Methodological Evaluation of Industrial Machinery Fleets in Uganda Using Multilevel Regression Analysis to Measure Adoption Rates

Kabaseezi Akello[1,2]**, Ochieng Oryema**[3,4]**, Tumwaffe Muhumuza**[3,5]**, Ssemakonya Mukasa**[4]

[1] Department of Electrical Engineering, Makerere University, Kampala

[2] Department of Sustainable Systems, Medical Research Council (MRC)/UVRI and LSHTM Uganda Research Unit

[3] Makerere University, Kampala

[4] Uganda Christian University, Mukono

[5] Department of Electrical Engineering, Medical Research Council (MRC)/UVRI and LSHTM Uganda Research Unit

Author notes

Kabaseezi Akello is affiliated with Department of Electrical Engineering, Makerere University, Kampala and focuses on Engineering research in Africa.
Ochieng Oryema is affiliated with Makerere University, Kampala and focuses on Engineering research in Africa.
Tumwaffe Muhumuza is affiliated with Makerere University, Kampala and focuses on Engineering research in Africa.
Ssemakonya Mukasa is affiliated with Uganda Christian University, Mukono and focuses on Engineering research in Africa.

Abstract

Industrial machinery fleets play a crucial role in various sectors of Uganda's economy, particularly agriculture and manufacturing. A mixed-method approach was employed to collect data from multiple sources including surveys and field observations. Multilevel regression analysis was used to account for both within-fleet variation and fleet differences. The multilevel regression model revealed that the adoption rate of industrial machinery varied significantly by region, with a coefficient estimate indicating an average increase in adoption rate of 5% per year over three years. This study provides robust evidence for understanding and predicting the adoption trends of industrial machinery in Uganda. Further research should focus on identifying specific factors that influence adoption rates to inform policy interventions aimed at enhancing machine utilization and economic performance. multilevel regression, industrial machinery adoption, Uganda, manufacturing sector The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

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