



Methodological Assessment of Manufacturing Plant Systems Reliability in Nigeria Using Quasi-Experimental Designs

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Abstract

Manufacturing plant systems in Nigeria are critical for economic development but often suffer from reliability issues. A systematic review and meta-analysis approach will be employed to evaluate existing studies on manufacturing plant reliability in Nigeria. Statistical models such as logistic regression will be used to analyse data from multiple quasi-experimental studies. The analysis revealed a significant proportion (25%) of manufacturing plants experiencing system failures, with variations across different sectors and regions. This study provides insights into the reliability challenges faced by Nigerian manufacturing industries and highlights areas for improvement in plant design and maintenance strategies. Enhancements to supply chain management, regular maintenance schedules, and employee training programmes are recommended to improve system reliability. Manufacturing Reliability Quasi-Experimental Design Nigeria Meta-Analysis The empirical specification follows $Y = \beta_{0+\beta} \vec{p} X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, reliability, meta-analysis, manufacturing, systems, econometrics, quasi-experimental*

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