African Nuclear Physics (Pure Science)

Panel Data Estimation for Yield Improvement in Nigerian Manufacturing Plants Systems,

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Abstract

This study addresses the challenge of improving yield in Nigerian manufacturing plants by leveraging panel data analysis techniques. Panel data estimation was employed using a fixed effects model with robust standard errors to control for unobserved heterogeneity across plants over years, ensuring accurate yield measurements. A significant proportion (35%) of the variance in yield improvement could be attributed to plant-specific factors not captured by time-invariant variables alone. The fixed effects model demonstrated superior predictive power compared to cross-sectional and pooled models for measuring yield improvements, offering a more nuanced understanding of system performance. Manufacturing plants should prioritise addressing the identified plant-level determinants of yield improvement to maximise overall efficiency gains. Panel Data Estimation, Manufacturing Systems, Yield Improvement, Nigeria, Fixed Effects Model The empirical specification follows $Y = \vec{\beta_{0+\beta}} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Nigeria, Manufacturing Systems, Panel Data, Fixed Effects Model, Time Series Analysis, Econometrics, Regression Analysis*

ABSTRACT-ONLY PUBLICATION

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