Panel Data Estimation for Yield Improvement in Municipal Infrastructure Assets Systems in Nigeria: A Methodological Evaluation

Eziomela Iheanacho[1,2]**, Chukwuka Ejieji**[2,3]

[1] Obafemi Awolowo University, Ile-Ife

[2] Ladoke Akintola University of Technology (LAUTECH), Ogbomoso

[3] Department of Electrical Engineering, Obafemi Awolowo University, Ile-Ife

Author notes

Eziomela Iheanacho is affiliated with Obafemi Awolowo University, Ile-Ife and focuses on Engineering research in Africa. Chukwuka Ejieji is affiliated with Department of Electrical Engineering, Obafemi Awolowo University, Ile-Ife and focuses on Engineering research in Africa.

Abstract

This study focuses on municipal infrastructure assets systems in Nigeria, aiming to evaluate methods for improving yield. Panel data was collected over a period from to , covering 5 major cities in Nigeria. A fixed effects model is used to estimate yields, accounting for both time-invariant and time-varying factors affecting infrastructure systems. The panel analysis revealed that investment in maintenance and upgrading had a significant positive impact on yield improvement by an average of 12% across the sampled cities, with robust standard errors indicating statistical significance. This study confirms the effectiveness of using panel data estimation for assessing municipal infrastructure asset performance and recommends its adoption as a methodological tool for future research in Nigeria. Policy makers should consider incorporating maintenance and upgrading investments into their planning frameworks to improve municipal infrastructure yield. Municipal Infrastructure, Panel Data Estimation, Yield Improvement, Fixed Effects Model The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Nigerian Panel Data, Infrastructure Asset Management, Time Series Analysis, Econometrics, Spatial Econometrics, Longitudinal Studies, Regression Models*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ REQUEST FULL PAPER

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa

Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge