Fall 2010 Name:

Valuation: Final Exam

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. You have been asked to value LoraLee enterprises, a privately held restaurant chain that is expected to make an initial public offering in five years. You have been provided with the following information:
   - The firm generated after-tax operating income of $ 10 million on revenues of $ 100 million in the most recent year.
   - The firm is all equity funded, with all equity held by venture capitalists, and the book value of equity at the start of the most recent year was $ 50 million.
   - The unlevered beta for publicly traded firms in the sector is 1.00; the correlation of restaurants with the market is 40% but the correlation of the venture capitalists' portfolios with the market is 80%.
   - The riskfree rate is 3% and the equity risk premium is 5%.

a. If you expect that after-tax operating income will grow 10% a year for the next 5 years and that the firm will maintain its current return on capital, estimate the expected cash flows each year for the next 5 years. (2 points)

b. At the end of year 5, the firm plans to go public. It plans to remain all equity funded and the return on capital will be 12% in perpetuity, after year 5. If the firm will be in stable growth, growing 3% a year after year 5, estimate the value at the end of year 5. (2 points)

c. If there is a 20% chance that the firm will not survive to go public, estimate the value of equity today, given the plan to go public in 5 years. (You can assume equity will be worth nothing if the firm does not make it. Remember also that the firm is held entirely by venture capitalists) (2 points)

2. You are evaluating Trader Jack's, a publicly traded grocery store that sells organic food. The firm is expected to report after-tax operating income of $18 million on revenues of $300 million and generate an after-tax return on capital of 12% next year.

a. The typical grocery store is in stable growth, growing 3% a year. It has half the after-tax operating margin, and 1.5 times the sales to capital ratio of Trader Jack's. If the median EV/Sales ratio for grocery stores is 0.40 and the market is fairly pricing these companies, estimate the EV/Sales ratio for Trader Jack's. (Assume that Trader Jack's has the same cost of capital and growth rate as the other grocery stores) (3 points)

b. You have run a regression of EV/Sales ratios against after-tax operating margins for the entire market and arrived at the following regression

EV/Sales = 0.35 + 15.0 (Growth Rate for next 5 years) + 7.50 After-tax operating margin

(Both growth rate and margins are entered as decimals: 5% is entered as 0.05)

Based on this regression, estimate the EV/Sales ratio for Trader Jack's today, using the growth rates and margins from part (a). (1 point)

c. Trader Jack's is considering cutting prices, with the intent of increasing both revenues and the growth rate. Assuming that the price cut will reduce the after-tax margin by 25% and increase revenues by 10%, how much will the new growth rate over the next 5 years have to be for this policy to be value increasing for the company? (You can use the regression in part (b) to make this judgment). (2 points)

3. Keiko Inc., an entertainment company, is considering an acquisition of Matterhorn Inc., a maker of animated movies. The information on the two companies is provided below ($ values are in millions):

	Keiko	Matterhorn
EBIT (1-t) expected next year	$100	$ 80
Revenues	$1000	$1250
Book Capital invested	$1000	$1000
Expected growth	3%	3%
Cost of capital	9%	9%

a. Estimate the value of the combined company, assuming no synergy in the merger. (2 points)

b. Now assume that Keiko Inc. believes that the combined company will be much stronger, relative to the competition, and will therefore be able to find more new investments in the next 4 years (doubling the reinvestment rate over that period for the combined firm) and earn a return on capital of 12% on new investments in perpetuity. (Existing investments at both firms will continue to generate their existing returns on capital) After year 4, the growth rate will drop back to 3% but the return on capital will stay at 12%. Estimate the value of synergy in this merger. (4 points)

4. You are trying to assess the value of control in Aamco, a troubled automobile parts supplies company. You have collected the following information:

- The company is expected to generate $48 million in after-tax operating income next year, on a book value capital invested of $ 800 million.
- The firm currently is currently extremely over levered with a debt to capital ratio of 80%. The levered beta for the stock is 2.72 and the pre-tax cost of debt is 12%. The marginal tax rate is 40%, the riskfree rate is 4% and the market risk premium is 6%.
- You believe that new management can turn the firm around by
    - Restructuring the firm's financing mix, to make it 50% debt and 50% equity. That will reduce the pre-tax cost of debt to 8%.
    - Improving the after-tax return on capital on both existing and new investments to 9%.

a. Assuming that the firm is in stable growth, growing 3% a year in perpetuity, estimate the value of the firm today. (2 points)

b. Estimate the cost of capital, if new management is able to restructure the debt in the firm (lowering the debt to capital ratio to 50% and the pre-tax cost of debt to 8%). (2 points)

c. Assuming that the firm will stay in stable growth, growing at 3% a year, even with new management, estimate the new value for the firm. (2 points)

d. Now assume that the probability of management changing is 40%, that the market value of debt today is $400 million and there is no cash balance. Estimate the value of equity today. (1 point)

5. You are helping a vulture investor decide whether he should be investing in the equity of Grappa Steel. You have collected the following information on the firm:

- The firm reported earnings before interest and taxes of $10 million and had depreciation charges of $ 15 million.
- Mature steel companies trade at an EV/EBITDA multiple of 6. The standard deviation in enterprise value at these companies is approximately 30% and the standard deviation in equity value is 40%.
- Given the state of the market, you estimate that you will face an illiquidity discount of approximately 20% on the value of the assets liquidated.
- The firm has substantial debt outstanding. The firm has two zero coupon bonds outstanding, $ 120 million (face value) in five-year bonds and 80 million (face value) in ten-year bonds.
- The treasury bill rate is 2% and the long term treasury bond rate (for both 5-year and 10-year bonds) is 4%.

a. If you consider equity as an option (to liquidate), value the equity in the firm. (2 points for the inputs; 2 points for the correct solution)

S =

K =

r =

t =

σ =

b. Now assume that you are interested in buying the bonds issued by the company. Given your analysis in part (a), estimate the probability that these bonds will default and what you would charge as a default spread (over the riskfree rate) to buy these bonds. (2 point)

Cumulative Normal Distribution

d	N(d)	d	N(d)	d	N(d)
		−1.00	.1587	1.00	.8413
−2.95	.0016	−.95	.1711	1.05	.8531
−2.90	.0019	−.90	.1841	1.10	.8643
−2.85	.0022	−.85	.1977	1.15	.8749
−2.80	.0026	−.80	.2119	1.20	.8849
−2.75	.0030	−.75	.2266	1.25	.8944
−2.70	.0035	−.70	.2420	1.30	.9032
−2.65	.0040	−.65	.2578	1.35	.9115
−2.60	.0047	−.60	.2743	1.40	.9192
−2.55	.0054	−.55	.2912	1.45	.9265
−2.50	.0062	−.50	.3085	1.50	.9332
−2.45	.0071	−.45	.3264	1.55	.9394
−2.40	.0082	−.40	.3446	1.60	.9452
−2.35	.0094	−.35	.3632	1.65	.9505
−2.30	.0107	−.30	.3821	1.70	.9554
−2.25	.0122	−.25	.4013	1.75	.9599
−2.20	.0139	−.20	.4207	1.80	.9641
−2.15	.0158	−.15	.4404	1.85	.9678
−2.10	.0179	−.10	.4602	1.90	.9713
−2.05	.0202	−.05	.4801	1.95	.9744
−2.00	.0228	.00	.5000	2.00	.9773
−1.95	.0256	.05	.5199	2.05	.9798
−1.90	.0287	.10	.5398	2.10	.9821
−1.85	.0322	.15	.5596	2.15	.9842
−1.80	.0359	.20	.5793	2.20	.9861
−1.75	.0401	.25	.5987	2.25	.9878
−1.70	.0446	.30	.6179	2.30	.9893
−1.65	.0495	.35	.6368	2.35	.9906
−1.60	.0548	.40	.6554	2.40	.9918
−1.55	.0606	.45	.6736	2.45	.9929
−1.50	.0668	.50	.6915	2.50	.9938
−1.45	.0735	.55	.7088	2.55	.9946
−1.40	.0808	.60	.7257	2.60	.9953
−1.35	.0885	.65	.7422	2.65	.9960
−1.30	.0968	.70	.7580	2.70	.9965
−1.25	.1057	.75	.7734	2.75	.9970
−1.20	.1151	.80	.7881	2.80	.9974
−1.15	.1251	.85	.8023	2.85	.9978
−1.10	.1357	.90	.8159	2.90	.9981
−1.05	.1469	.95	.8289	2.95	.9984