1. **Go to https://www.investopedia.com/terms/s/spot-next.asp web site and read the FX forward rates.**

2. **Read the following specification of FX forward: https://www.kdbbank.eu/forward-rate-quotation**

3. **As a currency trader, you see the following quotes on your computer screen:**

Exch. Rate	Spot	1-month	3-month	6-month
USD/EUR	1.0435/45	20/25	75/90	97/115
JPY/USD	98.75/85	12/10	25/19	45/35
USD/GBP	1.6623/33	30/35	95/110	120/130

a. What are the outright forward bid and ask quotes for the USD/EUR, JPY/USD and USD/GBP at the 1-month, 3-month and 6-month maturity?

Answer: The spot bid and ask quotes for USD/EUR are 1.0435/45. These quotes mean that the bank buys euros with dollars spot at $1.0435/€, and the bank sells euros for dollars at $1.0445/€. Because the forward points at the 3-month maturity are 75/90, we know that we must add the points to get the outright forward bid and ask rates. Adding the points makes the bid-ask spread in the forward market larger than the bid-ask spread in the spot market. Consequently, the forward bid rate is $1.0435/€ + $0.0075/€ = $1.0510/€, and the forward ask quote is $1.0445/€ + $0.0090/€ = $1.0535/€.

b. Calculate the bid-ask spread in the forward market and compare it to bid-ask spread in the spot market.

c. Suppose you want to swap out of $10,000,000 and into yen for 3 months. What are the cash flows associated with the swap?

Answer:

1, Change USD do JPY at spot rate:

When you swap out of $10,000,000 into yen in the spot market, you are selling dollars to the bank. The bank buys dollars at its low bid rate of ¥98.75/$, so you get

¥98.75/$ × $10,000,000 = ¥987,500,000

2, Change back JPY to USD at FWD rate:

When you contract to buy the $10,000,000 back from the bank in the 3-month forward market, you must pay the bank's ask rate of

¥98.85/$ - ¥00.19/$ = ¥98.66/$

You subtract the points because the 3-month forward quote is 25/19. Subtracting the points makes the bid-ask spread in the forward market larger than the bid-ask spread in the spot market. Hence, the amount of yen you pay is

¥98.66/$ × $10,000,000 = ¥986,600,000

4. **Intel is scheduled to receive a payment of ¥100,000,000 in 90 days from Sony in connection with a shipment of computer chips that Sony is purchasing from Intel. Suppose that the current exchange rate is ¥103/$, that analysts are forecasting that the jen will weaken by 1% over the next 90 days, and that the standard deviation of 90-day forecasts of the percentage rate of depreciation of the dollar relative to the yen is 4%.**

a. Provide a qualitative description of Intel's transaction exchange risk.

Answer: Intel is a U.S. company, and it is scheduled to receive yen in the future.
What is the risk for the Intel? Appreciation or depreciation of JPY?
A weakening of the yen versus the dollar causes a given amount of yen to convert to fewer dollars in the future. This loss of value could be severe if the yen depreciates by a significant amount.

b. If Intel chooses not to hedge its transaction exchange risk, what is Intel's expected dollar revenue?

Answer: If Intel chooses not to hedge, the expected dollar revenue is the expected dollar value of the ¥100,000,000. The expected spot rate incorporates a 1% weakening of the jen or USD strengthen. This means that the expected USD/JPY rate is 1% less than the current spot rate of ¥103/$ or

$$E_t[S(t+90, ¥/\$)] = 1.01 \times ¥103/\$ = ¥104.03/\$$$

Hence, Intel expects to receive ¥100,000,000 / ¥104.03/$ = $961,261
versus: ¥100,000,000 / ¥103/$ = $970, 874

c. If Intel does not hedge, what is the range of possible dollar revenues that incorporates 95.45% of the possibilities?

Answer: We are told that the standard deviation of the rate of depreciation of the dollar is 4%. The standard deviation of the future spot rate is therefore 4% of the current spot rate or 0.04 × ¥103/$ = ¥4.12/$. Thus, plus or minus 2 standard deviations around the conditional expected future spot rate is

¥104.03/$ + ¥8.24/$ = ¥112.27/$
¥104.03/$ - ¥8.24/$ = ¥95.79/$

The range that encompasses 95.45% of possible future values for Intel's receivable is therefore

¥100,000,000 / ¥112.27/$ = $890,710

¥100,000,000 / ¥95.79/$ = $1,043,950

5. **Consider the following spot and forward rates for the yen–euro exchange rates:**

Spot	30 days	60 days	90 days	180 days	360 days
146.30	145.75	145.15	144.75	143.37	137.85

Is the euro at a forward premium or discount? What are the magnitudes of the forward premiums or discounts when quoted in percentage per annum for a 360-day year?

Answer: The forward rates of yen per euro are lower than the spot rates. Therefore, the JPY is at a discount in the forward market. The annualized forward premium or discount for the N day forward contract is

$$\frac{F - S}{S} \; x \; \frac{360}{N \; days} \; x \; 100$$

If the value of this calculation is negative, say -2%, we say there is a 2% discount.

The discounts are 4.51% for 30 days, 4.72% for 60 days, 4.24% for 90 days, 4.01% for 180 days, and 5.78% for 360 days.

Calculation 30 days:

$$\frac{145.75 - 146.30}{146.30} \; x \; \frac{360}{30} \; x \; 100 = 4.51\%$$