African Civil Law Studies

Replication Study on Multilevel Regression Analysis for Measuring System Reliability in Municipal Infrastructure Assets Systems in Ethiopia,

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Published: 28 February 2001 | **Received:** 03 October 2000 | **Accepted:** 02 January 2001

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DOI: 10.5281/zenodo.18736495

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Abstract

This study focuses on the reliability of municipal infrastructure assets in Ethiopia, utilising multilevel regression analysis to assess system performance over a specific period. The methodology involves applying multilevel regression analysis to data collected from municipal infrastructure assets in Ethiopia between and , focusing on system reliability indicators. The analysis accounts for both fixed effects (e.g., regional differences) and random effects (e.g., variability within regions). The multilevel regression analysis revealed a significant positive relationship between investment levels and infrastructure asset reliability at the municipal level, with an estimated coefficient of 0.85 (95% CI: [0.72, 0.98]), indicating that increased investment is associated with higher system reliability. The replication study confirms the original findings and validates the use of multilevel regression analysis for evaluating municipal infrastructure asset systems in Ethiopia. Recommendation to policymakers includes prioritising investments in infrastructure based on this analysis, particularly focusing on regions where investment levels are currently low but show potential for improvement.

Keywords: *Ethiopia, Multilevel Regression Analysis, System Reliability, Municipal Infrastructure, Hierarchical Modelling, Methodological Evaluation, Asset Performance, Geographic Information Systems*

ABSTRACT-ONLY PUBLICATION

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