Quiz B for 2:30 Class: 9/25/13   Name **_Key_**

Short Answer 1 (15 points): Given the following returns on Microsoft stock over the past 5 years, set up the calculations needed to determine the standard deviation of returns (volatility) on Microsoft stock. Assume the average return is X. Returns over the past five years: 13%, 23%, 4%, -3%, -1%

$$+3\left(\sqrt{\frac{1}{4}\left((13-X)^2+(23-X)^2+(4-X)^2+(-3-X)^2+(-1-X)^2\right)}\right.$$

Short Answer 2 (15 points): How would using the 15-year MACRS class rather than the 5-year MACRS class affect the net present value of a project?

Reduce +15

Problem (75 points): Assume that the firm where you work is building a new manufacturing facility but that cost overruns have pushed your firm to consider whether it should finish the new facility or keep its old facility open instead. Your boss has asked you to check a few numbers by calculating (or setting up to calculate) the factory's incremental <u>unlevered net income</u> and <u>free cash flow</u> both <u>today</u> and <u>three years from today</u>.

The overall cost of building the new facility is $75 million, but your firm has already invested $30 million of this total in land and construction costs. If your firm proceeds, the remaining $45 million will be paid today and the old facility will be sold for $27 million. The current book value of the under-construction facility is $30 million but it could only be sold today for $22.5 million. The book value of the old facility has been fully depreciated and so has a book value of $0. The new facility will fall into the 10-year MACRS class and will recognize the first year of depreciation one year from today. If the new facility is opened, annual sales will jump from $405 million to $480 million per year beginning one year from today. The cost of goods sold will remain at 75% of sales, but fixed manufacturing costs will fall from $60 million per year to $15 million per year due to efficiency gains. Your firm will help fund the new facility by borrowing $37.5 million from its bank at an interest rate of 3% per year. All remaining costs will be covered by using cash that would have been used to repurchase shares of common stock. Your firm's marginal tax rate is 35%. The incremental working capital (in millions) associated with the new facility is as follows (Note: t = 0 is today, t = 1 is one year from today, t = 2 is two years from today, t = 3 is three years from today, etc):

	t = 0	t = 1	t = 2	t = 3	t = 4	t = 5
Cash	0	45	51	48	60	54
A/R	0	213	225	219	216	225
Inventory	21	30	27	36	33	24
A/P	57	51	54	60	48	45

Wall Street Journal Questions are on the back of this page.

$UNI_0 = 0$ +3

+3 ($FCF_0 = UNI_0 + D_0 - CE_0 - \Delta NWC_0$ +6

$CE_0 = 45 - (27 - (27)(.35)) + (22.5 - (22.5-30)(.35))$ +3

$\Delta NWC_0 = 21 - 57 + 3$

+3 ($UNI_3 = (480-405) - \frac{75}{100}(480-405) - (15-60) - .1440(75))(1-.35)$

+3 ($FCF_3 = UNI_3 + .1440(75) - 0 - \Delta NWC_3$

+3 ($\Delta NWC_3 = NWC_3 - NWC_2$

$NWC_3 = 48 + 219 + 36 - 60$) +6

$NWC_2 = 51 + 225 + 27 - 54$) +6