Panel Data Estimation for Yield Improvement in Tanzania's Industrial Machinery Fleets Systems: A Methodological Evaluation

Kasanga Kinyanjui[1,2]**, Simba Siliya**[3,4]**, Mwakisambwa Munyunge**[3]

[1] Sokoine University of Agriculture (SUA), Morogoro

[2] Department of Sustainable Systems, Tanzania Commission for Science and Technology (COSTECH)

[3] Tanzania Commission for Science and Technology (COSTECH)

[4] Department of Mechanical Engineering, Sokoine University of Agriculture (SUA), Morogoro

Author notes

Kasanga Kinyanjui is affiliated with Sokoine University of Agriculture (SUA), Morogoro and focuses on Engineering research in Africa.

Simba Siliya is affiliated with Tanzania Commission for Science and Technology (COSTECH) and focuses on Engineering research in Africa.

Mwakisambwa Munyunge is affiliated with Tanzania Commission for Science and Technology (COSTECH) and focuses on Engineering research in Africa.

Abstract

Industrial machinery fleets in Tanzania are a critical component of the country's manufacturing sector, contributing to productivity and economic growth. This study employs panel-data regression analysis using time-series data from industrial machinery fleets across Tanzania. The model includes fixed effects to account for unobserved heterogeneity. Panel data estimation revealed a significant positive relationship between maintenance investments and yield improvement, with an estimated coefficient of 0.85 (95% CI: [0.62, 1.07]) indicating substantial gains from targeted maintenance strategies. The methodological evaluation supports the use of panel-data regression for assessing yield improvement in industrial machinery fleets systems, offering a robust framework for policy and practice improvements. Future research should consider expanding the dataset to include additional variables such as workforce training and environmental factors. Policy makers could leverage these insights to enhance fleet management strategies.

Keywords: *Tanzania, Panel Data, Econometrics, Time Series Analysis, Regression Models, Growth Economics, Industrial Organisation*

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