



Power-Distribution Equipment Efficiency Assessment in Ghana Using Difference-in-Differences Methodology

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Abstract

Power distribution equipment (PDE) in Ghana faces challenges related to inefficiencies that hinder optimal energy delivery and utilization. A difference-in-differences (DiD) econometric model was employed to evaluate changes in PDE performance over time within selected regions versus control areas. The DiD approach accounts for inherent variation and assesses the impact of policy interventions or technological upgrades on efficiency levels. The analysis revealed a significant increase in PDE operational efficiency by approximately 15% in treated regions compared to controls, with a robust standard error of ± 2.3 percentage points. The DiD model successfully highlighted improvements in PDE performance, providing empirical evidence for the effectiveness of certain interventions in enhancing efficiency. Policies and investments should be directed towards implementing similar technological upgrades and monitoring mechanisms to sustain these gains in efficiency. power distribution equipment, difference-in-differences, efficiency gain assessment, Ghanaian context 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: Ghana, Power-Distribution Equipment, Efficiency Assessment, Difference-In-Differences, Econometrics, Energy Delivery, Methodological Evaluation

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