African Applied Mathematics (Pure Science)

Stability Analysis and Convergence Proofs in Time-Series Econometrics for Power-Grid Forecasting in Nigeria: A Methodological Approach

Ayodeji Adeyemoṣẹ[1,2], **Femi Ogunleyorun**[1]

[1] Nigerian Institute of Social and Economic Research (NISER)

[2] Department of Advanced Studies, University of Ilorin

Published: 17 December 2012 | **Received:** 21 August 2012 | **Accepted:** 22 October 2012

Correspondence: aadeyemo@gmail.com

DOI: 10.5281/zenodo.18956354

Author notes

Ayodeji Adeyemoṣẹ is affiliated with Nigerian Institute of Social and Economic Research (NISER) and focuses on Mathematics research in Africa.

Femi Ogunleyorun is affiliated with Nigerian Institute of Social and Economic Research (NISER) and focuses on Mathematics research in Africa.

Abstract

Time-series econometrics is a crucial tool for forecasting power-grid behaviour in Nigeria, where accurate predictions are essential for grid stability and reliability. This paper introduces a novel approach to analyse the stability and derive convergence proofs for econometric models applied to power-grid data. We establish an assumption that all model parameters are non-negative, ensuring realistic forecasts. The analysis employs a specific error term property, which guarantees stability under certain conditions. Our findings indicate that by applying these methodologies, we can achieve more reliable and consistent predictions of power-grid behaviour over time. The developed methods provide a solid foundation for improving the accuracy and reliability of future power-grid forecasts in Nigeria. Future research should validate these models using real-world data to ensure their practical applicability. Stability Analysis, Convergence Proofs, Time-Series Econometrics, Power-Grid Forecasting The analytical core is $\{\hat{y}\}t = mathcal\{F\}(xt;\theta)$ with $\{\hat{\theta}\} = argmin_{\theta} L(\theta)$, and convergence is established under standard smoothness conditions.

Keywords: *Nigerian, Time-series, Econometrics, Stability, Convergence, ARIMA, VectorAutoregression*

ABSTRACT-ONLY PUBLICATION

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

✉ REQUEST FULL PAPER

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa

Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge