



Methodological Assessment of Manufacturing Systems Efficiency in Ethiopian Plants Using Difference-in-Differences Analysis

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Abstract

Manufacturing systems efficiency in Ethiopian plants have been identified as a critical area for improvement to enhance productivity and competitiveness. A Difference-in-Differences (DiD) econometric model was employed to assess changes in manufacturing system efficiencies before and after the implementation of targeted interventions. Data from a sample of Ethiopian plants were analysed using robust statistical techniques to account for potential confounding factors. The DiD analysis revealed an average increase of 15% in efficiency gains across the sampled plants, with significant improvements particularly observed in production processes and resource utilization. The implemented reforms have successfully contributed to measurable efficiency enhancements in Ethiopian manufacturing systems, supporting the effectiveness of the DiD methodology for evaluating such interventions. Policy makers are encouraged to replicate this approach across broader sectors to identify further opportunities for efficiency gains. Additionally, continuous monitoring and periodic re-evaluation of these interventions should be maintained to sustain positive outcomes. Difference-in-Differences, Ethiopian Manufacturing Systems, Efficiency Gains, DiD Analysis The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + v_i \epsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Ethiopia, Manufacturing Systems, Efficiency Gains, DiD Analysis, Econometrics, Methodology, Productivity Enhancement

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