Abstract

This thesis uses Heterogeneous Autoregressive models of Realized Volatility on five-minute data of three of the most liquid financial assets – S&P 500 Futures index, Euro FX and Light Crude NYMEX. The main contribution lies in the length of the datasets which span the time period of 25 years (13 years in case of Euro FX). Our aim is to show that decomposing realized variance into continuous and jump components improves the predicatability of RV also on extremely long high frequency datasets. The main goal is to investigate the dynamics of the HAR model parameters in time. Also, we examine if volatilities of various assets behave differently.

The results reveal that decomposing RV into its components indeed improves the modeling and forecasting of volatility on all datasets. However, we found that forecasts are best when based on short, 1-2 years, pre-forecast periods due to high dynamics of HAR model's parameters in time. This dynamics is revealed also by a year-by-year estimation on all datasets. Consequently, we consider HAR models to be inapproppriate for modeling RV on such long datasets as they are not able to capture the dynamics of RV. This was indicated on all three datasets, thus, we conclude that volatility behaves similarly for different types of assets with similar liquidity.