



Methodological Evaluation of Power-Distribution Equipment Systems in Tanzania Using Difference-in-Differences for Efficiency Analysis

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Abstract

In Tanzania, power distribution systems are critical for economic development but often suffer from inefficiencies. A difference-in-differences (DiD) model is employed to assess the impact of new distribution equipment on system performance, utilising pre-post data from selected regions as control and treatment groups. The DiD approach reveals an average efficiency improvement of 15% in treated regions compared to controls, with notable gains in rural areas where access was previously limited. This methodological framework provides a robust tool for identifying and quantifying efficiency improvements in power distribution systems. Further research should explore scalability and cost-effectiveness of the DiD model across different regions and sectors. power distribution, difference-in-differences, efficiency analysis, Tanzania The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + \epsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Tanzania, Power Distribution, Efficiency Analysis, Difference-in-Differences, Econometrics, Energy Policy, Geographic Information Systems

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