



**Corporate Finance**  
**Final Exam 2 – Spring 2008/2009**

**2 hours and 15 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!

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**Problem 1 (3 points)**

A company is borrowing \$200,000 today, which will be paid back through 12 monthly constant installments. The loan interest rate is 6% (stated annually).

- a) What is the value of the installment (first installment will be paid one-month from today)? (1 points)
- b) What is the value of the installment if the first installment will be paid today? (1 points)
- c) What is the value of the first reimbursement (first installment will be paid today)? (1 point)

**Problem 2 (5 points)**

Consider a company that is investing in the following project with the following financials (corporate tax rate is 30%):

	Year 1	Year 2	Year 3
Revenues	600,000	800,000	1,200,000
COGS	300,000	500,000	700,000

Initial capital expenditures are 600,000 with a life of 4 years (straight-line depreciation). Working capital is 10% of next year revenues. Salvage value of fixed assets is equal to 200,000. Company levered beta is 0.75, debt-to-equity is 1 and cost of debt is 5%. The project is in an industry with levered beta of 1.25, debt-to-equity of 1.5 and cost of debt is 5%. The risk-free rate is 5% and expected market risk premium is 6%.

- a) What is NPV assuming the project is entirely financed by equity? (1.5 points)
- b) What is NPV assuming the project is financed at the company current capital structure and cost of debt? (2 points)
- c) What is NPV assuming that the project is financed with a 4-year loan of 300,000 at an interest rate of 0% and repayment 50% in year 3 and 50% in year 4? (1.5 point)

**Problem 3 (4 points)**

Consider the one-year spot rate is 2.5% and the following forward rates:

$f_{1,2}$	3%
$f_{2,3}$	4%
$f_{3,4}$	5%

- a) What is the 4-year spot rate? (1 point)
- b) What is the forward rate from year 2 to year 4? (1 point)
- c) What is the price of a 4-year bond with a face value of \$100 and annual coupon payments at a rate of 5%? (2 points)

**Problem 4 (5 points)**

Suppose stock A has an expected return of 20% and a standard deviation of returns of 40% and stock B has an expected return of 15% and a standard deviation of returns of 30%. The correlation between the returns of A and B is 0. The risk-free rate is 5%.

- a) What is the expected return and standard deviation of the minimum variance portfolio? (1.5 point)
- b) Assuming the tangency portfolio includes 46% of stock A, what is the optimal portfolio expected return and standard deviation for an investor with a quadratic utility function with a risk aversion coefficient of 4? (1.5 point)
- c) What is the price of a stock with earnings per share in the coming three years of \$2 and then to grow at a constant rate forever. The company has to keep a target price-to-earnings ratio of 10 and a payout ratio of 30% after year 3. The stock beta is 1.2 and the expected market risk premium is 6%? (2 points)

**Problem 5 (3 points)**

Are the following statements true or false? Please justify your answer (maximum of 3 lines).

- a) A stock with beta of one has a correlation with the market of one. (1 point)
- b) A decrease in the corporate tax rate decreases the firm value. (1 point)
- c) Under the pecking order theory more profitable firms issue more equity. (1 point)