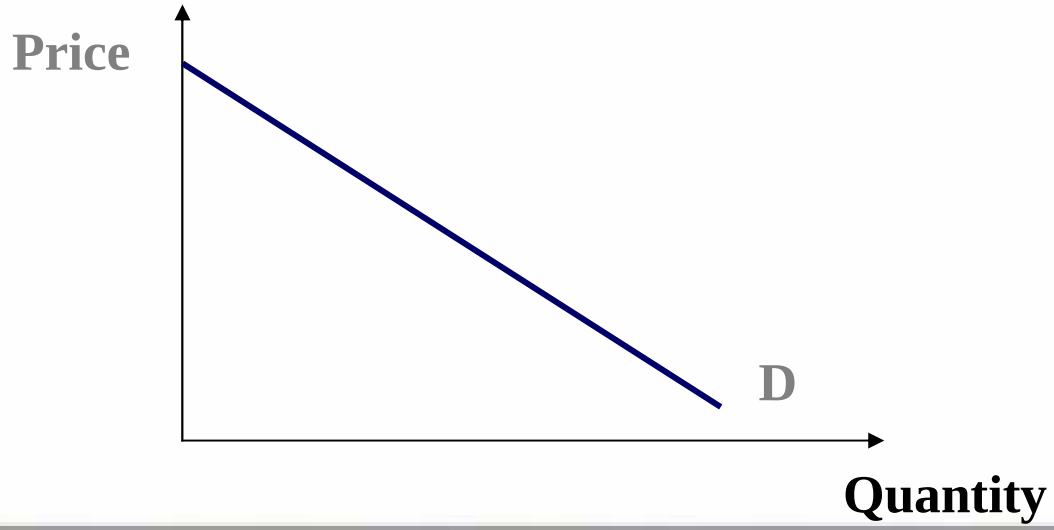
III. Market Equilibrium

IV. Price Restrictions

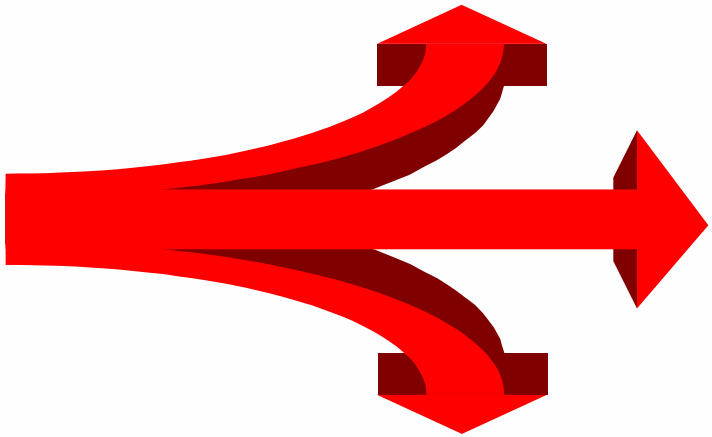
V. Comparative Statics

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.



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

The Demand Function

- A general equation representing the demand curve

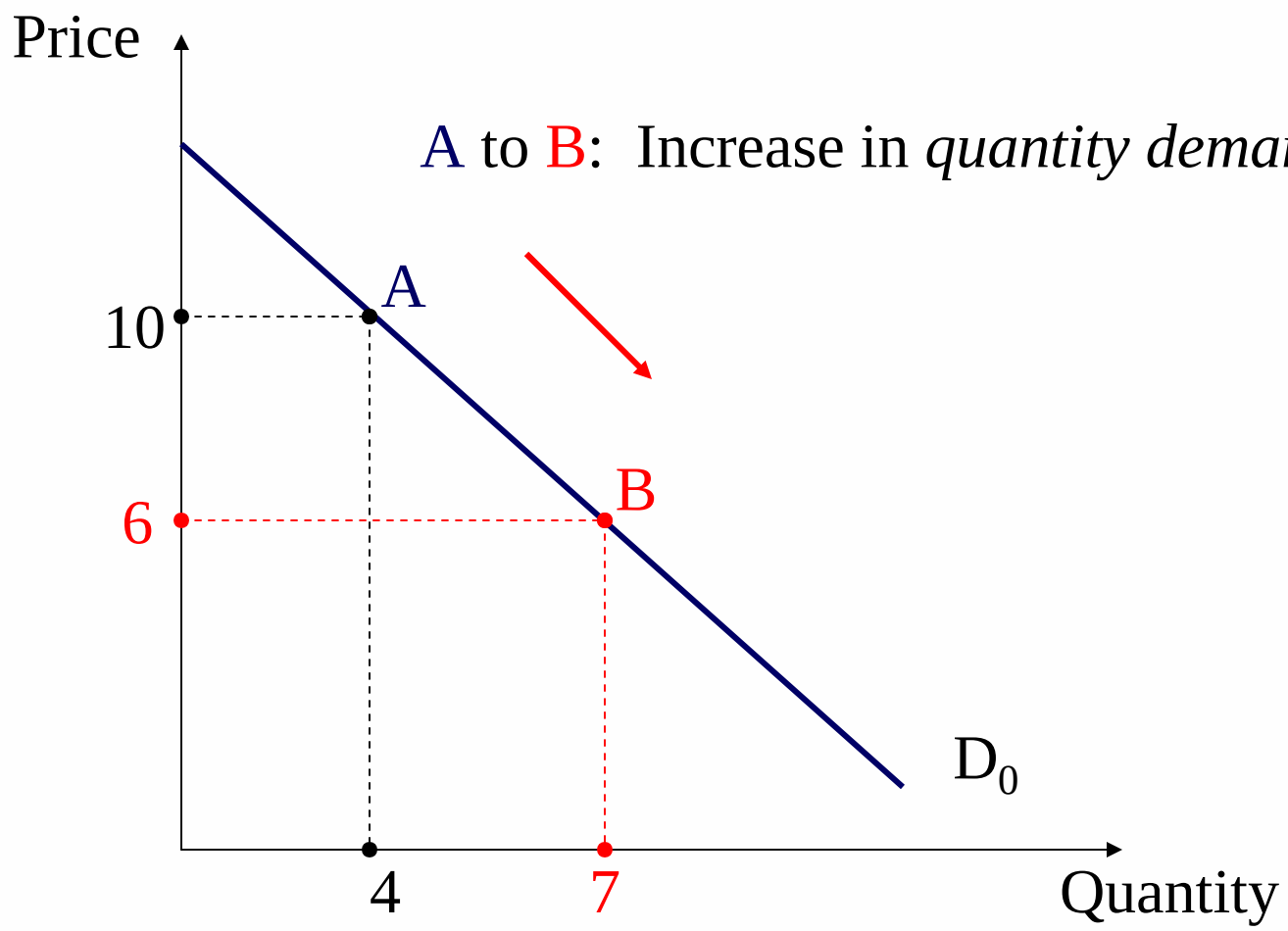
$$Q_x^d = f(P_x, P_Y, M, H,)$$

  - 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.

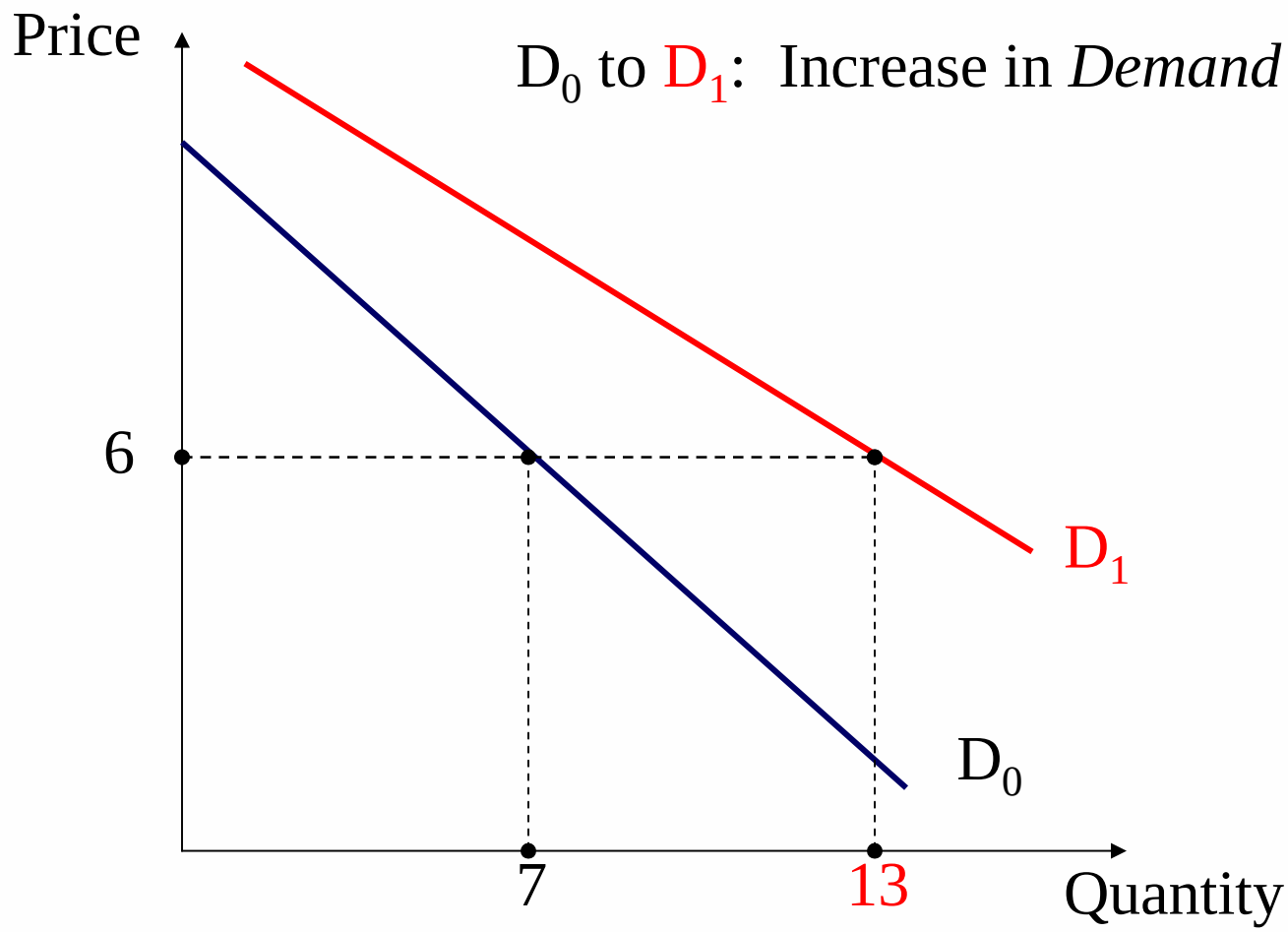
Inverse Demand Function

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

Change in Quantity Demanded



Change in Demand



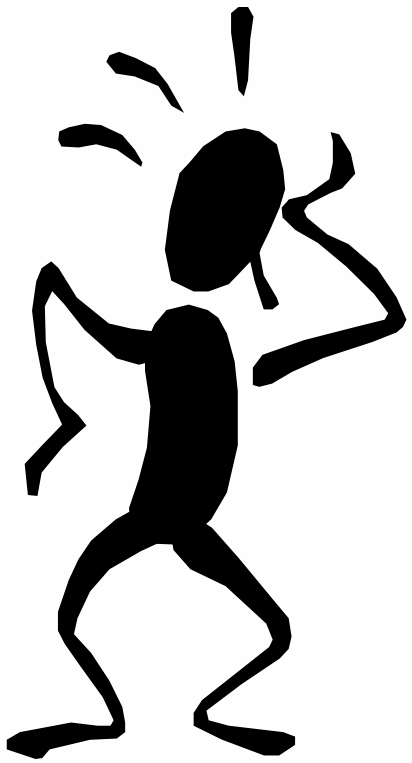
Consumer Surplus

- The value consumers get from a good but do not have to pay for.
- Consumer surplus will prove particularly useful in marketing and other disciplines emphasizing strategies like value pricing and price discrimination.

I got a great deal!

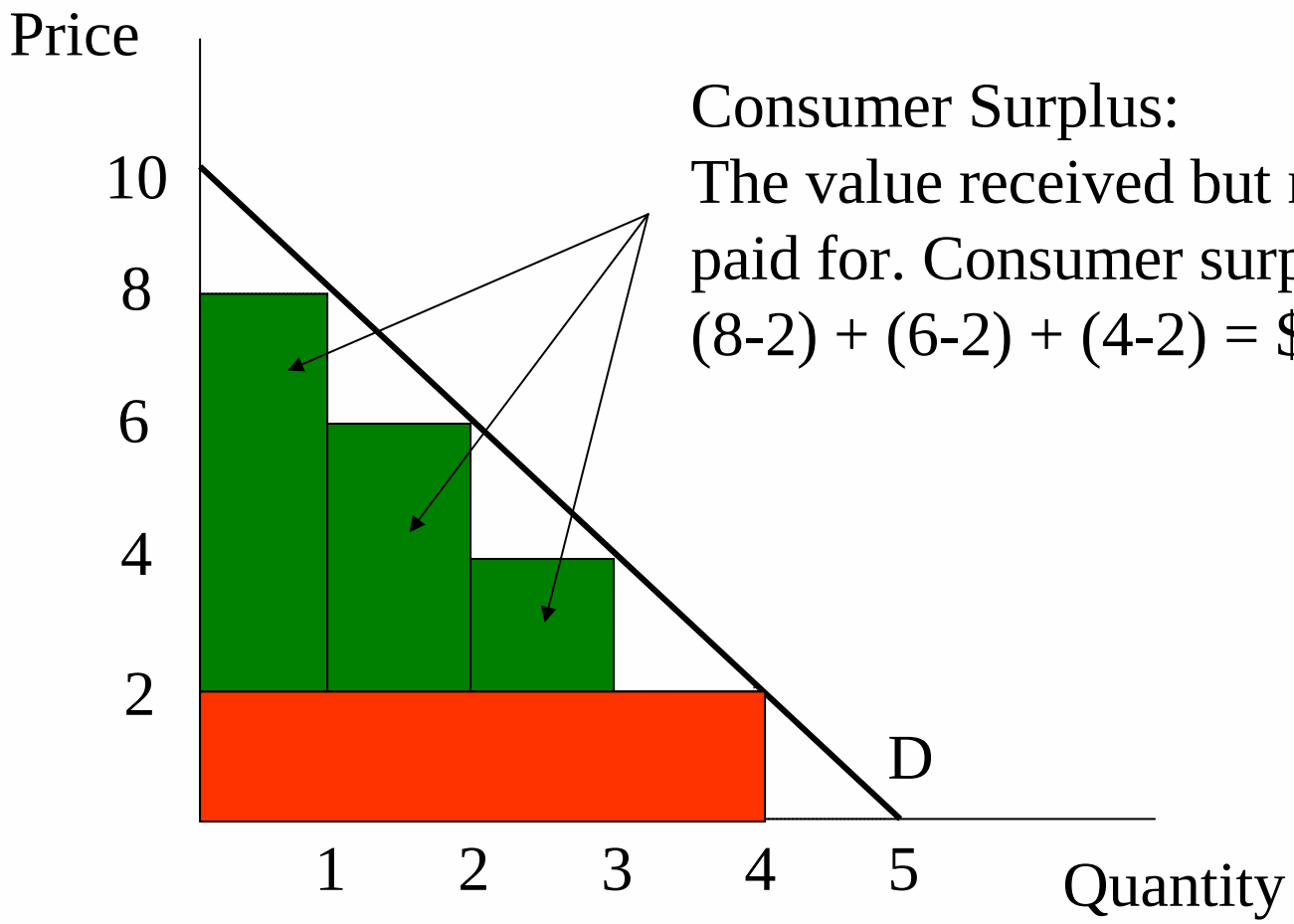
- That company offers a lot of bang for the buck!
- Dell provides good value.
- Total value greatly exceeds total amount paid.
- Consumer surplus is large.

I got a lousy deal!



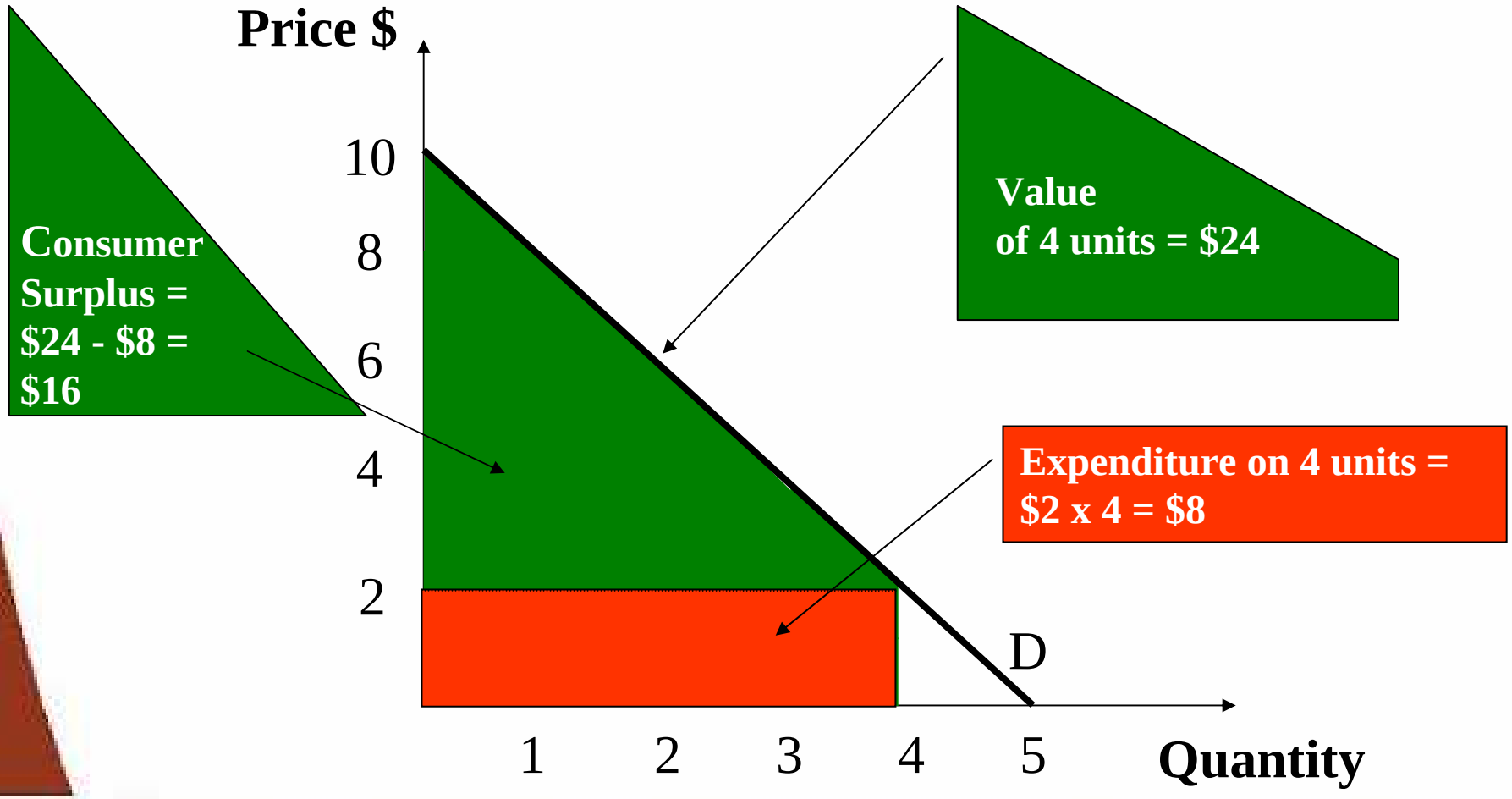
- That car dealer drives a hard bargain!
- I almost decided not to buy it!
- They tried to squeeze the very last cent from me!
- Total amount paid is close to total value.
- Consumer surplus is low.

Consumer Surplus: Discrete Case



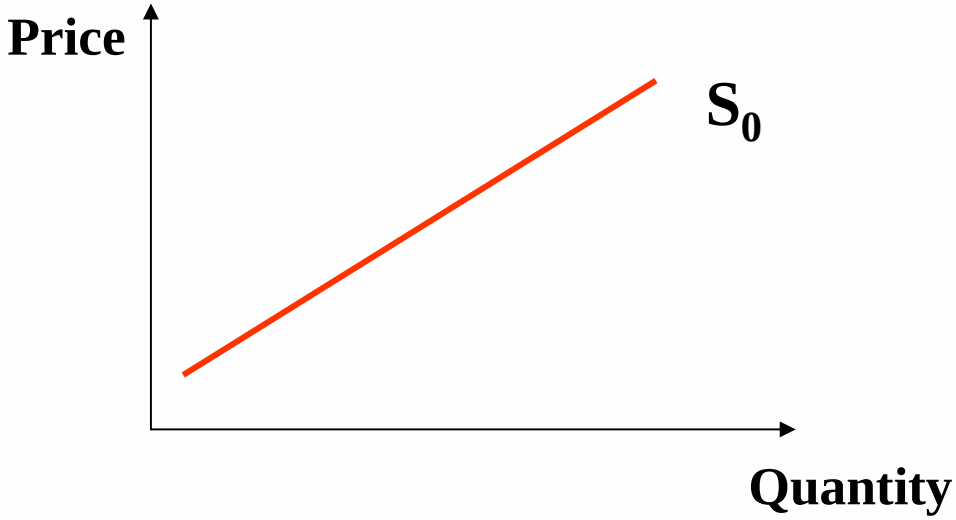
Consumer Surplus:
The value received but not paid for. Consumer surplus = (8-2) + (6-2) + (4-2) = $12.

Consumer Surplus: Continuous Case

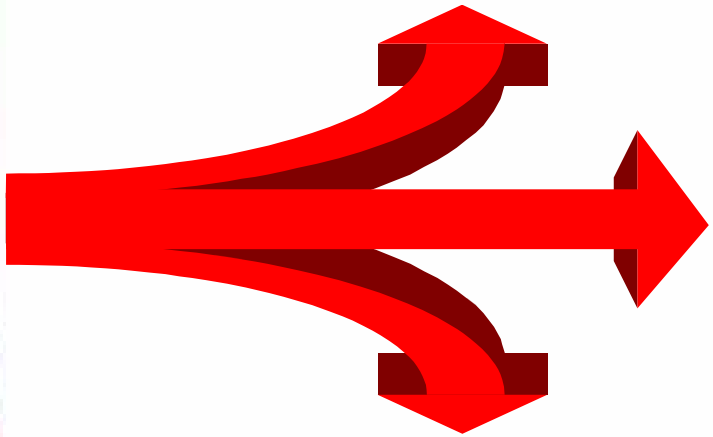


Market Supply Curve

- 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.



Supply Shifters



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

The Supply Function

- An equation representing the supply curve:

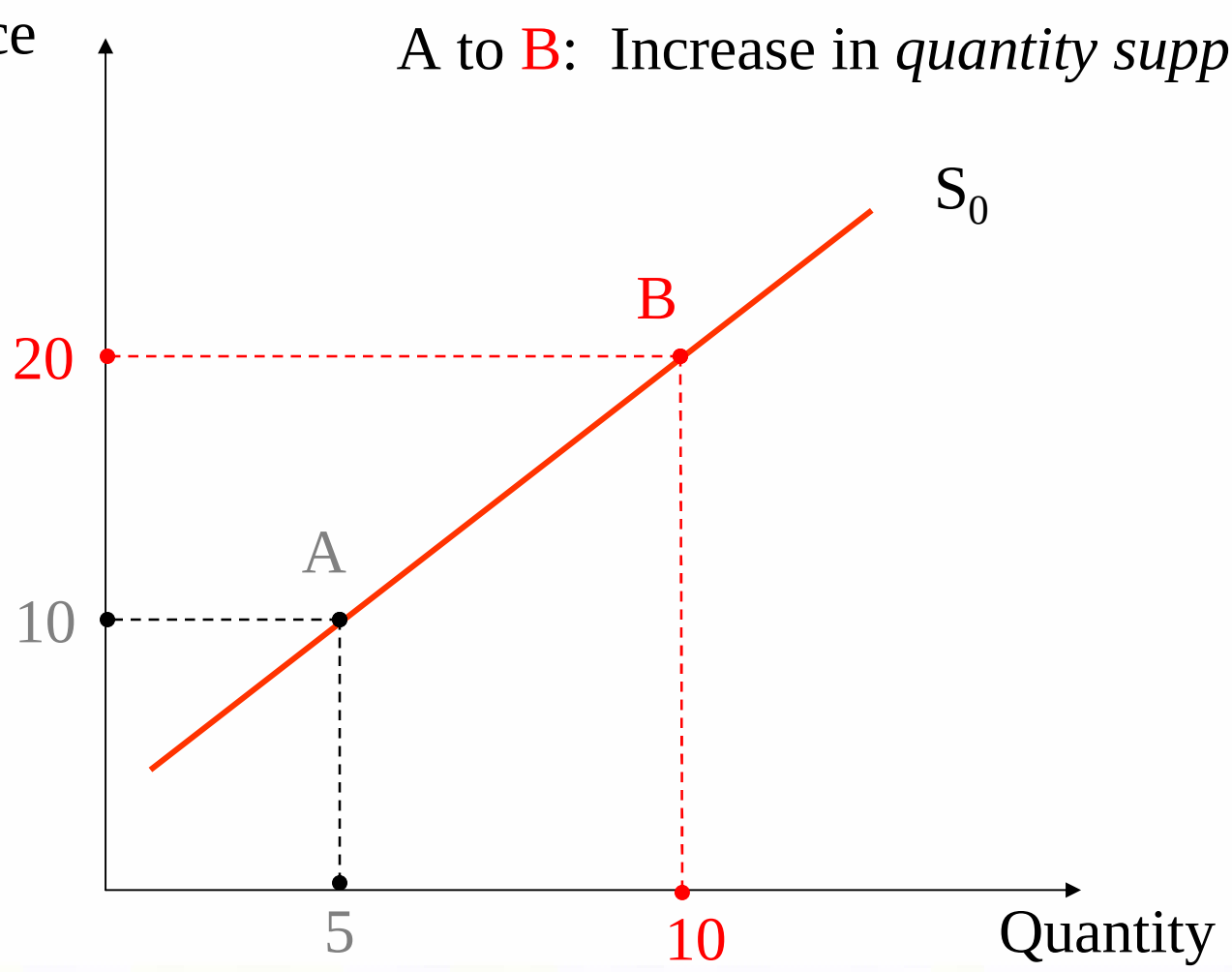
$$Q_x^S = f(P_x, P_R, W, H,)$$

  - 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.

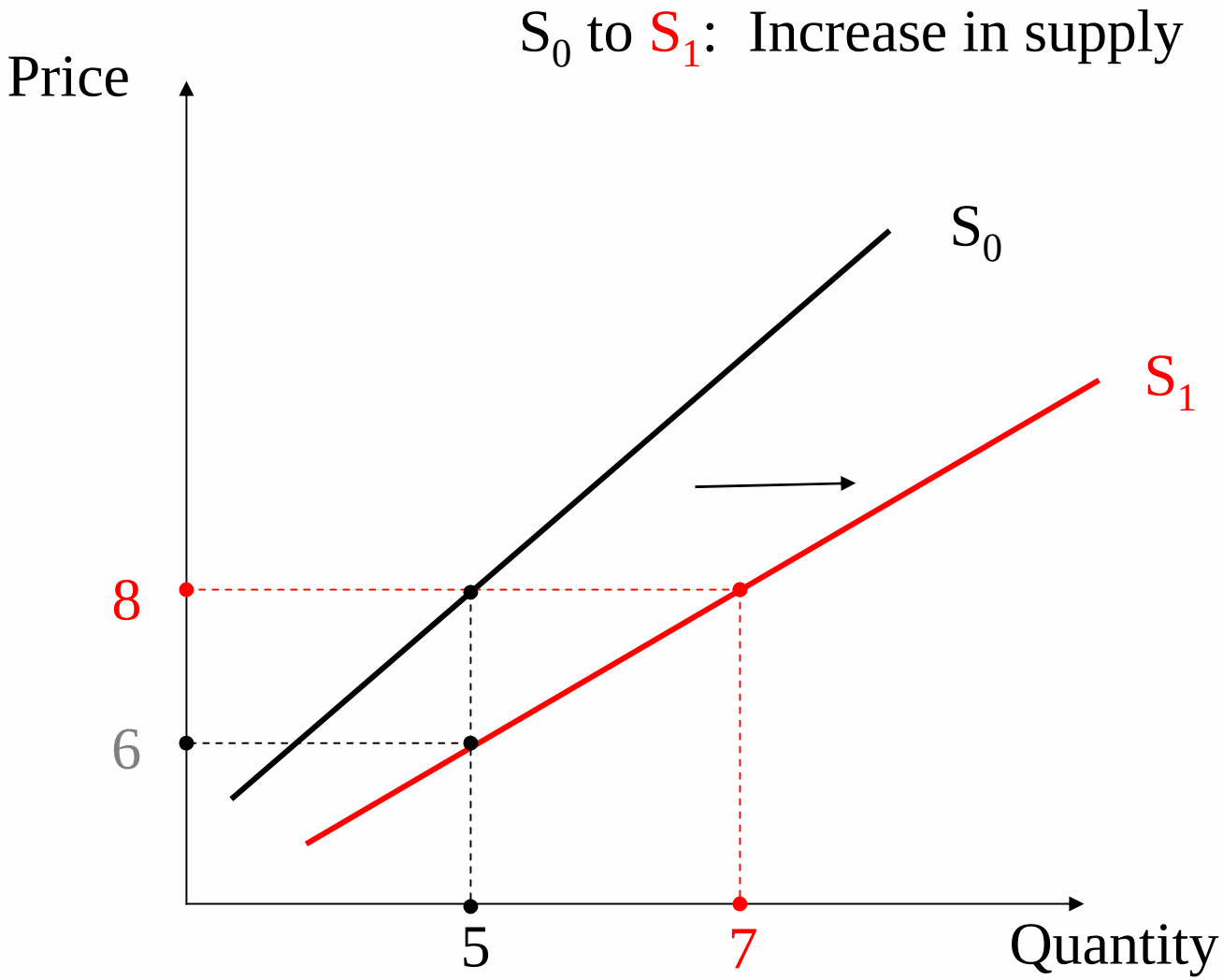
Inverse Supply Function

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

Change in Quantity Supplied

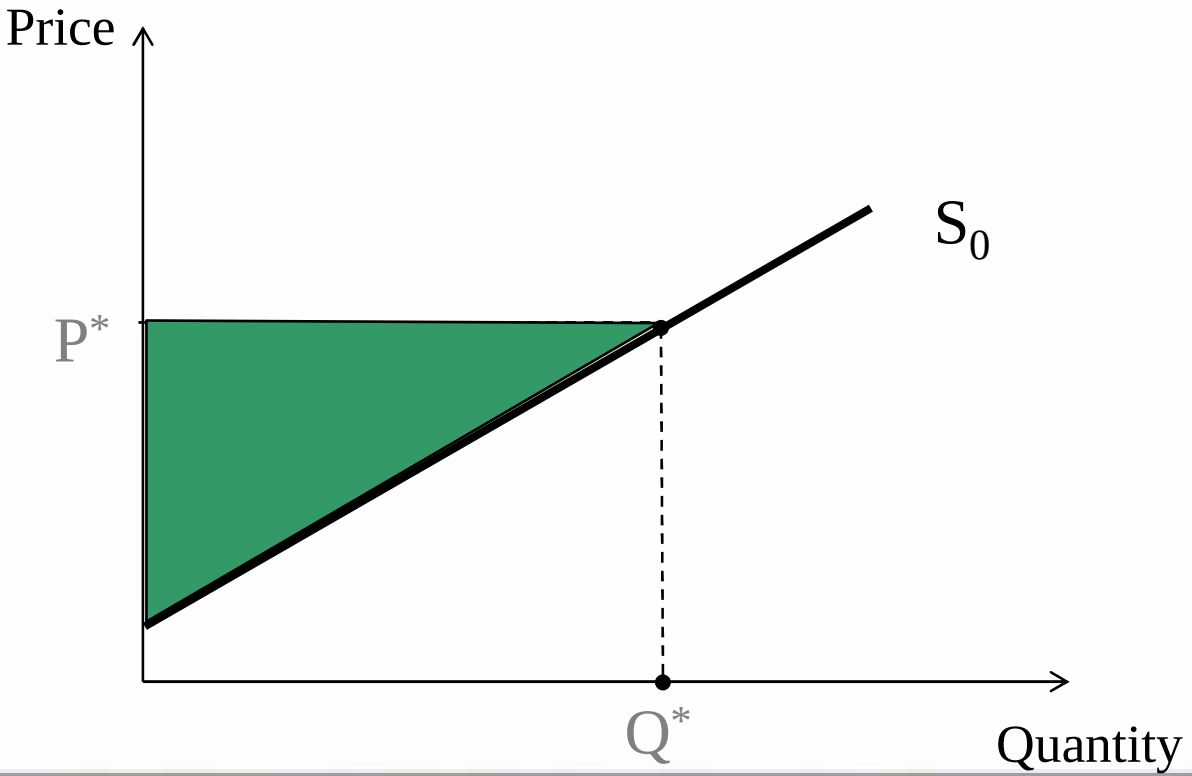


Change in Supply



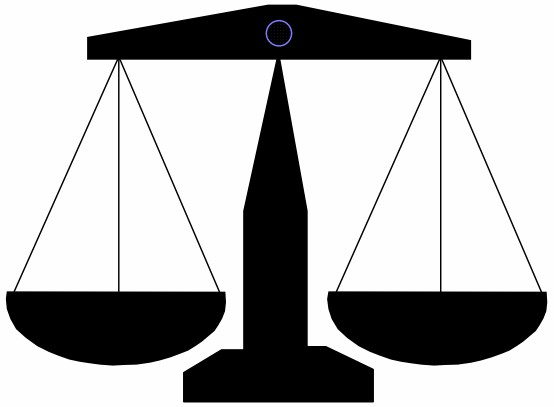
Producer Surplus

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

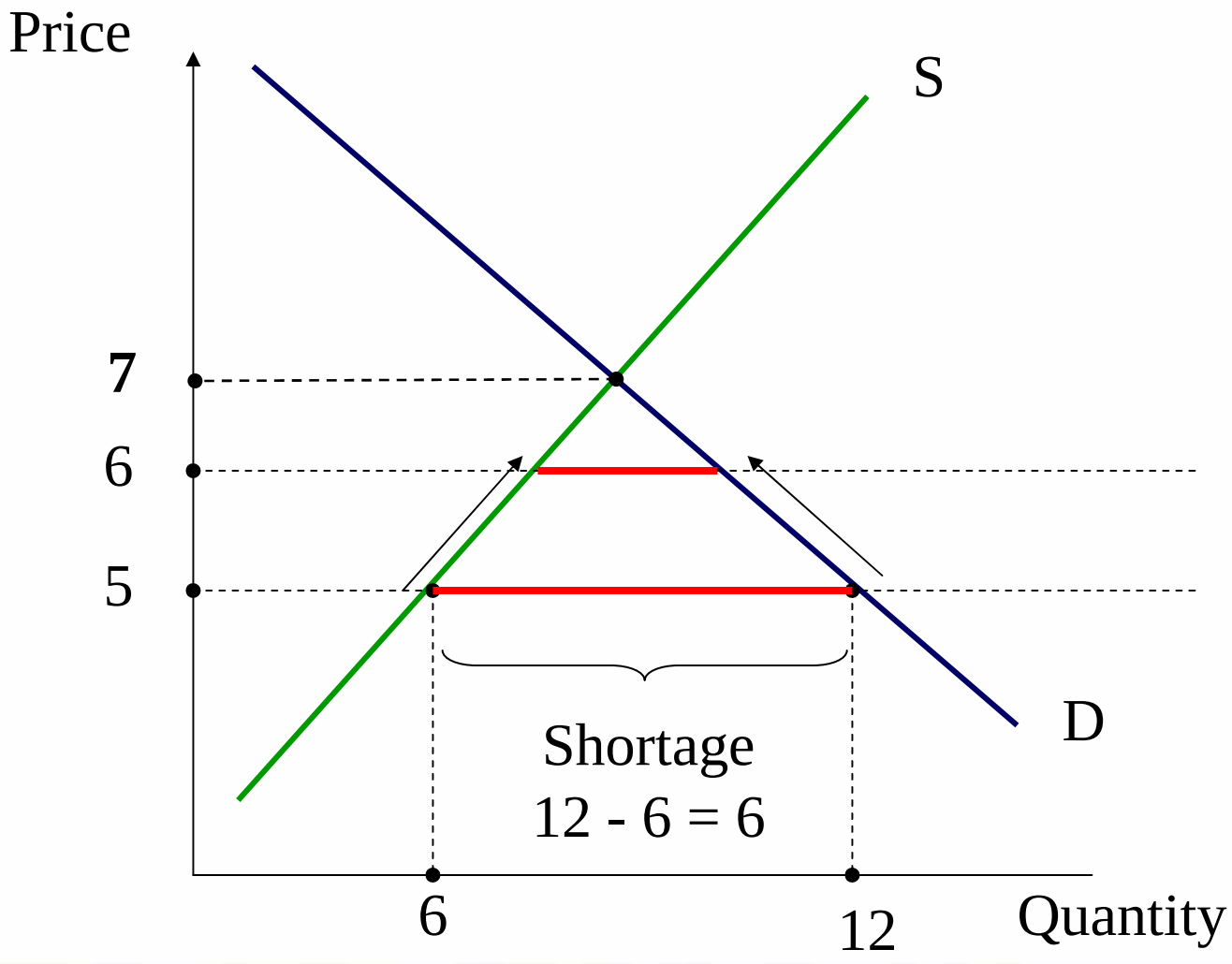


Market Equilibrium

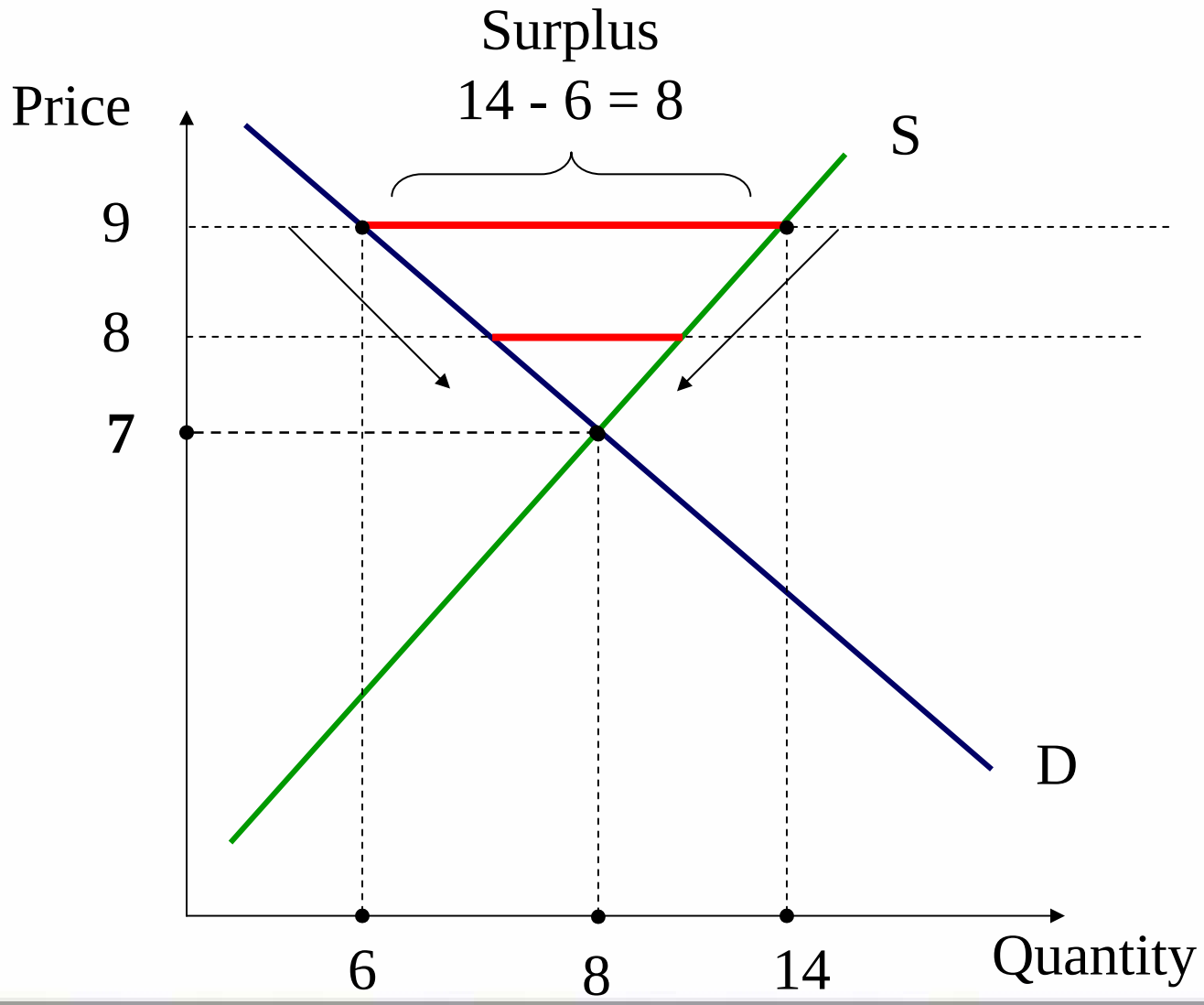
- The Price (P) that Balances supply and demand
  - $Q_x^S = Q_x^d$
  - No shortage or surplus
- Steady-state



If price is too low…



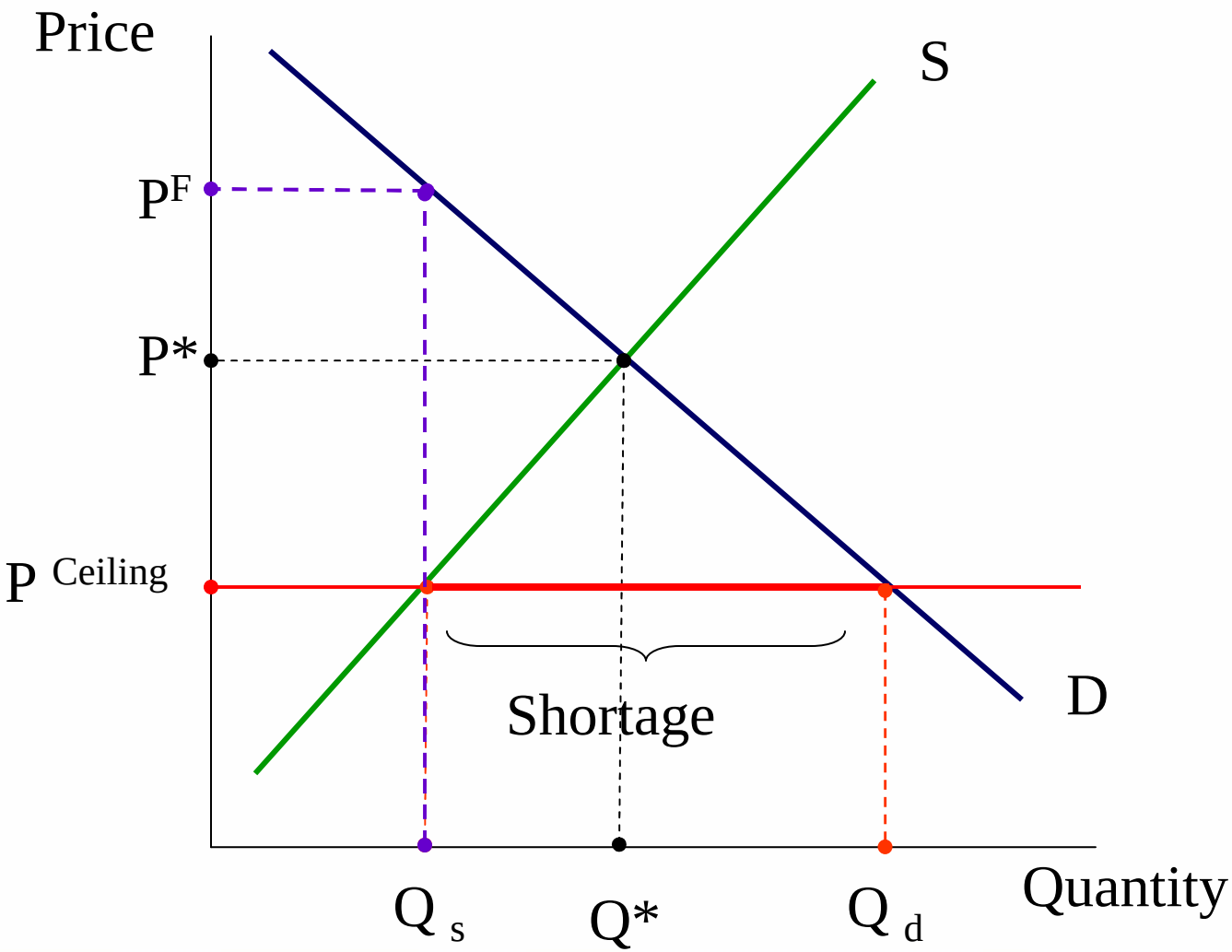
If price is too high…



Price Restrictions

- Price Ceilings
  - The *maximum* legal price that can be charged.
  - Examples:
    - Gasoline prices in the 1970s.
    - Housing in New York City.
    - Proposed restrictions on ATM fees.
- 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 non-pecuniary price.

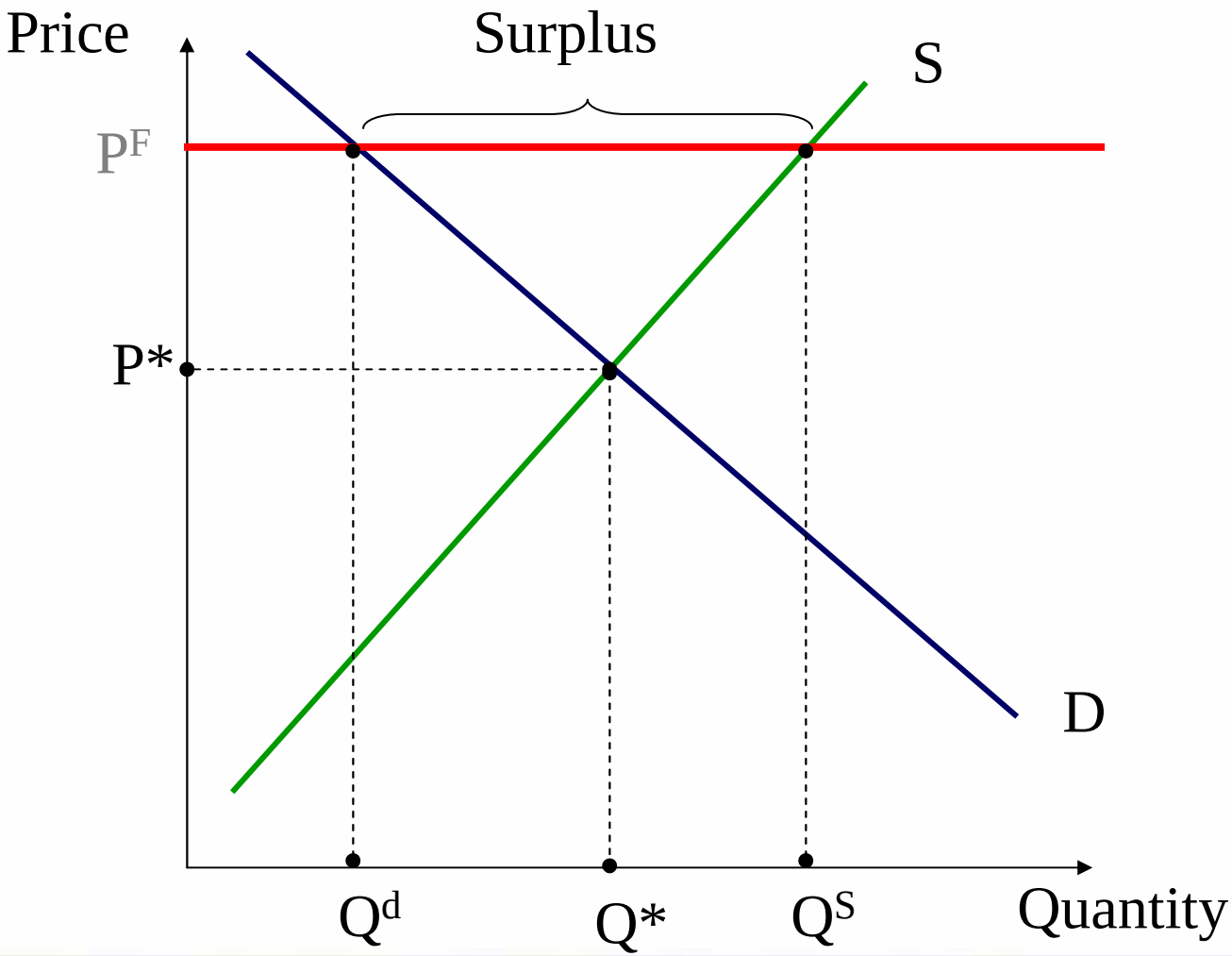
$$P^F = P^c + (P^F - P^C)$$

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

An Example from the 1970s

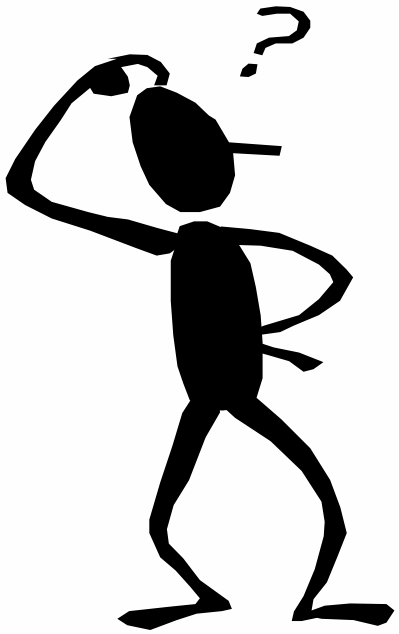
- Ceiling price of gasoline: $1.
- 3 hours in line to buy 15 gallons of gasoline:
  - Opportunity cost: $5/hr.
  - Total value of time spent in line: $3 \times \$5 = \$15$.
  - Non-pecuniary price per gallon: $15/15=$1.
- Full economic price of a gallon of gasoline: $1+$1=2.

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: 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.

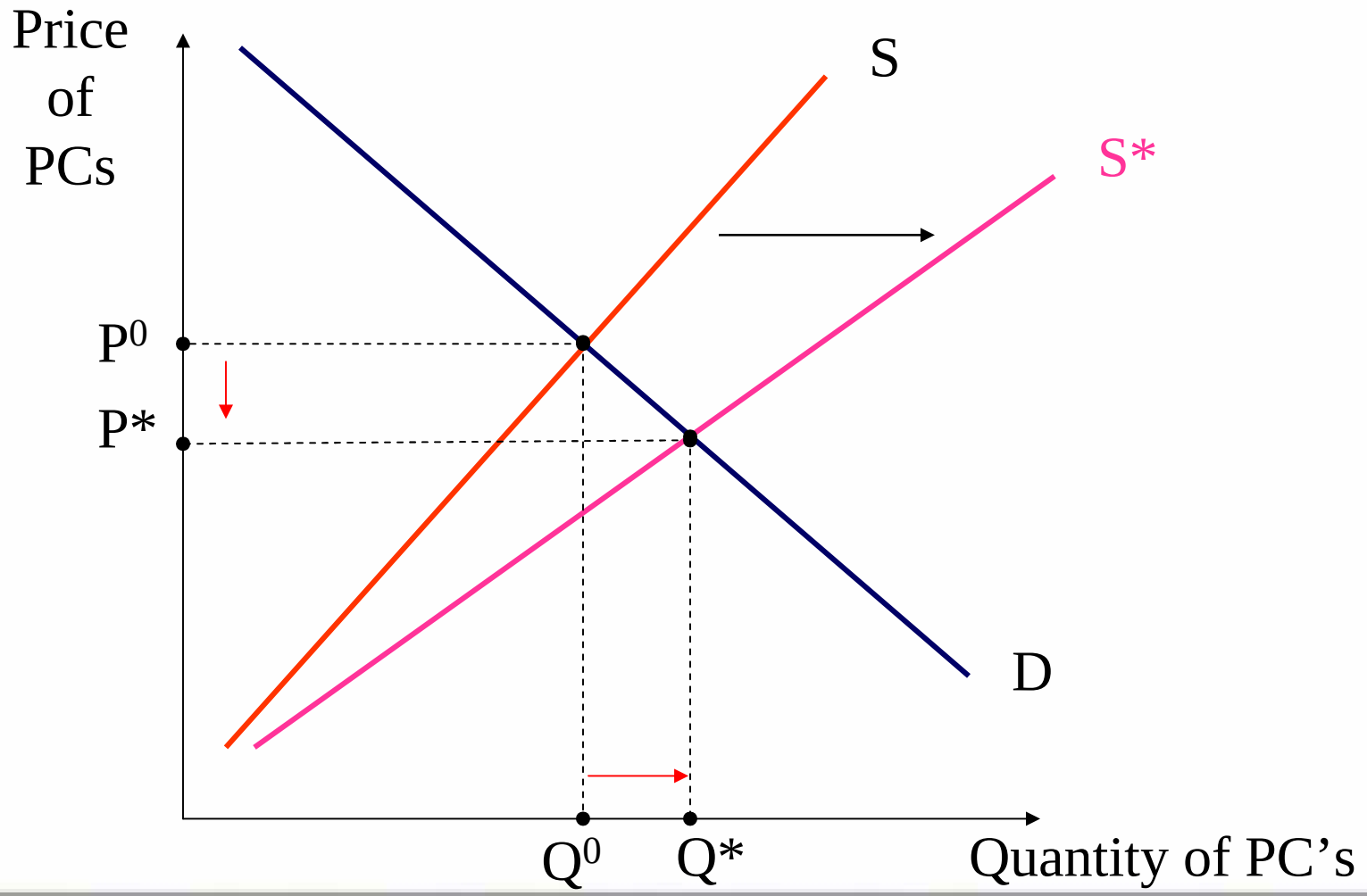
Use Comparative Static Analysis to see the Big Picture!

- *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



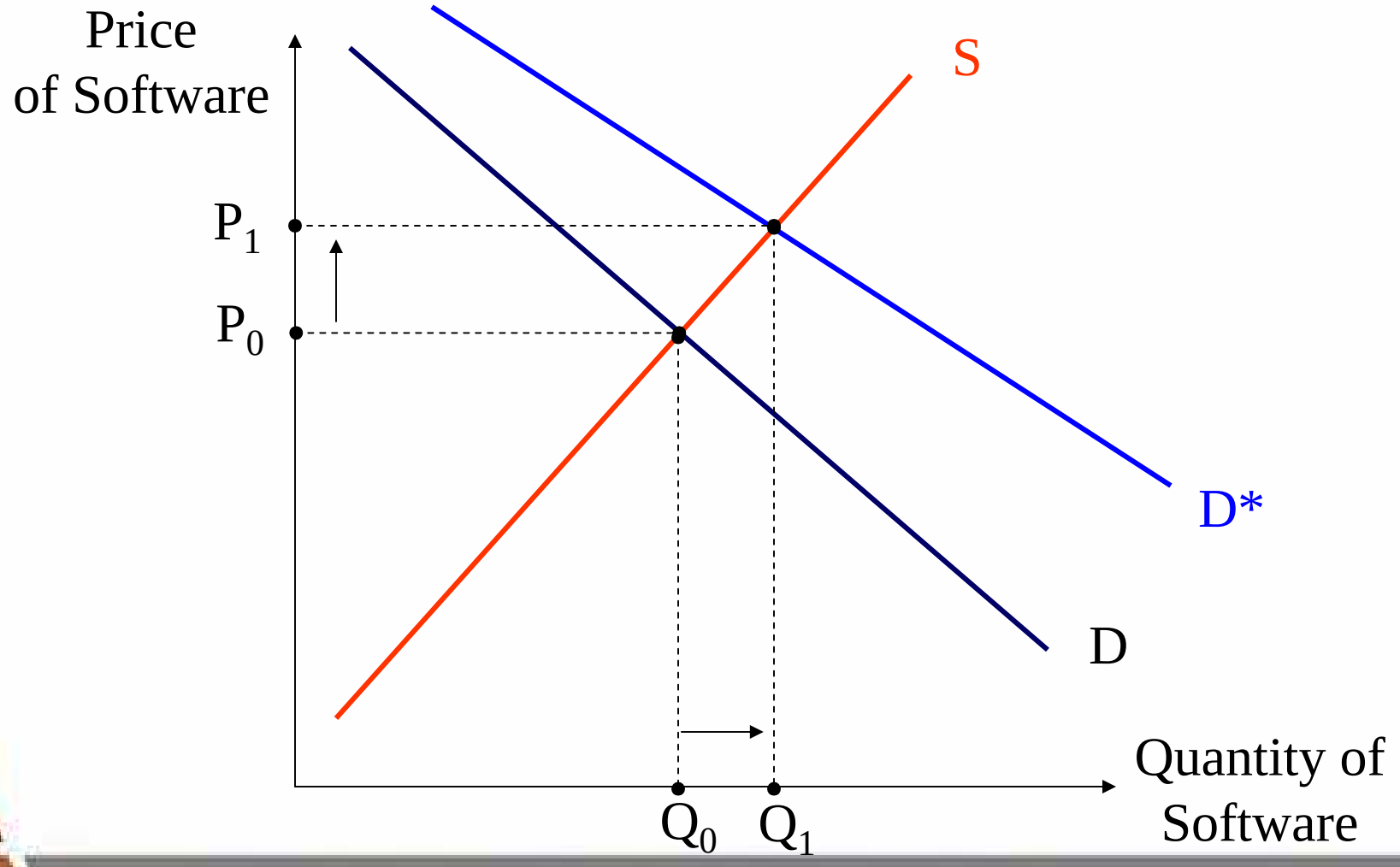
Big Picture Analysis: PC Market

- 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?
  - do I need quantitative estimates?

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.).