

Valuation: Final Exam

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

1. You are valuing Celia Inc, a retail firm. Celia generated \$ 25 million in after-tax operating income, in the most recent year, on revenues of \$ 500 million; the firm reported book value of invested capital of \$ 200 million at the start of the year. The cost of capital for the firm is expected to be 9% for the next 5 years and 8% thereafter.
 - a. You are expecting Celia Inc. to grow 15% a year for the next 5 years. Assuming that the firm will continue to generate the return on capital that it earned in the most recent year, estimate the free cash flows to the firm each year for the next 5 years. (2 points)
 - b. At the end of year 5, Celia Inc expects its marginal return on capital (on new investments) to drop to 10% and its expected growth rate to decline to a stable (perpetual) growth rate of 2%. Estimate the terminal value of the firm at the end of year 5. (2 points)

- c. Now assume that Celia has the following items on its balance sheet:
- (a) \$ 100 million in interest bearing debt (in market value terms),
 - (b) \$ 60 million in cash and marketable securities
 - (c) Minority cross holdings in other firms that have been valued (in market value terms) at \$ 40 million
 - (d) Minority interests of \$ 50 million (in market value terms).
 - (e) 10 million options outstanding with a value of \$3/option
- If there are 50 million shares outstanding currently, estimate the value of equity per share today. (2 points)

2. You are trying to value Peter Pan Media, a social media company that brings together people with common interests in movies. The company has 1.5 million members but no revenues right now; the average member is expected to stay on as a member for 2 years. The company has no debt outstanding and a cash balance of \$15 million, wants to tap into the public markets and is considering an IPO and has asked you to do a valuation.
- a. Looking across social media companies that are publicly traded, you obtain the following information (with enterprise value and # members in millions and the average life of a membership):

Company	Enterprise Value	# Members/users	Average life
A	\$ 1,000	40	1
B	\$ 3,000	30	4
C	\$ 1,500	20	3

Make your best estimate of Peter Pan's equity value per share today, if the company plans to issue 10 million shares. (2 points)

- b. Now assume that you are provided with estimates of Peter Pan's revenues (from advertising), net income and number of shares outstanding for the next 5 years.

	1	2	3	4	5
Revenues (\$ mil)	\$2.00	\$10.00	\$30.00	\$40.00	\$60.00
Net Income (\$ mil)	-\$10.00	-\$5.00	-\$2.00	\$8.00	\$15.00
# Shares	12.00	13.00	14.00	14.50	15.00

You have run a regression of price to sales ratios against net margins across publicly traded advertising companies and obtained the following:

$$\text{Price/Sales} = 0.5 + 7.5 (\text{Net profit Margin}) + 2.5 (\text{Expected Earnings growth})$$

[Enter percent as decimals. So, 10% will be input as 0.10]

Assuming that Peter Pan's expected growth in earnings after year 5 will be 10% a year for the following five years, estimate the value of equity per share in Peter Pan at the end of year 5. (2 points)

- c. Assume that your valuations in part (a) and part (b) are both reasonable and that the cost of equity for Peter Pan for the next 5 years is 10%. What is the probability that Peter Pan will not survive for the next 5 years? (You can assume that Peter Pan's equity will be worth nothing in the event of distress) (2 points)

3. Galinda Inc, a publicly traded food processing company, is considering acquiring Samoa Enterprises, a privately owned food processing company. You have collected the following information on the two companies:

	Galinda	Samoa
Revenues	\$1,000.00	\$500.00
EBIT (1-t) next year	\$90.00	\$60.00
Invested Capital	\$750.00	\$300.00
Debt ratio	20%	20%
After-tax cost of debt	3%	3%

Both companies are in stable growth, growing 3% a year. The unlevered beta of food processing companies is 0.90, the correlation of food processing companies with the market is 45% and the marginal tax rate for both public and private businesses is 40%. The owner of Samoa has all of her wealth invested in the business. (The riskfree rate is 2% and the equity risk premium is 6%)

- a. Estimate the value of Samoa as a stand-alone private business, to its owner.
(2 points)

b. Assume that if Galinda acquires Samoa, it expects to be able to cut costs (pre-tax) by \$ 30 million for the combined firm next year, without any addition to invested capital or change to the expected growth rate. If Galinda can buy Samoa for twice the estimated value in part a, estimate the value per share for Galinda after the acquisition. You can assume that Galinda has \$ 500 million in debt outstanding, no cash balance and 50 million shares. (4 points)

4. You have been hired as a CEO for Matrix Inc., a firm whose stock price has been languishing for the last few years. There are 23 million shares trading at \$ 10/share and the company has a cash balance of \$100 million and debt outstanding of \$ 20 million. The firm is expected to generate \$ 20 million in after-tax operating income next year and is in stable growth, growing 2% a year. The cost of capital for the firm is 10%.
 - a. If the firm is fairly valued right now, estimate the invested capital (book value) in the firm. (2 points)

- b. Now assume that you are planning on using your entire cash balance to acquire the subsidiary of another publicly traded company that operates in the same business that you do. If, by doing so, you can double your after-tax operating income for next year, estimate the value per share after this transaction assuming that you can sustain your new return on capital in perpetuity. (You can assume that you remain a stable growth firm, growing 2% a year) (2 points)
- c. As an alternative, you are considering an offer to divest a portion of your existing business for \$ 100 million; the portion that will be divested accounts for 75% of your invested capital and 50% of your after-tax operating income. If you plan to hold the proceeds from the divestiture as cash, estimate the value per share, assuming that you can sustain your new return on capital in perpetuity (Again, assume you will remain a stable growth firm, growing 2% a year). (2 points)

5. Magnalife, a troubled, chemical company generated \$ 10 million in EBITDA in the most recent year on revenues of \$ 50 billion. The firm has no cash balance and owes \$ 50 million (face or par value) in a zero coupon bond with a maturity of 3 years; the bond rating is CCC and the default spread is 6%. The standard deviation in firm value for chemical companies is 40% and the 3-year treasury bond rate is 4%.
- a. If chemical companies typically trade at an EV/EBITDA multiple of 6, estimate the equity value in Magnalife, based on a relative valuation.
- (2 points)

- b. Now assume that you were viewing the equity in Magnalife as an option. Estimate the value of equity in the company as an option. (3 points)

- c. If you were an investor interested in buying Magnalife's bonds, would you buy the bonds if they were yielding 10%. (1 point)

d	$N(d)$	d	$N(d)$	d	$N(d)$
-3.00	0.0013	-1.00	0.1587	1.05	0.8531
-2.95	0.0016	-0.95	0.1711	1.10	0.8643
-2.90	0.0019	-0.90	0.1841	1.15	0.8749
-2.85	0.0022	-0.85	0.1977	1.20	0.8849
-2.80	0.0026	-0.80	0.2119	1.25	0.8944
-2.75	0.0030	-0.75	0.2266	1.30	0.9032
-2.70	0.0035	-0.70	0.2420	1.35	0.9115
-2.65	0.0040	-0.65	0.2578	1.40	0.9192
-2.60	0.0047	-0.60	0.2743	1.45	0.9265
-2.55	0.0054	-0.55	0.2912	1.50	0.9332
-2.50	0.0062	-0.50	0.3085	1.55	0.9394
-2.45	0.0071	-0.45	0.3264	1.60	0.9452
-2.40	0.0082	-0.40	0.3446	1.65	0.9505
-2.35	0.0094	-0.35	0.3632	1.70	0.9554
-2.30	0.0107	-0.30	0.3821	1.75	0.9599
-2.25	0.0122	-0.25	0.4013	1.80	0.9641
-2.20	0.0139	-0.20	0.4207	1.85	0.9678
-2.15	0.0158	-0.15	0.4404	1.90	0.9713
-2.10	0.0179	-0.10	0.4602	1.95	0.9744
-2.05	0.0202	-0.05	0.4801	2.00	0.9772
-2.00	0.0228	0.00	0.5000	2.05	0.9798
-1.95	0.0256	0.05	0.5199	2.10	0.9821
-1.90	0.0287	0.10	0.5398	2.15	0.9842
-1.85	0.0322	0.15	0.5596	2.20	0.9861
-1.80	0.0359	0.20	0.5793	2.25	0.9878
-1.75	0.0401	0.25	0.5987	2.30	0.9893
-1.70	0.0446	0.30	0.6179	2.35	0.9906
-1.65	0.0495	0.35	0.6368	2.40	0.9918
-1.60	0.0548	0.40	0.6554	2.45	0.9929
-1.55	0.0606	0.45	0.6736	2.50	0.9938
-1.50	0.0668	0.50	0.6915	2.55	0.9946
-1.45	0.0735	0.55	0.7088	2.60	0.9953
-1.40	0.0808	0.60	0.7257	2.65	0.9960
-1.35	0.0885	0.65	0.7422	2.70	0.9965
-1.30	0.0968	0.70	0.7580	2.75	0.9970
-1.25	0.1056	0.75	0.7734	2.80	0.9974
-1.20	0.1151	0.80	0.7881	2.85	0.9978
-1.15	0.1251	0.85	0.8023	2.90	0.9981
-1.10	0.1357	0.90	0.8159	2.95	0.9984
-1.05	0.1469	0.95	0.8289	3.00	0.9987
-1.00	0.1587	1.00	0.8413		