



Corporate Finance
Final Exam 2 – Spring 2009/2010

2 hours and 30 minutes

This exam consists of 5 problems. This is a closed book exam. You are allowed one double-sided page of notes. Calculators are permitted. Good luck!

Print Name

Print Number

Problem 1

An investor is borrowing 500,000 today, which that will be paid back through 24 monthly constant instalments. The first installment will be paid one-month from today. The interest rate is 8% (stated annually).

- a) What is the value of the installment assuming the first installment will be paid one-month from today? (1 point)
- b) What is the value of the reimbursement and interest payment two-month from now? (1 point)
- c) What is the value of the installment assuming the company does not make any payment to the bank during the first year? (1 point)

Problem 2

Consider that the 1-year spot rate is 2%, the forward rate $f_{1,2}$ is 3% and the forward rate $f_{2,3}$ is 4%.

- a) What is 3-year spot rate? (1 point)
- b) What is the price today of a 3-year bond with a coupon of 5% (yearly frequency) and face value of 100? What will be the price one year from today assuming that future spot rates are equal to current forward rates? (2 points)
- c) A company wants to issue a 2-year bond at the face value of 100. What should be coupon rate (yearly frequency)? (1 point)

Problem 3

Consider a scale-enhancing project with the following financials (corporate tax rate is 30%):

	Year 1	Year 2	Year 3
Revenues	1,000,000	1,500,000	1,500,000
COGS	400,000	800,000	800,000

Initial capital expenditures are 800,000 with a life of 3 years (straight-line depreciation). Salvage value before taxes of fixed assets is equal to 100,000. Working capital is 10% of next year revenues. Company cost of debt is 5%. Company unlevered beta is 1.5 and debt-to-equity is 1. The risk-free rate is 2% and expected market risk premium is 5%.

- a) What is NPV assuming the project is financed at the company current capital structure? (2 point)
- b) What is NPV assuming that the project is financed with a three-year loan of 800,000 at an interest rate of 0% and repayment at the end? (1 point)

- c) The company in alternative can invest in a project with an initial investment of 800,000 that will generate a cash flow of 400,000 forever. The cost of capital of the project is 10%. What is the best project? (1 point)

Problem 4

Consider the following data on a stock market where the CAPM holds:

	Expected return	Standard deviation	Beta
Stock A	15%	60%	?
Market portfolio	10%	20%	1
T-bill	3%	0%	0

- a) What is the beta and Sharpe ratio of a portfolio with 80% invested in stock A and 20% in the T-bill? (1 point)
- b) What should be the portfolio composition and expected return of an efficient portfolio with a standard deviation of 50%? (1 point)
- c) What is the optimal portfolio, expected return, and standard deviation of an investor with a quadratic utility and a risk aversion coefficient of 4? (1 point)
- d) Earnings of stock A will be \$500,000 in one year and they will stay constant forever if the company does not make any investment. The company can invest \$300,000 next year in a project with a constant return on equity of 20% forever. The number of shares is 1 million. What is the price today of stock A if the company decides to invest in the project? What is value of growth opportunities? (2 points)

Problem 5

A company EBIT will be \$100,000 forever. The company is currently all-equity with 1 million shares. The cost of capital is 10%. Corporate taxes are 25%.

- a) What is the market value of equity? What is the price per share? (1 point)

The company will sell at par perpetual bonds with face value of \$500,000 with an annual coupon rate of 8%. The proceeds will be used to repurchase shares.

- b) What is the market value of equity and debt after the repurchase? What is the new price per share? (1 points)
- c) What is weighted-average cost of capital (WACC) after the repurchase? Explain the effect on WACC of the repurchase. (2 points)