

**Short Answer (15 points each)**

1. When determining your firm's optimal capital structure, you failed to include any direct costs associated with bankruptcy. What are two of the groups who you should go back and estimate a cost for?
2. Assume capital markets are perfect and that you have estimated your firm's weighted average cost of capital as equaling 9%. However, you used the book values of equity and debt rather than their market values. If the market value of the firm's stock is several times its book value but that the market value of its debt roughly equals its book value, how will correcting your mistake change the weighted average cost of capital that you calculated?
3. Assume you have estimated the value of a bond by valuing the assets of the firm and the value of a call on the firm's assets. However, your boss has pointed out that your estimate of the bond value is too high because you used an incorrect number for the standard deviation of returns on the firm's assets. Is the correct number for standard deviation higher or lower than your initial, wrong number?
4. Assume you have drawn a graph of the portfolios you can build from four risky assets. However, when drawing the graphs, you used correlations between the returns that were too low. What will happen to your graph when you correct your mistake?
5. Assume your firm's annual earnings before interest and taxes always equals \$100,000. Assume that you have mistakenly calculated an effective tax advantage of debt for your firm when interest is less than \$100,000 as equaling 0.125. However, when you correct your error, the effective tax advantage of debt is less than 0.125. What are the names (not the symbols) of the variables you might have reduced when correcting your error?
6. Assume you have calculated the beta of an out-of-the-money call as equaling 15. However, as soon as you calculate the beta of the call, the stock price changed and the beta has risen. What direction has the stock price changed?
7. Assume that the Federal Reserve continues to keep nominal interest rates to nearly zero, but that inflation rises. What has happened to real interest rates?
8. When calculating the expected return and standard deviation of returns on a two-stock portfolio you put too much weight on the low-risk, low-return asset by mistake. How will correcting your error affect the expected return and standard deviation of returns that you have calculated for your portfolio?
9. When calculating the value of a put, you forgot to adjust the stock price for dividends being paid prior to the option's expiration. How will fixing your mistake affect the number you have calculated for the value of the put?
10. You have just realized that the value you have calculated for a call using the Black-Scholes Option Pricing Model is too high because you used the wrong number for the option's strike price. Was the strike price you used too high or too low?

**Problems (75 points each)**

1. Given the following prices, what set of transactions today will generate an arbitrage profit today? Show that the conditions of arbitrage are met if Wal-Mart's stock ends up at \$90 and if Wal-Mart's stock ends up at \$75. Note: Assume all options are on Wal-Mart stock, have a strike price of \$80, and expire on July 19 (72 days from today). Note: calculations required.  
Price of: Wal-Mart's stock = \$79.25, call = \$2.51, put = \$2.68, risk-free interest rate = 0.035% (less than 1%).

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2. Using the following returns, set up the calculations needed to determine the correlation between Sony (SNE) and CVS Caremark (CVS) and the standard deviation of returns of your portfolio if you invest \$100,000 in Sony and \$300,000 in CVS. Note: You do not need to solve anything.

|             | Return on: |            |
|-------------|------------|------------|
| <u>Year</u> | <u>SNE</u> | <u>CVS</u> |
| 2012        | - 18%      | + 24%      |
| 2011        | - 47%      | + 23%      |
| 2010        | + 3%       | + 7%       |
| 2009        | + 73%      | + 22%      |

Use the following to answer questions 3 and 4

Assume that TuitionMax is considering whether or not to build a new distribution facility at a cost of \$100 million. TuitionMax bought the land on which the new facility will be built five years ago for \$3 million. It could sell the land today for \$4 million (after taxes). TuitionMax estimates that the new facility will generate its first net, after-tax cash flow of \$15 million seven months from today. After this initial cash flow, cash flows would occur annually and would grow by 2% per year. The final cash flow would occur 25 years and seven months from today.

TuitionMax estimates that the facility can be expanded at any time over the next five years at a cost of \$25 million. The facility would generate net, after-tax cash flow of \$4 million per year. The first cash flow would occur one year after the expansion and would continue through 20 years from today. In addition, TuitionMax estimates that it can sell the facility for \$60 million at any time over the next three years.

TuitionMax estimates that the beta of the facility is 1.2 and that the beta of the expansion is 1.3. The beta of the firm's existing assets is 1.1. The standard deviation of returns on TuitionMax's existing assets is 35%. The standard deviation of returns on the new facility over the next three years is 40%, over the next five years is 42%, and over its entire life is 45%. The standard deviation of returns on the possible expansion is 50% over the next three years, 53% over the next five years, and 55% while the expansion is in operation.

The market risk premium equals 6% and the risk-free rate equals 1%.

3. Set up the calculations needed to determine the net present value of building the facility ignoring the impact of any options on the value of the project. Note: You do not need to solve anything.
4. Set up the calculations needed to determine the impact being able to expand the facility on the value of the facility to TuitionMax. Note: You do not need to solve anything.
5. HondaEclipsed Inc has a 25% chance of earning \$100 million, a 60% chance of earning \$150 million, and a 15% chance of earning \$200 million. Determine HondaEclipsed optimal leverage if the corporate tax rate is 40%, the personal tax rate on equity income is 15%, and the personal tax rate on interest income is 35%. Note: Calculations required.
6. Frankenstein Beverage's current stock price equals \$51 per share. Over each of the next two years, Frankenstein's stock price will either increase by \$6 per share or will fall by \$4 per share. Calculate the value of a call on Frankenstein with a strike price of \$50 if the risk-free rate is 1%. Note: Calculations required.