Methodological Evaluation of Transport Maintenance Depot Systems in Nigeria Using Difference-in-Differences for Efficiency Gains Analysis

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Abstract

Transport maintenance depots are critical infrastructure components in Nigeria's transportation sector, responsible for ensuring vehicle reliability and safety. A Difference-in-Differences approach was employed to analyse changes in efficiency gains between control and treatment groups over time, with robust standard errors accounting for potential confounders. The DiD analysis revealed that the implementation of new maintenance protocols led to a statistically significant increase in vehicle reliability by approximately 15% in treated regions compared to controls. The findings suggest that targeted improvements in maintenance practices can enhance depot efficiency, which is crucial for maintaining high levels of service quality and safety standards. Further research should explore the scalability of these results across other sectors within Nigeria's transportation infrastructure. Transportation Maintenance Depots, Efficiency Analysis, Difference-in-Differences (DiD), Vehicle Reliability The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

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