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ECTS	3
Examination	Final exam together with Capital Market Theory (120 minutes)
Course description and learning objectives	The lecture deals with the general theory of pricing of risky cash flows and identifies well-known models of the literature like option pricing, term structure theory, CAPM, and corporate valuation procedures as special cases of no arbitrage theory.
Course outline	<ul style="list-style-type: none"> <li>1 Arbitrage theory <ul style="list-style-type: none"> <li>1.1 Basics of arbitrage theory <ul style="list-style-type: none"> <li>1.1.1 Definition of no arbitrage</li> <li>1.1.2 Consequences arising from no arbitrage</li> <li>1.1.3 Distinguishing arbitrage/dominance from other concepts of the literature</li> </ul> </li> <li>1.2 Five ways of translating risky cash flows into prices</li> <li>1.3 Determination of state prices (special pricing theories) <ul style="list-style-type: none"> <li>1.3.1 Law of One Price-oriented determination of state prices</li> <li>1.3.2 Utility-oriented determination of state prices</li> <li>1.3.3 Economic implications of Law of One Price-oriented and utility-oriented pricing</li> </ul> </li> <li>1.4 Extensions of the basic no arbitrage model <ul style="list-style-type: none"> <li>1.4.1 Arbitrage theory in a multi-period model</li> <li>1.4.2 Arbitrage theory and imperfect markets</li> </ul> </li> </ul> </li> <li>2 Classical derivatives <ul style="list-style-type: none"> <li>2.1 Overview of types of classical derivatives</li> <li>2.2 Forwards <ul style="list-style-type: none"> <li>2.2.1 Institutional details</li> <li>2.2.2 Valuation</li> </ul> </li> <li>2.3 Futures <ul style="list-style-type: none"> <li>2.3.1 Institutional details</li> <li>2.3.2 Valuation</li> <li>2.3.3 Comparison of forward and futures prices</li> </ul> </li> <li>2.4 Options <ul style="list-style-type: none"> <li>2.4.1 Institutional details</li> <li>2.4.2 Price bounds for options based on no arbitrage</li> <li>2.4.3 Pricing of European options in the binomial model</li> <li>2.4.4 The transition from the discrete-time and –state to the continuous-time and -state model: Black/Scholes formula</li> <li>2.4.5 Pricing of American options</li> </ul> </li> </ul> </li> <li>3 Term structure theory <ul style="list-style-type: none"> <li>3.1 Basics</li> <li>3.2 Term structure models <ul style="list-style-type: none"> <li>3.2.1 Dynamics of spot rates in the binomial model</li> <li>3.2.2 Dynamics of zero bond prices in the binomial model: the Ho/Lee model</li> <li>3.2.3 Dynamics of forward rates: the model of</li> </ul> </li> </ul> </li> </ul>

	<p style="text-align: center;">Heath/Jarrow/Morton</p> <p>3.3 Forward and futures measure</p> <p>3.3.1 Definition of forward and futures measure</p> <p>3.3.2 Capability of forward and futures measure</p> <p>3.4 Pricing/valuation of selected interest rate derivatives</p> <p>4 Extensions</p> <p>4.1 CAPM and APT</p> <p>4.1.1 CAPM as special case of arbitrage theory</p> <p>4.1.2 Arbitrage Pricing Theory (APT) as special case of arbitrage theory</p> <p>4.2 Core elements of arbitrage-based business valuation</p> <p>4.2.1 Basic structure</p> <p>4.2.2 Special case: business valuation using risk-adjusted discount rates</p> <p>4.3 Real options</p>
<p>Selected References</p>	<p>Refe-</p> <ul style="list-style-type: none"> <li>– Lecture notes</li> <li>– Cochrane, J. H. (2005): “Asset Pricing”, revised edition, Princeton 2005.</li> <li>– Hull, J. C. (2014): “Options, Futures, and Other Derivatives”, 9<sup>th</sup> edition, Upper Saddle River 2014.</li> <li>– Ingersoll, J. E., Jr. (1987): “Theory of Financial Decision Making”, Towa 1987.</li> </ul>