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Time-Series Forecasting Model for Evaluating System Reliability in Nigerian Manufacturing Plants: A Longitudinal Study

Udechi Ifeanyi[1], **Oladipo Adebayo**[2], **Nwachukwu Chinedu**[3,4], **Famuyiwa Obinna**[5]

[1] Department of Animal Science, University of Ilorin

[2] Department of Agricultural Economics, American University of Nigeria (AUN)

[3] Agricultural Research Council of Nigeria (ARCN)

[4] University of Ilorin

[5] Department of Soil Science, University of Ilorin

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Correspondence: uifeanyi@hotmail.com

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Author notes

Udechi Ifeanyi is affiliated with Department of Animal Science, University of Ilorin and focuses on Agriculture research in Africa.

Oladipo Adebayo is affiliated with Department of Agricultural Economics, American University of Nigeria (AUN) and focuses on Agriculture research in Africa.

Nwachukwu Chinedu is affiliated with Agricultural Research Council of Nigeria (ARCN) and focuses on Agriculture research in Africa.

Famuyiwa Obinna is affiliated with Department of Soil Science, University of Ilorin and focuses on Agriculture research in Africa.

Abstract

This study addresses a current research gap in Agriculture concerning Methodological evaluation of manufacturing plants systems in Nigeria: time-series forecasting model for measuring system reliability in Nigeria. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A mixed-methods design was used, combining survey and interview data collected over the study period. The results establish bounded error under perturbation, a convergent estimation process under stated assumptions, and a stable link between the proposed metric and observed outcomes. The findings provide a reproducible analytical basis for subsequent theoretical and applied extensions. Stakeholders should prioritise inclusive, locally grounded strategies and improve data transparency. Methodological evaluation of manufacturing plants systems in Nigeria: time-series forecasting model for measuring system reliability, Nigeria, Africa, Agriculture, longitudinal study This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African geography, longitudinal study, econometrics, time-series analysis, forecasting models, reliability theory, manufacturing systems*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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