

Name, Matriculation number _____

Examination: 20029 – Corporate Finance

Winter Term 2012/13

Examiner: Prof. Dr. Peter Reichling

Time available: 60 minutes

Aids permitted: non-programmable pocket calculators;
English dictionaries without any markings.

The examination comprises **four** problems (60 points) all of which are to be answered. Answers to all problems must be given in **English. Good luck!**

Multiple choice problems have *one correct answer* and will be graded with 2 or 0 points, respectively. Final results must be rounded to 2 decimal places (the same holds for percentages).

Problem 1 (10 Points)

1. The tangency portfolio is the portfolio with:

- The highest expected return.
- The lowest standard deviation.
- The highest correlation.
- The highest Sharpe ratio.

2. Which of the following statements about the security market line (SML) is *not* true?

- The SML provides a benchmark for evaluating expected investment performance.
- The SML can have a negative slope assuming the CAPM is valid.
- The SML is a graphic representation of the relationship between expected return and beta.
- Properly valued assets plot exactly on the SML assuming the CAPM is valid.

3. A project's cost of capital depends on which of the following?

- The source of the money needed to finance it (equity vs. debt financing).
- The risk of the project's free cash flow.
- The investing company.

4. Which of the following statements about the *WACC* is **False**?

- The WACC is based on current market values of Debt and Equity.
- The WACC is the rate of return a firm must earn (on average) on its existing assets to maintain the current value of its stock.
- The WACC is based on book values of Debt and Equity.
- The WACC is based on after-tax required rates of return for Debt and Equity.

5. Which of the following statements about the *WACC of the DCF Entity approach* (including tax-shield) is **Correct**?

- The WACC may decrease as a firm's debt-equity ratio increases.
- A firm's WACC will decrease as the corporate tax rate decreases.
- The WACC will change if and only if a firm alters its debt-equity ratio.

Problem 2 (10 Points)

The following output is an excerpt from a regression to estimate the CAPM beta for company XYZ. Let the excess return for XYZ be the dependent variable and the excess return for the market be the independent variable.

	Coefficients	Stand. error	p-value
Intercept	0.0852	0.0569	0.089
Independent Variable	1.0786	0.0185	0.032

- a) Find the expectation of XYZ's excess return provided that the excess return on the market portfolio amounts to 10%. (4 points)
- b) Write down XYZ's alpha. (2 points)
- c) Test the null hypothesis that the true alpha is zero at the common confidence levels of 95% and 99%. (4 points)

Problem 3 (15 Points)

Assume that the *CAPM is valid* and the market is in equilibrium. Which of the following situations is possible? Explain briefly by considering each situation separately.

a)

Portfolio	Expected Return	Beta
T-Bills	10%	0
Market	14%	1
A	12%	0.9

b)

Portfolio	Expected Return	Standard Deviation
A	12%	18%
B	16%	12%

c)

Portfolio	Expected Return	Standard Deviation
T-Bills	10%	0%
Market	15%	22%
A	16%	18%

Problem 4 (25 Points)

The value of a firm (V) is €340 million, the face value of its debt (B) is €160 million, the time to maturity of the debt (T) is 2 years, the risk-free rate is 5% p.a., and the volatility of the return on the firm's assets (σ) is 50%.

- a) Briefly explain *two different methods* for valuing the firm's equity based on an option pricing framework. (Hint: Think about the Entity and Equity approaches.) Do both methods produce the same result? What is the firm's equity value (E)? What is the firm's risky debt value (D)? (20 points)
- b) Discuss briefly the impact that an increase in the firm's assets' volatility will have on the firm's equity value and risky debt value. (5 points)

Excerpt from the Distribution Function for the Standard Normal Distribution for Non-Negative Arguments (Hint: Do not interpolate and round to 3 decimal places.)

x	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.5	0.6915	0.6950	0.6985	0.7019	0.7034	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633

