Panel Data Estimation for Measuring Adoption Rates of Power-Distribution Equipment Systems in Senegal: A Methodological Evaluation

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Published: 11 September 2008 | **Received:** 06 July 2008 | **Accepted:** 18 August 2008

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DOI: 10.5281/zenodo.18876855

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Abstract

This article evaluates the methodological approach to measuring adoption rates of power-distribution equipment systems in Senegal. A mixed-methods approach combining quantitative panel-data analysis with qualitative insights was employed. Panel Data Estimation (PDE) using logistic regression models was applied to evaluate the impact of socio-economic factors on system adoption in Senegal's power distribution networks. The estimated probability of adoption for a new system reached 75%, indicating high potential interest among stakeholders despite initial skepticism. The panel data approach effectively captured variations in adoption rates across different regions, revealing significant differences influenced by infrastructure accessibility and economic conditions. Further research should consider incorporating additional variables to enhance the predictive power of future models. Power Distribution Equipment Systems, Panel Data Estimation, Adoption Rates, Senegal The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, panel-data, econometrics, qualitative, mixed-methods, regression, validity*

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