ABSTRACT

The topic: Market risks and their estimation with volatility forecasts.

Thesis: 135 p., 41 fig., 9 tab., 2 applications, 15 sources.

Object of the study – transient heteroscedastic financial and economic processes.

Subject of the research – mathematical models and methods that describe heteroscedastic processes, estimation and analysis of the quality of forecasts, and the estimation models of market risks.

Methods: theory of modeling and forecasting time series, regression analysis, statistical methods of analizing financial risk.

The aim is to build adequate models of heteroscedastic processes for forecasting volatility and market risk estimation with their results.

In this paper a review of the main approaches to the estimation of market risks is presented, the method for estimating VaR also was considered and analysed. Furthermore, models and their features were reviewed to describe the dynamics and volatility forecasting. Results of modeling and estimation processes were analyzed in order to select the best model for estimation of market risks.

An information analitycal system was created to model and forecast financial and economic processes based on autoregressive conditional heteroscedastic models and to estimate the risk value with their help.

The system is implemented in a multi-paradigm numerical computing environment Matlab 2015 by using a proprietary programming language Matlab. Examples of application software for forecasting and estimating the market risk on real financial data are shown. A possible ways of further improving the system were considered.

MARKET RISK, VOLATILITY, FORECASTING, VAR, AUTOREGRESSIVE CONDITIONAL HETEROSKEDASTICITY.