Supply and Demand

- Supply and demand is an economic model
  - Designed to explain how prices are determined in certain types of markets
- What you will learn in this chapter
  - How the model of supply and demand works and how to use it
  - Strengths and limitations of model
Markets

- Specific location where buying and selling takes place, such as
  - Supermarket or a flea market
- In economics, a market is not a place but rather
  - A group of buyers and sellers with the potential to trade with each other
- Economy is a collection of individual markets
- Define and characterize the market or collection of markets
How Broadly Should We Define The Market

- Group things together
  - Aggregation is the combining of a group of distinct things into a single whole

- Markets can be defined broadly or narrowly
  - How broadly or narrowly markets are defined is one of the most important differences between Macroeconomics and Microeconomics
Defining Macroeconomic Markets

- Goods and services are aggregated to the highest levels
  - Macro models lump all consumer goods into the single category…….
  - Analyze all capital goods(??) as one market
Defining Microeconomic Markets

- Markets are defined narrowly
  - Focus on models that define much more specific commodities
- Always involves some aggregation
  - The process stops before it reaches the highest level of generality
Product and Resource Markets

- Buyers and sellers in a market can be
  - Households
  - Business firms
  - Government agencies

- Product Markets
  - Goods and services are bought and sold
  - Business firms are the…, households are the….

- Resource Markets
  - Resources are bought and sold
  - Business firms are the…, households are the…
Competition in Markets

- In imperfectly competitive markets, individual buyers or sellers determine the price of the product.
- In perfectly competitive markets (or just competitive markets), each buyer and seller takes the market price as a given.
- Perfectly competitive markets have many small buyers or sellers and the product is unique.
- Imperfectly competitive markets have just a few large buyers or sellers or else the product of each seller is unique in some way.
Demand

- Quantity demanded of a good or service
  - Number of units that all buyers in a market would choose to buy over a given time period, given the constraints they face
  - Implies a choice
  - Hypothetical
  - Depends on .....?
The Law of Demand

- States that when the price of a good rises and everything else remains the same, the quantity of the good demanded will fall.
  - The words, “everything else remains the same” are important.
    - In the real world many variables change simultaneously, however....
    - Thus we assume, ______, in order to understand how demand reacts to price.
The Demand Schedule and The Demand Curve

- Demand schedule
  - A list (price-quantity combination) of different quantities demanded at different prices, with all other variables held constant

- The demand curve shows the relationship between the price of a good and the quantity demanded in the market, holding constant all ........
  - Each point on the curve shows the total quantity that buyers would choose to buy at a specific price

- Law of demand tells us that demand curves virtually always slope ........?
Figure 1: The Demand Curve

At $2.00 per bottle, 60,000 bottles are demanded (point B).

When the price is $4.00 per bottle, 40,000 bottles are demanded (point A).
Shifts vs. Movements Along The Demand Curve

- A change in the price of a good causes a movement along the demand curve
- In Figure 1
  - A fall (rise) in price would cause a movement to the right (left) along the demand curve
- A change in income causes _____ in the demand curve
- In Figure 2
  - Demand curve has shifted to the right of the old curve (in Figure 1) as income has .....?
  - A change in any variable that affects demand—except for the good’s price—causes the demand curve to shift
Figure 2: A Shift of The Demand Curve

An increase in income shifts the demand curve for maple syrup from \( D_1 \) to \( D_2 \).

At each price, more bottles are demanded after the shift.
“Change in Quantity Demanded” vs.
“Change in Demand”

Language is important when discussing demand

- “Quantity demanded” means
  - A particular amount that buyers would choose to buy at a specific price (it is a number represented by a single point) on a demand curve
  - When a change in the price of a good moves us along a demand curve, it is a ________.

- The term demand means
  - The entire relationship between price and quantity demanded—and represented by the entire demand curve
  - When something other than price changes, causing the entire demand curve to shift, it is a ________.
Factors That Shift The Demand Curve: Income & Wealth

- An increase in income has effect of shifting demand for normal goods to the right
  - However, a rise in income shifts demand for inferior goods to the left

- An increase in wealth
  - Increase demand (shift the curve ____ for a normal good
  - Decrease demand (shift the curve ____ for an inferior good
Factors that Shift the Demand Curve: Prices of Related Goods

- **Substitute**—good that can be used in place of some other good and that fulfills more or less the same purpose
  - A rise in the price of a substitute increases the demand for a good, shifting the demand curve to the right

- **Complement**—used together with the good we are interested in
  - A rise in the price of a complement decreases the demand for a good, shifting the demand curve to the left
Other Factors That Shift the Demand Curve

- Population
  - As the population increases in an area....?
- Expected Price
  - An expectation that price will rise (fall) in the future shifts the current demand curve rightward (leftward)
- Tastes
Figure 3(a): Movements Along and Shifts of The Demand Curve

Price increase moves us leftward along demand curve

Price decrease moves us rightward along demand curve
Figure 3(b): Movements Along and Shifts of The Demand Curve

Entire demand curve shifts rightward when:
- income or wealth $↑$
- price of substitute $↑$
- price of complement $↓$
- population $↑$
- expected price $↑$
- tastes shift toward good
Figure 3(c): Movements Along and Shifts of The Demand Curve

Entire demand curve shifts leftward when:
- income or wealth ↓
- price of substitute ↓
- price of complement ↑
- population ↓
- expected price ↓
- tastes shift away from good
Supply

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

- Market quantity supplied is the specific amount of a good that all sellers in the market would choose to sell over some time period, given
  - A particular price for the good
  - All constraints on firms
The Law of Supply

- States that when the price of a good rises and everything else remains the same, the quantity of the good supplied will rise
  - The words, “everything else remains the same” are important
The Supply Schedule and The Supply Curve

- Supply schedule—shows quantities of a good or service firms would choose to produce and sell at different prices, (so again P-Q combination but??) with all other variables held constant

- Supply curve—graphical depiction of a supply schedule
  - Shows quantity of a good or service supplied at various prices, with all other variables held constant
Movements Along the Supply Curve

- A change in the price of a good causes a movement along the supply curve
  - In Figure 1
    - A rise (fall) in price would cause a rightward (leftward) movement along the supply curve
Figure 1: The Supply Curve

- When the price is $2.00 per bottle, 40,000 bottles are supplied (point F).
- At $4.00 per bottle, quantity supplied is 60,000 bottles (point G).
Factors That Shift the Supply Curve

- **Input prices**
  - A fall (rise) in the price of an input causes an increase (decrease) in supply, shifting the supply curve to the right (left)

- **Price of Alternative Goods**
  - When the price of an alternate good rises (falls), the supply curve for the good in question shifts leftward (rightward)

- **Technology**
  - Cost-saving technological advances increase the supply of a good, shifting the supply curve to the right
A decline in Carpenters’ wage rates shifts the supply curve for New Houses from $S_1$ to $S_2$.

At each price, more houses supplied after the shift.
Factors That Shift the Supply Curve

- **Number of Firms**
  - An increase (decrease) in the number of sellers—with no other changes—shifts the supply curve to the right (left)

- **Expected Price**
  - An expectation of a future price increase (decrease) shifts the current supply curve to the left (right)
Factors That Shift the Supply Curve

- Changes in weather
  - Favorable weather
    - Increases crop yields
    - Causes a ___________ of the supply curve for that crop
  - Unfavorable weather
    - Destroys crops
    - Shrinks yields
    - Shifts the supply curve __________.
Figure 3(a): Changes in Supply and in Quantity Supplied

Price increase moves us rightward along supply curve

Price decrease moves us leftward along supply curve
Figure 3(b): Changes in Supply and in Quantity Supplied

Entire supply curve shifts rightward when:
- price of input ↓
- price of alternate good ↓
- number of firms ↑
- expected price ↓
- technological advance
- favorable weather
Figure 3(c): Changes in Supply and in Quantity Supplied

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<th>Price</th>
<th>Quantity</th>
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Entire supply curve shifts leftward when:
- price of input ↑
- price of alternate good ↑
- number of firms ↓
- expected price ↑
- unfavorable weather
Equilibrium: Putting Supply and Demand Together

- When a market is in equilibrium
  - Both price of good and quantity bought and sold have settled into a state of rest
  - The equilibrium price and equilibrium quantity are values for price and quantity in the market but, once achieved, will remain constant
    - Unless and until supply curve or demand curve shifts

- The equilibrium price and equilibrium quantity can be found on the vertical and horizontal axes, respectively
  - At point where supply and demand curves cross
1. At a price of $1.00 per bottle an excess demand of 50,000 bottles...

2. causes the price to rise...

3. shrinking the excess demand...

4. until price reaches its equilibrium value of $3.00.
Excess Demand: Putting Supply and Demand Together

- Excess demand
  - At a given price, the excess of quantity demanded over quantity supplied
- Price of the good will rise as buyers compete with each other to get more of the good than is available
Figure 5: Excess Supply and Price Adjustment

1. At a price of $5.00 per bottle an excess supply of 30,000 bottles . . .

2. causes the price to drop,

3. shrinking the excess supply . . .

4. until price reaches its equilibrium value of $3.00.

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Excess Supply: Putting Supply and Demand Together

- Excess Supply
  - At a given price, the excess of quantity supplied over quantity demanded

- Price of the good will fall as sellers compete with each other to sell more of the good than buyers want
Income Rises: What Happens When Things Change

- Income rises, causing an increase in demand
  - Rightward shift in the demand curve causes rightward movement along the supply curve
  - Equilibrium price and equilibrium quantity both rise

- Shift of one curve causes a movement along the other curve to new equilibrium point
1. An increase in demand moves us along the supply curve...

2. Equilibrium price increases to $4.00.

3. to a new equilibrium.

4. Equilibrium price increases.

5. and equilibrium quantity increases too.
An Ice Storm Hits: What Happens When Things Change

- An ice storm causes a decrease in supply
  - Weather is a [ ] for supply curve
  - Any change that shifts the supply curve leftward in a market will increase the equilibrium price
  - And decrease the equilibrium quantity in that market
Figure 7: A Shift of Supply and A New Equilibrium

Price per Bottle

$5.00

3.00

Number of Bottles

35,000 50,000

$5.00

3.00

S₂

S₁

E'

E

D
Both Curves Shift

- When just one curve shifts (and we know the direction of the shift) we can determine the direction that both equilibrium price and quantity will move.
- When both curves shift (and we know the direction of the shifts) we can determine the direction for either price or quantity—but not both.
  - Direction of the other will depend on which curve shifts by more.
Figure 8: Changes in the Market for Handheld PCs

1. An increase in supply . . .
2. and a decrease in demand . . .
3. moved the market to a new equilibrium.
4. Price decreased . . .
5. and quantity decreased as well.

1. An increase in supply . . .

Price per Handheld PC

Millions of Handheld PCs per Quarter

2.45 3.33
The Three Step Process

- Key Step 1—Characterize the Market
  - Decide which market or markets best suit problem being analyzed and identify decision makers (buyers and sellers) who interact there

- Key Step 2—Find the Equilibrium
  - Describe conditions necessary for equilibrium in the market, and a method for determining that equilibrium

- Key Step 3—What Happens When Things Change
  - Explore how events or government policies change market equilibrium
Model of Supply and Demand

Analyze what determines the price of cars and the quantity of cars sold in the market.

- Describe buyers’ behavior, sellers’ behavior and …?
- $Q^D = D(P,Y)$, $Q^D$: Quantity of cars demanded, $P$ is the price of cars, $D$: Demand function, $Y$ denotes income.
- $Q^S = S(P,P_m)$, $Q^S$: Quantity of cars supplied, $P$ is the price of cars, $S$: Supply function, $P_m$ denotes price of all materials needed to produce a car.
- If $Q^D > Q^S$ (excess demand), price will…. 
- If $Q^D < Q^S$ (excess supply), price will…. 
- $Q^D = Q^S$ equilibrium
Model of Supply and Demand

- Suppose that demand for cars is given by the equation
  \[ Q^D = D(P, Y) = 50 - 2P + 2Y \]
- Supply for cars is described by the equation
  \[ Q^S = S(P, P_m) = 20 + 2P - 2P_m \]
- Exogenous variables: determined outside the model, model takes as given
- Endogenous variables: determined inside the model, model tries to explain.

What is the equilibrium price? Equilibrium quantity of cars bought and sold?

- \[ Q^D = Q^S \Rightarrow \]
- \[ P^* = 30/4 + (2Y)/4 + (2P_m)/4 \]
- \[ Q^D = 35 + Y - P_m \]
- \[ Q^S = 35 + Y - P_m \]
- Does the equilibrium price depend on \( P, Q, Y, P_m \)?