



Methodological Evaluation of Manufacturing Systems Reliability in Kenyan Plants Using Difference-in-Differences Approach

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Abstract

Recent studies have highlighted the importance of manufacturing systems' reliability in Kenyan agriculture. However, methodological challenges persist in accurately assessing system performance. A replication study employing the DiD model to analyse changes in manufacturing plant systems' reliability over time. The study uses data from two distinct periods: pre-intervention and post-intervention phases. The findings suggest a significant improvement ($p < 0.05$) in system reliability post-intervention, indicating that the DiD approach is effective for measuring such improvements in Kenyan agricultural contexts. This replication study validates the use of DiD for assessing manufacturing systems' reliability and recommends its application to further research in agriculture. Further studies should explore potential factors influencing system reliability changes, especially those related to technological advancements or policy interventions. Difference-in-Differences, Manufacturing Systems, Reliability, Agricultural Sector, Kenyan Context The empirical specification follows $Y = \beta_{0+\beta}^{\vec{p}} X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Kenya, Manufacturing Systems, Reliability Analysis, Methodology, Difference-in-Differences, Econometrics, Supply Chain Management

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