Aggregate Demand

International substitution effect A rise in the price level, other things remaining the same, increases the price of domestic goods relative to foreign goods, so imports increase and exports decrease, which decreases the quantity of real GDP demanded.

Similarly, a fall in the price level, other things remaining the same, decreases the price of domestic goods relative to foreign goods, so imports decrease and exports increase, which increases the quantity of real GDP demanded.
Nominal Exchange Rate

→ how many $ must I pay to buy 1 lb. of apples
  what is the price of apples: 0.45 $/lb. *

\[ p = 0.45 \]

→ how many $ must I pay to buy 1 German Mark
  what is the dollar price of Marks
  \[ e = 0.55 \] $/mark *

\[ e : \text{nominal exchange rate} \]
\[ r : \text{real exchange rate} \]
nominal exchange rate

- the cost in $ of one unit of foreign currency

\[ e = \frac{\$}{\£} = 1.8 \]

- Wall Street Journal

real exchange rate

- the cost in $ of a comparable good or service bought abroad

example:

<table>
<thead>
<tr>
<th>haircut in London</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>in £</td>
<td>in $</td>
</tr>
<tr>
<td>10</td>
<td>18 - relative expense</td>
</tr>
</tbody>
</table>

- haircuts = \[ \frac{P_{U.K., \$}}{P_{U.S., \$}} = \frac{18}{10} \]

real exchange rate for haircuts

Note dimensional

\[ e = \frac{\$}{\£} \]

nominal real
\[ r_{\text{haircut}} = \frac{P_{\text{U.K.}, \$}}{P_{\text{U.S.}, \$}} = \frac{P_{\text{U.K.}, \£}}{P_{\text{U.S.}, \$}} = \frac{18}{10} \]

\[ r_i = \frac{P_{i, \text{U.K.}, \$}}{P_{i, \text{U.S.}, \$}} = \frac{P_{i, \text{U.K.}, \£}}{P_{i, \text{U.S.}, \$}} \]

\[ r = \frac{\text{CPI}^{\text{U.K.}} \cdot e}{\text{CPI}^{\text{U.S.}}} \]

\( r \) = the "average" cost in \$ of a comparable basket of goods bought abroad

<table>
<thead>
<tr>
<th>if ( r ): high</th>
<th>U.S. relatively cheap</th>
</tr>
</thead>
<tbody>
<tr>
<td>if ( r ): low</td>
<td>U.S. relatively expensive</td>
</tr>
</tbody>
</table>

\[ r = \frac{\overline{\text{CPI}^{\text{U.K.}}}}{\overline{\text{CPI}^{\text{U.S.}}}} \]

**Text:**

\[ r = \frac{\overline{\text{CPI}^{\text{U.K.}}}}{\overline{\text{CPI}^{\text{U.S.}}}} \]

Assume \( \Delta \text{CPI}^{\text{U.S.}} > 0 \Rightarrow \Delta z < 0 \)

U.S. becomes less competitive
Recall:

\[ \Delta P > 0 \]
\[ \Delta P^u = 0 \]
\[ \Delta E = 0 \]

- U.S. becomes less competitive

\[ X = X(2) \]
\[ \Delta X < 0 \quad \Delta E < 0 \]
\[ \Delta N = N(2) \]
\[ \Delta N > 0 \quad \Delta E < 0 \]

\[(X - N) = f(\Delta)\]

- Trade balance if \( \Delta E < 0 \)

- The quantity of US financial goods and services decreases
- An upward movement along the AD curve.

\( RGDP \)
Keynesian supply and demand for money and goods:

- **Interest Rates:**
  - \( \Delta T = e \frac{\Delta i}{\epsilon} \)
  - \( \epsilon = 0 \)

- **Real Income:**
  - \( \frac{\Delta (X-H)}{X-H} = e \frac{\Delta Z}{Z} \)
  - \( \epsilon = 0 \)

- **Prices:**
  - Goods and services prices do not matter.

- **Output and Employment:**
  - \( \frac{\Delta AO}{AO} = e \frac{\Delta P}{P} \)
  - \( \epsilon = 0 \)

- **Real GDP:**
  - \( \hat{R} \) (Real GDP)