



# Methodological Evaluation of Process-Control Systems in Kenya Using Difference-in-Differences for Risk Reduction Measurement

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## Abstract

Process-control systems are critical in engineering to ensure quality and safety in manufacturing processes. A difference-in-differences (DiD) approach was used to analyse the impact of implemented process-control systems on risk reduction, comparing pre- and post-intervention periods across different sectors in Kenya. In one sector, there was an observed 20% decrease in accidents following the implementation of new control measures (95% CI: -18%, -23%). The DiD model demonstrated significant risk reduction from process-control systems, with a notable impact on accident rates. Process-control system implementations should be prioritised in high-risk sectors to further reduce accidents and improve safety. process control systems, difference-in-differences, risk reduction, engineering, Kenya The maintenance outcome was modelled as  $Y_i = \beta_0 + \beta_1 X_i + u_i + \varepsilon_i$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** Kenyan, Diff-in-Diff, Quality Control, Engineering Metrics, Econometrics, Risk Management, Process Improvement

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