

Quasi-Experimental Diagnostics of Process-Control Systems for Yield Optimisation in Kenyan Industrial Policy

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ABSTRACT

Background: Industrial policy in Kenya has increasingly emphasised advanced manufacturing, yet rigorous evaluation of the engineering process-control systems central to this ambition is lacking. Existing assessments often rely on descriptive case studies, failing to isolate the causal impact of control interventions on production yield.

Purpose and objectives: This policy analysis article aims to demonstrate the application of a quasi-experimental design for the causal diagnostic of industrial process-control systems. Its objective is to provide a methodological framework for quantifying yield improvements attributable to specific control enhancements, thereby informing evidence-based industrial policy.

Keywords: *Industrial Policy, Process-Control Systems, Quasi-Experimental Design, Sub-Saharan Africa, Yield Optimisation, Manufacturing Development*

Article Highlights

- Applies a difference-in-differences design to isolate the causal impact of process-control upgrades.
- Quantifies a significant 7.3 percentage point yield improvement from tuned PID systems.
- Identifies reduced output variance as the primary mechanism for fewer off-spec batches.
- Proposes evidence-based policy mandating causal evaluation frameworks for public support.

Core Methodology

A quasi-experimental difference-in-differences design analyses panel data from firms implementing upgraded PID control loops, using cluster-robust inference to establish causality.

This analysis provides a rigorous framework for linking engineering interventions to policy outcomes.

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