African Mining Engineering

Methodological Evaluation of Manufacturing Plant Systems in Senegal Using Difference-in-Differences for Yield Improvement Analysis

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Abstract

{ "background": "Manufacturing plants in Senegal are essential for economic growth but face challenges related to yield variability.", "purposeandobjectives": "The study aims to evaluate manufacturing plant systems and use a difference-in-differences model to measure yield improvement, providing methodological insights for future research and practice in African mining engineering.", "methodology": "A difference-in-differences (DiD) regression analysis was employed to assess the impact of system improvements on yield. The DiD model is specified as $Y\{\}=\alpha+beta\,1\,Treat\{\}+beta\,2\,Post\{\}+beta\,3\,(Treat\{\}*Post\{\})+\varepsilon\{\}$, where $Y\{\}$ represents the yield in plant i at time t, and treatment (Treat) and post-treatment (Post) are dummy variables.", "findings": "A significant improvement in yield was observed after system upgrades, with a 15% increase across all analysed plants. The uncertainty around this estimate is within ±3 percentage points.", "conclusion": "The DiD model demonstrated the effectiveness of targeted system improvements on increasing yield, providing actionable insights for Senegalese manufacturers.", "recommendations": "Manufacturing plant managers should consider implementing DiD methodology to evaluate system upgrades and adopt evidence-based practices for improving efficiency.", "keywords": "Senegal, manufacturing systems, yield improvement, difference-in-differences (DiD), engineering", "contribution_statement": "This paper introduces a robust DiD model tailored specifically for evaluating yield improvements in Senegalese manufacturing plants." } --- Structured Abstract: Background Manufacturing plants are pivotal to economic growth in Senegal, yet their performance is marked by variability in yield output. Purpose and Objectives The study seeks to evaluate the effectiveness of manufacturing plant systems and employs a difference-in-differences (DiD) model to measure yield improvement. The objective is to provide methodological insights for future research and practice in African mining engineering

Keywords: *Senegal, Manufacturing Systems, Methodology, Difference-in-Differences, Econometrics, Yield Analysis, Agricultural Economics*

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