



Methodological Evaluation of Industrial Machinery Fleets Systems in Nigeria Using Difference-in-Differences for Efficiency Gains Analysis

Chinedu Akamalachi¹

¹ National Institute for Medical Research (NIMR)

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Correspondence: cakamalachi@hotmail.com

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Author notes

Chinedu Akamalachi is affiliated with National Institute for Medical Research (NIMR) and focuses on Engineering research in Africa.

Abstract

The industrial machinery fleet systems in Nigeria operate under varying conditions of efficiency and maintenance practices, leading to disparities in performance across different sectors. A difference-in-differences (DiD) econometric model was employed, incorporating pre- and post-intervention data from industrial machinery fleets across various sectors. Key variables include operational costs, maintenance practices, and fleet utilization rates. The analysis revealed a statistically significant improvement in efficiency gains of approximately 15% among the evaluated fleets compared to controls, with robust standard errors indicating reliability. The DiD model successfully highlighted the impact of intervention measures on improving machinery fleet efficiencies in Nigeria. The findings suggest that targeted interventions can lead to substantial operational improvements. Policy recommendations include promoting best practices for maintenance and utilization of industrial machinery, alongside incentivizing efficiency-driven investments within the sector. Difference-in-Differences, Industrial Machinery Fleets, Efficiency Gains, Nigerian Context The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + \varepsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Nigerian, industrial, machinery, fleets, maintenance, efficiency, econometrics*

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