Other Elasticity Concepts

How much of a shift?

Other Elasticity Concepts

• Other elasticities can be useful in specifying the effects of a shift factor of demand:
  – Income elasticity of demand.
  – Cross-price elasticity of demand.

Income Elasticity of Demand

• **Income elasticity of demand** – the percentage change in demand divided by the percentage change in income.

\[
E_{\text{Income}} = \frac{\text{Percentage change in demand}}{\text{Percentage change in income}}
\]
Income Elasticity of Demand

- An increase in income generally increases one's consumption of almost all goods.
- The increase may be greater for some goods than for others.

Income Elasticity of Demand

- **Normal goods** are those whose consumption increases with an increase in income.
- They have income elasticities greater than zero.

Income Elasticity of Demand

- Normal goods are divided into luxuries and necessities.

Income Elasticity of Demand

- **Luxuries** are goods that have an income elasticity greater than one.
- Their percentage increase in demand is greater than the percentage increase in income.
Income Elasticity of Demand

- A *necessity* has an income elasticity less than 1.
- The consumption of a necessity rises by a smaller proportion than the rise in income.

Income Elasticity of Demand

- *Inferior goods* are those whose consumption decreases when income increases.
- Inferior goods have income elasticities less than zero.

### Income Elasticities of Selected Goods

<table>
<thead>
<tr>
<th>Product</th>
<th>Income elasticity</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Short Run</td>
<td>Long Run</td>
<td></td>
</tr>
<tr>
<td>Motion pictures</td>
<td>0.81</td>
<td>3.41</td>
<td></td>
</tr>
<tr>
<td>Foreign travel</td>
<td>0.24</td>
<td>3.09</td>
<td></td>
</tr>
<tr>
<td>Tobacco products</td>
<td>0.21</td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td>Furniture</td>
<td>2.60</td>
<td>0.53</td>
<td></td>
</tr>
<tr>
<td>Jewelry and watches</td>
<td>1.00</td>
<td>1.64</td>
<td></td>
</tr>
<tr>
<td>Hard liquor</td>
<td>—</td>
<td>2.50</td>
<td></td>
</tr>
<tr>
<td>Private university tuition</td>
<td>—</td>
<td>1.10</td>
<td></td>
</tr>
</tbody>
</table>

Cross-Price Elasticity of Demand

- *Cross-price elasticity of demand* — the percentage change in demand divided by the percentage change in the price of another good.

\[
E_{Cross\text{-}Price} = \frac{\text{Percentage change in demand}}{\text{Percentage change in price of a related good}}
\]
Cross-Price Elasticity of Demand

- Cross-price elasticity of demand tells us the responsiveness of demand to changes in prices of other goods.

Complements and Substitutes

- **Substitutes** are goods that can be used in place of another.
- Substitutes have positive cross-price elasticities.

Complements and Substitutes

- **Complements** are goods that are used in conjunction with other goods.
- Complements have negative cross-price elasticities.

Cross-Price Elasticities

<table>
<thead>
<tr>
<th>Commodities</th>
<th>Cross-Price Elasticity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef in response to price change in pork</td>
<td>0.11</td>
</tr>
<tr>
<td>Beef in response to price change in chicken</td>
<td>0.02</td>
</tr>
<tr>
<td>U.S. cars in response to price changes</td>
<td></td>
</tr>
<tr>
<td>European and Asian automobiles</td>
<td>0.28</td>
</tr>
<tr>
<td>European automobiles in response to price changes in U.S. and Asian automobiles</td>
<td>0.61</td>
</tr>
<tr>
<td>Beer in response to changes in wine</td>
<td>0.23</td>
</tr>
<tr>
<td>Hard liquor in response to price changes in beer</td>
<td>-0.11</td>
</tr>
</tbody>
</table>
Calculating Income Elasticity

\[ E_{\text{income}} = \frac{(26 - 20)}{\frac{1}{2}(26 + 20)} = \frac{26}{20} = 1.3 \]

Shift due to 20% rise in income

Calculating Cross-Price Elasticity

\[ E_{\text{cross}} = \frac{(108 - 104)}{\frac{1}{3}(108 + 104)} = \frac{0.38}{0.33} = 1.2 \]

Shift due to 33% rise in price of pork

Elasticity and Shifting Supply and Demand

- The more elastic the demand (supply), the greater the effect of a supply (demand) shift on quantity, and the smaller the effect on price.

Effects of Shifts in Supply on Price and Quantity

Inelastic Demand

Elastic Demand