Examination: 20029 – Corporate Finance **Summer Term 2008**
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. 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 (CAPM – 16 Points)

The 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 1 point; if it is answered incorrectly, it yields minus 0.5 points. However, if the total number of points is negative, it will be normalized to zero.

1. If one regresses the excess return on a security on a an excess return on the market, the rejection of the null hypothesis "the intercept term is not significantly different from zero" supports the validity of the standard CAPM.
   Correct ☐ False ☐
2. The error term from the regression in 1) corresponds to the non-diversifiable risk of the stock.
   Correct ☐ False ☐
3. The returns on the market portfolio and the zero-beta portfolio are not correlated.
   Correct ☐ False ☐
4. In the zero-beta version of the CAPM the market portfolio is the only portfolio for which systematic risk equals non-diversifiable risk.
   Correct ☐ False ☐
5. If only risky assets are available on the capital market, market portfolio does not lie on the efficient frontier. Correct ☐ False ☐
6. If borrowing and lending rates differ, the market portfolio still represents the unique efficient portfolio of risky investments. Correct ☐ False ☐
7. If only risky assets are available on the capital market, systematic risk equals non-diversifiable risk. Correct ☐ False ☐
8. Every portfolio which lies on the efficient frontier has a zero-beta companion portfolio. Correct ☐ False ☐
9. On the capital market one can invest at the risk-free lending rate r_L and borrow at the risk-free borrowing rate r_B. In addition, $r_L = r_B$ and short sales are not allowed. In this situation the expected return is bounded below. Correct ☐ False ☐
10. If only risky assets are available on the capital market, the expected rate of return of the efficient portfolio is bounded above. Correct ☐ False ☐

11. Treynor's ratio gives excess return per unit of non-systematic risk.
Correct ☐ False ☐
12. Appraisal ratio measures abnormal return per unit of risk that in principle could be diversified away by holding a market index portfolio.
Correct ☐ False ☐
13. In case an investor considers the systematic risk of an investment, a positive Treynor's ratio means a superior performance of that investment compared to the market.
Correct ☐ False ☐
14. According to the Modigliani-Miller propositions, the expected return on the common stock of a levered firm increases in proportion to the debt-equity ratio, expressed in book values.
Correct ☐ False ☐
15. Jensen's alpha represents an average return on a portfolio above that predicted by CAPM, given the portfolio's beta and the average market return.
Correct ☐ False ☐
16. Modigliani-Miller proposition I states that that the market value of any firm is independent of its capital structure. Correct ☐ False ☐

Problem 2 (Firm Valuation – 30 Points)

NBC corporation has a following balance sheet:

Balance Sheet (Book Values, $ million)

Assets		**Liabilities**	
Assets	1100	Debt	500
		Equity	600

The company has 100 million shares outstanding; the current stock price is $10 per share. The NBS's equity cost of capital is 12%. The borrowing rate is 5%. The company pays a corporate tax of 40%. In 2009 the annual sales are expected to be $290 million. In the years 2010 to 2012 the sales are expected to grow at the rate of 5% per year. From 2013 on, the annual long-term sales growth rate is estimated to be 7%. Manufacturing costs are expected to comprise 65% of the sales every year. Depreciation and capital expenditures are constant and amount to $10 million per year and $20 million per year, respectively.

a) Construct a table of the company's cash-flows and compute free cash flows of the company. (6 points)

b) Compute the company's value and the value of its equity assuming that the company maintains a constant debt-equity ratio. Are the company's shares fairly priced? (8 points)

c) Suppose that the company plans to implement a project which will generate perpetual free cash flows of $5 million. The debt to equity ratio of this project equals 0.6. The cost of debt stays at the level of 5 %. Using the Modigliani-Miller propositions, compute the weighted average cost of capital and the value of the project. (7 points)

d) Explain why, in general, the correct discount rate for the interest tax shield in the APV approach depends on the leverage policy. (4 points)

e) The manager of NBC corporation considers an additional new project. He wants to borrow 90% of the project's costs. With the company's borrowing rate of 5% and the return on equity of 12%, the manager thinks that the WACC of this project will equal 3.9%. Give reasons why the manager's considerations are not correct. (5 points)

Problem 3 (Hedging - 14 Points)

A company has borrowed $100 million at the long-term rate of 10.5%. However, it prefers to borrow at a short-term rate (such as LIBOR).

a) How can a company benefit from declining interest rates? Construct an appropriate contract assuming it wants to achieve net borrowing costs of floating rate + 0.5%. (4 points)

b) Consider the swap you have constructed in a). Suppose it has the remaining maturity of 2.75 years and the parties exchange the payments on a yearly basis. The LIBOR rates for the maturities 9, 21, and 33 month are 8%, 9%, and 10%, respectively. The 12-month LIBOR rate on the last payment date three month ago was 8.5%. Compute the value of the swap contract for the company in a) in terms of bond prices. What is the value of the swap for the opposite position? (7 points)

c) What is the value of the swap at the time when the contract was initiated? (3 points)