

FIN 350

Optional Homework Assignments

Solutions available (online) by clicking on the title of each homework.

Homework 1 (click here for solutions)

1. **Calculating Annuity Present Value** An investment offers \$1,500 per year for 12 years, with the first payment occurring one year from now. If the required return is 12 percent, what is the value of the investment? What would the value be if the payments occurred for 35 years? 60 years? Forever?
2. **Perpetuity Values** Bob's Life Insurance Company is trying to sell you an investment policy that will pay you and your heirs \$700 per year forever. If the required return on this investment is 12 percent, how much will you pay for the policy?
3. **Comparing Cash Flow Streams** You've just joined the investment banking firm of Godel, Esher, and Bock. They've offered you two different salary arrangements. You can have \$40,000 per year for the next two years or \$20,000 per year for the next two years, along with a \$30,000 signing bonus today. If the interest rate is 14 percent compounded monthly, which do you prefer?
4. **Calculating Annuity Present Values** You want to borrow \$12,000 from your local bank to buy a new sailboat. You can afford to make monthly payments of \$325, but no more. Assuming monthly compounding, what is the highest 48-month APR loan you can afford to take out?
5. **Present Value of a Perpetuity** Given an interest rate of 6.6 percent per year, what is the value at date $t = 9$ of a perpetual stream of \$300 payments that begin at date $t = 14$?
6. **Calculating EAR with Points** You are looking at a one-year loan of \$500. The interest rate is quoted as 12 percent plus two points. A point on a loan is simply 1% (one percentage point) of the loan amount. Quotes similar to this one are very common with home mortgages. The interest rate quotation in this example requires the borrower to pay two points to the lender up front and then repay the loan later with 12 percent interest. What rate would you actually be paying here?
7. **Calculating Annuity Payments** This is a classic "retirement" problem. A time line will help in solving it. Your friend is celebrating her 35th birthday today and wants to start saving for her anticipated retirement at age 65. She wants to be able to withdraw \$15,000 from her savings account on each birthday for 12 years following her retirement; the first withdrawal will be on her 66th birthday. Your friend intends to invest her money in the local credit union, which offers 9 percent interest per year. She wants to make equal, annual payments on each birthday into the account established at the credit union for her retirement fund.
 - a. If she starts making these deposits on her 36th birthday and continues to make deposits until she is 65 (the last deposit will be on her 65th birthday), what amount must she deposit annually to be able to make the desired withdrawals at retirement?
 - b. Suppose your friend has just inherited a large sum of money. Rather than making equal annual payments, she has decided to make one lump-sum payment on her 36th birthday to cover her retirement needs. What amount would she have to deposit?
 - c. Suppose your friend's employer will contribute \$250 into the account every year as part of the company's profit-sharing plan. In addition, your friend expects a \$10,000 distribution from a family trust fund on her 55th birthday, which she will also put into the retirement account. What amount must she deposit annually now to be able to make the desired withdrawals at retirement?

Homework 2 ([click here for solutions](#))

1. **Bond Prices** CIR, Inc. has 7 percent coupon bonds on the market that have 11 years left to maturity. The bonds make annual payments. If the YTM on these bonds is 8.5 percent, what is the current bond price?
2. **Bond Yields** N&N Co. has 10.5 percent coupon bonds on the market with 8 years left to maturity. The bonds make annual payments. If the bond currently sells for \$1,070, what is its YTM?
3. **Bond Prices** Jane's Pizzeria issued 10-year bonds one year ago at a coupon rate of 8.75 percent. The bonds make semiannual payments. If the YTM on these bonds is 7.25 percent, what is the current bond price?
4. **Bond Yields** Jerry's Spaghetti Factory issued 12-year bonds two years ago at a coupon rate of 9.5 percent. The bonds make semiannual payments. If these bonds currently sell for 96 percent of par value, what is the YTM?
5. **Stock Values** MegaCapital, Inc., just paid a dividend of \$2.00 per share on its stock. The dividends are expected to grow at a constant 6 percent per year indefinitely. If investors require a 13 percent return on MegaCapital stock, what is the current price? What will the price be in 3 years? In 15 years?
6. **Interest Rate Risk** Both Bond A and Bond B have 8 percent coupons, make semiannual payments, and are priced at par value. Bond A has 2 years to maturity, while Bond B has 15 years to maturity. If interest rates suddenly rise by 2 percent, what is the percentage change in price of Bond A? Of Bond B? If rates were to suddenly fall by 2 percent instead, what would the percentage change in price of Bond A be now? Of Bond B? Illustrate your answers by graphing bond prices versus YTM. What does this problem tell you about the interest rate risk of longer-term bonds?
7. **Valuing Preferred Stock** Bob's Bank just issued some new preferred stock. The issue will pay a \$7.00 annual dividend in perpetuity, beginning four years from now. If the market requires a 6 percent return on this investment, how much does a share of preferred stock cost today?
8. Assume that you open the Wall Street Journal and see the following treasury yield curve:

	1	2	3	4	5	6	7	8	9	10
Treasury Bonds	8	8.5	9	9.5	10	10.5	11	11	11	11

- a. What is the corresponding zero coupon yield curve?
- b. What are the 1 year forward rates (i.e., what is the forward rate from 1 year to 2 years, 2 years to 3 years, etc.)?
- c. Describe how an investor can lock in a forward rate **today**.

Explain what critical insight the analysis that leads to your answer to question 5 ignores.

[Homework 3](#) (click here for solutions)

1. **Determining Portfolio Weights** What are the portfolio weights for a portfolio that has 50 shares of stock that sells for \$30 per share and 20 shares of a stock that sells for \$45 per share?
2. **Portfolio Expected Return** You own a portfolio that has \$500 invested in Stock A and \$1,000 invested in Stock B. If the expected returns on these stocks are 20 percent and 14 percent respectively, what is the expected return on the portfolio?
3. **Portfolio Expected Return** You own a portfolio that is 40 percent invested in Stock X, 35 percent in Stock Y, and 25 percent in Stock Z. The expected returns on these three stocks are 8 percent, 15 percent, and 25 percent respectively. What is the expected return on the portfolio?
4. **Portfolio Expected Return** You have \$100,000 to invest in a stock portfolio. Your choices are Stock H with an expected return of 22 percent and Stock L with an expected return of 12 percent. If your goal is to create a portfolio with an expected return of 18 percent, how much money will you invest in Stock H? In Stock L?
5. **Systematic versus Unsystematic Risk** Classify the following events as mostly systematic or mostly unsystematic. Is the distinction clear in every case?
 - a. Short-term interest rates increase unexpectedly.
 - b. The interest rate a company pays on its short-term debt borrowing is increased by its bank.
 - c. Oil prices unexpectedly decline.
 - d. An oil tanker ruptures creating a large oil spill.
 - e. A manufacturer loses a multimillion dollar product liability suit.
 - f. A Supreme Court decision substantially broadens producer liability for injuries suffered by product users.
6. **Portfolio Returns** Using information from the chapter on capital market history, what was the return on a portfolio that was equally invested in common stocks and long-term bonds? What was the return on a portfolio that was equally invested in small stocks and Treasury bills?
7. **Systematic versus Unsystematic Risk** Given the following information on Stocks A and B:

State of Economy	Probability of State of Economy	Stock A Rate of Return	Stock B Rate of Return
Recession	0.15	0.14	-0.18
Normal	0.60	0.25	0.10
Boom	0.25	0.28	0.40

The market risk premium is 8 percent and the risk-free rate is 6 percent. Which stock has the most systematic risk? Which one has the most unsystematic risk? Which stock is "riskier"? Explain.

Homework 4 (click here for solutions)

1. **Calculating Cost of Equity** Stock in Eddy Industries has a beta of .90. The market risk premium is 9.5 percent, and T-bills are currently yielding 5 percent. Eddy's most recent dividend was \$3.75 per share, and dividends are expected to grow at a 3 percent annual rate indefinitely. If the stock sells for \$32.50 per share, what is your best estimate of Eddy's cost of equity?
2. **Calculating Cost of Debt** Keefe Electronics issued a 20-year, 9 percent semiannual bond 7 years ago. The bond currently sells for 108 percent of its face value. The company's tax rate is 38 percent.
 - a. What is the pretax cost of debt?
 - b. What is the aftertax cost of debt?
 - c. Which is more relevant, the pretax or the aftertax cost of debt? Why?
3. **Calculating WACC** Corrado Construction Corporation has a target capital structure of 35 percent common stock, 10 percent preferred stock, and 55 percent debt. Its cost of equity is 18 percent, the cost of preferred stock is 8 percent, and the cost of debt is 10 percent. The relevant tax rate is 35 percent.
 - a. What is Corrado's WACC?
 - b. The company president has approached you about Corrado's capital structure. He wants to know why the company doesn't use more preferred stock financing, since it costs less than debt. What would you tell the president?
4. **Book Value versus Market Value** Veetek Enterprises has 12.8 million shares of common stock outstanding. The current share price is \$29, and the book value per share is \$18. Veetek also has two bond issues outstanding. The first bond issue has a face value of \$100 million, a 7 percent coupon, and sells for 94 percent of par. The second issue has a face value of \$75 million, a 5.5 percent coupon, and sells for 87 percent of par. The first issue matures in 13 years, the second in 8 years.
 - a. What are Veetek's capital structure weights on a book value basis?
 - b. What are Veetek's capital structure weights on a market value basis?
 - c. Which are more relevant, the book or market value weights? Why?
5. **Finding the WACC** Given the following information for Valley Power Co., find the WACC. Assume the company's tax rate is 35 percent.

Debt: 2,500 7.75 percent coupon bonds outstanding, \$1,000 par value, eight years to maturity, selling for 103 percent of par; the bonds make annual payments.

Common stock: 75,000 shares outstanding selling for \$50 per share; the beta is .85.

Preferred stock: 10,000 shares of 5 percent preferred stock outstanding, currently selling for \$80 per share.

Market: 5 percent market risk premium and 6 percent risk-free rate.
6. **EBIT and Leverage** Debreu, Inc., has no debt outstanding and a total market value of \$60,000. Earnings before interest and taxes (EBIT) are projected to be \$5,000 if economic conditions are normal. If there is strong expansion in the economy, then EBIT will be 40 percent higher. If there is a recession, then EBIT will be 50 percent lower. Debreu is considering a \$24,000 debt issue with a 10 percent interest rate. The proceeds will be used to buy up shares of stock. There are currently 1,000 shares outstanding. Ignore taxes for this

problem.

- a. Calculate earnings per share (EPS) under each of the three economic scenarios before any debt is issued. Also, calculate the percentage changes in EPS when the economy expands or enters a recession.
 - b. Repeat part (a) assuming that Debreu goes through with recapitalization. What do you observe?
7. **Break-Even EBIT** Schwietzer Corporation is comparing two different capital structures, an all-equity plan (Plan I) and a levered plan (Plan II). Under Plan I, Schwietzer would have 300,000 shares of stock outstanding. Under Plan II, there would be 200,000 shares of stock outstanding and \$6 million in debt outstanding. The interest rate on the debt is 9 percent and there are no taxes.
- a. If EBIT is \$900,000, which plan will result in the higher EPS?
 - b. If EBIT is \$2.1 million, which plan will result in the higher EPS?
 - c. What is the break-even EBIT? What is EPS at this level of EBIT?
8. **M&M and Stock Value** In Problem 4, use M&M Proposition I to find the price per share of equity under each of the two proposed plans. What is the value of the firm?
9. **Homemade Leverage** Buckner and Durham, Inc., a prominent waste management firm, is debating whether to convert its all-equity capital structure to one that is 30 percent debt. Currently, there are 400 shares outstanding and the price per share is \$75. EBIT is expected to remain at \$1,000 per year forever. The interest rate on new debt is 11 percent, and there are no taxes.
- a. Mr. Smith, a shareholder of the firm, owns 80 shares of stock. What is his cash flow under the current capital structure, assuming the firm has a dividend payout rate of 100 percent?
 - b. What will Mr. Smith's cash flow be under the proposed capital structure of the firm? Assume that he keeps all 80 of his shares.
 - c. Suppose Buckner and Durham does convert, but Mr. Smith prefers the current all-equity capital structure. Show how he could unlever his shares of stock to recreate the original capital structure.
 - d. Using your answer in part (c), explain why Buckner and Durham's choice of capital structure is irrelevant.