



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

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Abstract

Manufacturing systems in Nigerian plants are critical for economic development but often face reliability challenges. A DiD model will be utilised to measure the impact of interventions on system reliability, employing data from a sample of Nigerian manufacturing facilities. The DiD method suggests an improvement in system reliability by 25% after implementing quality control measures across selected plants. The findings indicate that systematic improvements can enhance manufacturing system reliability in Nigerian settings. Further studies should explore broader impacts and potential scalability of the DiD methodology for other sectors. Difference-in-Differences, Manufacturing System Reliability, Nigerian Plants The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + \varepsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Nigerian, Manufacturing, Reliability, Methodology, DiD, Econometrics, Systems Engineering

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