Prediction of Stock Market with Sentiment Analysis

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1 Background

Stock market prediction is the core research area in trading and investment. Stock price is determined by the behavior of human investors, and the investers determine stock prices by using publicly available information to predict the market future trend. Financial news can thus play a significant role in influencing the stock trend as human react to the information. Previous reasearch have suggested that there is some lag between the time news article was released and the time the market absorbed and reflected these information. So our main goal here is to classify the news as our sentiment factor and use the sentiment factor to determine the impact of the news on the stock price. In our research, we focus on sentiment analysis with Google news in stocks division, and build up machine learning models to measure the relationship between news sentiment and stock index trend(DJIA) over time. Finally, we try to design a tradable portfolio based on our sentiment factor and test its application in investments.

2 Data Set

Our sentiment data would come from Google news.

Our financial data would come from Yahoo Finance (return data of DowJonesIndustrialAverage (DJIA)).

3 Methods

1. Firstly, we would design a web scraper to scratch the Google news headers in stock division from January 2007 - December 2009 and January 2013- December 2015 in daily basis.

2. We would worked on the sentiment analysis based on subjectivity analysis and polarity analysis.

3. We would then measure the prediction power with Granger Causility Test and build up the prediction model with SOFNN.

4. For investment back-testing, it comes to the construction of a simple portfolio and testing investments based on our indicator prediction. We would finally figrue out whether our indicator would work or not.