

Equity Instruments: 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 review a discounted cashflow valuation done by another analyst of Lichen Inc., a small manufacturing company. The analyst's estimates of after-tax operating income and free cashflows to the firm for the next 4 years are provided below:

<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
EBIT (1-t)	\$100.00	\$115.00	\$132.25	\$152.09
FCFF	\$25.00	\$28.75	\$33.06	\$38.02

a. Given the growth rate projected by the analyst and the FCFF numbers, estimate the return on capital that the analyst is assuming for the firm over the next 4 years. (You can assume that the return on capital will remain unchanged for the next 4 years) (2 points)

b. Assuming that the return on capital remains unchanged (from current levels) in perpetuity, that the cost of capital is 12% and that the expected growth rate is 4% forever after year 4, estimate the value at the end of the fourth year. (2 points)

c. Estimate the value per share today if Lichen Inc. has \$ 150 million in debt, \$ 100 million as a cash balance and 50 million shares outstanding. (1 point)

2. MiniTel Inc. is a company that operates in two businesses – telecomm equipment and cable. You are attempting to do a relative valuation of the company and have collected the following information on the two businesses:

- MiniTel reported revenues of \$ 1 billion and an operating loss of \$ 80 million from the telecomm equipment business. Most other publicly traded companies in the business also reported operating losses, but the average EV/Sales Ratio for the sector is 1.20.
- MiniTel reported revenues of \$ 1.5 billion and EBITDA of \$ 150 million from the cable business. The average EV/EBITDA multiple for other publicly traded cable firms is 8.

MiniTel has \$ 1 billion in debt outstanding and a cash balance of \$ 600 million.

a. If there are 100 million shares outstanding, estimate the value of equity per share.

(2 points)

b. Now assume that you are told that MiniTel has a 60% holding in a LiveTel, a smaller telecom equipment company. LiveTel had revenues of \$ 250 million, EBITDA of \$ 10 million, debt of \$ 100 million and a cash balance of \$ 150 million and these numbers are fully consolidated into MiniTel's financial statements. (The telecomm numbers and the balance sheet numbers on the last page come from these consolidated financial statements). Estimate the value of equity per share in MiniTel, with this additional information. (3 points)

3. Labtec Pharmaceuticals has 100 million shares trading at \$ 10.40 a share, no debt outstanding or cash holdings and reported after-tax operating income of \$ 180 million in the most recent financial year. The market is pricing the company as a stable growth firm, with an expected growth rate of 4% and a cost of capital of 10%. (The riskfree rate is 5% and the market risk premium is 4%; the tax rate is 40%)

a. Assuming that the market is pricing the company correctly, what return on capital is it assuming in perpetuity? (2 points)

b. You have been hired as a turn-around CEO of Labtec Pharmaceuticals. You believe that you can increase the debt to capital ratio to 20% (with an after-tax cost of debt of 4%). Estimate the cost of capital after the increased debt. (2 points)

c. You also believe that you can double the return on capital on both existing and new investments for the firm while maintaining your existing reinvestment rate for the next 3 years. After year 3, you will maintain the higher return on capital but your growth rate will drop back to 4%. Estimate the new firm value with the changes in your debt ratio and return on capital. (4 points)

4. Bandai Inc., the manufacturer of action toys (Power Rangers) is interested in acquiring Pac-Man Inc., a manufacturer of video games. You have collected the following information on the two firms:

- Bandai reported after-tax operating income of \$ 100 million on revenues of \$ 2 billion in the most recent financial year. Its return on capital is 12% and it expects to maintain a growth rate of 3% a year in perpetuity.
- Pac-Man Inc reported after-tax operating income of \$ 50 million on revenues of \$ 1.5 billion in the most recent year. Its return on capital is 10% and it expects to maintain a growth rate of 3% a year in perpetuity.

Both firms have a 9% cost of capital in perpetuity.

a. Estimate the value of Bandai as a stand-alone company. (1.5 points)

b. Estimate the value of Pac-Man as a stand-alone company. (1.5 points)

c. If Bandai acquires Pac-Man, it believes that it can increase the combined firm's return on capital on existing investments to 12% and on new investments to 15% while holding the growth rate in perpetuity at 3%. Estimate the value of synergy in this merger.

(3 points)

5. You are a private equity investor who has been approached by a technology firm, interested in raising money. The firm has revenues of \$ 10 million and an estimated current value of \$ 20 million. You have been offered a 20% share of the firm, which you can sell back to the other investors in the firm any time over the next 2 years for \$ 2 million. You also have the right to buy an additional 20% of the firm any time over the next 2 years for \$6 million. The standard deviation in firm value is 50% and the 2-year riskless rate is 4.

a. What is the value of the option to sell back the 20% to the other investors in the firm any time over the next 2 years for \$ 2 million? (3 points)

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b. What is the value of the option to acquire another 20% of the firm value any time over the next 2 years for \$ 6 million? (3 points)