Income Elasticity of Demand

And

Cross-Price Elasticity of Demand
Income Elasticity of Demand

\[ E_I = \% \Delta Q_d / \% \Delta I_d \]

Measures the sensitivity of DEMAND to changes in disposable income.
Engel Curve:

Shows the relationship between quantity demanded and disposable income given a constant price.
Engel Curve: Normal Good

Engel Curve for a Normal Good
\( E_I > 0 \)
Luxury Goods are Normal Goods but they have an

\[ E_I \geq 1 \]

Quantity demanded is *very sensitive* to changes in disposable income.
“Necessities” are Normal Goods but

\[ 0 < E_I < 1 \]

Quantity demand is not very sensitive to changes in disposable income
Engel Curve: Inferior Good

Engel Curve for an Inferior Good
$E_I < 0$
- Normal Goods \((E_I > 0)\)
  - Luxury Goods \((E_I \geq 1)\)
  - Necessitites \((0 < E_I < 1)\)

- Inferior Goods \((E_I < 0)\)
<table>
<thead>
<tr>
<th>Item</th>
<th>Elasticity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef</td>
<td>+.29</td>
</tr>
<tr>
<td>Pork</td>
<td>+.13</td>
</tr>
<tr>
<td>Chicken</td>
<td>+.18</td>
</tr>
<tr>
<td>Milk</td>
<td>+.20</td>
</tr>
<tr>
<td>All foods</td>
<td>+.18</td>
</tr>
<tr>
<td>Non foods</td>
<td>+1.25</td>
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</tbody>
</table>
Cross-Price Elasticity

Measures how sensitive DEMAND for a commodity is to changes in the price of a substitute or compliment commodity
Cross-Price Elasticity

\[ E_{cp \, of \, x,y} = \frac{\% \Delta Q_x}{\% \Delta P_y} \]
Cross-Price Elasticity

\[ E_{cp} > 0 \Rightarrow \text{Substitute} \]

\[ E_{cp} < 0 \Rightarrow \text{Compliment} \]

\[ E_{cp} = 0 \Rightarrow \text{Independent} \]
Example:

The Cross-Price Elasticity of Beef and Pork would be calculated as:

$$E_{cp, \text{Beef, Pork}} = \frac{\% \Delta Q_{\text{Beef}}}{\% \Delta P_{\text{Pork}}}$$
Example

The Cross-Price Elasticity of Pork and Beef would be calculated as:

\[ E_{cp, \text{Pork}, \text{Beef}} = \frac{\% \Delta Q_{\text{Pork}}}{\% \Delta P_{\text{Beef}}} \]
If the

\[ E_{cp, \text{Pork, Beef}} = +0.65 \]

Then for every 1% increase in the price of beef, the Qd of pork would increase 0.65%. We also would know that pork and beef are substitutes.