

This work deals with the possibilities of financial derivatives pricing. Explained are especially mathematical approaches used for modelling the development of random variables, which represent the evolution of underlying securities and interest rates. Based on this representation is then derived the pricing of various financial derivatives, mainly options, using the risk-neutral probability measure. Both the analytical pricing methods, especially those extending the Black-Scholes formula for European call and put options pricing, and the numerical and simulation pricing methods for modelling prices and interest rates based on assumptions about their distribution are involved. Mentioned are also ARCH and GARCH models for estimation of interest rates and indices distribution parameters. At the end of the work are these methods compared by application on an example of market data. Compared are various models to price the most usual types of options – analytical pricing (if available), underlying security price simulation by construction of binomial tree model, simulation of particular trajectories by Monte Carlo method.