

DS-670-Capstone: Big Data & Business Analytics

Lab 10: Comparison of Results

April 6th 2017, Madhumita D

1. Reference:

Kim, J. H., Shamsuddin, A., & Lim, K. P. (2011). Stock return predictability and the adaptive markets hypothesis: Evidence from century-long US data. *Journal of Empirical Finance*, 18(5), 868-879.

2. Comparison Table:

Competitor	My Algorithm
Results: Based on the regression metrics used they find evidence that return predictability fluctuates over time and is highly governed by changing market conditions. It is also found that during a market crash, no return predictability is prominently evident, mostly because of the extreme degree of associated uncertainty. They also state that inflation, risk-free rates and stock market volatility influence stock market predictability over a period of time.	Results: Using a hybrid approach of neural networks and time series analysis, return predictability is calculated. Based on the overall forecasted values we can say that the expected return of stocks in last quarter of 2014 has a negative trend while they show a positive trend in the first two quarters of 2015. However, later in third and fourth quarters in 2015 we see a similar negative trend as shown in last quarter of 2014. On the whole the averages depict a huge volatility in stock price movements.
Discussion:	Discussion:
Assumption is made that the market follows a weak-form of efficient market hypothesis (EMH).	We have assumed that the price for each stock is highly influenced by the fundamental factors.
Test for evidence of AMH (adaptive market hypothesis) in return predictability.	Test for semi-strong form of efficient market hypothesis (EMH) based on return predictability.
Used DJIA index i.e. index created for 30 blue chip stocks (large cap stocks) for century-long U.S. stock market data from 1900 to 2009.	Used daily closing prices of exchange traded fund (ETF) of both small and large cap stocks from the year 2000 to 2017 for U.S. stock market.
DJIA is used as a technical indicator. The index is a price-weighted average of 30 blue-chip stocks, accounting for 25–30% of the total value of U.S. stocks.	RSI is used as a technical indicator in our analysis. Relative Strength Index compares the magnitude of recent gains and losses over a period of time based on the change of price movements.

Regression Analysis was conducted on the measures of return predictability of stocks.	Neural Networks and Factor Models were implemented to forecast the returns of a stock in the market. We use a multivariate time series to study the behaviour of stocks.
Metrics Used – Sequential testing of market efficiency was not taken into consideration.	Metrics Used – Sequential testing of market efficiency played a major role in computing the returns accurately based on all the historical and present data available.
Metrics Used – Automatic variance ratio (AVR) test is used in testing weak-form of efficiency of financial markets	Metrics Used – Neural Network Weights from 15 training data sets (normalized data) are used to predict the weights in the test data sets to obtain return predictability.
Metrics Used - Automatic portmanteau test (AQ) for testing the auto-correlation of returns which are subject to unknown forms of heteroskedasticity.	Metrics Used – Time series analysis is performed on the weights from the neural networks to analyze if there are any deviations in the predictions.
Metric Used - Generalized spectral test (both linear and non-linear dependence are tested).	Metrics Used – Ranked the test data sets based on predicted returns and grouped these data sets into 5 buckets. These groups are used to study the behaviour of stocks.
All these metrics are used as inputs to regression analysis which does not completely cover the non-linearity of the financial markets.	The metrics used in our algorithm consider the non-linearity of the data. Neural network models are best suited for this kind of data where the model uses a learning algorithm and modelling is based on the data alone.
Deducted that return predictability depends on market conditions which contradicts the initial assumption that the market is weak form of efficient market.	Deducted that predicted returns are dependent on the publically available information or market conditions which proves that markets are semi-strong form efficient.
Their analysis addresses the fact that return predictability has been smaller during economic bubbles than in normal times. Also, return predictability is associated with stock market volatility and economic fundamentals.	Our analysis addresses not only the factors driving performance of the model but also the investability of our model with real-time data. This entails simulation of a portfolio controlling for risk and liquidity of the assets traded.
U.S. Stock markets are susceptible to market conditions such as inflation, crashes and are weak form of efficient markets.	U.S. Stock Markets are highly governed by changing market condition but are semi-strong form of efficient markets.