Fin6470_Ch05

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5.1

Description	Receive at Time	Give at Time	Payment
Outright Sale	0	0	S_0 at t_0
Loan/Security Sale	T	0	S_0e^{rT} at time T
Prepaid Forward	0	T	?
Forward	T	T	? x e^{rT}

5.2

$$a)50 - [(1e^{-.0151}) + (1e^{-.0152}) + (1e^{-.0153}) + (1e^{-.0154})] = 46.15$$
$$b)46.15e^{.061} = 49.00$$

5.3

$$a)50e^{-.081} = 46.16$$
$$b)50 * e^{(.06-.08)*1} = 49.01$$

5.4

$$a)35e^{.05.5} = 35.89$$
$$b)\frac{1}{.5}ln\frac{35.50}{35} = .028$$
$$c)35.5 = 35e^{(.02-\delta)*.5} = .0216$$

5.6

$$a)1100e^{(.05-.015).75} = 1129.26$$

b) To hedge, I would enter into a short sale of the index and go long a forward position.

c) To hedge, I would buy the underlying asset to offset the sale of the index and then sell the asset forward.

5.7

a) The no arbitrage price should be \$1127.85. With an observed price of \$1135, I would go long the underlying and sell the forward.
b) The no arbitrage price should be \$1127.85. With an observed price of \$1115, I would short the underlying and buy the forward.

5.8

a) The no arbitrage price should be \$1116.62. With an observed price of \$1120, I would long the underlying and sell the forward.
b) The no arbitrage price should be \$1116.62. so if the observed price is \$1110, I would short the underlying and buy the forward.

5.9

a) The money manager could go back in time and purchase the t-bill and hold it to make the yield difference. Or, the manager could sell forward contracts to purchase at a high yield in one year. With yields decreasing, the manager would be in a buy low sell high environment in 1982.
b) Interest rates would have to start declining to eliminate the arbitrage opportunity.
c) Arbitrage will drive some mad scientist to discover time travel so that he can intertemporally skewer the market. Arbitrage is a great motivator ;)

5.11

$$a)12002504 = 1,200,000$$
$$b)1,200,000 * .1 = 120,000$$

5.15

$$a)F^{+} = 800e^{.0551} = 845.23$$
$$a)F^{-} = 800e^{.051} = 841.02$$
$$b)F^{+} = (800 + 1)e^{.0551} = 846.29$$
$$b)F^{-} = (800 - 1)e^{.051} = 839.97$$
$$c)F^{+} = (800 + 1 + 2.4)e^{.0551} = 848.82$$
$$c)F^{-} = (800 - 1 - 2.4)e^{.051} = 837.44$$
$$d)F^{+} = (800 + 2.4 + 1)e^{.0551} + 2.4 = 851.22$$
$$d)F^{-} = (800 - 2.4 - 1)e^{.051} - 2.4 = 835.04$$
$$e)F^{+} = (800 + 2)(800 * .003) + 1e^{.0551} = 851.36$$
$$e)F^{-} = (800 - 2)(800 * .003) - 1e^{.051} = 834.92$$

5.16

$$a)875e^{.04751} = 917.57$$

$$b)contracts = \frac{800,000}{218,750} * 1.1 = 4.023$$

b) Each future has a value of \$218,750 (250 x 875). We could cover our exposure by purchasing futures contracts.We'd purchase 800,000 / 218,750 = 3.65714. We have to adjust for beta, so we get 1.1*3.65714 = 4.023. After the adjustment we purchase 4.023 contracts. We would earn the risk free rate over the next year with this hedged position.