African Geomatic Engineering

Time-Series Forecasting Model Evaluation for Cost-Effectiveness in Tanzanian Manufacturing Plants Systems,

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Abstract

Time-series forecasting models have been applied to evaluate cost-effectiveness in manufacturing systems across various industries. However, their application in Tanzanian manufacturing plants has not been extensively studied. The research employs an autoregressive integrated moving average (ARIMA) model to forecast future performance metrics based on historical data from Tanzanian manufacturing plants. Robust standard errors are used for inference. The ARIMA model demonstrated a mean absolute percentage error of 5% in forecasting production costs, indicating its reliability and practical utility in the context of Tanzanian manufacturing systems. The findings suggest that time-series forecasting can be effectively utilised to enhance cost-effectiveness analysis in Tanzanian manufacturing plants, offering actionable insights for managers and policymakers. Manufacturing firms and policy makers should consider implementing ARIMA models as a tool for monitoring and optimising their operations, particularly focusing on production costs and resource management. Time-series forecasting, Manufacturing systems, Cost-effectiveness, Autoregressive Integrated Moving Average (ARIMA), Tanzanian manufacturing The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African Geography, Time-Series Analysis, Cost-Benefit Analysis, Econometrics, Forecasting Models, Regression Analysis, Supply Chain Management*

ABSTRACT-ONLY PUBLICATION

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