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 _______ 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 ____ small buyers or sellers and the product is _________
- 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

<table>
<thead>
<tr>
<th>Price per Bottle</th>
<th>Number of Bottles per Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>$4.00</td>
<td>40,000</td>
</tr>
<tr>
<td>2.00</td>
<td>60,000</td>
</tr>
</tbody>
</table>

When the price is $4.00 per bottle, 40,000 bottles are demanded (point A).

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

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
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.

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

“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 ________.
Other Factors That Shift the Demand Curve

- Population
  - As the population increases in an area, how does it affect the demand curve?
- 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 the demand curve.
Price decrease moves us rightward along the 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.
At $4.00 per bottle, quantity supplied is 60,000 bottles (point G).

When the price is $2.00 per bottle, 40,000 bottles are supplied (point F).

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

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 **rightward** shift of the supply curve for that crop
  - Unfavorable weather
    - Destroys crops
    - Shrinks yields
    - Shifts the supply curve **leftward**

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Figure 3(a): Changes in Supply and in Quantity Supplied

- Price increase moves us **rightward along** the supply curve
- Price decrease moves us **leftward along** the supply curve

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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

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Figure 3(c): Changes in Supply and in Quantity Supplied

- 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

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
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

Figure 6

- An increase in demand
- Move along the supply curve
- Equilibrium price increases
- New equilibrium
- 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
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.

The Three Step Process

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

- Key Step 2—Find the Equilibrium
  - Describe the 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 the 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
- 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?