# Concluding Remarks

## Main Findings

Before answering the two central research questions, this paper analyzes crude oil returns and shows that the series of returns only exhibits weak intertemporal correlation. As a result, it is tough to forecast crude oil returns using historical returns only. In contrast, the series of news sentiments shows significant intertemporal correlation and predictable patterns. Altogether the significant relationship between these two time series, it is reasonable to conjecture that one can forecast crude oil returns by using sentiments as a bridge.

In the experiment section, this paper firstly examines the market efficiency hypothesis (MEH) on the crude oil market with respect to different combinations of information sets, predictive models, and searching technologies. In general, the market shows efficiency (i.e., unpredictability) with respect to simple models such as moving average predictors and ARIMA models. Still, returns are predictable using more sophisticated models such as LSTM-RNNs. As for the second research question, it turns out that news sentiments help predict returns

## Limitations and Extensions

I am using intra-day high-frequency trading data.

Transaction cost.

Back testing