

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

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## 1. What are the research questions?

- Can LLM predict stock returns while using news headlines?

## 2. Why are the research questions interesting?

- LLM in financial economics remains unknown area, especially to predict stock returns.
  - N:these models are general-purpose, not trained for stock return prediction.
  - Y:these models are trained using big text data, more capable of understand context.
  - Fill gap: study LLMs extract context from news headlines to predict stock returns.
- Evidence: stock returns are predictable using news and trained algorithms
  - possibly because combining new information is complicated
  - Focus on: can LLM acquire the capability as better at other natural language tasks.

## 3. What is the paper's contribution?

- contribute to literature on use ChatGPT in the context of economics.
  - Recent paper:
    - \* decode Fedspeak,helpful in teaching, writing (Korinek, 2023...)
    - \* using historical numerical data to predict:no better (Ko and Lee, 2023...)
  - Extend: first to study the potential of LLMs in financial markets, particularly the investment decision-making process.
- contribute to literature on finance questions using textual analysis and ML
  - Recent paper:
    - \* Text Mining,Tone... (Baker et al,2016; Chin and Fan, 2023)
  - Extend: first study potential of ChatGPT in predict stock returns(not trained)
- contribute to uses text analysis of news to extract sentiment, predict stock returns.
  - Recent paper:
    - \* studies media sentiment and aggregate stock returns (Tetlock,2007...)
    - \* firm news to predict future individual stock returns (Tetlock,2011...)
  - Extend:can LLM add value by extract additional information that predict return
- contribute to employment exposures and vulnerability to AI-related technology.
  - Recent paper:
    - \* extent of job exposure to AI-related tech, affect employment and productivity.
  - Extend:finance domain: adding value to market participants processing information

## 4. What hypotheses are tested in the paper?

- H1: positive correlation between ChatGPT scores and subsequent daily stock returns.
- H2: ChatGPT performs better than tradition ways.

### a) Do these hypotheses follow from and answer the research questions?

- Yes, and compares the performance of different models.

### b) Do these hypotheses follow from theory? Explain logic of the hypotheses.

- its advanced language understanding capabilities, which allow it to capture the nuances and subtleties within news headlines,generate more reliable sentiment scores.

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

- a more accurate “out-of-sample”, Will the ability decline over time?

**6. Comment on the appropriateness of variable definition and measurement.**

- Concise and clear, no problem. use more LLM models for robustness.

**7. Comment on the appropriateness of the regress/predict model specification.**

- Does regression not require the addition of other control variables?

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

- Is it possible to control for not using external resources as a reference?

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

- Temporal Analysis: the distance from the out-of-sample starting interval, market volatility, bull or bear market ?