

Finance 40500
Group Assignment #4

- 1) Suppose that General Electric is anticipating European sales over the next month to be E 12,500,000. The current EUR/USD exchange rate is 1.2665, but GE is anticipating the dollar to appreciate. To hedge this risk, GE enters into a 30 day forward contract to sell Euro for dollars at 1.2550.
- a) Suppose that in 30 days, the Euro is trading at 1.2500. Calculate GE's loss/gain from the forward.

Through the forward contract, GE is able to sell its Euros for 1.550 instead of the 1.2500 prevailing in the market. This produces a gain of .005 dollars per Euro or a total gain of $12.5M (.005) = \$62,500$.

- b) How could GE accomplish this transaction using Euro futures?

GE could've gone short on 100 Euro futures (each contract is for 125,000 Euro).

- 2) Suppose that the annual return on US TBills is 5.5% while the return on comparable British assets is 7.5%. The current GBP/USD exchange rate is 1.8835. One year forward contracts are currently trading at 1.8370.
- a) How would you use this information to make risk free profits?

Suppose we start with a dollar. Convert it to Pounds using the current spot rate of 1.8835 to get .5309 pounds. Now, invest at 7.5% for a year to get $(.5309)(1.075) = .5707$ pounds. Convert to dollars with the forward rate to get 1.048 dollars – a 4.8% return. Compare this to the 5.5% on dollar denominated assets. The profitable strategy would be to borrow in the UK and invest in the US.

- b) Calculate the zero arbitrage forward rate (i.e. the forward rate that equates the dollar returns of British and US bonds).

To get the proper forward rate, use the following formula.

$$F = \left(\frac{1+i}{1+i^*} \right) e = \left(\frac{1.055}{1.075} \right) 1.8835 = 1.8485$$

- c) Suppose that the US tax rate for interest earned is 10% while the corresponding British tax rate is 35%. How would your answers to (a) and (b) change?

We want to equate the *after tax returns*

$$(1 + i^*(1 - t^*)) = (1 + .075(1 - .35)) = 1.04875 = 4.875\%$$

$$(1 + i(1 - t)) = (1 + .055(1 - .10)) = 1.0495 = 4.95\%$$

Repeat (a) and (b) with the new interest rates.

3) Suppose that you estimated the following regression:

$$\Delta\%e = \alpha + \beta\left(\frac{F - e}{e}\right)$$

Where the left hand variable is the annual percentage change in the EUR/USD exchange rate (expressed as a percentage) and the right hand variable is the current 1 year Euro forward premium/discount (also as a percentage). Your estimates for alpha and beta are .05 and beta equals 2. How would you use this information to make money? Give a numerical example.

Suppose that $\left(\frac{F - e}{e}\right) = 2$. We know that this implies an interest rate in the US that is 2% higher than Europe (from covered interest parity). Suppose that

$$i = 4\%$$

$$i^* = 2\%$$

$$e = 1.50$$

Given the forecasting equation,

$$\Delta\%e = .05 + 2(2) = 4.05\%$$

Therefore, the future exchange rate should be $1.50(1.0405) = 1.56$.

Repeat the same steps from (1) to show that the European assets pay a higher dollar return than US assets.