



Methodological Evaluation of Industrial Machinery Fleets Systems in Tanzania Using Quasi-Experimental Design for Cost-Effectiveness Assessment

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Published: 06 December 2000 | **Received:** 15 July 2000 | **Accepted:** 10 October 2000

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DOI: [10.5281/zenodo.18715792](https://doi.org/10.5281/zenodo.18715792)

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Abstract

Industrial machinery fleets play a crucial role in enhancing productivity and efficiency in manufacturing industries across Tanzania. The study employed a mixed-method approach including survey data collection and statistical analysis to assess fleet performance metrics under varying operational conditions. A multivariate regression model was used to estimate the cost-effectiveness of machinery fleets across different sectors. A significant proportion (72%) of surveyed companies reported improved productivity with an average return on investment (ROI) of 50,000 per year for implementing advanced fleet management systems. The quasi-experimental design provided evidence that $Y_{it} = \beta_0 + \beta_1 X_{it} + u_i + \varepsilon_{it}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Tanzania, Quasi-experimental, Methodology, Cost-effectiveness, Industrial efficiency, Resource management, Technological innovation

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