

CASE STUDY

Methodological Evaluation of Industrial Machinery Fleets in Uganda

A Difference-in-Differences Model for Adoption Rate Analysis

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ABSTRACT

Background: The modernisation of industrial machinery fleets is critical for infrastructure development and economic growth in sub-Saharan Africa. However, robust methodologies for quantifying the adoption rates of advanced equipment, such as telematics-enabled or low-emission plant, are lacking, hindering evidence-based policy and investment decisions.

Purpose and objectives: This case study aims to develop and apply a quasi-experimental econometric model to measure the causal effect of a targeted capital allowance policy on the adoption rates of modern machinery within Ugandan industrial fleets. It seeks to isolate the policy's impact from broader temporal trends.

Keywords: *Industrial machinery, Sub-Saharan Africa, Difference-in-differences, Technology adoption, Infrastructure development, Fleet management, Uganda*

Article Highlights

- Difference-in-differences model isolates causal policy effects from temporal trends.
- Policy increased adoption of targeted machinery by ~15 percentage points.
- Impact concentrated in medium-to-large firms; smaller firms showed negligible uptake.
- Provides a rigorous methodological framework for evaluating technology adoption policies.

Core Methodology

A quasi-experimental difference-in-differences model compares adoption rates between eligible (treatment) and ineligible (control) firms before and after policy introduction.

This study offers a methodological framework for causal policy evaluation in industrial engineering contexts.

ABSTRACT-ONLY PUBLICATION

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