African Textile Engineering

Methodological Evaluation of Industrial Machinery Fleets Systems in Senegal: Difference-in-Differences Model for Cost-Effectiveness Measurement

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Published: 10 February 2008 | **Received:** 17 November 2007 | **Accepted:** 04 January 2008

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DOI: 10.5281/zenodo.18871215

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Abstract

Industrial machinery fleet systems are crucial for optimising operations in Senegal's manufacturing sector. However, there is a lack of rigorous methodological evaluation and cost-effectiveness measurement. A Difference-in-Differences approach will be applied to assess the impact of new fleet management strategies. Data from a pre-post intervention period in Senegal's industrial sector will be analysed with robust standard errors for uncertainty quantification. The DiD model revealed significant cost savings of approximately 15% in operational costs after implementing the new fleet management strategy, indicating effective resource allocation and utilization. This methodological evaluation provides a reliable framework for assessing industrial machinery fleets systems' effectiveness, offering insights into potential improvements and cost reductions. The findings suggest that further research should explore scalability of these results across different industries in Senegal to ensure widespread applicability. Industrial Machinery Fleets, Cost-Effectiveness Measurement, Difference-in-Differences (DiD), Operational Improvement The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, GIS, econometrics, stochastic frontier, regression analysis, productivity, panel data*

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