

Homework 5 quiz

Name KEY

1 Suppose the effective yearly interest rate is $r = .02$. Suppose the security value at time 0 is $S(0) = 70$ and it pays 1 dividend of \$ 5 at 3 months from today. What is the forward exchange (i) price to purchase the security in 9 months? ...

(ii) Suppose at 6 months the value of the security has risen to $S(1/2) = 80$, what is the value of the Long position?

$$(i) F(0, 3/4) = 70(1.02)^{3/4} - 5(1.02)^{1/2} = \underline{65.6717}$$

$$(ii) V(1/2; 0, 3/4) = \left(\frac{1}{1.02}\right)^{1/4} \left\{ F(1/2, 3/4) - F(0, 3/4) \right\} = 80 - 70(1.02)^{1/2} + 5(1.02)^{1/4} \\ = 14.328 \dots$$

2 Suppose \$ 1 USD buys ¥ 3 CNY today. Suppose the effective interest rate of a 1 year bond in USD is 1%, and the effective interest rate of a 1 year bond in CNY is 5%.

Suppose you wish to obtain ¥2000 in 16 months. How many dollars do you agree to pay for them at that time?

Suppose at $t = 6$ months \$ 1 USD buys ¥4 CNY what is the value/liability of the contract?

$$F(0, 4/3) = \frac{1}{3} \left(\frac{1.01}{1.05}\right)^{4/3} * 2000 \\ = 633.021$$

$$V = \left(\frac{1}{1.01}\right)^{10/6} \left\{ F(1/2, 4/3) - F(0, 4/3) \right\} \\ = \left(\frac{1}{1.01}\right)^{10/6} * 2000 * \left\{ \frac{1}{4} \left(\frac{1.01}{1.05}\right)^{5/6} - \frac{1}{3} \left(\frac{1.01}{1.05}\right)^{4/3} \right\} \\ = -148.0218 \dots$$