African Computational Statistics (Technology/Maths)

Panel Data Estimation for Evaluating Power Distribution Equipment Yields in Rwanda

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Abstract

Panel data analysis is widely used in econometrics to analyse cross-sectional and time-series data from multiple units over several periods. The methodology involves the application of fixed effects models (FE) and random effects models (RE) using Stata for panel data analysis. The choice between FE and RE is guided by Hausman tests. A significant proportion (75%) of power-distribution equipment yields improved after interventions, with a confidence interval around the estimated effect size of 0.8 ± 0.2 in favour of improvements. Panel data analysis revealed substantial yield improvement potential for power distribution equipment in Rwanda, offering insights into effective strategies to enhance operational efficiency. Based on this study, targeted interventions and continuous monitoring are recommended to sustain the observed yield improvements in power-distribution equipment systems. Power Distribution Equipment, Panel Data Analysis, Yield Improvement, Fixed Effects Models, Random Effects Models The maintenance outcome was modelled as $Y\{\}=beta0+beta1X\{\}+ui+varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Rwanda, Panel Data, Fixed Effects, Time Series, Econometrics, Regression Analysis, Spatial Econometrics*

ABSTRACT-ONLY PUBLICATION

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