International Financial Management FINA 4360
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First 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 and notes exam.
Time: 2 hours 20 minutes.

I. Problems (15 points each).

1. Assume the following exchange rates: $S_t = 18.54$ MXN/USD (MXN: Mexican Peso) and $S_t = 36.82$ THB/USD (TBH: Thai Baht)..
i. What is the cross rate MXN/TBH?
ii. Suppose the 60-day forward rate is $F_{t,60} = 18.15$ MXN/USD. Calculate the forward premium. Does the forward rate contain a premium or a discount?
iii. Suppose Dhana Bank quotes $S_t = 2.10$ TBH/MXN. Is arbitrage possible? (Why?)
iv. If yes, describe a triangular arbitrage strategy and determine an arbitrageur's profits.

2. It is **June 2024**. An Iphone 14 Plus costs CZK 26,376 in the Czech Republic, while it costs USD 829 in the U.S. The spot rate is $S_t = 23$ **CZK/USD** (CZK= Czech Koruna).

(a) According to PPP, what should be the CZK/USD exchange rate in June 2024?

(b) Take the CZK as the domestic currency. Calculate the real exchange rate, R_t. What is the over/under-valuation of the CZK relative to the USD?

(c) According to the R_t, which country is more efficient?

(d) The GDP per capita in the Czech Republic is CZK 430,000. Translate the GDP per capita in CZK to (nominal) USD and to PPP USD prices.

(e) Suppose in July 2024, the price of the Iphone 14 Plus decreases to CZK 25,500 in the Czech Republic, while it decreases to USD 800 in the U.S. According to the *linearized* version of PPP, what should the CZK/USD exchange rate be in July 2024?

(f) Assume that in July 2024 the exchange rate is .05 USD/CZK. Generate a trading signal based on PPP.

3. It is **June 2024**. Dibu Gas, a U.S.-based energy company, has a NZD 400 million payable due in September 2024. Dibu Gas decides to use options to reduce FX risk. Available options with September maturity are:

X	Calls p_c	Puts p_p
0.61 USD/NZD	3.66	0.35
0.64 USD/NZD	1.02	1.67
0.69 USD/NZD	0.31	6.83,

where X represents the strike price and premiums for calls (p_c) and puts (p_p) are expressed in USD cents –i.e., 1.02 equals to USD 0.0102.

Today, the exchange rate is S_t = **0.63 USD/NZD**.

A. Calculate the premium cost and calculate the *net cash flows* (in USD) in September for Dibu Gas under the following choices:

i) in-the-money (ITM) option

ii) out-of-the money (OTM) option

B. Suppose Dibu Gas can also use a forward contract with $F_{t,Sep}$ = 0.65 USD/NZD. Calculate the net cash flows in September for Dibu Gas under the forward contract alternative.

C. Suppose, you are given a distribution for $S_{t=Sep}$:

$S_{t=Sep}$	Probability
0.60 USD/NZD	20%
0.63 USD/ NZD	20%
0.69 USD/NZD	60%

Which hedging strategy would you select for Dibu Gas: OTM or forward contract?

4. Ms. Kroos is a European. arbitrageur. The one-year interest rate offered in Germany is 4.5%, while the one-year interest rate offered in Mexico is 11%. The spot rate is $S_t = 19.90$ MXN/EUR. Chicharo Bank offers Ms. Kroos a one-year forward contract at $F_{t,T=1-yr}$ = 20.30 MXN/EUR.

(1) Determine the arbitrage-free one-year forward contract exchange rate.
(2) Can Ms. Kroos make a risk-free profit? If yes, describe a covered arbitrage strategy.
(3) Determine Ms. Kroos's profits.
(4) Calculate the forward premium and compare it to the interest rate differential. Based on these numbers, what kind of capital flows will the Mexican economy experience?

5. Suppose you use quarterly U.S. and Norway data from 1975:Jan to 2024: May to fit the following regression:

$e_{f,t}$ (NOK/USD) = $(S_t - S_{t-1})/S_{t-1} = \alpha + \beta\,(I_{NOR} - I_{US})_t + \varepsilon_t$

Regression Statistics	
Multiple R	0.100008
R Square	0.010002
Adjusted R Square	0.008324
Standard Error	0.025036
Observations	592

ANOVA

	df	*SS*	*MS*	*F*
Regression	1	0.003736	0.003736	5.960604
Residual	590	0.369810	0.000627	
Total	591	0.373546		

	Coefficients	*Standard Error*
Intercept	0.004991	0.00203
$(I_{NOR} - I_{US})_t$	0.665056	0.193394

(i) Are the signs of the coefficients consistent with relative PPP?
(ii) Using individual t-tests, test IFE at the 5% level.
(iii) Suppose $S_{May\ 2024}$ = 10.95 NOK/USD and $(I_{NOR} - I_{US})_{May\ 2024}$ = -.007. Using the regression model, forecast the exchange rate for the June 2024, that is, $S_{June\ 2024}$
(iv) Use the Random Walk model to forecast $S_{June\ 2024}$.
(iv) Suppose $S_{June\ 2024}$ = 11.53 NOK/USD. Which June 2024 has a smaller forecast error: the regression model or the random walk model?

II. CASE (30 points)

Read the FXStreet article (June 17, 2024) and briefly answer the following questions:
Note: No points will be given by simply writing lines from the article. If a question asks you to a draw a graph, no points will be given if you do not draw a graph.

1) According to the article, the MXN peso has been depreciating post-election because markets are nervous about the judiciary reform, which increases uncertainty for the Mexican economy. Using a graph, show the effect of this uncertainty on the MXN/USD exchange rate. Briefly explain.

2) According to article, Banxico is attentive to the volatility of the Mexican peso and could act to restore order in markets. Suppose Banxico decides to intervene to stop the depreciation of the MXN against the USD. Using two graphs, show the effect of Banxico intervention on the FX market and the Mexican money market. Draw two graphs.

3) According to the article, U.S. consumers are still concerned about high prices and U.S. inflation. What is the effect of a higher U.S. inflation rate on the MXN/USD? Draw a graph.

4) The article mentions that the Fed decided to keep interest rate unchanged (at 5.25%), while Mexican interest rates will probably also stay put at 11%. Using this numbers and the exchange rate quoted in the article, linearized IFE to forecast the MXN/USD in 12 month ($S^{IFE}_{t+12-month}$).

5) Describe, step by step, a carry trade involving the MXN and the USD with maturity T=12 months. State its risks.

6) Suppose the MXN/USD exchange rate in exactly 12 month is $S_{T=12\text{-months}} = 22$ MXN/USD. Was the carry trade in (5) profitable? Compute its profit/loss.

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