

## **Abstract**

This thesis focuses on variance-covariance matrix modeling and forecasting. Majority of existing research evaluates covariance forecasts by statistical criteria. Our main contribution is economic comparison of parametric and non-parametric approaches of covariance matrix modeling. Parametric approach relies on RiskMetrics and Dynamic Conditional Correlation GARCH models that are applied on daily data. In the second approach, estimates of variance-covariance matrix are directly obtained from the high-frequency data by non-parametric techniques Realized Covariation and Multivariate Realized Kernels. These estimates are further modeled by Heterogeneous and Wishart Autoregression. Moreover, our contribution arises from the use of dataset that covers period of financial crisis. Portfolio of assets that is dynamically optimized consists of two highly liquid assets - Light Crude NYMEX and Gold COMEX, and of European asset represented by DAX index. Forecast evaluation results indicate better economic performance of models estimated on daily data. However, we found out that data synchronization procedure is the main driver of the results.