Summary of "Can ChatGPT Forecast Stock Price Movements? Return Predictability and Large Language Models"

Alejandro Lopez-Lira and Yuehua Tang(JF,2024)

Guowei Zhao Summarised in Jun. 2024

1 What are the research questions?

- How does large language models perform in predicting stock returns?
- How does it predict the returns without specific training?

2 Why are the research questions interesting?

- Recent traction on the application of large language models.
- Prior study reveals that news can move stock price, but gap by studying the potential of LLMs in extracting the context from news headlines to predict stock returns is still remaining.
- Though LLMs offer little value in directly predicting stock returns in financial meanings, they are of value for processing textual information to predict stock returns.

3 What is the paper's contribution?

- Contribute to the study of the potential of LLMs in financial markets, particularly the investment decision-making process.
  - Existing literature: LLMs like ChatGPT can decode Fedspeak and process textual data.
  - Extension: LLMs can assess the news headlines and then predict stock returns.
- Contribute to the literature employing text analysis and machine learning to study finance research questions.
  - Existing literature: employs textual analysis and machine learning to study a variety of finance research questions.
  - Extension: rely only on ChatGPT's natural language processing skills to make predictions.
- Contribute to the literature that uses linguistic analyses of news articles to extract sentiment and predict stock returns.
  - Existing literature: using traditional sentiment measures to assess textual content.
  - Extension: using ChatGPT to generate scores to measure news headlines.
- Contribute to decision making of professionals about incorporating LLMs into their investment strategies.
  - The study provides empirical evidence on the efficacy of LLMs in predicting stock market returns.

4 What hypotheses are tested in the paper?

- LLMs not trained in predicting returns are capable of combining new information to predict returns.
- LLMs perform better at assessing news than the existing sentiment analysis methods.
- Complex models perform better than basic models.
- The predictability of the ChatGPT scores is present among both small and large-cap stocks as well as stocks with positive and negative news.

4.1 Do these hypotheses follow from and answer the research questions?

- Yes, they are all analyzing the performance of LLM on predicting stock returns.

4.2 Do these hypotheses follow from theory? Explain logic of the hypotheses.

- Existing theory has revealed that news can move stock price, thus the result of news analysis from ChatGPT will be capable of predicting stock price. Also, trained LLMs will definitely outperform traditional sentiment methods on assessing textual content.

5 Sample: comment on the appropriateness of the sample selection procedures.

- Dataset of news excludes ChatGPT's training period, ensuring that the evaluation is based on information not present in the model's training data, allowing for a more accurate assessment of its predictive capabilities.

6 Dependent and independent variables: comment on the appropriateness of variable definition and measurement.

- The dependent variable is stock return, which is expected to be predicted. The inde- pendent variables are scores given by LLMs about news headlines.

7 Regression/prediction model specification: comment on the appropriateness of the regress/predict model specification.

- The regression reveals the measures' capability of predicting stock return. Comparing betas in the same regression is efficient of comparing the accuracy of the prediction.

8 What difficulties arise in drawing inferences from the empirical work?

- Sample contains only 15 months. Also, It is hard to conclude it is the news that alters the stock return. But I believe ChatGPT score is appropriate measure for the news neutrality.

9 Describe at least one publishable and feasible extension of this research.

- This study actually reveals that LLMs like ChatGPT are capable of dealing with textual data that used to be difficult to analyze. Thus LLMs can be used to assess other data such as financial reports, earning announcement and management resume.