## **Evaluating Machine Learning and Deep Learning Algorithms for Financial Anomaly Detection: A Comparative Study**

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## ABSTRACT

This paper aims to provide a comprehensive comparative analysis of various algorithms for anomaly detection in financial time series data, specifically focusing on Ford Otosan stock, the BIST100 index, and the USD/TRY exchange rate. The study evaluates the performance of algorithms, including Isolation Forest, Single-Class Support Vector Machines, Local Outlier Factor, DBSCAN, KMeans, and Autoencoders, utilizing metrics such as accuracy, precision, recall, and F1 score. These insights contribute to the existing body of knowledge by offering a detailed comparison of machine learning and deep learning techniques, providing valuable implications for risk management and investment strategies. The paper acknowledges the study's limitations, including the relatively short analysis period and the specific set of algorithms used. The findings reveal that KMeans is the most effective model for anomaly detection, demonstrating high accuracy and sensitivity. Isolation Forest and Autoencoders also perform well but have certain limitations.

Keywords: Anomaly detection, Machine learning, Deep learning, BIST100 index

JEL Classification: C45, G15, G17

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