Methodological Evaluation of Time-Series Forecasting Models for Process-Control Systems Adoption in Uganda,

Ssempa Fredrick[1,2]**, Mukasa Kizza**[1,2]**, Otombe Fredrick**[3]

[1] National Agricultural Research Organisation (NARO)

[2] Makerere University Business School (MUBS)

[3] Department of Electrical Engineering, National Agricultural Research Organisation (NARO)

Correspondence: sfredrick@hotmail.com

Author notes

Ssempa Fredrick is affiliated with National Agricultural Research Organisation (NARO) and focuses on Engineering research in Africa.

Mukasa Kizza is affiliated with National Agricultural Research Organisation (NARO) and focuses on Engineering research in Africa.

Otombe Fredrick is affiliated with Department of Electrical Engineering, National Agricultural Research Organisation (NARO) and focuses on Engineering research in Africa.

Abstract

The adoption of process-control systems in Ugandan industries has been slow due to varying levels of technical understanding and investment risks. The study employed a time-series analysis model to forecast future adoption trends based on historical data from selected industries. Robust uncertainty estimates were incorporated using bootstrapping techniques to account for model variability. A significant proportion of manufacturing firms (35%) showed an upward trend in adopting process-control systems over the next five years, with a predicted confidence interval ranging between 28% and 41%. The time-series forecasting models demonstrated reasonable accuracy in predicting adoption rates but highlighted varying levels of uncertainty across different sectors. Further research should focus on understanding factors influencing sector-specific adoptions to enhance model precision. Process-Control Systems, Time-Series Forecasting, Adoption Rates, Ugandan Industries, Engineering Applications The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, econometrics, ARIMA, intervention analysis, case study, forecasting, regression*

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