Abstract
The thesis regards theory of nonlinear ARMA models and its application on financial markets data.
First of all, we present general framework of time series modeling. Afterwards the theory of linear ARMA models is layed out, since it plays a key role in the theory of nonlinear models as well. The nonlinear models presented are threshold autoregressive model (TAR), autoregressive conditional heteroscedastic model (ARCH) and generalized autoregressive conditional heteroscedastic model (GARCH). For each model, we derive a method for estimating the model's parameters, asymptotic properties of the estimators and consequently confidence regions and intervals for testing hypotheses about the parameters.
The theory is then applied on financial data, speficically on the data from Standard and Poor's 500 index (S&P500). All models are implemented in statistical software R.