Asymptotic Analysis and Identifiability Checks in Time-Series Econometrics for Agricultural Yield Prediction in Tanzania,

Kamwiro Muhamed[1]**, Simiyu Emmanuel**[2]**, Mlimu Ali**[3]**, Sangaye Fikiri**[4,5]

[1] University of Dar es Salaam

[2] Catholic University of Health and Allied Sciences (CUHAS)

[3] Mkwawa University College of Education

[4] Department of Advanced Studies, Mkwawa University College of Education

[5] Department of Advanced Studies, Catholic University of Health and Allied Sciences (CUHAS)

Author notes

Kamwiro Muhamed is affiliated with University of Dar es Salaam and focuses on Mathematics research in Africa.
Simiyu Emmanuel is affiliated with Catholic University of Health and Allied Sciences (CUHAS) and focuses on Mathematics research in Africa.
Mlimu Ali is affiliated with Mkwawa University College of Education and focuses on Mathematics research in Africa.
Sangaye Fikiri is affiliated with Department of Advanced Studies, Mkwawa University College of Education and focuses on Mathematics research in Africa.

Abstract

This study addresses a current research gap in Mathematics concerning Time-Series Econometrics for agricultural yield prediction in Tanzania: asymptotic analysis and identifiability checks in Tanzania. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A theorem-driven mathematical framework was developed under explicit regularity assumptions, with stability and convergence analysis of the proposed estimator. The main results show stability of the proposed functional under bounded perturbations and convergence of the estimator to a well-defined limit, characterised by $R(x) = argmin_\theta L(\theta; x)$. The findings provide a reproducible analytical basis for subsequent theoretical and applied extensions. Stakeholders should prioritise inclusive, locally grounded strategies and improve data transparency. Time-Series Econometrics for agricultural yield prediction in Tanzania: asymptotic analysis and identifiability checks, Tanzania, Africa, Mathematics, theoretical This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims.

Keywords: *Sub-Saharan, Time-Series, Cointegration, Vector Autoregression (VAR), Asymptotic Distribution, Identifiability, Nonlinear Dynamics*

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