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Methodological Evaluation of South African Manufacturing Plants Systems: Difference-in-Differences Approach to Yield Improvement Analysis

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Abstract

Manufacturing plants in South Africa have been identified as critical sectors for economic growth but face challenges in productivity and yield improvement. A difference-in-differences approach was employed to analyse changes in plant yields pre- and post-intervention. The analysis considered control and treatment groups representing different time periods. The findings indicate a significant increase of 15% in yield for plants implementing energy-efficient measures compared to those without such interventions, with robust standard errors indicating a 95% confidence interval around the effect size. The difference-in-differences model successfully demonstrated that energy efficiency measures have a substantial positive impact on manufacturing plant yields in South Africa. Manufacturing plants are encouraged to adopt energy-efficient practices as a key strategy for yield improvement and overall productivity enhancement. South Africa, Difference-in-Differences, Manufacturing Plants, Yield Improvement, Energy Efficiency The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Geographic, Manufacturing, Yield Improvement, Methodology, Econometrics, Difference-in-Differences, Africa*

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