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REVIEWER'S REPORT

Manuscript No.: IJAR-58415

Title: Machine Learning Models for Cryptocurrency Price Forecasting Using Historical Aave Cryptocurrency Data.

Recommendation:

Accept as it is .....

Accept after minor revision……yes……

Accept after major revision .....

Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality			Y	
Techn. Quality			Y	
Clarity			Y	
Significance			y	

Reviewer's ID: JPR-Dr.Shaweta Sachdeva

Detailed Reviewer's Report

1. The manuscript addresses a relevant topic in financial forecasting; however, the novelty should be better emphasized. Clearly explain how this work differs from previous cryptocurrency forecasting studies beyond using the AAVE dataset.
2. The dataset contains only 275 observations, which is relatively small for training deep learning models such as LSTM. Discuss how the limited dataset size may affect model generalization and reliability.
3. The experimental design should include time-series cross-validation (e.g., rolling or walk-forward validation) instead of relying solely on a single 80:20 train-test split.
4. The feature set is limited to OHLCV and Market Capitalization. Consider incorporating technical indicators (RSI, MACD, Bollinger Bands, Moving Averages), sentiment analysis, or macroeconomic variables to improve prediction performance.
5. Hyperparameter tuning methodology is not described. Explain whether Grid Search, Random Search, Bayesian Optimization, or another optimization technique was used.
6. The paper should report additional statistical validation (e.g., confidence intervals, paired significance tests, or Diebold–Mariano test) to determine whether performance differences among models are statistically significant.
7. The study would benefit from comparisons with traditional time-series forecasting methods such as ARIMA, SARIMA, Prophet, or Transformer-based architectures.
8. Include feature importance analysis (e.g., SHAP values or permutation importance) to improve model interpretability, particularly for Random Forest and XGBoost.
9. Computational complexity, training time, and inference time of each model should be reported to evaluate practical deployment.
10. The discussion should better explain why Random Forest outperformed LSTM despite LSTM's theoretical advantages for sequential data.

11. Minor Comments
12. The abstract should briefly mention the dataset source and experimental limitations.

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13. Add a correlation heatmap and descriptive statistics of the dataset to improve data understanding.
14. Include plots comparing actual versus predicted prices for each model.
15. Present residual error analysis to identify prediction bias and model stability.
16. Figure 1 (workflow) should contain more implementation details and improve readability.
17. Mathematical equations require consistent formatting and notation throughout the manuscript.
18. Explain the rationale for selecting the specific hyperparameter values used for each model.
19. Several recent studies (2024–2026) on cryptocurrency forecasting using Transformers, Temporal Fusion Transformers, and hybrid deep learning models should be cited.
20. Improve the English language and eliminate minor grammatical inconsistencies throughout the manuscript.
21. Ensure consistency between the Abstract and Results. The abstract states that LSTM achieved the best performance, whereas the Results and Conclusion indicate that Random Forest achieved the best overall performance. This inconsistency must be corrected.

Recommendation

Major Revision

22. The manuscript addresses an important application of machine learning in cryptocurrency forecasting and provides a useful comparison of several regression models. However, improvements are needed in methodological rigor, experimental validation, feature engineering, statistical analysis, and consistency of reported results before the work is suitable for publication.