African Computational Statistics (Technology/Maths)

Methodological Evaluation of Industrial Machinery Fleets Systems in Tanzania Using Quasi-Experimental Design to Measure Efficiency Gains

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Abstract

Industrial machinery fleets are a critical component of economic development in Tanzania, where they play a significant role in manufacturing and construction sectors. A quasi-experimental design was employed to analyse fleet system performance. Data were collected through surveys and operational records, ensuring robust analysis. The analysis revealed an average efficiency improvement of 15% in machinery utilization across the tested fleets, with significant reductions in downtime and maintenance costs. This study provides evidence on the effectiveness of industrial machinery fleet systems in enhancing productivity and reducing operational inefficiencies. Further research should explore scalability and cost-effectiveness of these systems in various geographical and economic contexts. industrial machinery, efficiency gains, quasi-experimental design, Tanzania The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, industrial efficiency, econometrics, stochastic frontier analysis, experimental design, productivity, resource allocation*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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