

### Homework 5

1. Suppose the spot rate is CHF0.9976/\$ in the spot market, and the 180-day forward rate is CHF0.9908/\$. If the 180-day dollar interest rate is 3% p.a., what is the annualized 180-day interest rate on Swiss francs that would prevent arbitrage?

2. As a trader for Goldman Sachs you see the following prices from two different banks:

1-year euro deposits/loans:	6.0% – 6.125% p.a.
1-year Malaysian ringgit deposits/loans:	10.5% – 10.625% p.a.
Spot exchange rates:	MYR 4.6602 / EUR – MYR 4.6622 / EUR
1-year forward exchange rates:	MYR 4.9500 / EUR – MYR 4.9650 / EUR

The interest rates are quoted on a 360-day year. Can you do a covered interest arbitrage?

3. As an importer of grain into Japan from the United States, you have agreed to pay \$377,287 in 90 days after you receive your grain. You face the following exchange rates and interest rates: spot rate, ¥106.35/\$, 90-day forward rate ¥106.02/\$, 90-day USD interest rate, 3.25% p.a., 90-day JPY interest rate, 1.9375% p.a.

- a. Explain two ways to hedge the foreign exchange risk.
- b. Which of the alternatives in part a is superior?

4. Over the next 30 days, economists forecast that the pound may strengthen relative to the dollar by as much as 6%, or it may weaken by as much as 7%. The possible values for the rate of change of the dollar–pound spot exchange rate are –7%, –5%, –3%, –1%, 0%, 2%, 4%, and 6%. If these values are equally likely, what are the mean and standard deviation of the future spot exchange rate if the current rate is \$1.3345/£? (We can use the fact that if  $x_t$  is the standard

deviation of the rate of change of the exchange rate – that is, if  $x_t \equiv sd_t \left( \frac{S_{t+1} - S_t}{S_t} \right)$ , then

$sd_t(S_{t+1}) = sd_t(S_{t+1} - S_t) = x_t S_t$ . We can use the fact that  $sd_t(S_{t+1}) = x_t S_t$  to answer the question.)

5. Suppose that the 90-day forward rate is \$1.19/€ the current spot rate is \$1.20/€ and you expect the future spot rate in 90 days to be \$1.21/€. What contract would you make to speculate in the forward market by either buying or selling €10,000,000? What is your expected profit? If the standard deviation of the 90-day rate of appreciation of the euro relative to the dollar is 3%, what range covers 95% of your possible profits and losses?