

Valuation : Final Exam

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

1. Secure Mail is a young, privately owned, software company that has developed innovative anti-virus software. The firm has never sold any of its products but has accumulated \$5 million in net operating losses over its life. You have been provided with the following estimates of revenues and pre-tax operating income for the next 5 years.

| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|------------------|---------|---------|--------|---------|---------|
| Revenues | \$50 | \$175 | \$350 | \$575 | \$700 |
| Operating income | -\$6.00 | -\$2.00 | \$3.00 | \$25.00 | \$70.00 |

The firm is expected to remain all equity funded.

a. If the tax rate for the firm is 40%, estimate the free cash flow to the firm each year for the next 5 years. (The sales to book capital ratio in this sector is 4.00) (3 points)

b. Now assume that the firm is owned fully by its founder, who has his wealth tied up in the firm. Also assume that he has enough capital to fund the firm for the next 5 years. If the unlevered beta of the application software business is 1.20 and the correlation with the market is 40%, estimate the cost of equity for the firm. (The riskfree rate is 4% and the equity risk premium is 5%) (1 point)

c. At the end of year 5, Secure Mail plans to make an initial public offering. If the expected growth rate after year 5 (in revenues and operating income) is 3% and the return on capital in perpetuity is expected to be 15%, estimate the terminal value (at the end of year 5). (2 points)

d. Estimate the value of equity in Secure Mail today. (The firm currently has a cash balance of \$ 10 million) (2 points)

2. You are examining Valiant Automobiles, a company that reported EBITDA of -\$300 million (minus 300 million) last year. The firm is expected to turn the corner and deliver EBITDA of \$ 500 million five years from now on revenues of \$ 4 billion; the expected growth rate in EBITDA after year 5 is 4%. Valiant has \$ 1 billion in debt outstanding and a cash balance of \$ 250 million. You have run a regression of EV/EBITDA across healthy automobile companies and come up with the following:

$$\text{EV/EBITDA} = 2.50 + 50 (\text{Expected growth rate in EBITDA}) + 12 (\text{EBITDA/Revenues})$$

(Enter percent in decimals: 5% would be 0.05)

Valiant Auto has 20 million shares outstanding, trading at \$ 10 a share. The cost of capital for the firm is expected to be 12% for the next 5 years. If you believe that the market is correctly pricing the stock and that your estimate of EBITDA and value (from the relative valuation) are right, estimate the probability that the market is assessing that the firm will not survive. (4 points)

3. You have acquired a reputation as a turn-around CEO and have been hired to fix things at a multi-business, publicly traded company. The details of the three businesses are provided below:

| <i>Business</i> | <i>EBIT (1-t) next year</i> | <i>Expected growth (in perpetuity)</i> | <i>Cost of capital</i> | <i>Book Capital invested today</i> |
|-----------------|---------------------------------|--|------------------------|--|
| Retailing | 60 | 3% | 9% | 400 |
| Hospitality | 30 | 4% | 10% | 300 |
| Transportation | 36 | 2% | 8% | 600 |

The firm has 100 million shares outstanding, \$ 600 million in debt outstanding and a cash balance of \$ 100 million.

a. If you assume that the return on capital earned currently by each of these businesses continues in perpetuity estimate the value of equity per share in this firm today. (2 points)

b. Now assume that you divest yourself of the transportation business for fair value (given the fundamentals) and invest that money in the retailing business. If you can preserve the fundamentals of the retail business (same return on capital, cost of capital and growth rate), estimate the new value per share. (2 points)

c. How would your value per share be different if you used the proceeds from the sale of the transportation business (still assuming that the sale is at fair value) to buy back shares in the company at the value per share, instead of reinvesting in the retailing business. (The cost of capital will drop by 1% in its other businesses – from 9% to 8% for the retailing business and from 10% to 9% for hospitality). (2 points)

4. Lazarus Enterprises is a firm with 10 million voting shares and 15 million non-voting shares outstanding. You have made the following estimates for the firm, based on current management running it as well as an optimal management team in place:

| | <i>Status Quo</i> | <i>Optimal Management</i> | <i>Comments</i> |
|-----------------------|-------------------|---------------------------|------------------------------------|
| EBIT (1-t) next year | 80 | 100 | Cost cutting pays off |
| ROC on new investment | 8% | 10% | Better investment choices |
| Expected growth rate | 4% | 4% | Still a mature firm |
| Cost of capital | 9% | 9% | Firm will remain all equity funded |

You can assume that voting shareholders will be able to claim the entire expected value of control.

a. What is the effect on the value of the firm of changing management? (2 points)

b. If the voting shares are trading at a 20% premium over the non-voting shares in the market place, estimate the probability of management changing (assuming that the market prices for both classes are right) (3 points)

c. Assume now that you are a private equity fund and that you plan to acquire the firm and put optimal management in place. If you believe that making the changes will take 3 years to accomplish, estimate the most you would be willing to pay per voting share? (2 points)

5. Secure Mail is the company with the anti-virus software in problem 1. If the virus software acquires a ready market, there is the possibility that Secure Mail could introduce database software to its customer base some time over the next 5 years.

- The cost of developing a database software product is estimated to be \$ 500 million (in present value dollars)
- Based on the information that Secure Mail has right now, the estimated after-tax cashflows from a database product will be \$ 40 million a year for the next 10 years; the life of the investment will be unaffected by when you take the investment. The cost of capital for the investment is expected to be 12%.
- The standard deviation in firm value is 40% for companies in the anti-virus software business, 50% in the database software business and 30% for the entire market.
- The six-month treasury bill rate is 2%, the five-year treasury bond rate is 3% and the ten-year treasury bond rate is 4%.
- There is no cost to delaying the investment.

a. If you view the database software expansion as an option, estimate the inputs to the option pricing model (3 points)

S =

K =

t =

σ =

r =

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Name:

b. Use an option pricing model to value this option.

(2 points)