Name, matriculation number_____

Examination:	20029 – Corporate Finance	**Summer Term 2009**
Examiner:	Prof. Dr. Peter Reichling	
Time available:	60 minutes	
Aids permitted:	non-programmable pocket calculators; English dictionaries without any markings.	

The examination is comprised of **three** problems on **four** pages. All of them are to be solved. Answers must be given in **English**. **Please return these question sheets with the answers to problem 1 after the examination is finished. Good luck!**

Examination Questions (60 Points Total):

Problem 1 (Multiple Choice - 24 points)

This section will be evaluated in the following way: if a question is not answered, it yields zero points; if it is answered correctly, it yields 2 points; if it is answered incorrectly, it yields minus 1 point. However, if the total number of points is negative, it will be normalized to zero. For every question, there is **only one correct answer**.

1. Which of the following statements is true:
   - ☐ a) The securities market line (SML) depicts portfolios, whereas the capital market line (CML) depicts single assets.
   - ☐ b) The SML depicts portfolios and single assets, whereas the CML only depicts single assets.
   - ☐ c) The SML depicts portfolios and single assets, whereas the CML depicts only portfolios
   - ☐ d) none of the above answers is correct.

2. The beta coefficient of a stock can be obtained through
   - ☐ a) regressing the stock's excess returns on the excess returns of the market portfolio.
   - ☐ b) computing the covariance of the stock's return with the market rate of return and dividing it by the variance of the market rate of return.
   - ☐ c) both of the above answers are correct.
   - ☐ d) none of the above answers is correct.

3. Suppose you perform a CAPM test. You have already received the sample estimate of each asset's beta as a result of the first regression. In a second regression, $\bar{r}_i = \gamma_0 + \gamma_1 \beta_i + u_i$, for the validity of CAPM we expect:
   - ☐ a) γ_0 is statistically significant, but γ_1 not.
   - ☐ b) γ_0 is not significantly different from zero, but γ_1 is statistically significant.
   - ☐ c) γ_0 and γ_1 are both statistically significant.
   - ☐ d) γ_0 and γ_1 are both not significantly different from zero.

4. If short-sales restrictions exist,

- [ ] a) two fund separation is not feasible any more.
- [ ] b) the weight of every single assets must be non-negative.
- [ ] c) both of the above answers are correct.
- [ ] d) none of the above answers is correct.

5. A ratio of abnormal return per unit of non-systematic risk is referred to as

- [ ] a) Treynor's ratio.
- [ ] b) Sharpe's ratio.
- [ ] c) appraisal ratio.
- [ ] d) none of the above answers is correct.

6. Portfolio managers who conduct market timing

- [ ] a) keep the portfolio beta constant.
- [ ] b) choose a high beta if they expect a bull market and a low beta if they expect a bear market.
- [ ] c) choose a high beta if the expect a bear market and a low beta if they expect a bull market.
- [ ] d) none of the above answers is correct.

7. According to Modigliani-Miller Proposition I,

- [ ] a) under the assumption of no credit risk, the market value of any firm is a linear function of its debt-equity ratio.
- [ ] b) under the assumption of an arbitrage-free market, the market value of any firm is independent of its capital structure.
- [ ] c) both of the above answers are correct.
- [ ] d) none of the above answers is correct.

8. According to Modigliani-Miller Proposition II, under the assumption of no credit risk, the expected rate of return on equity of any firm

- [ ] a) increases proportionally with the debt-equity ratio, expressed in book values.
- [ ] b) decreases proportionally with the debt-equity ratio, expressed in book values.
- [ ] c) is independent of the debt-equity ratio.
- [ ] d) none of the above answers is correct.

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9. In company valuation, free cash flows

- ☐ a) have to be discounted at the risk-free rate.
- ☐ b) reflect a tax shield resulting from interest subsidy of a levered firm.
- ☐ c) do not take into account a tax shield resulting from the interest subsidy of a levered firm. Therefore, the tax rate is incorporated into the WACC formula.
- ☐ d) none of the above statements is correct.

10. Which of the following statements is true?

- ☐ a) The beta of a non-listed company is not observable. Therefore, it has to be estimated using the beta of a publicly-traded reference company.
- ☐ b) The beta of a non-listed company is observable. Therefore, it can be directly used in company valuation.
- ☐ c) The beta of a non-listed company is not observable. Therefore, it is not possible to determine the value of such a company.
- ☐ d) None of the above answers is correct.

11. In company valuation with credit risk,

- ☐ a) the cost of equity is independent of leverage.
- ☐ b) the cost of debt is independent of leverage and r_{WACC} stays constant.
- ☐ c) the cost of debt depends on leverage ratio, but r_{WACC} stays constant.
- ☐ d) none of the above answers is correct.

12. According to the Merton's model,

- ☐ a) firm's debt can be represented as a credit risk-free zero bond minus the payoff from a European call option on the firm's assets with a strike price equal to the promised repayment amount.
- ☐ b) firm's equity can be represented as a put option on the firm's assets with a strike price equal to the promised repayment amount.
- ☐ c) firm's debt can be represented as a credit risk-free zero bond minus the payoff from a European put option on the firm's assets with a strike price equal to the promised repayment amount.
- ☐ d) none of the above answers is correct.

Problem 2 (Firm Valuation – 21 Points)

Company *A* is a non-publicly-traded company with a debt-equity ratio of 1 and cost of debt of 6.5% p.a. In 2010, the annual sales are expected to be \$200 million and are expected to grow at the rate of 6% per year from 2010 to 2015. Manufacturing costs and operating expenses are expected to comprise \$130m and \$20m, respectively, in 2010 and are expected to grow at a rate of 6% per year.

Depreciation and capital expenditures are constant and amount to \$8m p.a. and \$10m p.a., respectively. From 2015 on, the free cash-flows of the company are estimated to grow at a rate of 5% per year. The company pays a corporate tax of 35%.

In addition, it is known that the beta coefficient of a publicly traded reference company *R* with a debt-equity ratio of 0.7 is equal to 1.2. The expected rate of return of the market index amounts to 8% p.a. whereas the risk-free rate of return is 3% p.a.

a) Construct a table of the company's cash-flows and compute the free cash flows of the company. (7 points)

b) Compute the current value of the company. (10 points)

c) Suppose there is another company, which is identical to company *A* except that it does not use debt. What is the value of this company according to Modigliani-Miller? What assumptions are necessary to derive this result? Name at least five of them. (4 points)

Problem 3 (Performance Measurement – 15 Points)

Consider the following data for portfolio *P* and the market portfolio *M*:

	Expected return	Volatility	Beta
Portfolio *P*	15%	25%	0.7
Market portfolio *M*	12%	20%	1.0

The risk-free rate of return amounts to 3%.

a) Compute the Jensen's alpha of the portfolio *P* and split it into selectivity and net selectivity. (6 points)

b) In an expected return-beta space, indicate the location of portfolio *P* and a perfectly diversified portfolio *Q*. Indicate the net selectivity component as well as the diversification component of portfolio *P*'s performance. (5 points)

c) Calculate the appraisal ratio for portfolio *P*. What are the advantages of this performance measure? (4 points)