Finance & Banking

Derivatives/Quantitative Finance

Summer Semester

Institute:	Institute for Finance & Banking
Lecturer:	Prof. Dr. Ralf Elsas
Assistant:	tba
Weekly hours:	Block lectures and exercise sessions
Credits	6ECTS
Examination:	Written exam (two hours)
Prerequisites:	Knowledge of finance, statistic and mathematics
Course Material:	Can be downloaded in Moodle

Course Description & Main Objectives

The derivative market is bigger than the stock market when measured in terms of underlying assets. The value of the assets underlying outstanding derivatives transactions is several times the world gross domestic product. Finance departments around the world desperately need well-trained staff in risk management or trading. It is not uncommon for students who join derivatives groups to earn significant salaries. Thus, thoroughly understanding derivatives is a prerequisite for many successful careers in finance. The course "Derivatives" provides students with an overview about forwards, futures, swaps, and options. By the end of the course, students will have good knowledge of how these products work, how they are used and how they are priced. Core questions are: How do forwards, futures, options and swaps work? Are there different valuation methodologies to price options besides the Black-Scholes-Merton model? How can we price interest rate derivatives? What are the underlying assumptions we have to make?

Main Objectives:

• Providing students on a graduate level with an advanced understanding of derivatives

• Offering comprehensive understanding of valuation methodologies, including hands-on Excel based tutorials

Lectures Overview / Course Outline

Module one covers basic concepts and instruments such as forwards, futures, swaps. The module motivates their use and the importance to understand the different derivatives. Module 2 will cover options in detail, starting by reviewing the put-call parity, covering the underlying assumptions of the Black-Scholes-Merton model, covering the Greeks letters and the volatility smile. The following module discusses valuation methodologies such as the Monte Carlo Method and other numerical procedures to constitute our current understanding of how to price derivatives. Module four discusses interest rate derivatives.

During the lecture, if appropriate practical examples will be covered in order to motivate the relevant section. We will closely follow Hull, John C. (2018) and will expect students to read the relevant chapters and prepare the exercises.

Literature

- Hull, John C. (2018): Options, Futures and Other Derivatives, 9th Global Edition, Pearson