

Problem Set 4

Problem 4.1.a. Share price is \$150.00, expected dividend is \$12.00 one year from now, expected capital gain is 9%. What is the return on equity?

- b. Share price is \$40.00, expected dividend is \$4.50 one year from now, growing thereafter at a rate of 3% per year in perpetuity. What is the return on equity?
- c. Expected dividend is \$7.50 one year from now, dividend yield is 8%, return on equity is 14%. What is the share price?

Problem 4.2. Exalted Co. will pay a dividend of \$2.25 per share this year, and dividends per share are expected to grow at a rate of 10% per year in perpetuity. The market capitalization rate is 12.8% for stocks having similar risk.

- a. Compute the current price and dividend yield for Exalted shares, and forecast the capital gain on these shares for the coming year.
- b. Estimate the share price, dividend yield and capital gain on Exalted shares three years from now.
- c. Based on new information, the growth rate on Exalted dividends is lowered to 2% per year in perpetuity. How does this change your answer for part a?

Problem 4.3. Lucre Corp. maintains a debt level of \$300 million, with a yield of 6%, along with 10 million shares of common stock, trading at \$65.00 per share. Lucre pays an annual dividend of \$9.50 per share. All residual cash flows are paid out as dividends.

- a. Calculate the market value of Lucre Corp., the return on equity, the market value of real assets, the amount of cash earned each year on real assets, and the return on real assets.
- b. Suppose Lucre issues \$100 million worth of new debt and repurchases equity. New debt has a yield of 6%. Calculate the value of Lucre, the return on equity, the share price, the number of shares outstanding, and the yearly dividend per share after the debt issue.
- c. Recalculate your answer to part b under the assumption that Lucre uses the half the proceeds of the debt issue to pay a special dividend, and repurchases equity with the remaining half.
- d. Recalculate your answer to part b under the assumption that Lucre wishes to obtain a debt-equity ratio of 75%. Assume that all proceeds from new debt are used to repurchase shares.

Problem 4.4. Probity, Inc. is financed exclusively by 450 million shares of common stock. Its real assets generate cash flows of \$500 million per year. The return on real assets is 16%.

- a. Suppose Probity pays out all cash flows as dividends. Calculate the return on equity, the yearly dividend, the share price and the market value of Probity. Also calculate the dividend yield and the rate of capital gain.

- b. Suppose Probity instead uses 30% of current cash flow to repurchase shares, and pays out the remainder as dividends. Calculate the current dividend, the share price and the market value of Probity. How many shares does Probity repurchase?
- c. Suppose Probity instead repurchases shares next year, using 30% of next year's cash flow. Calculate the dividend and share price one year from now, along with the current share price. Also calculate the dividend yield and the rate of capital gain.

Problem 4.5. Surge Investment Co. has a market value of \$2.7 billion, with 925 million shares of common stock outstanding. Surge maintains a debt-equity ratio of 60%. Next year Surge will pay a dividend of 25¢ per share. Surge projects that cash flows from its real assets will rise by 8% per year for the foreseeable future. Outstanding debt will also rise by 8% per year. All residual cash flows are paid out as dividends. The yield on Surge debt is 11% and the tax rate is 35%.

- a. Calculate the current value of debt and the current share price.
- b. Calculate the PV of ITS and the value of real assets.
- c. Calculate the growth rate of dividends and the return on equity.

Problem 4.6. The Automata Medical Group has a current market value of \$500 million, financed by \$250 million in debt and 50 million shares of common stock. Automata is considering an investment of \$100 million in a robotic clinic. The clinic is projected to generate future cash flows having a PV of \$125 million.

For each of the following financing plans, compute Automata's market value after project adoption, the value of equity after adoption, the APV of the project, the effect of project adoption on Automata's share price, and the number of shares that it must sell or repurchase.

- a. Automata issues \$40 million in new debt and finances the remainder with new equity.
- b. Automata borrows \$40 million and uses \$60 million in internal cash flow.
- c. Automata adjusts debt and equity to obtain a target debt ratio of 50% after project adoption.
- d. Automata sells an old clinic for \$35 million and finances the remainder by issuing new debt. The old clinic has a value of \$30 million if Automata does not sell it.

Problem 4.7. General Acquisitions, Inc. has a current market value of \$400 billion, financed by \$150 billion in debt and 4.5 billion shares of common stock. General is considering purchasing Advanced Systems Corp., which has a current market value of \$75 billion, with \$20 billion in debt and 80 million shares of common stock. Due to operating improvements, the merger will raise the PV of cash flows from Advanced Systems' real assets by \$8 billion. Both companies face a tax rate of 35%.

For each of the following financing plans, compute General's market value and the value of equity after the merger, the APV of the merger, the effect on General's share price, and the number of shares that it must sell or repurchase.

- a. General retires Advanced Systems' debt, issues \$35 billion in new General debt, and finances the remainder with new equity.
- b. General assumes Advanced Systems' debt, issues \$20 billion in new General debt, and finances the remainder using internal cash flow.

- c. General retires Advanced Systems' debt and structures financing to maintain its target debt ratio of 37.5%.

Problem 4.8. Henhouse Foods, Inc. has a market value of \$40 billion, financed by \$10 billion in debt and 600 million shares of common stock. Henhouse is considering a merger with Fox Supply Co., which has a market value of \$2 billion, financed by \$1.5 billion in debt and 25 million shares of common stock. The merger will raise the PV of cash flows from real assets by \$500 million. Both companies face a tax rate of 35%.

- a. Suppose Henhouse acquires Fox and retires its debt. Henhouse structures financing to maintain its target debt ratio of 25%. In addition, Fox's management group charges a consulting fee of 5% of the value of the merger. For tax purposes the consulting fee is treated as SG&A. Calculate Henhouse's market value and value of equity after the merger, the APV of the merger, the effect on Henhouse's share price, and the number of shares that it must sell or repurchase to finance the merger.
- b. Suppose merger rumors raise Fox's stock price by \$7.50 per share. Recalculate your answer to part a.
- c. Now suppose Henhouse rejects the merger, and instead Fox's management group purchases both companies. The combined company assumes all Fox and Henhouse debt and issues \$20 billion in new debt. The remainder of the investment is financed using private funds. Calculate the market value and value of equity for the combined company, and the APV of the LBO.

Problem 4.9. Aggressive Ventures, Inc., is considering financing a high-tech start-up company. Data on three competing companies are given in the following table.

	Value	D/E	β_D	β_E
Xicor	\$298 m.	0.43	0.72	1.16
Yorkin	\$160 m.	0.81	1.08	1.29
Zomax	\$321 m.	0.58	0.87	1.34

Each company faces a tax rate of 35%.

- a. Assuming a risk-free rate of 3.2% and an expected market return of 11%, use CAPM to estimate the returns on debt and equity for each company.
- b. Calculate the return on assets for each company.
- c. Calculate the return on the portfolio consisting of the real assets of the three companies.

Problem 4.10. Data on Staid, Inc. and Racy Co. are given in the following table.

	Value	D/E	β_D	β_E
Staid	\$1,860 m.	0.21	0.34	0.92
Racy	\$1,245 m.	1.18	0.75	1.69

Each company faces a tax rate of 35%.

- a. Assuming a risk free rate of 4.5% and a market risk premium is 6.7%, use CAPM to estimate the returns on debt and equity for each company.

- b. Estimate the return on assets for each company.
- c. Suppose Racy buys out Staid. The merger does not affect the PV of cash flows from real assets. Estimate the return on assets for Racy following the merger.
- d. Suppose Racy debt yields 8.2% following the merger. If Racy implements a debt-equity ratio of 85%, calculate the value of Racy and the return on equity.
- e. The real assets of Staid's book division have a current value of \$640 m. The OCC for similar assets is estimated at 7.1%. If Racy sells the division, calculate the value of Racy, the return on assets and the return on equity following the sale.

Problem 4.11. The Fulsome Gas Co. is evaluating a new energy project. An investment of \$112.4 million is required, and the project is projected to generate future cash flows of \$19.7 million per year in perpetuity. Fulsome has a current market value of \$2.65 billion. It maintains a target debt ratio of 25%, and the returns on its debt and equity are estimated to be 5.5% and 12.9%, respectively. Fulsome faces a tax rate of 35%.

- a. Calculate the WACC for Fulsome.
- b. Calculate the APV of this project using the WACC method.
- c. Calculate the return on assets and the APV of the energy project using the conventional method.