

This thesis is focused on the study of advanced methods of interest rate models calibration. The theoretical part provides introduction to basic terminology of financial mathematics, financial, concretely interest rate derivatives. It presents interest rate models, it is mainly aimed at HJM approach and describes in detail the Libor market model, then introduces the use of Bayesian principle in calculating the probability of MCMC methods. At the end of this section the methods of calibration of volatility to market data are described. The last chapter consists of the practical application of different methods of calibration Libor market model and consequently pricing of interest rate swaption. The introduction describes procedure of arrangement of input data and process of pricing of interest rate derivatives. It is consequently used for the valuation of derivative contract according to mentioned methods.