



CORPORATE FINANCE

Name of the Professor and contact information:

Name: Dr. Karl Ludwig KEIBER, Full Professor of Finance

Office: HG 227

E-Mail: keiber@euv-frankfurt-o.de

Office Hours: by appointment

Prerequisites:

Matrix and vector algebra, statistics (probabilities, binomial and normal distribution), microeconomics (utility functions)

ECTS-Credits:

6

Grading and form of assignment:

Written exam (100 %)

Course description:

Corporate finance from a derivative perspective is at the very heart of this course. In a first step, participants get to know the pricing of state-contingent claims in a quite general state-preference framework with no-arbitrage. Next, the Cox-Ross-Rubinstein (1979) binomial option pricing model is developed and the Black-Scholes (1973) model for the pricing of European-type stock options is introduced. In a third step, the insights about financial options are applied to the analysis of a corporation along Merton's (1974) firm-value model. Thereby the participants develop a notion of credit-risk and understand how to price credit risky corporate debt. Finally, the participants learn to apply the binomial model to the pricing of real options. Put differently, they get to know multi-period capital budgeting under uncertainty in the presence of managerial flexibility. Tutorials help the participants to develop the necessary skills in order to apply the developed pricing approaches themselves.

Aim of the module (expected learning outcomes and competencies to be acquired):

The expected learning outcomes and competencies to be acquired in this course in detail are as follows: The participants are able to describe the uncertainty in capital markets in discrete time and in some discrete state-space and can optimize some multi-asset wealth-constrained investment problem. The participants can distinguish type 1 and type 2 arbitrage profiles. The participants are able to check whether the first fundamental theorem of asset pricing (existence of an equivalent martingale measure) and the second fundamental theorem of asset pricing (uniqueness of the equivalent martingale measure) hold true in the capital market. The participants can apply the concept of risk neutral

valuation to the pricing of arbitrary payoff profiles (financial engineering). The participants can describe the payoff profiles of financial options, name the determinant factors of option prices, qualify the impact of determinant factors on option prices, and explain value bounds on option prices. The participants can apply the binomial model of option pricing as well as the Black and Scholes model to the pricing of European-type financial options. The participants can analyze a firm's capital structure from the derivative perspective. The participants can price both equity and debt in the presence of credit risk. The participants are able to explain agency problems (asset substitution, bondholder wealth expropriation, underinvestment) between bondholders and shareholders of corporations from a derivative viewpoint. The participants can distinguish capital budgeting from the classical perspective (net present value analysis) and the real options approach to capital budgeting. The participants are able to determine the value of managerial flexibility (real options to defer, abandon, expand, and extend projects) in corporate decision making in a binomial option pricing framework. The participants can calculate state-dependent cost of capital of both equity and debt.

Reading list:

- Björk, Tomas, *Arbitrage Theory in Continuous Time*, 3rd edition, Oxford University Press, 2009. Chaps. 2, 3.
- Brealey, Richard A., Stewart C. Myers and Franklin Allen, *Principles of Corporate Finance*, 9th edition, McGraw-Hill, 2008.
- Copeland, Thomas E., Fred J. Weston and Kuldeep Shastri, *Financial Theory and Corporate Policy*, 4th edition, Pearson Addison-Wesley, 2005.
- Ross, Stephen A., Randolph W. Westerfield and Jeffrey F. Jaffe, *Corporate Finance*, 8th edition, McGraw-Hill, 2006.
- Sundaram, Rangarajan K. and Sanjiv R. Das, *Derivatives - Principles and Practice*, McGraw-Hill, 2011. Chaps. 8-15, 22, 32.