FLORIDA STATE UNIVERSITY
The COLLEGE of BUSINESS

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Senior Seminar 4934

Option Pricing and Financial Risk Management
Homework #3

1. A trader buys 600 shares of a stock and sells six call options contracts on the stock. The strike price is $40. The price of the option is $7. What is the trader's minimum cash investment
    a. If the stock price is $38
    b. If the stock price is $42
    c. If the contracts were naked, what is the initial margin if the stock price is $38

2. You are the manager of a highly levered company. All the debt will mature in a year. If the value of the company is higher than the debt in one year, you will pay off the debt. If the value is less than the debt, you will declare bankruptcy, and the debtholders will own the company
    a. Express your position as an option on the value of the company
    b. Express the position of the debtholders in terms of options on the value of the company
    c. What can you do to increase the value of your position

3. A diagonal spread is created by buying a call with a strike price X_2 and exercise date T_2 and selling a call with strike price X_1 and exercise date T1 ($T_2>T_1$). Draw a diagram showing the profit when
    a. $X_2>X_1$
    b. $X_2<X_1$

4. A stock price is currently $50. Over each of the next two three-month periods it is expected to go up by 15%. The risk-free rate is 12% per year with continuous compounding.
    a. What is the value of a six-month European put option with a strike price of $51
    b. What is the value of a six-month American put option with a strike price of $15
    c. Estimate how high the strike price has to be for it to be optimal to exercise the option immediately

5. Download the current prices from yahoo for December 2007 options on SPY.
    a. Using all the options, project forward the required rate of return needed to break even on each option investment
    b. Plot the rates of return across strike prices.
    c. Why are the returns not equal?