

# ASSESSING THE ACCURACY OF CHATGPT IN STOCK MARKET PREDICTION WITH SPECIAL REFERENCE TO THE INDIAN MARKET

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## Abstract

Stock market prediction has been an area of extensive research, integrating artificial intelligence (AI) models to enhance forecasting accuracy. With the advent of generative AI models such as ChatGPT, investors and researchers are exploring their effectiveness in predicting stock trends. While AI has been widely used for financial forecasting in global markets, its application in the Indian stock market presents unique challenges and opportunities due to market volatility, regulatory frameworks, and investor behaviour. This paper critically examines the accuracy of ChatGPT in stock market prediction, with a special focus on the Indian stock market, by reviewing existing literature, methodologies, and empirical studies. The study incorporates Indian literature reviews (LRs) and examines case studies relevant to AI-driven stock prediction in India. The review highlights key challenges, including data limitations, model interpretability, and external factors such as economic policies and regulatory restrictions in India. While ChatGPT can analyze patterns and sentiments effectively, its predictive accuracy remains uncertain due to market complexities and stochastic nature.

**Keywords:** Stock Market Prediction, ChatGPT, Artificial Intelligence, Indian Stock Market, Market Sentiment Analysis, Financial Forecasting

## 1. INTRODUCTION

The stock market is influenced by various factors, including macroeconomic indicators, geopolitical events, corporate earnings, and investor sentiments. Traditional forecasting methods rely on historical data and econometric models, while modern techniques integrate AI and machine learning (ML) for enhanced precision. ChatGPT, a generative AI model developed by OpenAI, has demonstrated proficiency in language processing and sentiment analysis. However, its accuracy in stock market prediction remains a subject of debate.

The Indian stock market, represented primarily by the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE), is characterized by high retail investor participation, frequent regulatory interventions, and sensitivity to both domestic and international economic conditions. The application of AI models like ChatGPT in India's stock market requires special consideration due to the dynamic nature of trading, the influence of social media, and government policies on stock performance.

This paper reviews various studies evaluating ChatGPT's predictive capabilities, comparing it with conventional ML models such as neural networks and regression-based forecasting models, particularly in the Indian context. The primary research questions addressed in this review are:

- How does ChatGPT perform in stock market prediction compared to traditional models?
- What are the key challenges and limitations associated with using ChatGPT for market forecasting in India?
- What improvements can enhance the reliability of ChatGPT in financial analytics?

## 2. LITERATURE REVIEW (WITH INDIAN CONTEXT)

Several studies have explored the application of AI in stock market forecasting. In the global context, key contributions include:

- **Deep Learning Models:** Fischer & Krauss (2018) demonstrated that Long Short-Term Memory (LSTM) networks outperform traditional statistical models in financial time-series forecasting.

- **Sentiment Analysis in Trading:** Bollen, Mao, & Zeng (2011) investigated the impact of Twitter sentiment on stock market movements. Their study found that sentiment-driven AI models could predict short-term fluctuations in stock prices.
- **GPT-based Financial Analysis:** Lopez-Lira & Tang (2023) tested ChatGPT's ability to interpret financial news and its correlation with stock price movements.

### Indian Literature Review Studies

Several studies have examined AI applications in the Indian stock market:

1. **Srivastava, Pant, & Gupta (2022):**
  - **Title:** *Analysis and Prediction of Indian Stock Market: A Machine Learning Approach*
  - **Summary:** This study uses AI techniques such as LSTM, SVM, and Gradient Boosting to predict stock market trends for the Nifty 50 index.
2. **Chauhan et al. (2023):**
  - **Title:** *Indian Stock Market Prediction Using Augmented Financial Intelligence ML*
  - **Summary:** This research applies deep learning models, including CNN-LSTM, GRU, and hybrid architectures, to Indian stock data.
3. **Majumder & Hussain (2021):**
  - **Title:** *Forecasting of Indian Stock Market Index Using Artificial Neural Networks*
  - **Summary:** This paper presents a neural network model to predict the closing values of the S&P CNX Nifty 50 Index.

## 3. METHODOLOGY

This review adopts a systematic approach, analyzing peer-reviewed studies, white papers, and empirical research published between 2020 and 2024. The study is divided into two sections:

1. **Review of AI-based stock prediction models:** This section examines various AI techniques, including LSTMs, Random Forests, and NLP-based models.
2. **Evaluation of ChatGPT's predictive accuracy in India:** This section focuses on studies assessing ChatGPT's ability to predict stock market trends based on historical data, financial news, and social media sentiment in India.

For empirical validation, various models are compared based on their predictive accuracy, computational efficiency, and adaptability to market volatility.

## 4. ACCURACY OF CHATGPT IN INDIAN STOCK MARKET PREDICTION

### Challenges and Findings

- **Sentiment Analysis-Based Prediction:** ChatGPT can process financial news and social media discussions to gauge market sentiment. In India, where platforms like Twitter, Telegram, and WhatsApp drive retail investor behavior, sentiment analysis plays a critical role.
- **Historical Data Analysis:** Unlike ML models trained on structured financial data, ChatGPT lacks inherent quantitative analysis capabilities. When integrated with datasets from the NSE/BSE, predictive accuracy improves but remains inferior to LSTM-based models.
- **Regulatory Concerns:** The Securities and Exchange Board of India (SEBI) has strict regulations on automated trading and AI-driven stock analysis, limiting ChatGPT's full potential in algorithmic trading.

## 5. CASE STUDY: AI AND CHATGPT IN THE INDIAN STOCK MARKET

A study by **Chauhan et al. (2023)** tested AI models for Indian stock predictions:

- LSTM models outperformed ChatGPT in numerical predictions.
  - ChatGPT's sentiment analysis showed correlations with Nifty 50 index movements but lacked real-time adaptability.
  - When combined with traditional technical indicators, AI-based models achieved better accuracy.
- Similarly, fintech firms in India experimenting with GPT-based AI for portfolio management found that while ChatGPT provided insights into market sentiment, it underperformed against quantitative trading algorithms.

## 6. CHALLENGES AND LIMITATIONS IN THE INDIAN CONTEXT

1. **Data Availability & Quality:** Indian stock data is fragmented across multiple exchanges, making real-time AI predictions difficult.
2. **Market Sentiment & Retail Investors:** High retail investor participation in India causes unpredictable stock movements, making AI-based predictions less reliable.

3. **Regulatory & Compliance Barriers:** SEBI's strict stance on AI in financial markets limits automated stock predictions.
4. **Model Interpretability Issues:** ChatGPT lacks transparency, raising trust issues in financial applications.

## 7. CONCLUSION AND RECOMMENDATIONS

While ChatGPT demonstrates potential in sentiment-driven market analysis, its accuracy in direct stock market prediction for India remains limited.

### Recommendations:

- Integrate ChatGPT with **real-time stock market data from NSE/BSE**.
- Develop hybrid AI models combining **LSTMs, NLP sentiment analysis, and ChatGPT's generative capabilities**.
- Conduct **further empirical testing on Indian datasets** to validate predictive accuracy.

By addressing these challenges, ChatGPT could complement **traditional stock market forecasting models** rather than replace them in India's dynamic financial ecosystem.

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