

Abstract: This thesis studies the continuous-time financial models and their discrete versions, used for simulations and parameters estimations. Firstly, various stock price development and interest rates models are introduced. As a result of their uncertain future dynamics, these are defined as continuous-time stochastic processes. Secondly, a summary of discrete versions of continuous-time models, formed by Euler and Milstein discretization schemes, i.e. two most frequent ways of approximating a time-continuous stochastic process, is looked at. According to these discrete versions, simulations with different parameters are conducted in the third part of the thesis in order to illustrate individual behaviour of these models. In the conclusion, a comparison of a unique trajectory specified by the real data of one year interest rates swaps and of the simulations of Vasicek and Cox-Ingersoll-Ross model with parameters estimated from the real data is shown.