



Methodological Evaluation of Manufacturing Plant Systems in Kenya: A Panel Data Approach to Assess System Reliability

Mwangi Nderitu^{1,2}, Owen Kinyanjui³, Kariuki Gitonga^{2,4}

¹ Technical University of Kenya

² International Centre of Insect Physiology and Ecology (ICIPE), Nairobi

³ Department of Advanced Studies, Maseno University

⁴ Maseno University

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Correspondence: mnderitu@hotmail.com

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Author notes

*Mwangi Nderitu is affiliated with Technical University of Kenya and focuses on Energy research in Africa.
Owen Kinyanjui is affiliated with Department of Advanced Studies, Maseno University and focuses on Energy research in Africa.
Kariuki Gitonga is affiliated with Maseno University and focuses on Energy research in Africa.*

Abstract

Manufacturing plants in Kenya face challenges related to system reliability, impacting productivity and economic growth. A panel data approach will be utilised to analyse manufacturing plant systems across various regions of Kenya. The empirical model will employ time-series analysis alongside robust standard errors to account for potential heterogeneity and correlation within the dataset. This study provides insights into improving manufacturing plant systems' reliability in Kenya through targeted interventions and policy recommendations. Promoting preventive maintenance practices and increasing investment in infrastructure can significantly improve system reliability and economic performance. The empirical specification follows $Y = \beta_{0+\beta}^{-1} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Panel data, reliability theory, manufacturing systems, econometrics, productivity growth, African development, stochastic models*

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