Assignment 9: Evaluating our Analytic Solutions

Sougandh Kohli

Saurav Mawandia

Harrisburg University of Science and Technology-Harrisburg, PA

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Professor E. André L'Huillier M

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For this week's assignment, you will be evaluating different alternatives for your methodological approach.

Now that you have explored your data set, present at least 3 different methodological approaches to answer your research question.

Follow these steps:

1. ***Write the most specific and scoped down Research Question that you have.***

The Research question or our motivation for this project is –"*Are Bond Prices Predictable!"*

2. ***Present three different techniques that are appropriate for your data-set and can contribute to answer the question. Explain why they are appropriate (for the data and the problem) and how would you implement this approach.***
3. ***For each technique you propose, analyze it discussing the pros and cons. For example, how easy or viable is to implement the approach. How reliable could those results be? How much the technique would contribute to answering the question?***
4. ***After reviewing your options, select the technique you feel is the strongest alternative. This approach you will be your main methodology for your term project.***

Bonds market is impacted by asymmetrical data since trading information for bonds is not as readily available as stock/equity market. The goal of our research paper is to establish an algorithm to predict bond prices using historical data. The three techniques we would be considering for this paper are Hybrid time series model, since we have trade details from a time range and using this method, we can generate a new feature variable with additional explanatory powers or help in reducing the features in the model, thus further improving the explanatory power of the model. The second approach we were considering is the Generalized Linear Model. Using the unweighted, full set of features approach, we can use regression to predict bond prices using historical trade prices, where we are assuming the trades follow normalized distribution. Weighted least squares approach can also improve predictability of the model, with weights driven by statistically important feature variables getting higher weights. The last approach is an LSTM (Long Short Term Model), a type of neural network model. This algorithm is a combination of various algorithms, thus providing a more comprehensive tool for our data. This

model is capable of finding long term dependencies in the data, which is the crux for our algorithm. Hence this model will be the best fit for our analysis.