14.02 Principles of Macroeconomics  
Problem Set 5  
Fall 2005

Posted: Wednesday, November 16, 2005  
Due: Wednesday, November 23, 2005

Please write your name AND your TA’s name on your problem set. Thanks!

Exercise I. True/False? Explain

1) Depending on expectations, a contractionary fiscal policy can reduce the budget deficit without a decrease of the output level.

2) Tradable goods prices are a better measure of the degree of openness of an economy than trade volume.

3) In the medium run equilibrium, the current account has to be balanced.

4) If the uncovered interest parity does not hold, it surely means that there is an arbitrage opportunity.

5) The higher the degree of openness of an economy, the less of an effect a domestic expansionary fiscal policy has on the output level.

Exercise II. Exchange Rates and the Interest Parity Condition

Assume that the uncovered interest parity holds.

<table>
<thead>
<tr>
<th>European bonds</th>
<th>US bonds</th>
</tr>
</thead>
<tbody>
<tr>
<td>maturity</td>
<td>i*</td>
</tr>
<tr>
<td>1-y</td>
<td>0.02</td>
</tr>
<tr>
<td>2-y</td>
<td>0.02</td>
</tr>
<tr>
<td>3-y</td>
<td>0.0225</td>
</tr>
<tr>
<td>4-y</td>
<td>0.035</td>
</tr>
<tr>
<td>5-y</td>
<td>0.025</td>
</tr>
</tbody>
</table>

1) Knowing that the current exchange rate between dollar and euro $E_i$ is 0.85 (euros per 1 dollar), calculate the market expectation about the nominal exchange rate for the next 5 years $(E_{i+1}^e, E_{i+2}^e, E_{i+3}^e, E_{i+4}^e, E_{i+5}^e)$. (HINT: You may want to use a spreadsheet to do the calculations.)

2) Assume that the price indexes are $P_i^* = 0.99$ for Europe and $P_i = 1.32$ for the US. Calculate the current bilateral real exchange rate between the US and Europe, $\varepsilon_i$. 
3) Suppose that in the next 5 years inflation rates are expected to be fixed at \( \pi^* = 2\% \) in Europe and at \( \pi = 3\% \) in the US. Calculate the market expectations for the real exchange rate for the next 5 years.

4) Keeping everything else constant, how does your answer change if the market expects \( \pi^* = 3\% \) and \( \pi = 2\% \) instead? Is the assumption to keep everything else constant plausible? Explain.

Exercise III. Open Economy IS-LM

Consider the following open economy:

\[
\begin{align*}
TYC &= 2.0100 - rYI \\
2402.0 &= IM + \epsilon^2 \\
2241.0 &= \epsilon^2 + YIM \\
Y &= 5000 (\text{GDP of the rest of the world}) \\
50 &= T \\
50 &= G \quad \text{(GDP of the rest of the world)} \quad 5000 = Y \\
200 &= sM \\
3600 &= d
\end{align*}
\]

Suppose that \( P = P^* = 1 \) and that there is no inflation \( \pi^* = \pi = 0 \).

1) Assume the economy commits to having a trade balance (net exports) equal to zero (TB=0). Calculate the equilibrium \((Y, r, \epsilon)\).

2) If \( r^* = 0.02 \) and the uncovered interest parity holds, what is the expected change in the real exchange rate for the next period?

3) Keep TB=0 and imagine that \( G \) increases by 48. Calculate the new equilibrium. How does your answer to part 2) change?

4) Assume \( G=50 \) as in the beginning of this question. Imagine the economy commits to having a fixed real exchange rate \( \epsilon_t = \epsilon_{t+1} = \epsilon \) and allows the trade balance to vary. Calculate the equilibrium.

5) Imagine that \( G \) increases by 48. Assume that the Central Bank does not accommodate this policy, (i.e. the CB does nothing). Calculate the new equilibrium. How does the TB change? Comment. (HINT: The government still wants to keep \( \epsilon_t = \epsilon_{t+1} = \epsilon \), but they could change the value of \( \epsilon \)).

6) Assume \( G=50 \) again. How does a decrease in \( Y^* \) by 2400 affect the equilibriums you calculated in part 1) and part 3), respectively? Comment.