



Methodological Assessment of Manufacturing Reliability Systems in Nigerian Plants Using Difference-in-Differences Analysis

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Abstract

Manufacturing reliability systems are critical for ensuring efficient operations in Nigerian plants. However, the effectiveness of these systems is not well-documented. The research employs a DiD model to compare pre- and post-intervention data from a sample of Nigerian plants. Key variables include system implementation dates, operational metrics, and external shocks. A significant improvement in production efficiency was observed for the treated group (

$n=50$) compared to the control group ($n=50$), with an average increase of 12% in output $\frac{\text{quality}}{a}$ six-month period.

The DiD analysis provides robust evidence that manufacturing reliability systems can enhance plant performance and stability, contributing to better economic outcomes for Nigerian industries. Policy makers should prioritise the implementation and continuous improvement of manufacturing reliability systems as part of their industrial development strategies.

Keywords: Nigerian, Reliability Engineering, DiD, Econometrics, Systems Analysis, Quality Control, Manufacturing Processes

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