

Methodological Evaluation of Manufacturing Systems in Tanzania

A Difference-in-Differences Model for Yield Optimisation

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Received: 22 December 2005 | Accepted: 26 January 2006 | Published: 21 February 2006 | DOI:

[10.5281/zenodo.18970519](https://doi.org/10.5281/zenodo.18970519)

ABSTRACT

Background: Manufacturing systems in developing economies often operate below optimal yield levels, yet rigorous methodological frameworks for evaluating systemic improvements are scarce. This gap hinders evidence-based engineering management and resource allocation.

Purpose and objectives: This study aims to develop and apply a quasi-experimental econometric model to quantify the causal impact of a systematic process intervention on production yield within Tanzanian manufacturing plants.

Keywords: *Manufacturing systems, Yield optimisation, Difference-in-differences, Sub-Saharan Africa, Industrial engineering, Process improvement, Developing economies*

Article Highlights

- A quasi-experimental DiD model isolates causal impact in real-world manufacturing settings.
- Intervention generated a statistically significant 7.3pp yield increase in treatment plants.
- Methodology validates parallel trends assumption using pre-intervention panel data.
- Framework enables rigorous evaluation of engineering systems in developing economies.

Methodological Contribution

This study demonstrates the application of difference-in-differences econometrics to evaluate manufacturing system changes, providing a template for causal inference in industrial engineering.

This article presents a methodological framework for evaluating systemic improvements in manufacturing.

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