

ABSTRACT

APPLICATION OF THE HYBRID VECTOR AUTOREGRESSIVE INTEGRATED MOVING AVERAGE (VARIMA) – TEMPORAL CONVOLUTIONAL NETWORK (TCN) MODEL IN FORECASTING THE STOCKS OF PT MERCK TBK AND PT KALBE FARMA TBK

By

Ariz Fadilah Tanjung

Forecasting in stock investment plays a crucial role in understanding market trends, determining optimal transaction timing, and supporting more rational, data-driven investment decisions. The *hybrid* VARIMA–TCN model combines the strengths of linear and nonlinear approaches in time series forecasting, where VARIMA captures linear dependencies while TCN learns the nonlinear patterns from VARIMA residuals. Two *hybrid* variants are applied: VARIMA–E_TCN, which only utilizes residuals, and VARIMA–EP_TCN, which combines residuals with VARIMA predictions as input features. This *hybrid* approach enhances the model's ability to represent the complex dynamics of stock prices and improves forecasting accuracy. The study analyzes MERK and KLBF stock data from November 2020 to December 2025 using RMSE, MAPE, and accuracy as evaluation metrics. The results indicate that the *hybrid* models consistently outperform VARIMA and TCN models, with VARIMA–EP_TCN demonstrating the best performance across all three metrics. The Kolmogorov–Smirnov (KS) test for *goodness of fit* also confirms that the *hybrid* model better aligns with the data distribution. Overall, VARIMA–EP_TCN exhibits superior forecasting performance by effectively combining linear and nonlinear learning mechanisms.

Keywords : Forecasting, Stock Investment, Hybrid Model, Vector Autoregressive Integrated Moving Average (VARIMA), Temporal Convolutional Network (TCN), Time Series.

**PENERAPAN MODEL *HYBRID VECTOR AUTOREGRESSIVE
INTEGRATED MOVING AVERAGE (VARIMA) – TEMPORAL
CONVOLUTIONAL NETWORK (TCN)* DALAM PERAMALAN
SAHAM PT MERCK TBK DAN PT KALBE FARMA TBK**

Skripsi

Oleh

**ARIZ FADILAH TANJUNG
NPM. 2117031074**



**FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
UNIVERSITAS LAMPUNG
BANDAR LAMPUNG**

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