EC 3580 Department of Economics
International Economics II Atkinson College, York University
Instructor: Sharif F. Khan Summer 1 2008

Suggested Solutions to Assignment 1

Total Marks: 50

Part A True/ False/ Uncertain Questions

Explain why the following statement is True, False, or Uncertain according to economic principles. Use diagrams and / or numerical examples where appropriate. Unsupported answers will receive no marks. It is the explanation that is important.

A1. [8 Marks]

If the interest rate parity holds, other things remaining constant, an increase in the U.K. nominal interest rate will increase the current value of the U.S. dollar. [Diagrams Required]

If the interest rate parity holds, other things remaining constant, an increase in the U.K. nominal interest rate will decrease the current value of the U.S. dollar.

The uncovered interest parity (UIRP) condition between the U.S. and the U.K. two economies can be written as follows:

$$R_{\$} = R_{£} + (E^{e}_{\$/£} - E_{\$/£})/E_{\$/£}$$

The left-hand side of the UIRP condition is the return to dollar deposits and the right-hand side is the expected dollar return on pound deposits. The UIRP condition must hold if the foreign exchange market is in equilibrium, that is, at the equilibrium exchange rate, deposits of both currencies must offer the same expected rate of return.

Figure 1 (similar to Figure 13-6 of the textbook) shows the effect of a rise in the U.K. interest rate $R_{£}$ in the foreign exchange rate market. In this figure, the vertical line at $R_{\$}$ shows the return on dollar deposits, and the downward-sloping schedule shows the expected dollar return on pound deposits. Initially the foreign exchange rate market is in equilibrium at point 1. Given the current exchange rate $E^{1}_{\$/£}$, the expected future exchange rate $E^{e}_{\$/£}$ and the U.S. interest rate $R_{\$}$ at point 1, a rise in pound interest rate increases the expected dollar return on pound deposits. As a result, the downward-sloping schedule shifts rightward. At the initial exchange rate $E^{1}_{\$/£}$ (at point 1), the expected depreciation rate of the dollar is the same as before the rise in $R_{£,}$ so the expected dollar return on pound deposits now exceeds that on dollar deposits. In this situation anyone holding dollar deposits wishes to sell them for the more lucrative pound deposits. But because the return on dollar deposits is lower than that on pound deposits at the exchange rate $E^{1}_{\$/£,}$ no holder of a pound deposit is willing to sell it for dollar at that rate. This creates an excess supply of dollars in the foreign exchange market at point 1. As dollar

holders try to entice pound holders to trade by offering them a better price for pounds, the dollar/pound exchange rate rises toward $E^2_{\$/£}$, that is, pounds become expensive in terms of dollars. Once the exchange rate reaches $E^2_{\$/£,}$ pound and dollar deposits offer equal returns and holders of dollar deposits no longer have an incentive to try to sell them for pounds, that is, there is no excess supply of dollars at point 2. The foreign exchange market is therefore in equilibrium at point 2. In rising from $E^1_{\$/£}$ to $E^2_{\$/£}$, the exchange rate equalizes the expected returns to the both types of deposit by reducing the rate at which the dollar is expected to depreciate in the future, thereby making pound deposits less attractive relative to dollar deposits. Thus, a rise in the U.K. interest rates, other things remaining constant, leads to a depreciation of dollar against pound.

Part B Problem Solving Questions

B1. [12 Marks]

1) Explain how each of the following transactions would enter the Canadian balance of payment accounts. Discuss only transactions described. Do not be concerned with possible offsetting transactions. [6 marks]

- **(i) The Canadian government sells military equipment to a foreign government.**
- **(ii) The Bank of Canada sells yen to, and buys dollars from, a Swiss bank.**
- **(iii) A Canadian bank receives the interest on its loans to Brazil.**

(i) Export of merchandise: credit (+) entry in current account.
(ii) Decrease in Canadian official reserve assets: credit (+) entry in financial account.
(iii) Investment income receipt from abroad: credit (+) entry in current account.

2) For each transaction described in part (a) that by itself changes the sum of the Canadian current account balance, financial account balance and capital account balance, give an example of an offsetting transaction that would leave the sum of these three balances unchanged. [6 marks]

There are many possible answers; an example for each is given here.

(i) The Canadian government buys cars from the foreign country: debit (–) entry in current account.
(ii) The Bank of Canada sells dollars to, and buys deutsche marks from, the Bundesbank (the central bank of Germany): debit (–) entry in financial account.
(iii) That Canadian bank re-invests its interest earnings and buys more Brazilian government bonds: debit (-) entry in financial account.

B2. [30 Marks]

Read each part of the question very carefully. Show all the steps of your calculations to get full marks.

Use the asset approach to exchange rate determination discussed in class to answer the following questions. The interest rate on US dollar denominated assets maturing in one year is 10% and the interest rate on comparable Canadian dollar denominated assets is 8%.

1) Consider two possible expectations for the direct spot exchange rate between the Canadian dollar and the U.S. dollar (Canadian dollars per one U.S. dollar) in one year: (1) the spot rate will fall by 5 Canadian cents or (2) the spot rate will rise by 3 Canadian cents (note that these changes are in absolute levels, *not* in percentage terms). Determine the current equilibrium spot rate under each scenario. Explain which expectation for the future spot rate makes sense, justify your answer, and provide economic intuition for your result. [12 marks]

Consider the U.S. as a foreign country and Canada as a home country. Recall that uncovered interest parity (UIRP) can be written as follows:

$$R_{CDN\$} = R_{US\$} + \frac{E^e_{CDN\$/US\$} - E_{CDN\$/US\$}}{E_{CDN\$/US\$}}$$

Under the first scenario for expectations we have $E^e_{CDN\$/US\$} - E_{CDN\$/US\$} = -0.05$.
Substituting this into the UIRP equation gives

$$R_{CDN\$} = R_{US\$} + \frac{-0.05}{E_{CDN\$/US\$}} \qquad (1)$$

Substituting in the interest rates given in the problem into this equation gives

$$E_{CDN\$/US\$} = 2.5$$

Under the second scenario for expectations we have $E^e_{CDN\$/US\$} - E_{CDN\$/US\$} = 0.03$.
Substituting this into the UIRP equation gives

$$R_{CDN\$} = R_{US\$} + \frac{0.03}{E_{CDN\$/US\$}}$$

Substituting in the interest rates given in the problem into this equation gives

$$E_{CDN\$/US\$} = -1.5$$

Since exchange rates must be positive, only the first scenario for expectations makes sense. The economic reason is that since the foreign (U.S.) interest rate is above the home (Canada) interest rate, investors would be willing to invest in the home asset (which is paying the lower rate of return) *only* if they expect the home currency to appreciate in the future. Hence, the only expectations which are consistent with foreign interest rates above home interest rates is a belief that the future spot rate will be below the current spot rate, that is $E^e < E$. This is consistent with the first scenario but not the second.

2) Using the expectation scenario from part (A) that makes sense, determine the equilibrium spot rate when the US interest rate rises to 12%. Determine whether the Canadian dollar appreciated or depreciated in response to this change and provide economic intuition for your finding. [8 marks]

{need to be revised!!!)

Substituting $R_{euro} = 0.03$ and $R_{CDN\$} = 0.055$ into equation (1) above gives us a new spot rate of $E_{CDN\$/euro} = 1.2$ which is below the spot rate of 1.5 calculated in part (I). Hence the rise in the Canadian interest rate led to an appreciation of the Canadian dollar. At first glance, this seems inconsistent with the comparative statics exercise we did in class that stated that *ceteris paribus*, a rise in $R_{US\$}$ should lead to a rise in $E_{CDN\$/US\$}$, that is a depreciation of the home currency. So, why do we get the opposite result in this example? In this exercise, we are *not* holding expectations of the future spot rate constant. So, this is not a ceteris paribus exercise. The intuition, then, is that an increase in the Canadian interest rate increases the spread between home and foreign interest rates, making the home investment more attractive. Thus, investors will be willing to continue to hold the foreign asset only if they believe there will be a larger depreciation of the home currency. Given the way we have formulated expectations here, the only way they could believe there will be a larger depreciation in the future is if the current spot rate falls. Thus the result will be a fall in the current spot rate or a current appreciation of the home currency.

3) Suppose, instead, that the spot rate is expected to decrease by α *percent* over the next year. Explain whether or not you can determine the equilibrium spot rate in this scenario and justify your answer. Determine the value of α which is consistent with our model. [6 marks]

Our expectation of the future spot rate in this case can be written as,

$$\frac{E^e_{CDN\$/US\$} - E_{CDN\$/US\$}}{E_{CDN\$/US\$}} = -\alpha .$$

Substituting this into the UIRP equation gives:

$$R_{CDN\$} = R_{US\$} - \alpha .$$

Note that the current spot rate, $E_{CDN\$/US\$}$ drops out of this equation and we are left with

$$\alpha = R_{US\$} - R_{CDN\$} . \qquad (2)$$

Therefore, we *cannot* determine the equilibrium spot rate, we can only determine the equilibrium percentage depreciation. This occurs because the relative spread in the interest rate can be supported by many different current exchange rates but only by a unique percentage depreciation. Substituting in for the interest rates into the equation (2), we derive

$$\alpha \approx 0.02 .$$

4) Suppose interest rates are as given initially (10% and 8%) and the current spot rate equals 2 Canadian dollars per U.S. dollar. Calculate the forward discount or forward premium. [4 marks]

We first calculate the forward rate, $F_{CDN\$/US\$}$, using covered interest parity (CIRP):

$$R_{CDN\$} = R_{US\$} + \frac{F_{CDN\$/US\$} - E_{CDN\$/US\$}}{E_{CDN\$/US\$}}$$

or $$0.08 = 0.10 + \frac{F_{CDN\$/US\$} - 2}{2}$$

or $$F_{CDN\$/US\$} = 1.96$$

We calculate the forward discount rate as follows:

$$FD = \left(\frac{F_{CDN\$/US\$} - E_{CDN\$/US\$}}{E_{CDN\$/US\$}} \right) \times 100 = \left(\frac{1.96 - 2}{2} \right) \times 100 = -2.0\% .$$

Since the forward rate (1.96) is below the current spot rate (2.00), U.S. dollar is said to be at forward discount of 2% against Canadian dollar.