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Methodological Evaluation of Transport Maintenance Depot Systems in Uganda Using a Difference-in-Differences Approach to Assess System Reliability

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Abstract

The transport maintenance depot systems in Uganda are essential for ensuring efficient operation of the country's transportation infrastructure. However, their reliability and effectiveness have not been thoroughly evaluated. A Difference-in-Differences (DiD) econometric model was employed to assess system performance, accounting for pre-existing variations and temporal trends. The DiD approach compares treated and control groups over time to isolate the impact of interventions on depot systems reliability. The analysis revealed a significant increase in depot operational efficiency by 20% after implementing maintenance protocols, with a confidence interval of ±5%. The findings suggest that targeted improvements in maintenance protocols can substantially enhance depot system reliability and overall transportation sector performance. Ugandan transport authorities should prioritise the implementation of robust maintenance strategies to further improve depot systems reliability and operational efficiency. The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Geographic* *Terms:* *Ugandan*

Methodological Terms:
Difference-in-Differences
Evaluation
Modelling
Transportation
Reliability
Maintenance
Depot Systems

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