Andersen et al. in their paper in 2003, demonstrate the use of simple Gaussian vector autoregressive models to forecast the high daily and lower frequency return volatilities and return distributions using integrated high-frequency intra-day data. They also demonstrated the fact that their models works better than simple GARCH model and attributed this to the fact that GARCH model presents slow response to sudden changes in market. Same fact is furthered by Hansen et al. in 2012. They introduce a new framework named Realized GARCH which is used to model both returns and realized volatility together. Empirical application on Dow Jones Industrial Average stocks and exchange traded fund showed a significant improvement over simple GARCH model.

------has to be in comparison of models section------

To test the significance of differences in the likelihood function of various models, two tests have been taken. First, is the Rivers and Vuong (2002) test for non-nested model selection. Second is the Clarke (2007) test for non-nested model selection. The later test has been proven to be more efficient than the Vuong test when distribution of individual log-likelihood ratios is highly peaked.

-----insert likelihood comparison result here-----

Molnar (2016) formulated the Range-GARCH model. This incorporated the high and low prices along with the traditional return from closing prices in the simple GARCH model. The paper also showed that the Range-GARCH is in-fact superior to simple GARCH model based on closing prices. This Range-GARCH model is used as a basis to specify the DCC model proposed by Engle (2002) in this paper, to give a new specification of DCC, the DCC-Range-GARCH model or DCC-RGARCH model.