

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.....

Accept after major revision✓.....

Do not accept (*Reasons below*)

Rating	Excel.	Good	Fair	Poor
Originality		✓		
Techn. Quality	✓			
Clarity		✓		
Significance		✓		

Reviewer's ID: JPR- **098**

Detailed Reviewer's Report

Decision: Accept after Major Revision

The manuscript presents a **comparative study of machine learning and deep learning models** (Linear Regression, SVR, Random Forest, XGBoost, and LSTM) for **AAVE cryptocurrency price forecasting** using historical market data. The models are evaluated using MAE, RMSE, MAPE, R^2 , and directional accuracy to identify the most suitable forecasting approach.

Strengths:

- Addresses a relevant topic in **cryptocurrency price prediction and financial forecasting**.
- Compares several widely used machine learning and deep learning models under the same experimental setup.
- Uses multiple evaluation metrics (MAE, RMSE, MAPE, R^2 , and Directional Accuracy) for performance assessment.
- The methodology is clearly organized, including preprocessing, feature selection, model development, and evaluation.
- The discussion appropriately recognizes the limitations of deep learning on small datasets.

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Major Issues:

- The dataset contains only **275 observations**, which is insufficient for robust training and evaluation, particularly for LSTM models.
- **A critical inconsistency exists between the Abstract and Results.** The Abstract claims that **LSTM achieved the best performance (RMSE = 2.74, $R^2 = 0.965$)**, whereas the Results section concludes that **Random Forest achieved the best performance (RMSE = 44.85, $R^2 = 0.808$)**. These contradictory findings must be resolved.
- The feature set includes the **current day's Close price** while predicting the **next day's Close price**, raising concerns about data leakage and unrealistic forecasting assumptions.
- No statistical significance tests, cross-validation, rolling-window validation, or confidence intervals are provided.
- Comparisons with modern forecasting approaches such as **Transformers, Temporal Fusion Transformer (TFT), N-BEATS, or Informer** are absent.
- The study evaluates only one cryptocurrency (AAVE), limiting the generalizability of the conclusions.
- Hyperparameter optimization methodology is not described, making the experiments difficult to reproduce.

Minor Issues:

- Several mathematical equations are incompletely formatted or missing proper notation.
- Numerous grammatical and formatting inconsistencies require proofreading.
- Some figures and tables require clearer captions and interpretation.
- Directional Accuracy values are close across models, but their practical significance is not discussed.
- The literature review could include more recent studies (2024–2026) on transformer-based financial forecasting.

Final Comment:

The manuscript addresses an important problem in cryptocurrency forecasting and provides a useful comparison of several machine learning models.

International Journal of Advanced Research

Publisher's Name: Jana Publication and Research LLP

www.journalijar.com

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However, the **major inconsistency between the Abstract and experimental results**, the small dataset, potential data leakage, and limited experimental validation substantially weaken the scientific contribution. Addressing these concerns through rigorous validation, corrected reporting, and broader benchmarking is essential before publication.