

**Second Midterm Exam**

No points will be given by simply writing down formulas, and writing down definitions or irrelevant statements from the book, or saying "yes," will get you zero points. Justify all your answers. If you cannot prove something give some intuition. Good luck. Reminder: this is an open book exam, but no open notes.

Time: 1hr 20 minutes.

I.- Problems (10 points each).

1.- You work for a Chinese firm. The six-year annualized interest rate in Australia is 8% and the six-year annualized interest rate in China is 6%. Assume interest rate parity hold for a six-year horizon. Assume that one Australian dollar (AUD) is worth 6.80 Chinese yuans (CNY) ( $S=6.80$  CNY/AUD).

a. If the forward rate is used to forecast exchange rates, what will be the forecast for the CNY/AUD spot rate in six years?

b. What percentage appreciation or depreciation does this forecast imply over the six-year period? What would be the percentage appreciation over the same six-year period predicted by the random walk?

c. Suppose the exchange rate in 6 years is 6.40 CNY/AUD. Which model had the lowest squared error?

2.- Chambers Corporation will receive CAD 1,000,000 in 180 days. It considers using (1) a forward hedge, (2) an option hedge, or (3) money market hedge. Its analysts develop the following information, which can be used to assess the alternative solutions:

- Spot rate of mark as of today = .60 USD/CAD
- 180-day forward rate of mark as of today = .67 USD/CAD
- Interest rates are as follows:
  - 180-day rate: 5.5% in Canada, and 6.0% in the U.S.
- A call option that expires in 180 days has an exercise price of .70 USD/CAD and a premium of USD .05.
- A put option that expires in 180 days has an exercise price of .71 USD/CAD and a premium of USD .03.
- Chambers Corporation forecasted the future spot rate in 180 days as follows:

| Possible Outcomes | Probability |
|-------------------|-------------|
| .63 USD/CAD       | 20%         |
| .66 USD/CAD       | 60%         |
| .74 USD/CAD       | 20%         |

Which strategy would you recommend to Chambers Corporation? Why? (Be precise about the strategy -i.e., buy, sell, put, call, borrow, lend, etc.)

3.- Assume that the following regression model was applied to historical annual data:

$$e_{f,t} = \alpha + \beta \text{INT}_t + \tau \text{INT}_{t-1} + \delta \text{TB}_t + \varepsilon_t,$$

where  $e_{f,t}$  is the percentage change in the SAR/USD exchange rate in period  $t$ ,  $\text{INT}_t$  is the interest rate differential between Saudi Arabia and the U.S. in period  $t$ ,  $\text{INT}_{t-1}$  is the interest rate differential between Saudi Arabia and the U.S. in period  $t-1$ ,  $\text{TB}_t$  represents changes in the U.S. trade balance and  $\varepsilon_t$  is an error term. The error term is normally distributed with a zero mean, and a variance  $\sigma^2$ . All variables are independent of each other –i.e. zero covariance.

Assume that the regression coefficients were estimated as

$$\alpha = .005$$

$$\beta = .850$$

$$\tau = .400$$

$$\delta = -.1$$

$$\sigma = .01$$

This year, Trade balance,  $\text{TB}_t$ , is forecasted to be -15%, with a standard deviation of 10%. Last year, the interest rate differential,  $\text{INT}_{t-1}$ , was 3%.  $\text{INT}_t$  follows a normal distribution with a mean of 3% and a standard deviation of 0.5% (.005).

Now, you have to answer the following questions:

i. Using the above information, what will be your forecast for a 95% confidence interval for  $e_{f,t}$ ? (Hint: recall that if  $Y = a + b X + c Z$ , where  $Y$ ,  $X$  and  $Z$  are random variables, then the variance of  $Y$  is given by  $\text{Var}(Y) = b^2 \text{Var}(X) + c^2 \text{Var}(Z) + 2bc \text{Cov}(X, Z)$ .)

ii. Assume  $S_{t-1}$  is equal to .24 USD/SAR. Determine a range for your forecast for  $S_t$ ?

4.- You work for Sternin Inc., a large U.S. MNC. You are given the following projections for next year:

| Currency | Total inflows | Total outflows | Current Exchange rate |
|----------|---------------|----------------|-----------------------|
| CHF      | CHF 90,000    | CHF 50,000     | .60 USD/CHF           |
| EEK      | EEK 200,000   | EEK 350,000    | .09 USD/EEK           |

a.- Calculate the net transactions exposure for Sternin Inc. (in USD).

b.- Suppose the Swiss Franc (CHF) and the Estonian Kroon (EEK) are positively and perfectly correlated ( $\rho=1$ ). A year from now, the USD/CHF rate changes to .78 USD/CHF. What is the change in the net transaction exposure of Sternin Inc. (in USD)?

c.- Now, suppose that the CHF and the EEK are negatively and perfectly correlated ( $\rho=-1$ ). A year from now, the USD/CHF rate changes to .78 USD/CHF. What is the change in the net transaction exposure of Sternin Inc. (in USD)?

## II. WSJ CASE (20 points)

Read the attached WSJ Currency Markets article (Friday, March 7, 1997) and answer the following questions.

Note: No points will be given by simply writing lines from the article.

1) According to the WSJ, a strong economic report might tease the market into thinking that the Federal Reserve would make a pre-emptive strike against inflation by raising U.S. interest rates. The Federal Reserve key short-term interest rate is set at 5.25%. The Bundesbank (Germany's Central Bank) is expected to maintain its key short-term interest rate at 4%. Today, according to the IFE, what is the expected annualized change in the USD/DEM exchange rate? (Hint: annualize the daily interest rate differential.)

2) You believe in the linearized approximation of the relative PPP. According to the quotes in the article, which currency has the smallest inflation rate differential with the U.S.?

3) "The U.S. currency broke through key psychological resistance levels against the mark in early European trading to hit an intraday high of 1.7208 marks," says the article. Theoretically speaking, does the statement make sense? What kind of analysis is the WSJ using?

4) According to the WSJ, the dollar edged higher against the CAD, but remained unchanged against the GBP. Based on this statement, Boyd Corp., a U.S. company, has to decide on hedging transaction exposure. The company has matching outflows in GBP and inflows in CAD dollars. Should the company worry about the USD movements?

5) According to the WSJ, traders were not persuaded to sell yen for dollars as Japan's current-account surplus continues to widen. In 10 days, Boyd Corp. will export goods to Japan, priced in JPY. According to this opinion, should Boyd Corp. hedge this transaction?