HOMEWORK V
(Due April 29th, 2010, beginning of lecture)

Directions: Please staple your homeworks. Acknowledge the person you work with by mentioning his/her name on top of the first page of your solutions.

1. Define the following terms (both in algebraic terms and in words, wherever necessary):
   (i) Nominal exchange rate
   (ii) Real exchange rate
   (iii) Purchasing power parity
   (iv) Uncovered interest rate parity
   (v) Devaluation
   (vi) Soft peg
   (vii) Exchange rate appreciation

2. Consider the following data:

<table>
<thead>
<tr>
<th>Years</th>
<th>Price level in the US (in dollars)</th>
<th>Price level in Europe (in Euros)</th>
<th>Nominal exch. Rate (Euros per Dollar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>100</td>
<td>100</td>
<td>0.85</td>
</tr>
<tr>
<td>2001</td>
<td>105</td>
<td>95</td>
<td>0.7</td>
</tr>
<tr>
<td>2002</td>
<td>110</td>
<td>103</td>
<td>0.9</td>
</tr>
</tbody>
</table>

   (i) Which country is the domestic economy?
   (ii) Calculate the real exchange rate for each year.
   (iii) In which years did dollar depreciate against euro?
   (iv) In which year(s) would a European tourist be better-off in the US? Why?
   (v) Does the purchasing power parity hold in this data? Discuss the factors that may cause deviations from the purchasing power parity.

3. Please visit www.x-rates.com. Draw graphs of the Mexican Peso-US Dollar exchange rate (dollars per peso) and the Euro-US Dollar exchange rate (dollars per euro) for the last 120 days. Notice the web-site draws the graphs for you – you do not need to download the data for this.

   (i) What happened to the value of dollar against these two currencies in the last 4 months?
   (ii) Which exchange rate is more volatile? What might explain the volatility in exchange rates?
(iii) EU and Mexico are major trade partners for the US. Explain how trade between two nations may help explain the behavior of the exchange rates through time.

4. Consider an economy with savings rate \( s = 0.2 \), depreciation rate \( \delta = 0.08 \), production function \( Y_t = K_t^{1/3}(Q_t L_t)^{2/3} \). The law of motion for capital is as usual: \( K_{t+1} = (1 - \delta)K_t + I_t \). Assume that this economy is closed so that \( IS = 0 \), where \( Y_s = 0 \). Suppose that \( Q \) is endogenous and varies directly with the level of capital stock per worker, i.e., \( Q_t = K_t/L_t \) for all \( t \). Also, suppose that there is no population growth in this economy, so that number of people at time \( t \) is equal to number of people at time \( t+1 \), i.e., \( N_t = N_{t+1} \).

(i) Find the steady state level of capital stock and steady state level of GDP in this case.
(ii) Consider two economies, A and B, with the same initial capital stock, same production function and same knowledge function in the scope of endogenous growth model. Suppose that \( \delta^A = \delta^B = \delta = 0.08 \) and \( s^A = 0.5, s^B = 0.4 \). What is the prediction of the endogenous growth theory in terms of the growth paths of the two countries? Provide graphs, which support your explanation.