**Trade-Weighted Dollar**  
( *a.k.a. Effective Exchange Rate*)

**Given:**
- rates *are the foreign currency price of the $*

<table>
<thead>
<tr>
<th>Country</th>
<th>%</th>
<th>( r_{s \text{ spot}} ) 1990</th>
<th>( r_{\text{Spot} \ 2000} )</th>
<th>% Δ</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.K.</td>
<td>30%</td>
<td>( r_s = 0.50 (\£/$) )</td>
<td>( r_s = 0.525 (\£/$) )</td>
<td>5.0 %</td>
</tr>
<tr>
<td>Japan</td>
<td>40%</td>
<td>( r_s = 100 (¥/$) )</td>
<td>( r_s = 116.0 (¥/$) )</td>
<td>16.0 %</td>
</tr>
<tr>
<td>Germany</td>
<td>30%</td>
<td>( r_s = 5.00 (\text{DM}/$) )</td>
<td>( r_s = 4.50 (\text{DM}/$) )</td>
<td>-10 %</td>
</tr>
</tbody>
</table>

Since \( \%Δ = (r_f - r_s)/r_s \times 100\% \), the $:

a) *appreciated by* +5.0 % against the £,

b) *appreciated by* +16.0 % against the ¥ and

c) *depreciated by* -10.0 % against the DM.

The *trade-weighted dollar* = a weighted average of the $ cost of each currency. (Weights proportionate to trade volume)

The change in weighted value of the $ equals:

\[
TW\$ = 0.3 \times \%Δ r_£ + 0.4 \times \%Δ r_¥ + \%Δ r_{\text{DM}}
\]

\[
TW\$ = 0.3 \times 5\% + 0.4 \times 16\% + 0.3 \times -10\% =
\]

\[
TW\$ = 4.9\% \approx 5\%
\]

According to this measure,

the dollar has appreciated by about 5% overall.