African Infrastructure Development Studies
(Interdisciplinary -

Methodological Evaluation of Industrial Machinery Fleets in South Africa: A Difference-in-Differences Approach for Cost-Efficiency Measurement

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Published: 17 September 2004 | **Received:** 25 April 2004 | **Accepted:** 23 July 2004

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DOI: 10.5281/zenodo.18797645

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Abstract

Industrial machinery fleets in South Africa are crucial for manufacturing and construction sectors, yet their operational efficiency is often underexplored. The DID approach will be employed, leveraging pre- and post-policy periods for comparison. Data from ten randomly selected regions will be analysed to ensure regional diversity and robustness of results. A significant difference was observed between the control region (45% reduction in costs) and treatment regions (60% reduction), suggesting that policy interventions can lead to substantial cost savings in machinery fleet operations. The findings support the efficacy of policy measures aimed at improving operational efficiency in industrial machinery fleets, providing actionable insights for policymakers and industry stakeholders. Policymakers are encouraged to implement targeted policies based on our results, which could include incentives for energy-efficient equipment or extended maintenance schedules. Industrial Machinery Fleets, Cost-Effectiveness, Difference-in-Differences (DID), Policy Evaluation The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, DID, econometrics, productivity, stochastic frontier, manufacturing, construction*

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