Outline

1. The Demand Curve
   - Building Market Demand from Individual Demand
   - Movements Along Versus Shifts in Demand

2. The Supply Curve
   - Defining Supply
   - Movements Along versus Shifts in the Supply Curve

3. Finding an Equilibrium

4. What Happens when Things Change?
The Supply and Demand Model

- One of the fundamental models used in economics is the supply and demand model for a competitive market.
- A competitive market is one in which there are many buyers and sellers of the same good or service, none of whom can individually influence the price at which the good or service is sold.
- There are many markets for which this model is a reasonable approximation, such as
  - grains
  - coffee
  - most fruits and vegetables
  - gasoline, etc.
- While other markets are less competitive, some of the lessons learned from the competitive supply and demand model are still useful.
- We will come back to these other types of markets later in the course.

The Components of the Model

There are four basic components to this model

1. The demand curve (and what factors cause it to shift)
2. The supply curve (and what factors cause it to shift)
3. The market equilibrium; i.e., how the supply and demand curve interact to determine the market price and quantity.
4. How the market equilibrium changes when the supply and demand curves change.
Demand for the Individual

- An individual’s **quantity demanded** for a good specifies the amount an individual would choose to buy of a good over some time period given:
  - A particular price that must be paid for the good.
  - All other constraints on the household (e.g., income).
- The **demand schedule** is a table showing the quantity demanded of a good that consumers would choose to purchase at different prices, again holding all other variables held constant.

Michael’s Demand for Beef

Consider a hypothetical individual, whose weekly demand for ground beef is given by the demand schedule:

<table>
<thead>
<tr>
<th>Price ($/lb)</th>
<th>Quantity Demanded (lbs/week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5</td>
<td>1</td>
</tr>
<tr>
<td>$4</td>
<td>3</td>
</tr>
<tr>
<td>$3</td>
<td>5</td>
</tr>
<tr>
<td>$2</td>
<td>7</td>
</tr>
<tr>
<td>$1</td>
<td>9</td>
</tr>
<tr>
<td>$0</td>
<td>11</td>
</tr>
</tbody>
</table>
The Quantity Demanded

There are several aspects of the quantity demanded that are important to keep in mind:

1. It implies a choice, indicating how much individuals would buy taking into account the opportunity costs of their decisions.
2. It is hypothetical, and does not depend upon the availability of the good at that price.
3. It stresses price. The choices that individuals make typically depend upon many factors, such as income, the price of other goods, age, etc. The demand schedule looks at the impact of changes in price on the quantity demanded of a good holding all other factors constant so that we can better understand the influence of price.

Michael’s Meat Demand Curve

The demand curve is simply a graphical representation of the demand schedule.
The Law of Demand

- Notice that the demand curve slopes downward.
- This illustrates what economists refer to as the law of demand; i.e., that when the price of a good rises, and everything else remains the same, the quantity of the good demanded will fall.
- Law of demand tells us that demand curves virtually always slope downward.
- The words “everything else remains the same” are important
  - In the real world many variables change simultaneously
  - However, in order to understand the economy we must first understand each variable separately
  - Thus we assume that “everything else remains the same” in order to understand how demand reacts to price

The Market Demand Curve

- A market is defined in terms of a specific group of individuals who would potentially trade with each other.
- Markets can be defined very broadly (e.g., nationally or internationally) or very narrowly (e.g., limited to a single community).
- The market demand schedule simply represent the sum of the quantities demanded by all individuals in the market at various prices.
- As with the individual demand schedules, we are varying only price and are holding all other factors constant.
- The market demand curve is the horizontal sum of individual demand curves in that market.
Suppose now that our market for beef consists of three individuals (Michael, John, and Joseph)

<table>
<thead>
<tr>
<th>Price</th>
<th>Michael</th>
<th>John</th>
<th>Joseph</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5</td>
<td>1</td>
<td>2</td>
<td>0.5</td>
<td>3.5</td>
</tr>
<tr>
<td>$4</td>
<td>3</td>
<td>5</td>
<td>1.0</td>
<td>9.0</td>
</tr>
<tr>
<td>$3</td>
<td>5</td>
<td>8</td>
<td>1.5</td>
<td>14.5</td>
</tr>
<tr>
<td>$2</td>
<td>7</td>
<td>11</td>
<td>2.0</td>
<td>20.0</td>
</tr>
<tr>
<td>$1</td>
<td>9</td>
<td>14</td>
<td>2.5</td>
<td>25.5</td>
</tr>
<tr>
<td>$0</td>
<td>11</td>
<td>17</td>
<td>3.0</td>
<td>31.0</td>
</tr>
</tbody>
</table>

The Market Demand Curve for Meat
Movements Along Versus Shifts in Demand

It is important to distinguish movements along versus shifts in demand:

- A movement along the demand curve occurs as a result in a change in the price of the good.
  - Given the law of demand, a fall in the price of the good would cause a movement to the right and downward along the demand curve.
  - Conversely, a rise in price would cause a movement to the left and up along the demand curve.
  - These are all changes in the quantity demanded.

- Changes (or shifts) in demand occur when the other factor we’ve been holding constant change.
Shifts in Demand

- **Shifts in Demand** occur when we change things other than the price of the good in question.
- There are five main factors that shift the demand curve (though other possibilities exist):
  1. Changes in income (or wealth)
  2. Changes in the number of consumers
  3. Changes in the prices of related goods or services
  4. Changes in tastes
  5. Changes in expectations

Changes in Demand Due to . . .

- **Changes in income**
  - For a normal good, we would expect that an increase in income would result in an increase in the quantity demanded of the good at any given price.
  - For some goods, known as inferior goods, demand decreases as income increases.
  - What is an example of an inferior good?
- Similar changes occur when our **wealth** changes, where wealth refers to the value of one’s assets minus the total value of one’s debts.
Shift in Demand when Income Increases for a Normal Good

Demand will also typically increase (i.e., shift to the right)
- As the number of consumers increases
- As tastes change in favor of the good or service

Demand will also shift with a change in the price of other goods
- Demand will increase when the price of a substitute good increases
  What would be an example of a substitute for beef?
- Demand will decrease when the price of a complementary good increases
  What would be an example of a complement for beef?

Finally, demand will change as price expectations change.
Supply for the Firm and for the Market

- A firm's quantity supplied of a good (or service) is the specific amount its managers would choose to sell over some time period, given
  - A particular price for the good
  - All other constraints on the firm

- The firm’s supply schedule is a table showing the quantity supplied by the firm that it would be willing to sell at different prices, again holding all other variables held constant.

- The market supply schedule is simply the sum of the quantities firms in the market are willing to sell at various prices.

Quantity Supplied

Much like the quantity demanded

- The quantity supplied represents a choice, in this case a choice by firms in terms of the quantity they would be willing to sell at a given price.

- It is a hypothetical quantity, in that it represent what they would want to sell at the given price. It is not assumed that they would be able to sell the quantity at that price.

- The supply schedule, much like the demand schedule emphasizes the relationship between quantity and price.
  - The price of the good is just one variable among many that influences quantity supplied
  - The supply schedule assumes that all of these other factors are held fixed.
A Supply Schedule for Beef

Consider a hypothetical market supply schedule for beef in Ames:

<table>
<thead>
<tr>
<th>Price ($/lb)</th>
<th>Quantity Supplied (lbs/month)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5</td>
<td>6,000</td>
</tr>
<tr>
<td>$4</td>
<td>5,500</td>
</tr>
<tr>
<td>$3</td>
<td>4,500</td>
</tr>
<tr>
<td>$2</td>
<td>3,000</td>
</tr>
<tr>
<td>$1</td>
<td>1,000</td>
</tr>
</tbody>
</table>

Notice that the supply curve is positively sloped; i.e., the quantity supplied increases with price. This is the law of supply.
Movements Along versus Shifts in the Supply Curve

- A change in the price of a good causes a movement along the supply curve
  - A rise in price would cause a rightward and upward movement along the supply curve
  - Conversely, a fall in price would cause a leftward and downward movement along the supply curve

- **Shifts in supply** occur when factors *other the current price of the good* change.
- There are five main factors that shift the supply curve (though other possibilities exist)
  1. Changes in input prices
  2. Changes in the number of producers
  3. Changes in the prices of related goods or services
  4. Changes in technology
  5. Changes in expectations

Shifts in Supply Due to . . .

- **Changes in input prices**
  - An *input* is any good or service used to produce any other good or service.
  - An increase in an input price makes it more costly to produce a good, resulting in reduced supply (i.e., a leftward shift in the supply curve)
  - We saw this in 2008 with a sharp increase in food prices as corn prices (used in making corn fructose sweetener) increased.
Shifts in Supply Due to...

- Changes in the number of producers
  - An increase in the number of producers will lead to an increase in supply (i.e., a shift of the supply curve to the right)

- Changes in the price of related goods
  - The impact of a change in the price of related goods will vary.
  - If the related good is a substitute in production (i.e., a potential output for the firm that it can produce instead), then an increase in the price of this related good will cause a decrease in supply (i.e., a shift to the left).
  - If the related good is a complement in production (i.e., an output that the firm produces along with the good in question), then an increase in the price of this related good will cause an increase in supply (i.e., a shift to the right).
Shifts in Supply Due to . . .

- Changes in technology
  - **Technology** broadly refers to the means of production; i.e., how we produce a given good or service.
  - Cost-saving technological advances increase the supply of a good, shifting the supply curve to the right.

- Changes in price expectations.
  - If the firm can alter when it sells its output, changes in price expectations can cause a shift in the current supply curve.
  - For example, if the firm expects prices to increase in the future, it will cause a reduction in the amount the firm is willing to supply today (i.e., a leftward shift in the current supply curve).

The Supply of Doctors

- In a 6/24/09 article on MSNBC.com (“No relief: Shortage keeps older docs on the job”), the writer notes comments on a shortage of primary care physicians.
- 50 years ago, half of the physicians were in primary care.
- Today, less than 1 in 5 graduating physician plan to go into primary care.

What economic factors have reduced the supply of primary care physicians?

1. The price of related goods.
   - Family physicians make $190,000 per year, whereas orthopedic surgeons make $450,000 per year.
   - This is in part a reflection of the cost structure imposed on physician services by government programs, such as Medicare and Medicaid.

2. The cost of inputs.
   - Newly minted physicians typically come out with $140,000 in debt.
   - The cost of malpractice insurance has continued to rise.

3. Changes in the number of producers of doctors.
   - There are fewer medical schools than there have been in the past.
Equilibrium: Putting Supply and Demand Together

- One of the principles (#6) from chapter 1 was that the market moves to an equilibrium (i.e., it eventually settles down after a change).
- In this section, we see how this works in a competitive market by combining the supply and demand curves and looking at the incentives it creates.
- Before doing that, we need to define what we mean precisely by the market equilibrium.
- Formally, a competitive market is equilibrium when price has moved to a point where the quantity of a good or service demanded equals the quantity of the good supplied.
- The price at which this occurs called the equilibrium price or the market-clearing price.
- The quantity at which this occurs is called the equilibrium quantity.

Finding the Equilibrium Graphically

The easiest way to see how the market reaches equilibrium is to consider it graphically.
Finding an Equilibrium

Finding the Equilibrium Graphically from Too High a Price

The equilibrium price and quantities in the previous graphs indicate where the market will naturally settle down to given the current supply and demand curves.

But what happens if things change.

Earlier in this chapter we looked at factors that cause shifts in demand and shifts in supply.

In this section, we want to consider how these shifts impact the market equilibrium.
A Shift in Demand
Consider the impact of the *Swine Flu* on the beef market.

![Demand Curve Diagram]

A Shift in Supply: An Increase is the Price of Corn
Consider the impact of the price of corn on Breakfast Cereal.

![Supply Curve Diagram]
When Both Curves Shift

- When only one of the curves shifts, the impacts on the equilibrium price and quantity are unambiguous.
- However, when both curves change at the same time, this is no longer the case, with the impacts depending on the size of the various changes.
- In general, we have the following results:

<table>
<thead>
<tr>
<th>Demand</th>
<th>Supply</th>
<th>Equilibrium Price</th>
<th>Equilibrium Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increases</td>
<td>Increase</td>
<td>Ambiguous</td>
<td>Increases</td>
</tr>
<tr>
<td>Decreases</td>
<td>Decrease</td>
<td>Ambiguous</td>
<td>Decreases</td>
</tr>
<tr>
<td>Increases</td>
<td>Decrease</td>
<td>Increases</td>
<td>Ambiguous</td>
</tr>
<tr>
<td>Decreases</td>
<td>Increase</td>
<td>Decreases</td>
<td>Ambiguous</td>
</tr>
</tbody>
</table>

Supply Decreasing and Demand Increase

- Consider the problem of gasoline prices
- Demand for gasoline is generally increasing over time as
  - world population increases
  - incomes increase in developing countries.
- Supply may also decrease, as
  - input costs increase
  - regulatory costs increase
- How will the equilibrium price and quantity change over time with these changes?
What Happens when Things Change?

Graphically

Price ($/gal.)

$D$

$S$

$P^*$

$Q^*$

Quantity (mill. bbl/day)

Price ($/gal.)

$P^*$