Fall 2013: Final B for 4:00 Class Name ____________________________

Notes: 1) If a problem asks you to "set up the calculations needed to determine…" then all points are earned for writing down the appropriate equations and plugging in the appropriate numbers. Calculations do not affect your grade. All other problems will require some calculations to solve them and final answers may be worth a few points. 2) Throughout the exam, an annuity or perpetuity may have constant, growing, or shrinking cash flows.

Short Answer (15 points each)

For short-answer questions 1 through 8, assume that when your boss asked you to check some calculations done by a new hire you found an error (or errors) in the variables the new hire used. Use words not symbols in your answers.

1. Assume your corrections increased the present value of an annuity. Which of the variables might you have increased?

2. Assume your corrections reduced the effective annual interest rate on a bank account. Which of the variables might you have increased?

3. Assume your corrections increased the nominal interest rate. Which of the variables might you have reduced?

4. Assume your corrections increased free cash flow but reduced unlevered net income three years from today. Which variables might you have increased?

5. Assume that you have switched from MACRS depreciation to straight-line depreciation. How will the change affect the project's unlevered net income over its life?

6. Assume your corrections reduced the standard deviation of a portfolio. Which variables might you have increased?

7. Assume markets are perfect, that the firm is currently levered, and that the new hire has calculated the expected return on the stock were the firm to issue common stock and repurchase all of its debt. Your corrections increased the expected return on the firm's stock after the equity issue. Which variables might you have increased?

8. Assume your corrections increased the value of a call. Which variables might you have increased?

9. Assume that when you set the Black-Scholes value of Airbust stock equal to its market value of $500 million, you find that d_1 equals 1.1495 and that d_2 equals -0.0648. Airbust's bonds mature for $485 million five years from today and have a current market value of $300 million. If the beta of Airbust's equity equals 0.7, set up the calculations needed to determine the beta of Airbust's unlevered equity.

10. In a graph show how the portfolios you can achieve change if you hold long and short positions in two assets and the correlation between the asset returns drops. Note: Be sure to clearly identify "before" and "after" the change.

Problems (75 points each)

1. Assume that capital markets are perfect and that two firms (Sysco and Cisco) have identical assets. However, Sysco is funded entirely with equity that has a market value of $250 million while Cisco is funded with debt that matures for $200 million three years from today and with equity. The yield to maturity on Cisco's bonds equals 5% and the market value of its equity equals $85 million. What transactions would create an arbitrage profit today? Show that the conditions of arbitrage are met if the two firm's assets end up equaling $150 million and $300 million three years from today.

Use the following information to answer questions 2 and 3 below.

Skybound Farms is considering whether or not to build a new processing facility on land it purchased three years ago for $22 million and which could be sold today for a pre-tax cash flow of $20 million. The new facility could be built for $300 million (a single payment today to the contractor). Based on the marketing study that was delivered to Skybound this morning, the new facility would produce its first net, after-tax cash flow of $8 million ten months from today. Subsequent cash flows would occur quarterly thereafter through nine years and seven months from today and would shrink by 2% each. The payment of $2 million for the marketing study is due today and will be a tax-deductible expense for the firm. Building the facility would increase the firm's net working capital today by $10 million but would not change over the life of the project. Skybound's marginal tax rate equals 35%.

The facility can be expanded at any time over the next three years at a cost of $150 million. This expansion would be expected to produce five years of additional net, after-tax cash flow of $30 million per year with the first cash flow occurring one year after the expansion. The facility can also be sold at any time over the next year for $250 million.

The beta of the project is 1.0 and of the expansion is 1.2. This compares to an overall beta of the firm of 0.9. The standard deviation of returns on the project over its life equals 37%, but equals 45% over the next year. The standard deviation of returns on the expansion over its life equals 53% but equals 59% over the next three years. The market risk premium equals 6% and the risk-free rate per year varies by maturity as follows: 1-year = 0.15%, 2-year = 0.31%, 3-year = 0.65%, 4-year = 1.07%, 5-year = 1.46%, 6-year = 1.86%, 7-year = 2.11%, 8-year = 2.27%, 9-year = 2.47%, 10-year = 2.79%, 15-year = 3.32%, 20-year = 3.99%.

2. Set up the calculations needed to determine the net present value of the project excluding any options.

3. Set up the calculations needed to determine how the possibility of selling off the facility affects the net present value of the project.

4. Budget Deal Inc. has a current stock price of $51 and over each of the next two years, Budget's stock price is expected to rise by $4 or fall by $3 per share. The risk-free rate equals 1.5% and is not expected to change. Assume you want to build and maintain a portfolio that behaves like a call on Budget's stock that has a strike price of $50 and that expires two years from today. What trades would be required one year from today to rebalance your portfolio if Budget's stock price falls in the first year?

5. Assume there is a 15% chance that GM (Governmentless Motors) will earn $200 million, a 40% chance that GM will earn $500 million, a 25% chance that GM will earn $750 million, and a 20% chance that GM will earn $950 million. Assume the corporate tax rate equals 35%, the personal tax rate on equity income equals 18%, and the personal tax rate on interest income equals 27%.
   a. Determine GM's tax-optimal capital structure. Note: calculations required.
   b. Would the presence of conflicts between stockholders and bondholders tend to raise or lower GM's optimal leverage (compared to your answer in part "a")? Note: no justification or calculations needed.

6. Based on the following information, set up the calculations needed to determine the beta and required return on Tyson (TSN). Assume that the risk-free interest rate equals 2.2% and that you expect the return on the market to equals 7% going forward.

	Return on:		
Year	Boeing	Tyson	S&P500 Index
2013	84%	54%	21%
2012	2%	20%	14%
2011	9%	14%	2%
2010	18%	20%	20%