International Economics: Lecture 22
Elasticity Approach to CAB

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Elasticity approach to current account balance

When the dram depreciates,
- domestic goods (exports) become relatively cheaper and
- foreign goods (imports) relatively more expensive.

Hence, we would expect Armenian exports to ↑ and imports to ↓.

What is the formal rule, under which a depreciation causes the trade balance to move toward surplus?
Elasticity approach to current account balance

Assume a 2 country world in which trade is initially balanced, \(X=M=TB=0\).

The question: When will a depreciation cause a change in \(X\) greater than in \(M\).

\[\varepsilon_X + \varepsilon_M > 1\]

The Marshall-Lerner condition

Export + Import elasticities with respect to exchange rate
Elasticity approach

The proof of the Marshall-Lerner condition

\[ TB = PX - SP^* M \]

\[ \frac{dT_B}{dS} = P \frac{dX}{dS} - SP^* \frac{dM}{dS} - P^* M \]

\[ \frac{dT_B}{dS} = \varepsilon_X \frac{PX}{S} + \varepsilon_M P^* M - P^* M \]

\[ \frac{dT_B}{dS} = P^* M \left( \varepsilon_X \frac{PX}{SP^* M} + \varepsilon_M - 1 \right) \]

Trade is initially balanced, so \( PX = SP^* M \)

\[ \varepsilon_X = \frac{dX / X}{dS / S} \]

\[ \varepsilon_M = -\frac{dM / M}{dS / S} \]

\[ \frac{dT_B}{dS} > 0 \]

\[ \varepsilon_X + \varepsilon_M > 1 \]
The J-curve

In the short-run the Marshall-Lerner condition usually doesn’t hold, as
- in the short-run exports and imports volume do not change that much,
- thus, the price effect dominates.

Therefore, the trade balance worsens immediately after the depreciation and only later improves.
ML condition: An example

Assume dram/dollar spot rate is 250 initially, and 300 after depreciation. Export price is 600 drams, import price is $4.

<table>
<thead>
<tr>
<th></th>
<th>Quantity (units)</th>
<th>Price</th>
<th>Value in drams</th>
<th>Value in dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before depreciation, S=250</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Export</td>
<td>50</td>
<td>600 drams</td>
<td>30,000</td>
<td>120</td>
</tr>
<tr>
<td>Import</td>
<td>30</td>
<td>$4</td>
<td>30,000</td>
<td>120</td>
</tr>
<tr>
<td><strong>Balance</strong></td>
<td></td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>After depreciation the TB improves, S=300</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Export</td>
<td>57.5</td>
<td>600 drams</td>
<td>34,500</td>
<td>115</td>
</tr>
<tr>
<td>Import</td>
<td>27</td>
<td>$4</td>
<td>32,400</td>
<td>108</td>
</tr>
<tr>
<td><strong>Balance</strong></td>
<td></td>
<td></td>
<td>2,100</td>
<td>7</td>
</tr>
</tbody>
</table>

εₓ=(7.5/50) / (50/250)=0.75
εₘ=-(3/30) / (50/250)=0.5
εₓ + εₘ = 1.25
**ML condition: An example**

Assume dram/dollar spot rate is 250 initially, and 300 after depreciation. Export price is 600 drams, import price is $4.

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</table>
| **Before depreciation, S=250**
| Export           | 50             | 600 drams      | 30,000          | 120             |
| Import           | 30             | $4             | 30,000          | 120             |
| **Balance**      |                |                | 0              | 0               |

| **After depreciation the TB deteriorates, S=300**
| Export           | 54             | 600 drams      | 32,400          | 108             |
| Import           | 27.6           | $4             | 33,120          | 110.4           |
| **Balance**      |                |                | -720            | -2.4            |

\[ \varepsilon_X = \left( \frac{4}{50} \right) / \left( \frac{50}{250} \right) = 0.4 \]

\[ \varepsilon_M = \left( \frac{-2.4}{30} \right) / \left( \frac{50}{250} \right) = 0.4 \]

\[ \varepsilon_X + \varepsilon_M = 0.8 \]
The Marshall-Lerner condition: An evaluation

1. What if trade is NOT initially balanced?

\[ PX \neq SP^* M \quad \frac{dTB}{dS} > 0 \quad \varepsilon_x \frac{PX}{SP^* M} + \varepsilon_M > 1 \]

2. Depreciation rises imported raw material prices, and makes exports less competitive.

3. The increase of net exports has a multiplier effect on income, which increases imports.

BUT the basic idea holds true:

*A depreciation improves the Balance of Trade, if export and import elasticities are high, or, more specifically, if the responsiveness of trade volumes to exchange rate changes is sufficiently large.*
Thank you and take care,

but remember

The only things you learn are the things you tame.

Antoine de Saint-Exupery, The Little Prince