African Civil Law Studies

Multilevel Regression Analysis for Measuring Adoption Rates in Transport Maintenance Depot Systems: A South African Perspective

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Abstract

Transport maintenance depot systems in South Africa face variability across different regions due to varying economic conditions and infrastructure levels. A multilevel regression analysis was conducted using data from various maintenance depots. The model incorporates fixed effects for region to account for local variations. The multilevel model revealed that per capita income is a significant predictor of adoption rates, with a coefficient of -0.35 (95% CI: [-0.42, -0.28]), indicating lower adoption in areas with higher incomes. This study provides insights into the factors affecting depot system adoption and highlights the importance of socio-economic considerations in policy formulation. Policy makers should consider regional economic disparities when planning for new maintenance depots, focusing on areas with lower income levels to promote broader adoption. The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, African, Nested-Effects, Random-Effects, Structural-Equation Modelling, Hierarchical, Mixed-Methods*

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