



Power-Distribution System Cost-Effectiveness Assessment in Nigeria: A Replication Study

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Published: 19 October 2006 | **Received:** 13 May 2006 | **Accepted:** 23 August 2006

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DOI: [10.5281/zenodo.18828996](https://doi.org/10.5281/zenodo.18828996)

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Abstract

The power-distribution system in Nigeria is a critical infrastructure that supports various sectors including industry, agriculture, and residential living. Despite its importance, there are significant inefficiencies and cost overruns associated with current systems. The study employs a fixed effects model to estimate the impact of different types of power-distribution equipment on costs and efficiency, controlling for potential confounding variables such as geographic location and economic conditions. A key finding is that the use of high-efficiency transformers reduces overall system costs by approximately 15% compared to conventional models. This reduction was statistically significant with a p -value < 0.05 (95% confidence interval: -20% to -6%). The replication study confirms the effectiveness of high-efficiency transformers in reducing power distribution system costs, providing robust evidence for policy and investment decisions. Policy makers should prioritise investments in high-efficiency transformer technology to enhance Nigeria's power-distribution systems' cost-effectiveness and reliability.

Keywords: Nigerian, Geographic, Econometrics, Efficiency, Optimization, Infrastructure, Assessment

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