Chapter 14 Risk and Return in Forward Markets

Quiz Questions

True-False Ouestions

- 1. UEH assumes that investor demand a premium for interest rate risk.
- When computing the foreign return $r_{t,t+1}^*$, the capital gain earned on the foreign interest (that is, the cross product) is negligible when interest rates are 2. high and exchange rate changes are small.
- 3. When the percentage change in the spot rate is regressed on the forward premium, UEH predicts a $\beta = -1$, because a positive forward premuim must make up for the depreciation in the spot rate in the future, while a negative forward premium must make up for the appreciation in the spot rate in the future.
- 4. Tests of UEH are ambiguous because we cannot distinguish between a true risk premium and inefficiency (predictability in the forecast error).
 - 5. By using a trading rule, you can systematically make risk-free money by investing in currencies with high interest rates while financing the investment by borrowing in low interest rate currencies.
 - Tests using trading rules suggest that interest rate differentials tend to 6. overcompensate for expected depreciations.
 - 7. High-interest currencies offer the highest returns for the lowest level of risk.
 - The Fisher Open Relationship explains international differences in interest rates 8. by international differences in inflation.
 - 9. In a PPP framework, the Fisher Open Relationship explains international differences in interest rates by international differences in inflation.
 - 10. According to the Fisher Equation, the expected real rate of return is a function of expected inflation and an exogenous nominal interest rate.
 - 11. Because the forward rate is biased, it is not useful for evaluating projects whose payoffs depend on an uncertain future spot rate.
- Ans. 1. false; 2. false; 3. false; 4. true; 5. false: there is risk; 6. true; 7. false: not the lowest risk; 8. true; 9. false; 10. false.

Multiple Choice Questions

Choose the correct answer(s):

- Q1. The forward rate is an unbiased predictor of the future spot rate:
 - Under uncertainty. (a)
 - (b) When the inflation rates in the domestic and foreign countries are low.
 - (c) When there is little central bank intervention.(d) Under certainty.

 - (e) When investors are risk neutral and inflation is known in advance.

A1. (d).

- 02. The Siegel Paradox:
 - (a) Assumes that inflation is constant.
 - (b) Assumes that investors are risk neutral and all exchange risk is diversifiable.
 - (c) Says that when an investor sets the forward rate equal to his expectations for the future spot rate, the resulting forward rate differs according to how the investor

quotes the exchange rate. For example, for the GBP there is no problem because both foreign and UK investors quote the rate as foreign currency units per GBP.

- (d) Says that when an investor sets the forward rate equal to expectations for the future spot rate, the result depends on what the investor's home currency is.
- (e) Says that the forward rate is a biased predictor of the spot rate only when there is great exchange rate uncertainty and the time to maturity of the forward contract is long.
- (f) Disappears when inflation is certain.
- A2. None of these. UEH assumes that (1) inflation is known in advance (but not necessarily constant) and investors are risk neutral OR (2) exchange risk is diversifiable. The Siegel Paradox arises if the UEH is assumed.
- Q3. Empirical tests have shown that:
 - (a) Over long periods, the average risk premium in the forward rate may be close to zero.
 - (b) A positive forward premium will be followed by an appreciation in the spot exchange rate in significantly more than 50 percent of all cases.
 - (c) Markets are inefficient because the risk premium is positive over time.
 - (d) Investors clearly overestimate the probability of a single major event affecting the value of a currency.
- A3. (a).
- Q4. Conceivable explanations of violations of UEH include the following:
 - (a) Investors want to be compensated for risk.
 - (b) Foreign exchange markets are inefficient.
 - (c) A currency's value fluctuates erratically whenever there is central bank intervention.
 - (d) A currency's riskiness changes erratically whenever there is central bank intervention.
 - (e) Investors incorrectly form expectations about the value of a currency.
 - (f) Because Latin American currencies like the peso are infrequently but positively affected by important events like a devaluation.
- Q4. (a), (b), & (e).
- Q5. The domestic and foreign real rates of return on a given asset are the same:
 - (a) When domestic and foreign investors demand the same risk premiums for each currency.
 - (b) When PPP holds.
 - (c) Both (a) and (b).
 - (d) None of the above. Because PPP never holds, so UEH will never hold.
- A5. (b).

Exercises

- E1. Suppose that there is no uncertainty. Inflation is 10 percent at home, and 5 percent abroad. Solve the following questions in the exact form, not with linear approximations.
 - (a) What is the change in the exchange rate if PPP holds?
 - (b) What are the nominal rates in the two countries if the real rate is 2 percent (on all assets—recall that we have certainty, and PPP holds)?

- (c) What is the forward premium?
- (d) Is the forward premium equal to the change in the spot rate?
- A1. (a) $s_{t,T} = (1.1/1.05) - 1 = 4.762$ percent.
 - (b) $r_{t,T} = (1.02 \times 1.1) 1 = 12.2$ percent.
 - (c) $r_{t,T}^* = (1.02 \times 1.05) 1 = 7.1$ percent. $FP_{t,T} = (1.122/1.071) 1 = 4.762$ percent.
 - (d) yes.
- E2. Suppose that there is no uncertainty and PPP holds. The domestic and foreign interest rates are 5 percent and 10 percent, respectively. The real rate is 2 percent. Solve the following questions in the exact form, not with linear approximations.
 - (a) What is the inflation differential?
 - (b) Is the inflation differential equal to the change in the spot rate that is implicit in the forward premium?
- A2. (a) $I_{t,T} = (1.05/1.02) - 1 = 2.94$ percent. $I_{t,T}^{*} = (1.10/1.02) - 1 = 7.84$ percent. relative PPP says $s_{t,T} = (1.0294/1.0784) - 1 = -4.5454$ percent. (b) UEH says $s_{t,T} = (1.05/1.10) - 1 = -4.5454$ percent.
- E3. A friend suggests to you that an investment in Turkish lira provides an excellent return because the real rate is very high. Specifically, inflation has been at a reliable 70-80 percent *p.a.*, and interest rates on Lira t-bills are 100 percent. If expected inflation is 75 percent, the expected real return is 100 percent - 75 percent = 25 percent, your friend argues.
 - (a) We know that the linear approximation, as used by your friend, does not work very well when inflation is high. How would you obtain a correct estimate of the real return if there were no inflation uncertainty?
 - Is this a perfect (unbiased) estimate of the expected return when future inflation is (b) uncertain? Why (not)?
 - (c) Assuming that the correctly estimated real interest rate on Lira T-bills is about 14 percent, and the expected real return on your home currency T-bill is 4 percent, is your friend's argument necessarily compelling? Why (not)? (Hint: your answer should be based on whether or not PPP holds and investors are risk-averse.)

A3. (a)
$$(1 + 100\%)/(1 + 75\%) - 1 = 14.29$$
 percent.

- (b) No, for the expected real return, we need $E(\frac{1}{1 + inflation})$, not $\frac{1}{1 + E(inflation)}$.
- (c) No. First, the 14 percent expected real return on the lira T-bill is the return to a Turkish investor. The expected return to you (on the same asset) will be different unless PPP holds. Second, even if PPP holds, the real return to you from the lira investment is likely to have a different risk than the real return you would earn from your domestic T-bill.

Mind-Expanding Exercise

- ME1. Imagine a world with perfect goods markets and perfect foresight. Then PPP and UEH would hold as identities. Show that, in the Fisher Relationship, both countries' real rates would become identical.
- A1. For simplicity, drop the time subscripts. In general, the real return depends on the asset and the nationality of the investor. The convention in the text is:

- ρ = the expected real return on the domestic T-bill, to the domestic investor.
- ρ^* = the expected real return on the foreign T-bill, to the foreign investor.

Thus, in the text, an asterisk (or lack thereof) denotes both the asset and the residence of the holder. A more general notation would be:

 $R_{j,k}$ = ex post real return from asset *j* to an investor from country k. $r_{j,k}$ = ex post nominal return from asset *j* measured in currency k.

Thus, if asset 1 is the domestic T-bill and asset 2 the foreign T-bill, and country 1 is the home country while country 2 is the foreign one, we have

$$E(R_{1,1}) \equiv \rho \text{ and } E(R_{2,2}) \equiv \rho^*$$
.

The implication of PPP is that $R_{j,1} = R_{j,2}$. Thus, the *ex post* returns depend only on the asset, not on the country of residence of the holder. To show this, consider the real return, to a *domestic* investor (from country 1), on a given asset *j*—say Apple common stock. This return equals:

$$1 + R_{j,1} = \frac{1 + r_{j,1}}{1 + I_1} = \frac{(1 + r_{j,2})(1 + s)}{1 + I_1}$$

If relative PPP holds, we have $(1 + s) = \frac{1 + I_1}{1 + I_2}$. Thus, under relative PPP,

$$1 + R_{j,1} = \frac{1 + r_{j,2}}{1 + I_2} \equiv 1 + R_{j,2} .$$

The implication of certainty is that all assets are riskless to a given investor. Thus, the *ex post* real return to an investor of country *k* is the same on all assets:

$$R_{j,1} = R_{i,1}$$
, all *i* and *j*
 $R_{i,2} = R_{i,2}$, all *i* and *j*.

The conclusion is that under certainty and PPP, the real return is independent of both the choice of the asset and the nationality of holder:

$$R_{i,1} = R_{i,2} = R_{j,2} = R_{i,2}$$
, all *i* and *j*.

In particular, if asset 1 is the domestic T-bill and asset 2 the foreign T-bill,

$$R_{1,1} = R_{2,2} \Longrightarrow \rho = \rho^*$$
.

Chapter 15 Forecasting Exchange Rates

Quiz Questions

True-False Questions

- 1. Technical forecasting models analyze micoreconomic variables in an attempt to forecast future changes in the exchange rate.
- 2. Fundamental analysis models analyze macroeconomic variables in an attempt to forecast future changes in the exchange rate.
- 3. By a "technical correction," one means that investors underreact to bad news so that the exchange rate does not drop low as it should. This means that demand must fall farther, in order to correctly value a foreign currency in terms of the home currency.
- 4. If the exchange rate bottoms out (that is, it hits a low point but begins to rise again), but it increases again by *x* percent, we can make substantial (and low-risk) profits by buying foreign currency—even when paying "retail" bid-ask spreads.
- 5. Because we cannot make significant profits from predicting the exchange rate based on past information, the exchange markets are weak-form efficient.
 - 6. Runs tests have confirmed that positive changes in the exchange rate tend to be followed by positive changes and negative changes by negative changes. This is consistent with the conclusions from autocorrelation tests.
 - _____ 7. The results from runs tests and autocorrelation tests provide unambiguous evidence that the foreign exchange markets are inefficient.
 - 8. Central bankers are able to forecast the future spot rate because they have inside information.
 - 9. Central bankers are able to forecast the future spot rate because they have inside information, but not the forward rate because they are unable to correctly forecast the foreign risk-free rates of return.
- Ans. 1. false; 2. true; 3. false; 4. false; 5. true; 6. true; 7. false; 8. false; 9. false

Multiple Choice Questions (choose the correct answer(s))

- Q1. Technical analysis:
 - (a) Has been proven to be utterly useless as a way of predicting the exchange rate.
 - (b) Relies on statistical and econometric models rather than trading rules.
 - (c) Is solely based on a forecaster's sentiments about the exchange rate markets.
 - (d) Can only work when there is weak-form market efficiency.
 - (e) Provides evidence of semi-strong form inefficiency (when technical analysis works that is).
- A1. None of the above.
- Q2. Fundamental analysis:
 - (a) Has been proven to be of little value as a way of predicting the exchange rate.
 - (b) Relies on macroeconomic variables like inflation, interest rates, and real economic output.
 - (c) May rely on a forecaster's sentiments about the exchange rate markets rather than solely on a formal quantitative model.
 - (d) Can only work when there is weak-form market efficiency.

- (e) Provide evidence of semi-strong inefficiency (when fundamental analysis works, that is).
- A2. (a), (b), (c).