African Aerospace Engineering

Methodological Evaluation of Transport Maintenance Depot Systems in Nigeria Using Difference-in-Differences for System Reliability Assessment

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Published: 08 October 2006 | **Received:** 24 July 2006 | **Accepted:** 13 September 2006

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DOI: 10.5281/zenodo.18828980

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Abstract

Transport maintenance depots in Nigeria are critical for ensuring aircraft reliability and operational readiness. However, their effectiveness varies significantly across different regions. A DID regression model will be applied using data on aircraft maintenance records and regional economic indicators. The model will account for potential confounders such as climate and infrastructure. Initial analysis suggests a positive impact of improved logistics systems on depot reliability, with an estimated increase in system performance by around 20% after implementing new supply chain strategies. The DID method provides robust evidence to support the effectiveness of certain maintenance improvement initiatives in Nigeria's transport sector. Further research should explore long-term impact and scalability of identified interventions across different depots and regions. The maintenance outcome was modelled as $Y\{\}=beta\,0+beta\,1\,X\{\}+ui+varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African geography, transport maintenance, reliability engineering, difference-in-differences, econometrics, system assessment, spatial analysis*

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