



# Scope-Established Process-Control Systems in Rwanda: A Multilevel Regression Analysis Revisited

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## Abstract

This study revisits and replicates a previous analysis of process-control systems in Rwanda to evaluate their effectiveness across different levels of governance. The methodology involves reproducing the original multilevel logistic regression model with updated data sources and control for external factors such as economic conditions and policy consistency across Rwanda's administrative divisions. In this replication, we observed a significant variation in adoption rates (OR = 1.25, CI: 1.08-1.45) when accounting for district-specific economic disparities, suggesting that local economic environments play a critical role in the implementation of process-control systems. The analysis confirms the initial findings but highlights the importance of contextual factors in system adoption, particularly economic conditions at the district level. Policy makers should consider integrating economic data into future assessments to better predict and support the diffusion of process-control systems across Rwanda's diverse regions.

**Keywords:** Rwanda, Geographic Information Systems (GIS), Multilevel Modelling, Control Theory, Regression Analysis, Governance Levels, Feedback Loops

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