CHAPTER 2: LITERATURE REVIEW

2.1 Stock Market Forecasting

Stock market forecasting aims to estimate future prices or trends using historical market data and auxiliary signals such as financial news sentiment. Linear regression models have gained significant attention in recent research due to their simplicity, interpretability, and effectiveness for short-term price prediction. Lavanya and Gnanasskaran [1] demonstrate the application of linear regression for stock exchange price prediction, highlighting its computational efficiency and practical applicability in real-time systems. Their work emphasizes that linear models can provide reliable forecasts when properly configured with appropriate feature engineering.

2.2 Linear Regression for Stock Price Prediction

Linear regression has proven to be an effective approach for financial forecasting, particularly for short-horizon predictions. Sangeetha and Alfia [2] present an evaluated linear regression-based machine learning technique for financial stock market forecasting, demonstrating that linear models can achieve competitive accuracy while maintaining low computational overhead. This makes them particularly suitable for web-based applications where response time is critical. Li [3] further validates the effectiveness of linear regression for stock price prediction through significance analysis, showing that properly selected features can lead to robust predictive performance. The interpretability of linear regression coefficients also provides valuable insights into which factors most influence price movements.

2.3 Multiple Linear Regression and Feature Selection

Recent studies have explored multiple linear regression approaches that incorporate various market indicators and technical features. Lin [4] investigates predicting stock returns using linear regression with multiple predictors, demonstrating that combining historical price patterns with volume data can

improve forecast accuracy. Hu [5] extends this work by developing a multiple linear regression model that integrates diverse market features, showing that feature selection and preprocessing significantly impact model performance. These studies reinforce the value of linear regression as a practical and interpretable approach for stock price forecasting in production systems.

2.4 Gaps Identified

While existing research demonstrates the effectiveness of linear regression for stock price prediction [1], [2], [3], [4], [5], most studies focus solely on the forecasting component without addressing the broader context of portfolio management and decision support. A key gap addressed by this project is the end-to-end integration of:

- stock price forecasting using Linear Regression with proper feature engineering,
- multi-source sentiment analysis for contextual market interpretation,
- and a complete simulated portfolio management workflow with user and admin dashboards.

This integrated approach provides a practical platform for learning and experimentation that goes beyond isolated prediction models.