

ABSTRACT

Predicting stock price movements is a challenge in the investment world due to its fluctuating nature and the influence of various factors. This study utilizes an Artificial Neural Network (ANN) to predict weekly stock price movements for 19 companies in the LQ45 index. The data include weekly closing prices (Close) and six financial ratio indicators: EPS, ROA, ROE, P/B Value, P/E Ratio, and DER. Stock price movements are classified into 1 (up), 0 (stagnant), and -1 (down) based on three price change thresholds (1%, 2%, 3%). The study applies Principal Component Analysis (PCA) to reduce noise and enhance model performance. Results indicate that the optimal threshold is 2%, yielding better accuracy and F1-Score. Models based on historical data demonstrated the best performance in predicting stock price movements, with an average accuracy of 90%. Conversely, models integrating financial ratios without PCA had lower accuracy 50%-70%, indicating that financial ratios have a low correlation with stock price movements in the short term. The application of PCA to historical data and financial ratios improved the accuracy to levels comparable to models based solely on historical data. Statistical tests showed no significant differences in accuracy and variance between the historical data-based model and the combined model with PCA. This study concludes that historical data is the primary source for predicting short-term stock price movements, while financial ratios require additional approaches to enhance their contribution to the model's overall performance.

Keywords: *stock price movement prediction, artificial neural network, historical data, financial ratios, threshold, PCA.*