Deepseek for Investment Advisory: Generating and Evaluating Stock Recommendations

Trinh Tuan Ngoc Bao, Nguyen Vu Quang Anh, Phan Tran Manh Cuong
VNU University of Engineering and Technology
ngocbaotrinhtuan@gmail.com

Abstract

Large language models (LLMs) like Deepseek offer advanced capabilities for generating investment recommendations by processing complex textual data. We utilize Deepseek to produce stock recommendations based on Wall Street Journal articles, achieving a monthly three-factor alpha of up to 3.2

Keywords: Generative AI, Deepseek, Stock Recommendations, Investment Advisory

1 Introduction

The emergence of large language models (LLMs) has revolutionized financial advisory by enabling sophisticated analysis of textual data for investment decisions. Deepseek, a cutting-edge LLM, excels in interpreting financial news to generate actionable stock recommendations. This paper explores Deepseek's application in producing U.S. stock recommendations based on Wall Street Journal articles, followed by a rigorous evaluation of these recommendations by financial experts. Our findings demonstrate Deepseek's ability to construct portfolios that outperform market benchmarks, offering a scalable solution for investment advisory.

2 Related Work

Previous research in financial NLP has focused on sentiment analysis and keyword-based methods to predict stock performance [**??**]. These approaches often lack the contextual depth required to capture complex market dynamics. Recent LLMs, such as GPT and BERT, have improved text comprehension for financial applications [**??**]. Deepseek advances this further with enhanced reasoning capabilities, making it ideal for generating precise stock recommendations. Our work leverages Deepseek to bridge the gap between textual analysis and actionable investment strategies.

3 Method

We use Deepseek to generate stock recommendations through a structured conversational query, simulating interactions with a financial advisor. The methodology includes prompt design, fine-tuning, and expert evaluation.

3.1 Stock Recommendation Prompt

The prompt for Deepseek is: "Assume you are a senior financial analyst. Carefully read the following news from the Wall Street Journal. Based on the news content, if you recommend buying stocks, write 'YES' and list five NYSE or Nasdaq stock names with their ticker symbols. If you answer 'NO,' briefly explain why."

39th Conference on Neural Information Processing Systems (NeurIPS 2025).

3.2 Fine-Tuning Deepseek

To optimize Deepseek's recommendations, we fine-tuned the model using Wall Street Journal articles from 2018–2019. For each article, we provided Deepseek with the top five performing stocks in the relevant industry (based on two-digit SIC codes) to refine its output. The temperature parameter was set to 1 to ensure a balance between creativity and consistency.

3.3 Evaluation Process

Deepseek's recommendations were evaluated by a panel of CFA Level 3-certified financial analysts and CFA Level 1-certified finance students. Each recommendation was assessed based on:

- Relevance to the industry mentioned in the news.
- Reasonableness of the rationale behind the recommendation.
- Potential investment opportunity based on the news and recommended stocks.

Two analysts independently reviewed each recommendation. If they agreed, the result was accepted. In cases of disagreement (8

4 Experiments

We tested Deepseek's performance using Wall Street Journal articles from January 2020 to August 2023, comprising over 20,000 news items. Deepseek identified approximately 45

- Deepseek-generated portfolios achieved a monthly three-factor alpha of up to 3.2
- Recommended stocks exhibited characteristics such as beta (Scholes-Williams-Dimson), market capitalization, book-to-market ratio, investment, profitability, momentum (Jegadeesh-Titman), and short-term reversal (Jegadeesh-Lehmann), as shown in Table 1.

Table 1: Summary Statistics for Stock Characteristics

Stock Characteristic	**U.S. Market**
Beta (Scholes-Williams-Dimson)	1.12
Market Capitalization (SIZE)	$15.2B
Book-to-Market Ratio (BM)	0.45
Investment (INV)	0.32
Profitability (PROFIT)	0.18
Momentum (MOM)	0.25
Short-term Reversal (REV)	-0.05

5 Limitations and Future Work

Deepseek's performance depends on the quality and clarity of input news data, with ambiguous articles potentially leading to less accurate recommendations. The fine-tuning process is also resource-intensive. Future work will explore integrating real-time market data and expanding Deepseek's application to other financial markets to enhance recommendation robustness.

6 Conclusion

Deepseek demonstrates exceptional potential in investment advisory by generating stock recommendations from Wall Street Journal articles, achieving a monthly three-factor alpha of up to 3.2

References