

# Abstract

In this thesis, we strive to build on the fractal market hypothesis and to develop two methods which aim to reveal whether the fractal dimension, as a property of the short memory, can be applied for forecasting of financial time series. In the first one, we use ten world market indices and repeatedly estimate the fractal dimension by boxcount, Hall-Wood, and Genton estimators on fixed number of returns and make one step ahead forecasts by AR(1) and ARMA(1,1) models; then, we look whether forecast errors from realized returns are lower when the fractal dimension is estimated lower. The second method incorporates only the fractal dimension and studies, if the sign of return persists in next period more likely with lower fractal dimension. The results indicate that the short memory is truly present in the markets and the fractal dimension may be potentially useful for prediction and increased profit for investors. However, the significance of our results is not strong. We recommend more sophisticated methods and models for further research.