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

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Abstract

The study evaluates time-series forecasting models in Tanzanian manufacturing plants to assess their cost-effectiveness in the Agriculture sector. The study employs ARIMA (Autoregressive Integrated Moving Average) as the primary statistical model to forecast cost variables such as production expenses and revenue over time. Uncertainty is quantified using robust standard errors, ensuring reliable predictions within a confidence interval of 95%. An empirical analysis showed that the ARIMA model outperformed other models in forecasting costs with an accuracy rate of up to 80%, indicating significant cost savings and operational efficiency improvements in Tanzanian agricultural manufacturing systems. The findings suggest that adopting the ARIMA model for cost forecasting can lead to substantial financial benefits by reducing uncertainties and improving decision-making processes within Tanzanian agricultural manufacturing environments. Manufacturing plants are encouraged to implement the ARIMA model for ongoing cost forecasting, thereby enhancing their productivity and profitability in Tanzania's Agricultural sector. Additionally, further research should be conducted on integrating machine learning techniques into time-series forecasting models for even greater accuracy. The empirical specification follows $Y = \vec{\beta}_{0+\beta} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African agricultural practices, econometrics, forecasting models, linear regression, time-series analysis, ARIMA, stochastic processes*

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