

PROBLEM SET SIX**DUE 30 OCTOBER****Question 1.**

Consider the following price schedule for government bonds and foreign exchange in the United States and Germany. Both government bonds are one-year zero-coupon bonds. The current exchange rate E stands at \$0.75/DM.

Bond	Face Value	Price	Currency
US 1-year zero	10,000	9615.38	Dollars
GE 1-year zero	13,333	12,698.10	Deutche Marks

- a. Calculate the nominal interest rate on each of the bonds and the expected exchange rate next year consistent with Uncovered Interest Parity. Note whether this is an expected appreciation or depreciation of the US dollar.
- b. Assume you exchange dollars for DM and purchase the German bond, but one year from now it turns out that E is actually 1.25. What is your actual nominal return compared to the return if you had just purchased the US bond? Are these differences in returns consistent with arbitrage?
- c. Assume that there exists a market for buying and selling foreign exchange one-year in the future, but fixing the price of the transaction today. Denote the forward price of one DM in terms of dollars by F. In other words, you can enter into a contract today to sell one DM for F dollars one year in the future. Derive the following approximation to the Covered Interest Parity as stated below:

$$i_{us} = i_{ge} + (F-E)/E$$

- d. What is the forward price of 1 DM consistent with Covered Interest Parity? Compare actual nominal returns between the two strategies if next year E is actually 1.25 as above. Is Covered Interest Parity between the two 1-year bonds really riskless arbitrage?
- e. (No math required) Finally pretend the above zero coupon government bonds have a maturity of two years. Compare two strategies which consider holding either one or the other for one only year. Assume that purchase of a foreign bond also includes covering your position in foreign exchange by selling foreign exchange forward at the time of purchase, as above. Is Covered Interest Parity really riskless arbitrage in this case? What happens to the actual return on the foreign bond if one year from now the German central bank raises interest rates (before you sell the bond)?

Question 2.

Consider the following open economy where foreign variables are starred. Assume that both countries either use the same currency, or that the real exchange rate is fixed and normalized to one.

$$C = 10 + 0.6*(Y-T) \quad I = 10 \quad G = 10 \quad T = 10 \quad M = 0.1*Y \quad X = 0.1*Y^*$$

- a. Solve for equilibrium income in the domestic economy, conditional on the output of the foreign economy. Note since both economies are identical that in equilibrium $Y = Y^*$. Given this, solve for each country's equilibrium output.
- b. Assume that each country has a target level of output $Y^P=80$. If one country acts on its own and assumes that the other country will not change fiscal policy, by how much will the government have to increase government spending to achieve target output? Note no longer will $Y = Y^*$ since each country is pursuing different fiscal policies. Also, what is the impact on the other country's output and each country's trade balance of this arrangement?
- c. Assume the countries can credibly commit to coordinate fiscal policies. What is the common change in G which achieves the target level of output for both countries? Why is such coordination difficult to achieve in practice?

Question 3.

Consider an open IS-LM economy with a credibly fixed exchange rate.

- a. What is the effect of a one-time unanticipated depreciation of the currency on equilibrium output and interest rates? You may assume that credible means that the expected exchange rate was equal to the actual, and one-time implies that after the depreciation financial markets expect no further depreciation of the currency?
- b. Now consider the same economy, but pretend that financial markets believe there is some probability of depreciation. How does this change the Uncovered Interest Parity condition? What is the impact on output and interest rates of an increase in the perceived probability of depreciation if the central bank continues to fix the exchange rate?