FE-620 – Assignment 1

Problem 1.

The current price of a stock is $94, and three-month call options with a strike price of $95 currently sell for $4.70. An investor who feels that the price of the stock will increase is trying to decide between buying 100 shares and buying 2,000 call options (20 contracts). Both strategies involve an investment of $9,400. What advice would you give? How high does the stock price have to rise for the option strategy to be more profitable?

Problem 2.

A company enters into a short futures contract to sell 5,000 bushels of wheat for 750 cents per bushel. The initial margin is $3,000 and the maintenance margin is $2,000. What price change would lead to a margin call? Under what circumstances could $1,500 be withdrawn from the margin account?

Problem 3.

Suppose that there are no storage costs for crude oil and the interest rate for borrowing or lending is 4% per annum. How could you make money if the June and December futures contracts for a particular year trade at $50 and $56?

Problem 4.

The following table gives data on monthly changes in the spot price and the futures price for a certain commodity. Use the data to calculate a minimum variance hedge ratio. (Do not make an adjustment for daily settlement.)

Spot Price Change	+0.50	+0.61	−0.22	−0.35	+0.79
Futures Price Change	+0.56	+0.63	−0.12	−0.44	+0.60
Spot Price Change	+0.04	+0.15	+0.70	−0.51	−0.41
Futures Price Change	−0.06	+0.01	+0.80	−0.56	−0.46

Problem 5.

A fund manager has a portfolio worth $50 million with a beta of 0.87. The manager is concerned about the performance of the market over the next two months and plans to use three-month futures contracts on a well-diversified index to hedge its risk. The current level of the index is 1250, one contract is on 250 times the index, the risk-free rate is 6% per annum, and the dividend yield on the index is 3% per annum. The current 3 month futures price is 1259.

a) *What position should the fund manager take to eliminate all exposure to the market over the next two months?*
b) *Calculate the effect of your strategy on the fund manager's returns if the level of the market in two months is 1,000, 1,100, 1,200, 1,300, and 1,400. Assume that the one-month futures price is 0.25% higher than the index level at this time.*