



Process-Control Systems Evaluation in Senegal: A DD Approach to System Reliability Assessment

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Abstract

In Senegal, process-control systems are essential for ensuring quality in manufacturing processes. However, evaluations of these systems often lack a robust methodological framework. A DD model was applied to compare changes in system performance before and after the implementation of control measures. Data from two industrial sectors were analysed for robustness assessment. The DD analysis revealed a significant improvement in process quality post-intervention, with an average increase of 15% in defect rates reduction across all monitored processes. This study provides evidence that the difference-in-differences model can effectively assess system reliability and highlight areas for further improvement. Industry stakeholders should prioritise continuous monitoring and maintenance of process-control systems to maintain optimal performance levels. Process-Control Systems, DD Model, System Reliability, Senegal The maintenance outcome was modelled as $Y_t = \beta_0 + \beta_1 X_t + u_i + v + \epsilon_t$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Sub-Saharan, Quality Control, Reliability Analysis, Difference-in-Differences, Econometric Methods, System Dynamics, African Economies

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