

**Equity Instruments: Final Exam**

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

1. UVA Inc. is a company that manufactures and retails eye wear. The firm reported \$ 50 million in after-tax operating income on revenues of \$ 500 million in the most recent year. The company has 50 million shares outstanding, trading at \$ 8 per share, and \$ 150 million in debt at a current market interest rate of 8%; the corporate tax rate is 40%. The firm also has a cash balance of \$ 50 million. The stock trades at 1.6 times the book value (of equity) and debt trades at book value (of debt). The unlevered beta for eyewear firms is 0.80; the riskfree rate is 5% and the market risk premium is 4%.

- a. Estimate the cost of capital for UVA Inc. ( 2 points)

- b. UVA had capital expenditures of \$ 80 million and depreciation of \$ 40 million in the most recent year. If UVA has no working capital investments and expects to maintain its existing reinvestment rate and return on capital for the next 3 years, estimate the expected annual growth rate for this period. (1 point)

- c. Estimate the value of UVA at the end of the third year, assuming that its growth rate drops to 4% after year 3 and it maintains its existing return on capital and cost of capital. ( 2 points)

- d. UVA has 10 million options outstanding. If you value each of the options at \$ 12, estimate the value of equity per share based upon your estimated cashflows (from parts b and c). (3 points)

2. You are comparing the valuations of two telecomm firms and have come up with the following information:
- SoundTech Telecom reported EBITDA of \$ 500 million last year. The firm had 100 million shares outstanding trading at \$ 20 a share and \$ 2 billion in debt outstanding. The company expects earnings to grow 20% a year for the next 5 years.
  - Zif Telecom reported EBITDA of \$ 400 million last year. The firm had 50 million shares trading at \$ 30 a share, \$ 2 billion in debt and \$ 500 million as a cash balance. The company has a 40% tax rate but you do not know the expected growth rate in earnings.

Running a regression of EV/EBITDA multiples across telecomm companies, you have arrived at the following results:

$EV/EBITDA = 7.5 - 2.40 (\text{Tax rate}) + 6.50 (\text{Expected earnings growth rate: next 5 years})$

(Use decimals for tax rates and growth; enter 25% as .25)

- a. If SoundTech is correctly valued, relative to the sector, estimate the tax rate that the company faces. ( 2 points)

- b. Is Zif Telecom is under valued by 10% relative to the sector, estimate the expected growth in earnings in the next 5 years? (2 points)

3. Vader Enterprises, a chemical company, has fallen on hard times. Its stock had dropped 50% to \$ 6 a share; there are 100 million shares outstanding. The firm also has \$1.4 billion (market value) in debt outstanding (with an interest rate of 12%) and reported earnings before interest and taxes of \$ 300 million last year; the book value of capital of the firm is \$4 billion. The firm currently has a beta of 1.80, the riskfree rate is 5% and the market risk premium is 4%; the tax rate is 40%. You have been hired as CEO and you believe that you can do two things:
- You will issue new equity and reduce the market debt to capital ratio to 40%. This will reduce the interest rate on debt to 8%.
  - You will be able to raise the return on capital to the cost of capital that will prevail after you recapitalize the firm (and reduce the debt ratio). This improvement will be only on new investments. (Existing investments will continue to earn the current return on capital)
- a. Estimate the cost of capital after you make the change in your debt ratio. (2 points)

- b. The firm is in stable growth, growing 4% a year. Estimate the firm value after the recapitalization and the improvement in return on capital, assuming that the growth does not change. (3 points)

4. Cavuto Inc. is a private company, in the software business. The owner, who has her entire wealth invested in the business, has come to you for some advice on a proposed acquisition of Soros Inc, a private retail business, also owned by an undiversified individual. You have collected the following information on the two companies:
- Cavuto reported after-tax operating income of \$ 10 million last year on a book value of capital of \$ 50 million. The firm is in stable growth, growing 4% a year in perpetuity.
  - Soros reported after-tax operating income of \$ 5 million last year on a book value of capital of \$ 40 million. The firm is in stable growth as well, growing 4% a year in perpetuity.

Both firms are entirely equity funded. You have collected the following information on publicly traded firms in the software and the retail businesses:

Business	Unlevered Beta	Correlation with the market
Software	1.20	30%
Retail	0.90	40%

The tax rate is 40%. The riskfree rate is 5% and the market risk premium is 4%.

- a. Estimate the value of Cavuto as a stand-alone firm. (1.5 points)

b. Estimate the value of Soros Inc. as a stand alone firm. (1.5 points)

c. Estimate the value of synergy in the acquisition. The combined firm's equity will have a correlation of 50% with the market and you can assume that there are no operating synergies in this merger. ( 3 points)

5. You are considering how much you should bid for a five-story office building in New York. The building generates after-tax rental revenue (net of operating costs) of \$ 5 million a year, expected to grow 2% a year in perpetuity. The appropriate discount rate, based upon the riskiness of real estate, is 8%. Due to a quirk in the building code, the building carries with it a right that will allow you to add 25 floors anytime over the next 10 years<sup>1</sup>. You anticipate that the cost of adding these floors will be \$ 125 million today. Given the state of the office rental market right now, you believe that if you added these floors now, you would generate \$ 6 million in additional after-tax rental revenues, expected to grow 2% a year in perpetuity. The standard deviation in rental revenues is 20% and it will take you one year to complete the construction. The ten-year treasury bond rate is 4%.
- a. Estimate what you would pay for this building if it did not have the right to add on additional floors. ( 2 points)

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<sup>1</sup> It is very difficult to get permission in New York to add to an existing building and you cannot do so without having the legal permission.

- b. Estimate the value of the right to add the 25 additional floors to the building.  
(2 points for inputs and 3 points for option valuation)

S =

K =

t =

Cost of delay (if any) =