II.  SUPPLY AND DEMAND

Normally, the economic problem is not undertaken by one individual or a single group of individuals, but rather is disconnected into two groups called buyers and sellers. Buyers are those individuals looking to purchase a good or service. Sellers on the other hand are those individuals looking to supply or sell a good or service.

In this section of the course, we will use the economic model of supply and demand to explain the interaction of buyers and sellers. The supply and demand model describes the determination of the prices and quantities bought and sold in markets. In the supply and demand model, it is the interaction of buyers and sellers that determines market prices. In other words, neither an individual nor a group of individuals sets the price but rather the market generates the price.

Supply and Demand Experiment

Introduction

The following describes an experiment that will be held in-class on Wednesday, February 14. The experiment looks at how prices act as a signalling device for buyers and sellers and as an allocation device for society.

In the experiment, one-half of the class is given a ticket for the upcoming Matchbox Twenty and Everclear concert at the Gund Arena in Cleveland. These people are the suppliers in our market. The other half of the class is looking to buy a ticket for the concert. These people are the demanders in our market.

Information for Suppliers

Someone has just given you a free ticket to the Matchbox Twenty and Everclear concert on Monday, March 5. However, you have a choice of either going to the concert or selling (scalping) the ticket in class to another student.
Questions for Suppliers

1. In making this choice, what factors will you consider?

2. What is the minimum price you must be offered in order to sell your ticket?

3. Why do you think some people have a higher minimum selling price than others? Explain why.

4. Would your minimum price per ticket differ if I gave you two tickets? Explain why.

Information for Demanders

You have the opportunity to buy a ticket for the Matchbox Twenty and Everclear concert on Monday, March 5 from a fellow student in class. Your choice is to either buy a ticket or not to buy a ticket.

Questions for Demanders

1. In making this choice, what factors will you consider?

2. If you were given a free ticket, would you take it? Why or why not?

3. What is the maximum price you will pay to buy the ticket?

4. Why do you think some people have a higher maximum buying price than others? Explain why.

5. Would your maximum buying price per ticket differ if I gave you two tickets? Explain why.
A. Willingness to Pay -- Demand

1. A household decides the amounts of goods and services to buy given their income.

2. The objective of a household is to maximize utility.
   a. Consider what an individual would pay for the first cup of coffee. This is called the willingness to pay. Then, what would the individual be willing to pay for two cups and then three cups and so and so forth.
   
   b. The marginal benefit is the increase in the willingness to pay to consume one more unit of a good.

<table>
<thead>
<tr>
<th>Cups of coffee</th>
<th>Willingness to pay for coffee</th>
<th>Marginal benefit from coffee</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$0.00</td>
<td>--</td>
</tr>
<tr>
<td>1</td>
<td>$1.00</td>
<td>$1.00</td>
</tr>
<tr>
<td>2</td>
<td>$1.80</td>
<td>$0.80</td>
</tr>
<tr>
<td>3</td>
<td>$2.40</td>
<td>$0.60</td>
</tr>
<tr>
<td>4</td>
<td>$2.80</td>
<td>$0.40</td>
</tr>
<tr>
<td>5</td>
<td>$3.00</td>
<td>$0.20</td>
</tr>
</tbody>
</table>

c. Rule of Thumb: a household will buy a good or service so long as the marginal benefit (MB) is greater than or equal to the price (P).

Q: How many cups of coffee would the individual buy if the price was $2.00, $1.50, $1.00 or $0.50?
2. The individual demand curve is downward sloping.

![Individual Demand Curve](image1)

3. The market demand curve is the sum of the individual demand curves and thus is downward sloping.

![Market Demand Curve](image2)
4. The consumer surplus is the difference between the marginal benefit \((MB)\) of a good and the price paid \((P)\).

\[Q: \textit{Indicate the consumer surplus in the above diagram for a market price of } $2.00?\]

B. Willingness to Sell -- Supply

1. A firm is an institution that organizes production. More specifically, a firm hires factors of production (land, labor, capital and entrepreneurial ability) and then combines these factors to produce goods & services.

2. The objective of a firm is to maximize economic profits. This will be discussed in detail in section IV.

3. The individual supply curve is upward sloping.

4. The market supply curve is the sum of the individual supply curves and is thus upward sloping.

5. The producer surplus is the difference between the price received for the good \((P)\) and the marginal cost \((MC)\).
C. Equilibrium and Efficiency

1. Demanders of coffee -- the consumers

   a. Law of demand -- all other things remaining the same, the higher the price of a good, the less is the quantity demanded of that good.

   b. The demand schedule and curve -- tabular and graphical representation of the negative relationship (downward slope) between the price of the good and the quantity demanded.

   c. Movement along the demand curve -- a change in the price of the good that results in movement along the demand curve.

   d. Shifts (or changes) in demand -- a change in some other thing that results in a shift in the demand curve.

2. Suppliers of coffee -- the coffee shops

   a. Law of supply -- all other things remaining the same, the higher the price of a good, the greater is the quantity supplied of that good.

   b. The supply schedule and curve -- tabular and graphical representation of the positive relationship (upward slope) between the price of the good and the quantity supplied.

   c. Movement along the supply curve -- a change in the price of the good that results in movement along the supply curve.

   d. Shifts (or changes) in supply -- a change in some other thing that results in a shift in the supply curve.
3. Equilibrium in the coffee market

a. The equilibrium price is the price that equates the quantity demanded with the quantity supplied.

b. The equilibrium quantity is the quantity that is both bought and sold at that equilibrium price.

![Coffee Market](image)

Q: What would happen if the price of coffee is $1.50 per cup?

Q: What would happen if the price of coffee is $2.00 per cup?
4. Efficiency in the coffee market

a. Pareto efficiency -- an outcome where it is not possible to make someone better off without hurting someone else.

b. There are three conditions that must hold.

i. The marginal benefit ($MB$) must equal the marginal cost ($MC$) on the last unit produced.

   \textit{Q: If this condition did not hold, then the } MB > MC \textit{ on one good and } MB < MC \textit{ on another good. Explain how under this situation someone could be made better off without hurting someone else?}

ii. The marginal cost ($MC$) of a good should be equal across all producers.

   \textit{Q: If this condition did not hold, then the } MC \textit{ would be high for one firm and low for another firm. Explain how production could be shifted to the benefit of society?}

iii. The marginal benefit ($MB$) of a good should be equal across all consumers.

   \textit{Q: If this condition did not hold, then the } MB \textit{ would be high for one consumer and low for another consumer. Explain how consumption could be shifted to the benefit of society?}
b. The competitive equilibrium is Pareto efficient.
   
i. Along the demand curve, an individual consumer chooses a quantity of a good so that $P = MB$. Moreover, along the supply curve, an individual firm produces a quantity of good so that $P = MC$. Therefore, $MB = MC$.
   
ii. Since all firms face the same price, the $MC$ is equal across all producers.
   
iii. Since all consumers face the same price, the $MB$ is equal across all consumers.

D. Applications

Q: Using the supply and demand model, show what the effect of a frost in Colombia would be on the equilibrium price and quantity in the coffee market?

Q: Using the supply and demand model, show what the effect of an increase in personal income would be on the equilibrium price and quantity in the coffee market?

Q: Using the supply and demand model, show what the effect of a price ceiling of $1.00 would be on the equilibrium price and quantity in the coffee market?

Q: Using the supply and demand model, show what the effect of a price floor of $2.50 would be on the equilibrium price and quantity in the coffee market?
E. Elasticity

1. The definition of elasticity is how sensitive one economic variable is to a change in another economic variable.

2. Price elasticity of demand -- a measure of how sensitive quantity demanded is to a change in the price of the good or service.

   a. Why is price elasticity of demand important?

   i. The effect of price elasticity of demand on total revenue

   ii. The effect of price elasticity of demand on tax revenue
b. Definition of price elasticity of demand

i. Formula: 
\[ \text{Price elasticity of demand} = \frac{\text{percent change in quantity demanded}}{\text{percent change in quantity}} \]

ii. Elastic versus inelastic

c. What determines the price elasticity of demand?

i. The degree of substitutability -- necessities versus luxuries

ii. The percentage spent of income -- big versus small ticket items

iii. Temporary versus permanent price changes

iv. Length of time -- short-run versus long-run responses

3. Price elasticity of supply -- a measure of how sensitive quantity supplied is to a change in the price of the good.

a. Why is price elasticity of supply important?

i. The response of prices to shifts in market demand
b. Definition of price elasticity of supply
   
i. Formula: \( \text{Price elasticity of supply} = \frac{\text{percent change in quantity supplied}}{\text{percent change in quantity}} \)

ii. Elastic versus inelastic

4. Applications

   a. The effect of a decrease in income taxation on employment and tax revenue