Time-Series Forecasting Model Replication in Municipal Infrastructure Assets Systems of Tanzania,

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Abstract

This study replicates a time-series forecasting model previously applied to municipal infrastructure assets systems in Tanzania. A time-series forecasting model was replicated using a state-space approach, incorporating robust standard errors for uncertainty quantification. The model demonstrated an R² of 0.82 in predicting municipal infrastructure asset performance over the period studied, indicating strong explanatory power. The replication study confirms the original findings and offers methodological enhancements applicable to similar systems worldwide. Future research should explore additional variables for a more comprehensive model and consider different forecasting horizons. The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, econometrics, forecasting, stochastic, Kalman filter, state-space, evaluation*

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