The Basics of Supply and Demand
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Lecture 2

The Basics of Supply and Demand

$$\text{MARKET} \begin{cases} \text{BUYERS} \Longrightarrow \text{DEMAND} \\ \\ \text{SELLERS} \Longrightarrow \text{SUPPLY} \end{cases} \text{EQUILIBRIUM}$$

Outline

1   Demand and Supply Curves

Quantity Demanded and Quantity Supplied

Q_D **(Quantity demanded).** Depends on price.

$$Q_D = D(P). \tag{1.1}$$

Q_S **(Quantity supplied).** Depends on price.

$$Q_S = D(P). \tag{1.2}$$

Notes: 1. Market demand/supply is the sum of individual demands/supplies.

2. Assume individuals are price takers who cannot affect price.

Demand and Supply Curves

From Equations (1.1) and (1.2), draw demand curves and supply curves as follows:

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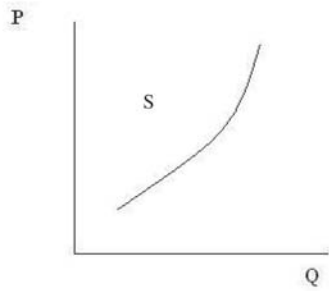*Saylor URL: http://www.saylor.org/courses/econ101/*

Figure 1: Supply curve. Price higher, quantity supplied more.
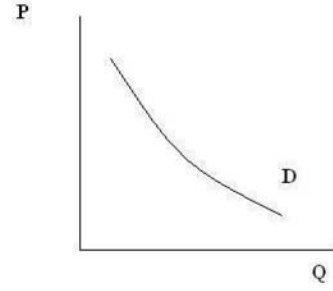
Figure 2: Demand curve. Price higher, quantity demanded less.

Figure 3: Shift in supply curve.
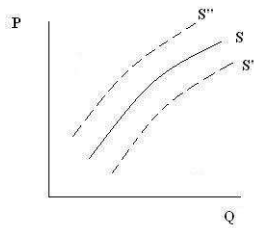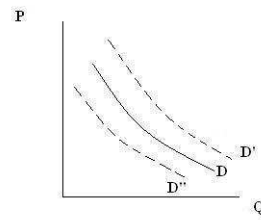
Figure 4: Shift in demand curve.

Supply curve

See Figure 1 and Figure 3:

1. Change in price causes change in quantity supplied, on the graph, there is movement along the curve accordingly.

2. Change in something other than price causes change in supply, on the graph, the supply curve shifts.

   Example. Production cost falls → supply curve S shifts to S' (See Figure 3).

Demand curve

See Figure 2 and Figure 4:

1. Change in price causes change in quantity demanded, on the graph, there is movement along the curve accordingly.

2. Change in something other than price causes change in demand, on the graph, the demand curve shifts.

   Example. People's income increases → demand curve D shifts to D' (Figure 4).

Substitutes and Complements

Substitutes. Increase in the price leads to an increase in the demand of the other.

   Example (Italian and French bread). Price of Italian bread increases, demand of French bread increases.

Complements. Increase in the price leads to a decrease in the demand of the other.

   Example (Pasta and pasta sauce). Price of pasta increases, demand of pasta sauce decreases.

2 Equilibrium in the Market

Equilibrium state:

- No shortage

- No surplus

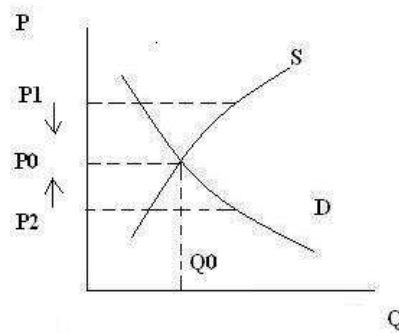- Equilibrium price clears the market.

Figure 5: Demand and Supply curves. Equilibrium state.

Refer to Figure 5. (P_0, Q_0) is the equilibrium state, which is the intersection point of the demand and supply curves.

$$\text{Change in } \begin{array}{c} \text{Supply} \\ \text{Demand} \end{array} \implies \text{Change in equilibrium } \begin{array}{c} \text{Price} \\ \text{Quantity} \end{array}$$

Surplus and Shortage

Surplus. Price P_1 is higher than P_0 and will fall down.

Shortage. Price P_2 is lower than P_0 and will raise up.

Comparative Static Analysis and Comparative Dynamics

Comparative static analysis. Compares the new and old equilibrium and not the actual path through time of the change.

Comparative dynamic analysis. Traces out the path over time.

This course will cover primarily Comparative Static analysis.
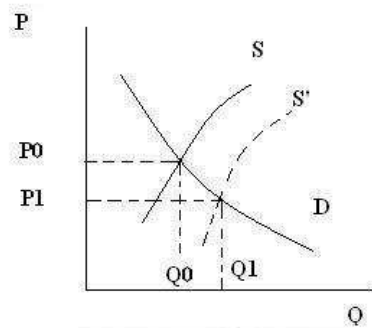
Figure 6: Decrease in raw material prices.

Examples

Example (Decrease in raw material prices). Raw material prices $\searrow \rightarrow$ Supply $\nearrow \rightarrow$ Price $\searrow$ and Quantity $\nearrow$ (Figure 6).

Example (Increase in income). Income $\nearrow \rightarrow$ Demand $\nearrow \rightarrow$ Price $\nearrow$ and Quantity $\nearrow$ (Figure 7).

Dual shifts in supply and demand

When supply and demand change simultaneously, the impact on the equilibrium price and quantity is determined by the size and direction of the changes and the slope of two curves.

3   Government Interventions

How can government help sellers? Discuss two methods.

Problem Description
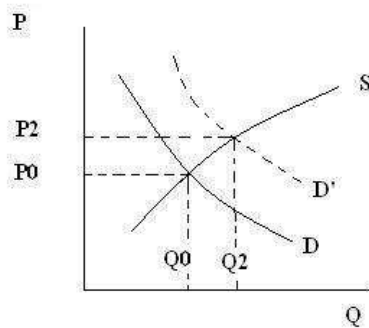
Assume that

$$Q_D = 10 - P,$$

$$Q_S = -2 + P.$$

Figure 7: Increse in income.

The original equilibrium point is

$$P_0 = 6,$$

$$Q_{D0} = Q_{S0} = 4,$$

and the revenue before government intervention is:

$$REVENUE = P_0 \times Q_{D0} = 6 \times 4 = 24.$$

The government's goal: increase sellers' revenue.

Price Floor

The first method: set a price floor. Assume the lowest price is set to be 8, thus:

$$Q_D = 2,$$

$$Q_S = 6.$$

The revenue after using method 1 is:

$$REVENUE = P \times Q_D = 8 \times 2 = 16 < 24.$$

Subsidy

The second method: provide subsidy.

Customers get a 2 unit price refund per unit quantity bought, thus the quantity demanded changes:

$$Q_D = 10 - (P - 2) = 12 - P.$$

The new intersection point is

$$P = 7,$$

$$Q_D = Q_S = 5.$$

The revenue after using method 2 is:

$$\text{REVENUE} = P \times Q_D = 7 \times 5 = 35 > 24.$$

For this example, providing subsidies achieves the government's goal to increase seller's revenue, but setting price floor does not and even makes the revenue less.