

I. Uncovered versus Covered Interest Parity

Uncovered interest parity condition implies that the domestic interest rate is approximately equal to the foreign interest rate plus the expected depreciation of the domestic currency.

(a) Explain why it is often called a *risky* arbitrage condition.

Consider the following choice:

You are trying to decide whether to invest \$1 in U.S. bonds for one year. U.S. interest rate is  $i$ . Alternatively you could invest in German bonds. German interest rate is  $i^*$ . You could buy \$1 worth of DM today and buy one-year German bonds with the proceeds. Instead of converting the DM into dollars one year from now at an unknown exchange rate, you could agree to sell the DM for dollars a year ahead at a predetermined price, called the forward exchange rate,  $F$ . When you buy the DM for dollars and at the same time sell the proceeds of your investment forward for dollars, you have “covered” yourself, i.e., avoided the possibility of unexpected depreciation of DM.

(b) Derive the covered interest parity condition:  $i \approx i^* + \frac{F - E}{E}$ .

(c) What condition insures that the covered and uncovered interest parity conditions are consistent with each other?

II. True/False/Uncertain

- (a) Given the expected future exchange rate and the foreign interest rate, an increase in the domestic interest rate leads to an increase in the exchange rate.
- (b) Under flexible exchange rates, a contractionary monetary policy leads to a decrease in output, an increase in the interest rate, and an appreciation.
- (c) Under fixed exchange rates, a contractionary monetary policy leads to a decrease in output and an increase in the interest rate.
- (d) Fiscal policy is more powerful under flexible exchange rates.
- (e) The United States cannot reduce its trade deficit until it reduces its budget deficit.
- (f) Under fixed exchange rates, a fear of devaluation can lead to a recession.

III. Large versus Small Countries

In class, we have assumed that the foreign interest rate is fixed. But when a very large country like the United States changes its interest rate, the foreign rate will change as well. In this case, a better assumption might be that the foreign interest rate ( $i^*$ ) adjusts as follows:  $i^* = (1 - a)\bar{i}^* + ai$ , where  $i$  is the domestic (U.S.) interest rate,

$\bar{i}^*$  is a target foreign interest rate, and  $a$  is an adjustment parameter, between zero and one.

- (a) What can we say about the determination of the foreign interest rate if  $a$  is equal to zero? If  $a$  is equal to one? If  $a$  is equal to one half?
- (b) Suppose that  $a$  is equal to one half, and the target foreign interest rate is equal to 6%. Suppose that the U.S. interest rate rises from 4% to 5%. What will happen to the current foreign interest rate?  
Suppose that the expected exchange rate (the price of foreign currency in terms of dollars) is equal to 10. If interest parity holds, what happens to the current exchange rate when the U.S. interest rate rises from 4% to 5%?
- (c) “The closer the parameter  $a$  is to one, the more monetary policy works as in a closed economy.” Explain.

#### IV. A Simplified Open Economy IS-LM model

Assume that aggregate spending by domestic residents is  $A = \bar{A} + cY - bi$ . Note that in this simplified model,  $\bar{A}$  is a constant representing all other influences including government spending.

Net exports are given by:  $NX = W - mY + v\varepsilon$ , where  $\varepsilon$  is the real exchange rate and  $W$  is a constant representing all other influences including the role of the foreign income.

- (a) Assume Marshall-Lerner Conditions hold. Is  $v$  positive or negative? Why?
- (b) We know that  $c$  is marginal propensity to consume. What will be the interpretation of  $m$ ?
- (c) What is the demand for domestic goods in this economy?
- (d) Write down IS relationship. Solve for equilibrium output as a function of the interest rate, exchange rate and other parameters.
- (e) What is the effect of real depreciation on domestic output?

Next assume that exchange rates are flexible and capital is perfectly mobile ( $i = i^*$ ).

LM curve is described by  $\frac{M}{P} = kY - hi$ .

- (f) Solve for equilibrium level of income implied by the equilibrium in the financial markets.
- (g) Solve for the equilibrium exchange rate implied by the overall equilibrium. Does fiscal expansion lead to an appreciation or a depreciation? What about monetary expansion?