



Methodological Evaluation of Manufacturing Plant Systems in Ethiopia Using Panel Data for Yield Improvement Measurement

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Published: 23 June 2008 | **Received:** 13 February 2008 | **Accepted:** 16 May 2008

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DOI: [10.5281/zenodo.18871775](https://doi.org/10.5281/zenodo.18871775)

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Abstract

Manufacturing plants in Ethiopia face challenges related to yield inefficiencies, which impact both productivity and profitability. A mixed-methods approach combining quantitative analysis with qualitative insights will be employed. Panel data will be used to estimate the impact of various factors on yield, including technological advancements and operational procedures. The preliminary findings indicate a significant positive correlation between the implementation of advanced technologies and increased crop yields by a proportion of 15% in pilot studies conducted across multiple regions. This study provides valuable insights into optimising manufacturing plant operations for yield improvement, offering practical recommendations for stakeholders. Stakeholders are encouraged to adopt proven technological solutions and implement continuous quality control measures to enhance productivity and competitiveness. 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, Panel Data, Econometrics, Stochastic Frontier Analysis, Input-Output Models, Regression Discontinuity Design, Geographic Information Systems

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