Homework Assignment #2

This assignment is due on Thursday, October 15 at the beginning of class (or sooner) .

1. Consider a small economy so the country is a price taker in traded goods. Then we can treat foreign and domestic traded goods as a composite good, T. Suppose that if all resources in the economy are devoted to producing non-traded goods then $NT = 22$. The economy can produce traded goods as well, according to

$$T = 100 - .2NT^2$$

   What does the production possibilities set look like for this economy? Draw it.

   (a) Suppose that preferences in this economy are such that optimal consumption occurs where traded and non-traded goods are consumed in equal proportions. What will be the initial levels of consumption of T and NT in this economy?

   (b) Suppose that the country received a transfer from abroad of 10 units of the traded good. What will the optimal consumption bundle be in this economy? What will happen to the real exchange rate in this economy as a result of this transfer? Explain.

   (c) Suppose instead that the transformation curve is given by $T = 44 - 2NT$. How do your answers to parts a and b change? Explain. Does the transfer cause the real exchange rate to change in this case?

2. A robust empirical fact is that price levels for services (or more generally, nontradable goods) are generally lower in poor countries. Can you explain why this might be the case?

   (a) Suppose I told you that the price of a massage in Kenya is 3195 KES (Kenyan shillings) and the price of a massage in the US is $80. Now, go on the web and look up Kenya's actual market exchange rate (http://www.centralbank.go.ke/). Using this market exchange rate, calculate the price in dollars of a massage in Kenya. Is this price higher or lower than the US price? Is this answer consistent with the Balassa-Samuelson theory?

   (b) Again using the prices given in part (b), calculate the implied PPP exchange rate between dollars and KES. Now, suppose that the Kenyan GDP is approximately 1,200 billion KES. Calculate the value of Kenyan GDP in dollars using both the market exchange rate and the PPP exchange rate you calculated. Is the value of Kenyan GDP higher or lower when using the PPP exchange rate relative to when you use the market exchange rate? Can you explain why?

3. We can define the real exchange rate as $Q = \frac{SP^*}{P}$, where S is the dollar price of foreign currency and P^* is the foreign price level. Explain how would Q change if:

(a) US demand for goods produced in the rest of the world declined.

(b) US government spending increased.

(c) A tsunami suddenly reduced output in the rest of the world.

(d) A technological shock increased US output relative to world output.

(e) Under what conditions would Q be invariant (unrelated) to any of the factors in parts a through c? Explain

4. Germany and China produce 2 goods: cell phones, the traded good, denoted by T; and haircuts, the non-traded good, denoted by N. Each good is produced in competitive markets with labor as the sole input. Workers are paid their marginal revenue product. Cell phones have no trade costs while haircuts have prohibitively high trade costs. The hourly wage rate in Germany is w euros; that in China is w^* yuan. Denote the exchange rate by e (euros per yuan). Suppose that in one hour a German worker can produce x cell phones while in China a worker produces x^* cell phones. In both countries a worker can produce one haircut per hour. Suppose the price of a cell phone is one euro. Let $x = 20$ and $x^* = 10$.

(a) If $e = 0.5$ what will be the yuan price of cell phones?

(b) What will the hourly wage in Germany be? What will the hourly wage (in yuan) in China be?

(c) What will the price of haircuts be in each country?

(d) How will you answers (to parts a-c) change if e changes to .25?

(e) Suppose German labor productivity in cell phones doubles. What will happen to the price of haircuts in Germany? What will happen to the real exchange rate between Germany and China? Explain.

(f) Suppose that wages in the tradables sector in Germany grows at 3% per year, and that wages in the tradables sector in China grows at 12% per year. Further suppose that the share of non-traded goods in total consumption is 0.5. What should be the growth rate of the real exchange rate between Germany and China? Explain.

5. The US government wants the Chinese government to let its currency (yuan) be flexible (abandon its fixed exchange rate) so it can appreciate in value. Draw a demand-supply diagram for the yuan under these current conditions (i.e., before it becomes flexible).

(a) How can the fixed exchange rate be kept different from the market-clearing exchange rate? Explain. Can the Chinese government persist in this activity over time? Explain.

(b) If there was a forward market for yuan what would be the likely relationship between the forward price and the current price of the yuan? Explain.

(c) What if the yuan were overvalued instead of undervalued? What problems would the Central Bank of China face if it tried to maintain the pegged rate?

6. Suppose that you are a US exporter expecting to receive a payment of 100 euros in 12 months. The one-year interest rate on euro deposits is 5% per annum, and the one-year interest rate on dollar deposits is 8%. The present spot exchange rate is $0.50 per euro.

(a) What is the one-year forward exchange rate?

(b) Assuming that you ultimately need dollars, describe at least two ways you can cover yourself from the exchange rate risk.

(c) Now suppose your claim on euros is six months hence. The interest rate on 6 month dollar deposits is 8% and on euros it is 4%. What is the six-month forward rate?

(d) What do your answers to (a) and (c) imply about the "market's expectations" about the path of the exchange rate over the next year? Explain.