

Quiz 2: 30 minutes

According to the New York Fed, at 10AM on March 6, 2007, the direct spot price ($\$/¥$) for the Japanese Yen was 0.859¢ (i.e., the indirect price was 116.37¥ per dollar). The six month forward rate was 0.880¢ (i.e., 113.69¥ per dollar). On the same day a \$10,000 U.S. Treasury Bill with a six-month maturity sold for \$9,754.55. (These numbers are actual).

a) *What is the forward premium on Yen? What is the premium in annual terms?*

The forward premium is $0.880/0.859 - 1 = 2.4\%$, or 4.8% per year. (3 pts.)

b) *What is the actual yield on the U.S. T-Bill, as a percentage of the price? What is the yield in annual terms?*

The T-Bill yield is $10,000/9754.55 - 1 = 2.5\%$, or 5.1% per year. (3 pts.)

c) *What is the yield for an equivalent Japanese government bond? In annual terms?*

Because of interest rate parity, the Japanese yield is $2.5\% - 2.4\% = 0.1\%$, or $5.1\% - 4.8\% = 0.3\%$ per year. (3 pts.)

d) *Suppose the above U.S. annual interest rate was 4%, and the Japanese rate was 2%. Explain how you could lock in a higher return than 4% with a spot-forward swap. Assuming many investment funds took advantage of this opportunity, how would this affect the spot and forward prices for the Yen?*

You could make roughly 2% over six months with a T-Bill, or 3.4% instead by buying a Japanese bond (1% yield over six months, plus the 2.4% forward premium). This works out to 5.8% annually. You could lock this in with a swap, by buying Yen now on the spot market and selling it forward. If everybody did this, then the spot rate would rise and the forward rate would fall until you had interest rate parity again. (4 pts.)

e) *Suppose that you just signed a contract to import goods from Japan in six months, and the contracted price is denominated in Yen. If you decide to wait to buy the Yen you will need, are you speculating or hedging? If you purchase a six-month forward contract to buy Yen with Dollars, are you speculating or hedging?*

Speculating. Hedging. (2 pts.)

f) *If you purchased a six-month forward contract to buy Yen with Dollars, but have no import contract, are you speculating or hedging? Are you long or short in Yen?*

Speculating by going long in Yen, and hoping it appreciates so you can turn around and sell it for more than the forward price you bought it at. (2 pts.)

- g) *Suppose that you just heard news today that makes you think U.S. interest rates will increase by the end of Summer, while you think Japanese interest rates will remain constant. Use a diagram to predict how this would affect the direct spot price for the Yen in the future. Then use another diagram to predict how this change to the forward rate should affect the direct spot price for the Yen now.*

Since $R = R^* + (E^e / E - 1)$, E will fall in the future when R rises. Because E^e thus rises now, E rises now on the spot market, before R ever actually rises. You should show this on two separate IRP graphs: in the first for the future, the domestic return shifts out; in the second, for the present, the foreign return shifts down. (4 pts.)

- h) *Suppose you think that the market has underpriced the forward rate for Yen, and you want to try to make money on this knowledge by arranging a forward contract to buy Yen for the current forward premium. However, to avoid the chance that you might be expensively wrong, you decide to buy an option. What type of option would you buy, a call or a put for Yen? Which would cost you more, a strike price of 0.85¢ or 0.95¢? Suppose you buy a European option with a strike price of 0.85¢, and on the strike date the spot rate is 0.95¢. Are you in or out of the money? Would you exercise the option? Ignoring the price of the option, did you make money or lose money?*

The danger is that the Yen will not appreciate enough, or even depreciate, and thus you will have to sell your Yen for much less than the forward price you will pay. So you buy a put option for Yen. With a put, the higher strike price of 0.95¢ is more expensive. With a European option, you can only strike on the maturity date, and if the spot price then is higher than the strike price, you are out of the money and would not exercise your put option. However, you made money because you bought Yen forward at 0.88¢ and sold it immediately for 0.95¢, a return of 8% on the money you put at risk. (4 pts.)