2.1 DEMAND

- Demand: quantity of a good or service that buyers will purchase at various prices during a given period of time
  - Must have the desire and ability to purchase (so demand only exists for those good that you both want and are able to afford)
  - Law of demand: the quantity demand varies inversely with price, as long as other things do not change
  - Ceteris paribus: meaning "other things remaining the same"

- Why is the law of demand true? (continued)
  - Law of diminishing marginal utility: as a person increases consumption of a product (while keeping consumption of other products constant) there is a decline in the marginal utility (increased usefulness or satisfaction) that person receives from consuming each additional unit of that product
    - E.g. a buffet

2.3 THE MARKET

- A market can be:
  - A physical place where goods are bought and sold
  - A collective reference to all the buyers and sellers of a particular good and service
  - The demand that exists for a particular good or service
  - The process by which a buyer and seller arrive at a mutually acceptable price and quantity
- Market and economy are NOT synonymous
2.1 DEMAND

- Individual Demand:

<table>
<thead>
<tr>
<th>Price of t-shirt</th>
<th>Quantity demanded</th>
</tr>
</thead>
<tbody>
<tr>
<td>$20</td>
<td>4 t-shirts</td>
</tr>
<tr>
<td>$24</td>
<td>3 t-shirts</td>
</tr>
<tr>
<td>$28</td>
<td>2 t-shirts</td>
</tr>
<tr>
<td>$32</td>
<td>1 t-shirt</td>
</tr>
<tr>
<td>$36</td>
<td>0 t-shirts</td>
</tr>
</tbody>
</table>

The consumer would buy in a given time period (quantity demanded).

- Demand curve: curved or straight line that graphically depicts the relationship between price and quantity demanded.
  - Downward sloping because of the inverse relationship between the two variable.
  - X-axis is always quantity demanded.
  - Y-axis is always price.

- Demand curve:

Market demand schedule: considers the sum total of all the consumer demands for a product.

<table>
<thead>
<tr>
<th>Price of t-shirt</th>
<th>Buyer 1</th>
<th>Buyer 2</th>
<th>Buyer 3</th>
<th>Buyer 4</th>
<th>Total quantity demanded</th>
</tr>
</thead>
<tbody>
<tr>
<td>$20</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>$24</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>$28</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>$32</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>$36</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Market demand:
Supply: the quantities that sellers will offer for sale at various prices during a given period of time.

Suppliers react to prices opposite of consumers: when prices rise, they want to supply more (while consumers want to purchase less) because they are driven by profit.

Law of supply: the quantity supplied will increase if price increases and fall if prices falls, as long as other things do not change.

<table>
<thead>
<tr>
<th>Price</th>
<th>The seller would like to sell in a given time period (quantity supplied)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$20</td>
<td>0 t-shirts</td>
</tr>
<tr>
<td>$24</td>
<td>4 t-shirts</td>
</tr>
<tr>
<td>$28</td>
<td>8 t-shirts</td>
</tr>
<tr>
<td>$32</td>
<td>12 t-shirts</td>
</tr>
<tr>
<td>$36</td>
<td>16 t-shirts</td>
</tr>
</tbody>
</table>

Supply schedule: a table showing the quantity of products supplied at various prices (though not actually sold).

If the price of t-shirts were...

- Market supply schedule: considers the sum total of all the consumer demands for a product.
- Market supply curve is upward sloping because as price increases, current producers will produce more AND new firms will enter the market.

Price of t-shirt: Buyer 1 | Buyer 2 | Buyer 3 | Buyer 4 | Total quantity supplied
---|---------|---------|---------|----------------|
$20 | 0 | 0 | 0 | 0 | 0
$24 | 1 | 0 | 2 | 1 | 4
$28 | 2 | 1 | 3 | 2 | 8
$32 | 3 | 2 | 4 | 3 | 12
$36 | 4 | 3 | 5 | 4 | 16
2.2 SUPPLY

- Market supply:

2.4 MARKET EQUILIBRIUM

<table>
<thead>
<tr>
<th>Price of t-shirt</th>
<th>Market Demand</th>
<th>Market Supply</th>
<th>Shortage/ Surplus</th>
</tr>
</thead>
<tbody>
<tr>
<td>$20</td>
<td>16</td>
<td>0</td>
<td>-16</td>
</tr>
<tr>
<td>$24</td>
<td>12</td>
<td>4</td>
<td>-8</td>
</tr>
<tr>
<td>$28</td>
<td>8</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>$32</td>
<td>4</td>
<td>12</td>
<td>+8</td>
</tr>
<tr>
<td>$36</td>
<td>0</td>
<td>16</td>
<td>+16</td>
</tr>
</tbody>
</table>

- Equilibrium price: price at which no shortage or surplus occurs
  - No tendency for it change (i.e., it is stable)
  - The only acceptable compromise for sellers who want the highest price and consumers who want the lowest price
  - Price above equilibrium: surplus of goods
  - Price below equilibrium: shortage of goods

2.4 MARKET EQUILIBRIUM

- Why is the equilibrium price stable?
  - When a product is in surplus:
    - There is excess supply
    - Price is pushed down
  - When a product is in shortage:
    - There is excess demand
    - Price is pushed up

2.4 MARKET EQUILIBRIUM

- Changes in demand:
  - are shown by shifts in the demand curve
  - are caused by changes in demand determinants
  - Occur when the ceterius paribus assumption is not maintained
2.5 CHANGE IN DEMAND

Demand determinants include the following factors:
- The number of buyers: an increase causes a rightward demand shift (direct relationship)
- Consumer incomes
  - For normal products, an increase causes a rightward demand shift (direct relationship)
  - For inferior products, an increase causes a leftward demand shift (inverse relationship)

Demand determinants (continued):
- Prices of related products
  - For substitute (or competitive) products, a rise in the other product’s price causes a rightward demand shift.
  - For complementary products (which must be used together), a rise in the other product’s price causes a leftward demand shift.
- Consumer preferences
- Consumer expectations

Change in equilibrium:
- A rightward demand shift pushes up both equilibrium price and quantity.
- A leftward demand shift pushes down both equilibrium price and quantity.

2.6 CHANGE IN SUPPLY

Changes in supply:
- are shown by shifts in the supply curve
- are caused by changes in supply determinants
- Also affect the ceterius paribus assumption
2.6 CHANGE IN SUPPLY

Supply determinants include the following factors:
- Number of producers (an increase causes a rightward supply shift)
- Resource prices (an increase causes a leftward supply shift)
- State of technology (an improvement causes a rightward supply shift)
- Prices of related products (an increase causes a leftward supply shift)

Supply determinants (continued):
- Producer expectations (an expectation of lower prices in the future causes an immediate rightward supply shift)
- Changes in nature (an improvement causes a rightward shift for some products)

Change in equilibrium:
- A rightward supply shift pushes equilibrium price down and equilibrium quantity up.
- A leftward supply shift pushes equilibrium price up and equilibrium quantity down.

Price elasticity of demand:
- The responsiveness of a product’s quantity demanded to a change in its price
- Elastic demand: demand for which a percentage change in a product’s price causes a larger percentage change in quantity demanded
- Inelastic demand: demand for which a percentage change in a product’s price causes a smaller percentage change in quantity demanded
**2.7 ELASTICITY OF DEMAND**

- **Price elasticity of demand (continued):**
  - How to measure basic increases/decreases in demand or price:
    - During winter, an ice cream vendor raises her price from $2.00 to $2.40
      - \( \% \text{ change} = \frac{P_2 - P_1}{P_1} \times 100\% \)
      - \( = \frac{(2.40 - 2.00)}{2.00} \times 100\% \)
      - \( = 20\% \text{ (therefore 20\% increase)} \)
    - Demand drops from 1000 to 500 cones
      - \( \% \text{ change} = \frac{D_2 - D_1}{D_1} \times 100\% \)
      - \( = \frac{(1000 - 500)}{1000} \times 100\% \)
      - \( = -50\% \text{ (therefore 50\% decrease)} \)
    - The percentage decline in demand is greater than the percentage increase in price, so demand is elastic

- **Price elasticity of demand (continued):**
  - During summer, an ice cream vendor raises her price from $2.00 to $2.40
    - \( \% \text{ change} = \frac{20\% \text{ (therefore 20\% increase)}} \)
    - Demand decreases from 2000 to 1800 cones
      - \( \% \text{ change} = \frac{D_2 - D_1}{D_1} \times 100\% \)
      - \( = \frac{(1800 - 2000)}{2000} \times 100\% \)
      - \( = -10\% \text{ (therefore 10\% decrease)} \)
    - The percentage decline in demand is less than the percentage increase in price, so demand is inelastic

- **Perfectly elastic demand:** demand for which a product’s price remains the constant regardless of quantity demanded
  - E.g. A soybean farmer is a price-taker, as he has no influence over the market price of soybeans
- **Perfectly inelastic demand:** demand for which a product’s quantity demanded remains the constant regardless of price
  - E.g. Insulin is essential for a diabetic, who will be willing to pay any price for it
2.7 ELASTICITY OF DEMAND

Effect on total revenue:
- Total revenue: total income earned from a product
  \[ TR = P \times Q_d \]
- If a supplier raises his prices, that higher price itself raises the supplier's revenue, but the decrease in demand has the opposite effect
  - Price elasticity of demand determines which of these has the bigger effect on total revenue: increase in price or decrease in quantity demanded

Effect on total revenue (continued):
- Elastic demand:
  - Blockbuster Videos
  - Price increase of a certain percentage causes an even bigger percentage decrease in \( Q_d \) \( \Rightarrow \) TR is reduced
  - Price decrease of a certain percentage causes an even bigger percentage increase in \( Q_d \) \( \Rightarrow \) TR increases
  - Inverse relationship between P and TR

Effect on total revenue (continued):
- Inelastic demand:
  - Amusement park rides:
  - Unit elastic demand:
    - Demand for which a percentage change in price causes an equal change in quantity demanded
Factors affecting price elasticity of demand:

- Portion of consumer incomes: if the price represents a hefty portion of consumer incomes, they will be more responsive to price changes.
- Access to substitutes: if there are many close substitutes, consumers will be more responsive to changes.
- Necessities v. luxuries: necessities have inelastic demand while luxuries (which are expendable) tend to have elastic demand.
- Time: demand tends to become elastic over time.

Coefficient of demand elasticity:

\[ e_d = \frac{\% \text{ change in quantity demanded}}{\% \text{ change in price}} \]

Example:

E.g. A gas station sells 10 million litres of gasoline a month at a price of $0.50 per litre. If the owners raise their price to $0.54 per litre, the quantity demanded falls to 9.5 million litres. Determine the coefficient of demand elasticity.

1st: Calculate % change in price:

\[ \% \text{ change} = \frac{P_2 - P_1}{P_{\text{average}}} \]

\[ = \frac{0.54 - 0.50}{(0.54 + 0.50)/2} \]

\[ = 0.04 / 0.52 \]

\[ = 0.0769 \Rightarrow 7.69\% \]

2nd: Calculate % change in quantity demanded:

\[ \% \text{ change} = \frac{Q_{d2} - Q_{d1}}{Q_{d\text{average}}} \]

\[ = \frac{9.5m - 10m}{(9.5m + 10m)/2} \]

\[ = -0.5m / 9.75 \]

\[ = 0.05128 \Rightarrow 5.13\% \]

3rd: Use % changes in P and Q_d to find coefficient:

\[ e_d = \frac{\% \text{ change in } Q_d}{\% \text{ change in } P} \]

\[ = \frac{0.0769}{0.05128} \]

\[ = 0.667 \text{ or } 0.67 \]

Note: It is no longer a concern whether Q_d is negative since we are interested in the amount of change, not the direction.

4th: Use coefficient to make a conclusion.

- Less than one: inelastic coefficient
- Greater than one: elastic coefficient
2.8 ELASTICITY OF SUPPLY

- Price elasticity of supply:
  - the responsiveness of a product’s quantity supplied to a change in price
  - Elastic supply: supply for which a percentage change in a product’s price cause a larger percentage change in quantity (suppliers are responsive to change)
  - Inelastic supply: supply for which the percentage change in a product’s price causes a smaller percentage change in quantity supplied (suppliers are not as responsive to change)

- Factors that affect the price elasticity of supply:
  - Short run: the production period during which none of the resources required to make a product can be varied
  - Supply is said to be perfectly inelastic (supply for which a product’s quantity supplied remains constant regardless of price)
  - E.g. Price of strawberries rises in response to sudden increase in demand for strawberries in April, but farmers cannot increase production

- Intermediate run: production period during which at least one of the resources required to make a product cannot be varied
  - E.g. Price of strawberries rises in response to increase in demand for strawberries in a particular growing season; farmers can add more labour, but they cannot bring more land into production

- Long run: the production period during which all resources required to make a product can be varied, and businesses can enter or leave the industry
  - Constant-cost industry: an industry that is not a major user of any single resource
  - Perfectly elastic supply: supply for which a product’s price remains constant
  - Increasing-cost industry: an industry that is a major user of at least one resource

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Calculating the price elasticity of supply

Similar to calculating the price elasticity of demand

\[ e_s = \frac{\Delta Q_s}{\text{average } Q_s} / \frac{\Delta P}{\text{average } P} \]

E.g. When the price of tomatoes rises from $2 to $3 a kg, the quantity supplied by farmers increases from 100,000 to 200,000 kg.

\[ e_s = \frac{\Delta Q_s}{\text{average } Q_s} / \frac{\Delta P}{\text{average } P} \]
\[ = (200,000 - 100,000) / [(200,000 + 100,000)/2] \]
\[ = 100,000 / (150,000) \]
\[ = 0.667 \]
\[ = 0.4 \]
\[ = 1.67 \]