



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

Kabageni Muhire¹

¹ University of Rwanda

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Correspondence: kmuhire@gmail.com

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Author notes

Kabageni Muhire is affiliated with University of Rwanda and focuses on Mathematics research in Africa.

Abstract

Time-series econometrics is a critical tool for analysing agricultural yield data in Rwanda to understand trends and predict future yields. Asymptotic analysis will be conducted on a dataset of historical agricultural yield data in Rwanda, with identifiability checks applied to ensure model parameters are uniquely determined. The asymptotic properties indicate that the variance of forecast errors decreases as time increases, suggesting improved predictive accuracy over longer periods. The identifiability checks validate the models' ability to estimate agricultural yield trends accurately without ambiguity. Future research should explore integrating climate data into these models for enhanced predictive capabilities. The analytical core is $\hat{y}_t = \text{mathcal}\{F\}(x_t; \theta)$ with $\hat{\theta} = \text{argmin}_{\theta} L(\theta)$, and convergence is established under standard smoothness conditions.

Keywords: *African Geography, Time-Series Analysis, Econometrics, Identifiability, Asymptotic Properties, Stationarity, Forecasting Models*

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