Examination in Financial Management (5077) **Summer Term 2008/9**
Examiner: Prof. Dr. Alfred Luhmer

Examinee: Student Number:

This examination contains 10 problems on 8 pages. Please check that you have got the complete set.
Please enter your answers in the space immediately below each question. Only answers given there will be graded.
Admissible aids: Pocket calculator, language dictionary

Useful formulas:
The present value of a series of n equal payments a due at the end of each period at a discount rate r (per period) is: $PV = \frac{a}{r}\left(1 - \frac{1}{(1+r)^n}\right)$.

The two solutions of the quadratic equation $ax^2 + bx + c = 0$ are: $x_{1,2} = \frac{1}{2a}\left(-b \pm \sqrt{b^2 - 4ac}\right)$.

Take your time, you have plenty of it. Think about solutions carefully.

1	2	3	4	5	6	7	8	9	10	Σ	Grade
/14	/8	/8	/6	/12	/8	/25	/10	/15	/20		

Problem 1: General Motors Acceptance Corporation (GMAC) offered a zero bond to the public to be purchased at \$500 payable on December 2nd, 1982. \$ 10 000 were promised to be repaid on December 1st, 2012.

a) What interest rate was GMAC paying at that time to borrow money? (5 points)

b) Suppose, the price of this security was \$7000 on December 1st, 2005. If an investor would have purchased it at the offering and sold it on this day, what annual rate of return would she have earned? (6 points)

c) Assume for a moment GMAC will pay the \$10 000 as promised, would the rate of return for an investor who purchased the security at market on 1st of December 2005 be higher or lower than the answer to part b? Why? (3 points)

Problem 2: An interest-only bond with face value $10,000, annual coupon of 6% and two years to maturity is available at a price of $11,000. Determine the yield to maturity. (Do not use the trial-and-error method). (8 points)

a) Give an equation that can be solved for the YTM:

b) Solve the equation:

Problem 3: Trader Joe buys a used truck for his business at a price of $25,000. The auto dealer offers payment by equal monthly installments over 5 years at an effective annual interest rate of 8%. Determine the monthly payment. (8 Points)

a) Determine the monthly discount factor for a yearly interest rate of 8%.

b) Give an equation that can be solved for the monthly payment:

c) Solve for the monthly payment:

Problem 4: A zero bond (face value $10,000) is available at $4050. The long run market interest rate for the issuer is 8% p.a. Determine the time to maturity. (6 points)

a) Give an equation that can be solved for the time to maturity:

b) Solve it:

Problem 5: On 15th of March you purchased a bond at a quoted price of $1,038.80, the bond has a 7% coupon rate paid annually on July 1st. The face value is $1,000. (12 points)

a) How much will you have to pay for it?

b) What is the current yield of the bond?

c) Assume the yield to maturity is 5.2%, constant over time. What is the capital gains yield for the year to come?

d) Which quoted price do you expect in one year?

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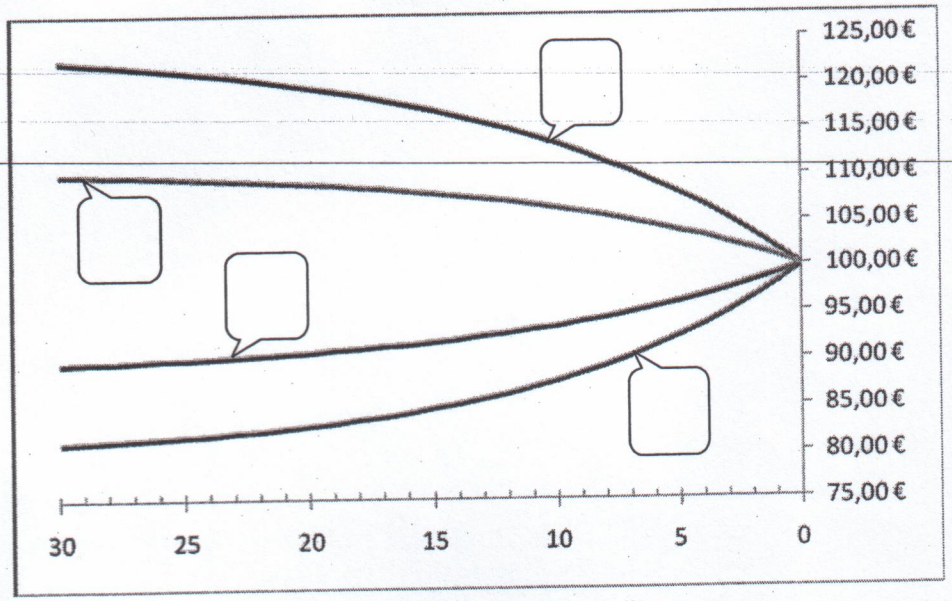
Problem 6: The following figure shows the value of two bonds as a function of time to maturity. Curve **A** shows the value of a bond with 8% coupon rate for YTM = 10%, curve **B** shows the value of the same bond for YTM = 9%, curve **C** shows the value of a bond with coupon rate 10% for YTM = 8% and curve **D** represents the value of the same bond when YTM = 9%. Fill in the respective labels. (8 points)



Be careful, don`t guess at random! For false guesses you will lose points!

(The total number of points for this problem will not become negative, however.)

Problem 7: Grindwell Corp. is considering a four-year project to improve production efficiency. Buying a new CNC machine for € 690,000 is estimated to result in € 205,000 in annual pretax cost savings. The machine is to be depreciated straight-line over five years to a salvage value of € 50,000. The machine also requires an initial investment in a tools inventory of € 20,000. If the income tax rate is 25% and the discount rate is 16% p.a. before tax (i.e. 12% after 25% tax), should Grindwell buy and install the machine?

a) Determine the influence of the project on EBIT, tax bill, and net income for the five years of the machine's useful life.

Cost savings:

Depreciation:

ΔEBIT:

Tax:

ΔNI:

[5]

b) Determine the sequence of project-related cash flows

t = 0	1	2	3	4	5

c) Determine the NPV of the project. (Be careful: correct calculation of the NPV on the basis of false CFs does not yield any points!)

NPV =

d) How would the result change if the tax rate is 30% and the tax authority allows assuming a zero salvage value for calculating regular depreciation? Does a higher tax rate always inhibit investment activity?

Problem 8: Stock Y's beta is 1.5 and its expected rate of return is 17% p.a. Stock Z has a beta of .8 and an expected rate of return of 10.5% annually. If the risk-free rate is 5.5% p.a. and the market risk premium is 7.5%, is the market in equilibrium according to the CAPM? (Show your calculations.) (10 points)

a) Calculation to test for equilibrium

b) What risk-free rate would be compatible with CAPM equilibrium?

Problem 9: Stock X has an expected rate of return of 10% and a beta of 0.8, stock Y has 15% expected rate of return and a beta of 1.25. The risk-free rate is 4%. Which portfolio of stocks X and Y and the riskless asset has maximum expected rate of return, if the portfolio beta is constrained to 0.8?

(15 points)

a) Determine the reward-to-risk ratios of the two stocks

b) What are the portfolio weights that maximize the return?

c) What is the rate of return of that portfolio?

d) Are both stocks correctly priced? What must be the riskless rate if this would be so?

[8]

Problem 10: Grindwell Corp. has four million shares of common stock outstanding with a par value of €1 and a current market price of €39. The market risk premium is 7.5% and treasury bills are yielding 4.8%. The firm has also 75,000 bonds outstanding with a 9% annual coupon, 18 years to maturity, and a current price of €110. If the stock has a beta of 1.05, what is Grindwell's WACC, if the tax rate is 35%?

(20 points)