Economics 173B - Corporate Finance Spring 2011-12
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Study Problems II

Problem 4.1. Compute the NPV and set of possible values of the IRR for the following investment projects:

a. Invest \$50,000 now to obtain \$35,000 one year from now and \$40,000 two years from now, OCC is 12%.

b. Invest \$80,000 now to obtain \$240,000 one year from now and \$40,000 three years from now, but \$200,000 must be paid two years from now, OCC is 14%.

Problem 4.2. Calculate the IRR of the retail investment project in Problem 3.8 to within one percentage point.

Problem 4.3.a. Colossal Corp. bonds have a face value of \$10,000 and a coupon rate of 8%. Interest is paid annually. For a bond maturing one year from now, the current market price is \$9,750. Calculate the yield to maturity to within one basis point (1/100%).

b. Suppose Colossal issues new bonds having a face value of \$10,000, a time to maturity of 5 years and a coupon rate of 11%, with interest paid annually. The yield on the new bonds is the same as in part a. Calculate the price of a new bond.

Problem 4.4. Sam's Deli agrees to pay 5% annual interest (APR) for six years on a \$200,000 balance, along with an additional \$200,000 at the end of six years. Interest payments are made semiannually.

a. Based on this agreement, investors are willing to lend Sam's exactly \$200,000. What is the annualized yield on the loan?

b. Suppose lenders were only willing to lend Sam's \$180,000 based on this agreement. Calculate the annualized yield on the loan to within one percentage point.

Problem 4.5.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 4.6. 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 return on equity is 12.8%.

a. Calculate the current share price and dividend yield for Exalted shares, and forecast the rate of capital gain on these shares for the coming year.

b. Estimate the share price, dividend yield and rate of 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?

d. Suppose Exalted reduces this year's dividend by 27%, and announces that its stock will trade at $89.00 per share one year from now. Calculate the current share price, dividend yield and rate of capital gain for this case.

Problem 5.1. Ms. Hazel Highroller wishes to borrow $500,000 at 2% yearly interest. Interest payments are made annually. The loan will be retired with a fixed payment at the end of 10 years. Investors demand an annual return of 13% on this loan. Ms. Highroller's tax rate is 45%.

a. Calculate the fixed payment needed to induce investors to lend $500,000.

b. Calculate the value of ITS received by Ms. Highroller.

c. Suppose instead that Ms. Highroller borrows $500,000 at 13% annual interest and repays $500,000 at the end of 10 years. Calculate the value of ITS received by Ms. Highroller in this case.

Problem 5.2. Conventional Corp. has $200 million worth of outstanding Series A bonds, yielding 7%, and $130 million worth of Series B bonds, yielding 6.5%. It also has $100 million worth of outstanding commercial paper, yielding 4%. Interest payments are made semiannually. The tax rate is 35%.

a. Calculate the value of Conventional's portfolio of outstanding debt and its return on debt.

b. The Series A bonds have a coupon rate of 5.5% and mature in four years, at which point they will be retired. Calculate the face value of these securities and the PV of ITS generated by them.

c. Suppose that the coupon rates on Series B bonds and commercial paper are equal to their yields. Moreover, Conventional plans to refinance these securities indefinitely at their current face values by means of equivalent issues. Calculate the PV of ITS generated by these securities.

d. Suppose that Conventional plans to issue $80 million worth of new Series C bonds one year from now. These bonds will have a coupon rate and yield of 6.7%, and they will be refinanced indefinitely by means of equivalent issues. Calculate the PV of ITS from these securities. How does the value and OCC of Conventional's debt portfolio change?

Problem 5.3. The bonds of Breezy Brands, Inc. have a total market value of $1.29 billion and a yield of 7.26%, and the company's common stock has a total market value of $2.42 billion and a beta of 1.229. One-year Treasury bills currently yield 4.65%, while the market index is expected to yield 10.9% over the coming year.

a. Use CAPM to forecast the rate of return on Breezy stock.

b. Calculate the expected rate of return on a portfolio consisting of $150,000 in Breezy bonds and $100,000 in Breezy stock.

c. Calculate the value of Breezy and its CCC.

Problem 5.4. Cash Corp. stock currently trades at $95.00 per share. In the coming year, Cash Corp. will pay a dividend of $12.00 per share, and dividends are expected to grow by 4% per year in subsequent years. Currently there are 120 million shares of Cash Corp. stock outstanding.

a. Assume the number of outstanding shares remains constant. Calculate the current value of equity, dividend yield, rate of capital gain and return on equity. What is the value of equity one year from now?

b. Suppose Cash Corp. announces that it will use 55% of available cash to repurchase shares at the end of this year. Recalculate your answer to part a. How many shares will be repurchased one year from now?

c. Now suppose Cash Corp. will not repurchase shares, and instead the number of outstanding shares grows by 2% per year.

Problem 5.5. Simple, Inc. has one real asset, valued at $1 billion, and one outstanding bond issue, having a total face value of $300 million and a coupon rate of 5%. Interest is paid annually, and the bond issue matures in six years. Simple faces a tax rate of 35%.

a. Suppose the bond issue currently trades at $285 million. Calculate the yield to maturity to the nearest percentage point.

b. Suppose the risk free rate is 3%, the market risk premium is 7% and the beta of Simple's real asset is 1.2. Use CAPM to estimate the OCC of Simple's real asset.

c. Suppose Simple will issue no new bonds after the current issue matures. Calculate Simple's market value, return on equity and CCC.

d. Suppose instead that Simple's debt trades at $300 million. In addition, Simple will refinance its bonds with equivalent issues whenever they mature.

Problem 5.6. Washout, Inc. manufactures appliances and operates a chain of retail stores. Annual cash flows from the manufacturing and retailing operations are $420 million and $280 million, respectively. Washout has $2.5 billion worth of outstanding debt, yielding 8.25%, and it faces a tax rate of 35%.

Market betas for cash flows from appliance manufacturing and retailing assets are estimated at 1.13 and 1.28, respectively. The risk-free rate is 5.4% and the market risk premium is 6.7%.

a. Use CAPM to estimate the ICCs for appliance manufacturing and retailing.

b. Calculate the values of Washout's manufacturing and retailing divisions.

c. Calculate the market value of Washout.

Problem 5.7. Lucre Corp. has outstanding debt valued at $300 million, yielding 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, which is expected to remain constant. The number of outstanding shares is also expected to remain constant. Lucre faces a tax rate of 35%.

a. Calculate the value of Lucre Corp. and its return on equity.

b. Estimate the unlevered value of Lucre, its unlevered CCC, and the amount of cash earned each year from real assets.

c. How do your answers to parts a and b change if Lucre's dividend is expected to grow by 3% per year?

Problem 5.8. 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 $0.25 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, while the number of outstanding shares will remain constant. The yield and coupon rate on Surge debt are 11% and the tax rate is 35%.

a. Calculate the value of Surge's debt and its 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 5.9. Aggressive Ventures, Inc., is considering financing a high-tech start-up company. Data on three competing companies are given in the following table.

	Value of Firm	D/E	r_D	β_E
Xicor	$298 m.	0.43	0.088	1.16
Yorkin	$160 m.	0.81	0.116	1.29
Zomax	$321 m.	0.58	0.100	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 return on 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 5.10. Tangled Technologies, Inc. has a market value of $80 billion, with $20 billion worth of debt outstanding. Based on financial data, Tangled's debt and equity betas have been estimated at 0.33 and 1.19, respectively. Tangled consists of two divisions, biotech and computers. Each division generates cash flows of $3 billion per year. The tax rate is 35%.

a. Use CAPM to estimate the returns on debt and equity. Assume that the risk-free rate is 2% and the market risk premium is 7%.

b. Calculate the unlevered CCC for Tangled.

c. Using data from biotech firms, the ICC for biotech assets has been estimated at 8.9%. Use this information to estimate the OCC for the computer assets of Tangled.

Problem 6.1. Singular Systems, Inc. has $10 billion in outstanding debt and 800 million shares of common stock trading at $50 per share. Singular can invest $5 billion in a black

hole generator that will yield future cash flows having a PV of $6.5 billion. Singular faces a tax rate of 35%.

a. Compute the market value of Singular before project adoption.

b. Compute the market value of Singular's real assets before project adoption.

c. Suppose Singular finances the project with $4 billion in new debt and $1 billion in new equity. Calculate the APV of the project, the company's post-adoption market value, value of equity, change in share price and number of shares sold or repurchased.

d. Suppose instead that Singular finances the project with $3 billion in new debt and $2 billion in internal cash flow.

e. Suppose instead that Singular finances the project in a manner that maintains its current debt ratio.

Problem 6.2. 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. Automata faces a tax rate of 35%.

For each of the following financing plans, calculate the APV of the project, Automata's market value after project adoption, the value of equity after adoption, 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 sells an old clinic for its current market value of $35 million and finances the remainder by issuing new debt. The old clinic has an undepreciated book value of $25 million.

d. Automata adjusts debt and equity to maintain its target debt ratio of 50%.

Problem 6.3. Impossible Industries, Inc., has $10 billion worth of outstanding debt and 800 million shares of common stock trading at $50 per share. Impossible can invest $5 billion in a perpetual motion machine yielding future cash flows having a PV of $6.5 billion. Impossible faces a tax rate of 35%, and pays brokerage commissions of 5% on equity and real asset transactions, financed using internal cash. Ignore brokerage costs on debt.

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

a. Impossible finances the project with 80% debt and 20% equity.

b. Impossible structures debt and equity financing to maintain its current debt ratio.

c. Impossible sells existing assets for $4 billion, and finances the remainder with internal cash. The assets have a current book value of $2.5 billion.

Problem 6.4. The Fulsome Gas Co. is evaluating a new energy project. An investment of $112.4 million is required, and the project is forecasted 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%. Ignore brokerage costs.

a. Calculate the WACC for Fulsome.

b. Calculate the APV of the project using the WACC method.

c. Calculate the APV of the project using the conventional method.

Problem 6.5. Weyland Corp. is financed by $6.8 billion worth of debt and 106 million shares of common stock, trading at $96.25 per share. Problems at Weyland's Antarctic facility have caused its share price to fall by 12%. Weyland faces a tax rate of 35%.

a. Assume that the value of Weyland's debt remains unchanged. How much does the market value of Weyland fall? How much does the value of its real assets fall?

b. Suppose Weyland restructures financing to maintain its target debt ratio. Calculate the amount of debt retired, the number of shares issued to finance the retirement, and Weyland's value and share price after the restructuring. Ignore brokerage costs.

c. Suppose that following the restructuring, Weyland purchases the space shuttle program for $11.3 billion. Weyland calculates that the program will be worth $16.9 billion once it is controlled by Weyland. The purchase will be financed using new debt and internal cash flow. Financing is structured to maintain the target debt ratio. Calculate the APV of the asset acquisition, along with Weyland's value and share price after the purchase and restructuring. Ignore brokerage costs.