

Corporate Finance: 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 assess the impact of a proposed acquisition on the beta of a firm and have been provided the following information on the two firms involved in the deal:

	Hercules (Acquirer)	Avion (Target)
Number of shares outstanding	1000	1000
Share price	\$10.00	\$5.00
Market & Book value of debt	\$1000	\$2000
Book value of equity	\$5000	\$4000
Levered Beta	1.1	1.4
Tax rate	40%	40%
Rating	AAA	BBB
Default spread	0.50%	2.50%

The riskfree rate is 4% and the equity risk premium is 6%.

a. Estimate the unlevered beta of the combined firm. (3 points)

b. Now assume that Hercules plans to retire all of Avion's debt and that it will be able to buy Avion's equity at the current market price. If Hercules would like to have a levered beta of 1.25 for the combined firm after the transaction, estimate how much new debt it will need to raise to finish this acquisition. (2 points)

c. Finally, assume that the bond rating for the firm will drop to A+ after the transaction, with a default spread of 1.5%, estimate the cost of capital for the combined firm after the merger. (1 point)

2. You have been asked to examine the net present value computation for a 10-year project done by another analyst. The project will require an initial investment of \$ 500 million and will be depreciated straight line over 10 years to a salvage value of zero. The project is expected to generate constant after-tax operating earnings every year for the next 10 years. The analyst estimated a net present value of \$ 20 million for the project. To arrive at this value, he discounted the after-tax operating income (EBIT (1-t)) at the cost of equity and ignored working capital investments in his NPV computation. (In effect, the analyst discounted after-tax operating income at the cost of equity and subtracted out the initial investment in fixed assets to arrive at the NPV)

- You estimate that the project will require an initial investment in non-cash working capital of \$ 50 million, which can be fully salvaged back at the end of the 10th year.
 - The cost of equity is 10%, based upon the correct levered beta, but the firm has a debt to capital ratio of 20% and an after-tax cost of debt of 4%. (The tax rate is 40%)
- a. Estimate the “correct discount rate” that the analyst should have used to discount the cash flows. (1 point)

- b. Assuming that the analyst’s estimate of after-tax operating income is correct, and taking into consideration his mistakes in computing the NPV, estimate the annual after-tax operating income on this investment. (2 points)

c. Estimate the correct net present value on this investment, with all of the cash flows considered and using the correct discount rate. *[You will need part b to do part c. If you have trouble with part b, use \$ 100 million as your after-tax operating income and specify that you did so]* (2 points)

d. How would your answer to part c change if you were told that the initial investment could be depreciated over five years instead of ten. (The project will still last 10 years) [Hint: You do not have to do the whole analysis over. There is a short cut] (1 point)

3. You have been asked by Healthy Appliances Inc, a medical device maker, for advice on whether they are using the right mix of debt and equity to fund their operations. The firm has 80 million shares trading at \$ 10 a share and \$ 200 million in outstanding debt. The current levered beta for the firm is 1.10 and the pre-tax cost of borrowing is 6%. The marginal tax rate is 40%, the riskfree rate is 5% and the equity risk premium is 4%.

a. Estimate the current cost of capital for the firm. (1 point)

b. If the market is valuing the firm correctly today and the expected free cash flow to the firm next year is \$ 50 million, estimate the implied growth rate in this cash flow in perpetuity (given the cost of capital that you estimated in part a). (2 points)

c. You estimate the optimal debt ratio for the firm to be 40% and believe that the cost of capital will drop to 8%, if you move to the optimal by borrowing money and buying back shares. If you buy back the shares at \$10.25/share, estimate the increase in value per share for the remaining shares. *[You will need part b to do part c. If you have trouble with part b, use 5% as your growth rate forever and specify that you did so]* (2 points)

d. Healthy Appliances is considering whether it should be reinvesting the funds from new debt back into the existing business, rather than buying back stock. Under which of the following circumstances does it make sense for Healthy Appliances to make this switch? (1 point)

- i. Never. Buying back stock will always increase the stock price more than taking new investments.
- ii. Only if the new investments generate returns that exceed the after-tax cost of debt.
- iii. Only if the new investments generate returns that exceed the cost of capital at the existing debt ratio.
- iv. Only if the new investments generate returns that exceed the cost of capital at the new debt ratio.
- v. Always, because the new investments will increase future growth.

4. You are trying to get a sense of how much Danica Inc, a sports supplies firm, should pay in dividends looking forward. You do know the following facts about the firm:

- The firm generated \$ 15 million in net income on revenues of \$ 50 million in the most recent year and reported depreciation of \$ 5 million for the same time period.
- Capital expenditures in the most recent time period amounted to \$ 12 million and total non-cash working capital currently is \$ 8 million.
- The firm expects revenues, net income, depreciation and capital expenditures to grow 20% a year for the next 3 years and non-cash working capital to be maintained at its current proportion of revenue.
- The firm has a cash balance right now of \$ 20 million. (You can assume that cash does not earn interest income)
- The firm has a debt to capital ratio of 25% currently.

a. If the firm would like to increase its cash balance to \$ 30 million by the end of the third year, estimate the payout ratio that the firm will have to maintain for the next 3 years, assuming that the firm maintains its existing debt ratio.. (3 points)

b. Now assume that the firm is considering an alternative strategy. It will like to repay \$ 5 million in debt each year for the next 3 years. Estimate the payout ratio that the firm will have to maintain, on average over the next 3 years, if it wants its cash balance to remain unchanged at its current level of \$ 20 million. (2 points)

c. Stock buybacks have increased in popularity over the last two decades in the United States. Which of the following is the most likely explanation for the phenomenon? (1 pt)

- i. Pension funds, which are tax exempt, hold a larger proportion of stocks than they used to.
- ii. Dividends are taxed at higher rates than capital gains.
- iii. Firms are less certain about future earnings and cash flows.
- iv. Buybacks reduce the number of shares outstanding.
- v. None of the above.

5. Nostalgia Inc. is a small firm that sells antique furnishings. In the most recent year, the firm generated \$ 1.5 million in after-tax operating income on revenues of \$ 20 million; the firm reported book value of equity of \$ 5 million and book value of debt of \$2.5 million at the beginning of the year. During the year, the firm invested \$ 1 million in a new warehouse for furniture (its only cap ex) and reported depreciation of \$400,000 in its income statement. The firm's only working capital item is its inventory, which increased by \$150,000 during the course of the year. The cost of capital for the firm is expected to be 12% for the next 3 years and 10% thereafter. You have been asked to appraise the value of the company

a. Assuming that the firm maintains its existing return on capital and reinvestment rate for the next 3 years, estimate the expected free cash flow to the firm each year for the next 3 years. (2 points)

b. Estimate the value of the firm at the end of year 3, assuming that the return on capital stays at the current level but the growth rate drops to 3%. (2 points)

c. Assuming that Nostalgia has 1 million shares outstanding, estimate the value of equity per share. (You can assume that the book value of debt = market value of debt, and that the debt remained unchanged over the most recent year. You can also assume no cash)
(2 points)