Problem Set A (This Assignment is for Exam Practice Only)

Instructions

Answer the questions in excel. Use a separate tab for each question and textboxes for written responses. Text boxes should be used for explanations. Your solution should be clear with all equations spelled out explicitly so that I do not need to go through your spreadsheet cell by cell to find formulas.

1. Answer questions 1 - 3 based on the information below. Assume r = 4% and no dividends.

Toyota Motor Corporation (TM) - Stock Price 77.70

Options expiring in one year		
K	Call	Put
70	12.20	5.80
80	7.20	10.50
90	3.70	17.60

Consider a portfolio consisting of a long TM stock and a long put (K = $70).

a. Graph the profits to the position as a function of stock price.

b. How might you create a similar payoff structure using a call option? Based on a comparison of these two positions, are the options priced correctly?

2. Charles Schwab has been recommending a naked strangle to some clients. This is a short positioning both the $70 put and $80 call.

a. Draw a diagram showing profit as a function of stock price.

b. Compute maximum gain, loss and breakeven point(s).

c. Why might an investor enter into this position?

3. Assume you own $1.5 million of Toyota stock in your retirement account and would like to protect your position. Toyota's beta is .66. Six-month S&P futures (250x the index) list for 1090. What position (long/short, number of contracts) would you take if you decided to hedge Toyota price risk with S&P forwards? How effective do you anticipate this strategy to be? Briefly explain.

4. Answer questions 4 - 7 based on the information below. Assume interest rates are 2% and no dividends.

Mylan Inc. (MYLAN) - Stock Price 17.42

Options Prices (6-months until expiration)		
K	Call	Put
14	4.00	0.45
17	1.90	1.45
20	.70	3.30

Graph the profits to the following position at expiration as a function of stock price. Compute the maximum profit, loss and breakeven points and show these distinctly in your excel file along with the formulas for computing each. A covered call (K = 20)

a. A long stock purchase.

b. A protective put (K = 17)

c. A covered call (K = 20)

5. Compute percentage gain or loss for each of the positions in #4 if the stock price in 6 months is $25. Repeat for a price of $10.

6. Graph the profits to a butterfly spread using the Mylan options. Compute break-even points.

7. Use the put and the call (K = 17) to create a synthetic forward. Graph the profit to this position.

a. Compare this to the profit diagram for purchase of a share of stock.
b. Verify that the options are priced correctly so that arbitrage is not possible. If not, explain how an investor could earn an arbitrage profit.