African Petroleum Engineering

Evaluating Process-Control Systems Adoption Rates in Uganda Using Difference-in-Differences Methodology

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Abstract

Process-control systems (PCS) are critical for optimising operations in various industries, including petroleum engineering. In Uganda, adoption rates of PCS vary significantly across different sectors and regions. A DID model was employed to analyse data from multiple sites representing different contexts within Uganda. The model accounts for pre-existing differences and potential confounding variables to isolate the effect of PCS adoption incentives on operational performance. The analysis revealed a significant increase in PCS adoption rates in regions where training programmes were implemented, indicating that targeted educational initiatives can accelerate uptake. This study contributes to the literature by offering empirical evidence on how specific interventions can enhance the diffusion of advanced technologies like process-control systems in developing countries. Based on findings, policymakers and industry leaders should prioritise collaborative training programmes as a key strategy for promoting PCS adoption across Uganda's petroleum sector. The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Ugandan, Petroleum, Methodology, Adoption, Evaluation, Difference-in-Differences, Analytics*

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