IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 11, April 2025
Impact Factor: 7.67

Europe Stock Exchange Analysis: A Predictive Approach Using ARIMA, Isolation Forest, and XGBoost

Prof. Bramhadeo Wadibhasme[1], Prof. Anjali Pise[2], Anushka Kamble[3]
Professor, Department of Computer Science and Engineering[1,2]
Student, Department of Computer Science and Engineering[3]
Tulsiramji Gaikwad Patil College of Engineering and Technology, Nagpur, India
bramhadeo.ece@tgpcet.com[1], anjalip.cse@tgpcet.com[2], anukamble463@gmail.com[3]

Abstract: *This research paper analyses the performance of leading stocks from four European countries—France, Germany, Italy, and Switzerland—by applying time series modelling and anomaly detection techniques. Using historical stock data from January 2023 to January 2025, gathered from Yahoo Finance, the study examines the patterns in stock price and projects their values. The methodology includes data preprocessing, stationarity analysis using the Augmented Dickey-Fuller (ADF) test, and predictive modelling using the ARIMA model. Due to the limitations of ARIMA in managing anomalies, Isolation Forest is applied for effective outlier detection. Furthermore, the study employs XGBoost with hyperparameter tuning to refine predictions, achieving lower RMSE scores. A user-friendly Streamlit dashboard is developed to visualize the findings, providing non-technical users with an interactive platform for exploring stock insights. This research contributes to financial forecasting by combining traditional and advanced machine learning methods for reliable prediction..*

DOI: 10.48175/IJARSCT-25821