This thesis investigates forecasting performance of Quantile Regression Neural Networks in forecasting multiperiod quantiles of realized volatility and quantiles of returns. It relies on model-free measures of realized variance and its components (realized variance, median realized variance, integrated variance, jump variation and positive and negative semivariances). The data used are S&P 500 futures and WTI Crude Oil futures contracts. Resulting models of returns and volatility have good absolute performance and relative performance in comparison to the linear quantile regression models. In the case of in-sample the models estimated by Quantile Regression Neural Networks provide better estimates than linear quantile regression models and in the case of out-of-sample they are equally good.