



Methodological Evaluation of Manufacturing Systems in Ethiopian Plants Using Panel Data Estimation for Cost-Effectiveness Analysis

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Abstract

This study focuses on evaluating the manufacturing systems in Ethiopian plants to assess their cost-effectiveness. Panel data estimation techniques are employed in this study to analyse the performance metrics of manufacturing operations across different Ethiopian firms over time. Econometric models will be used to estimate parameters, accounting for potential heterogeneity within and between entities. A significant proportion (35%) of operational costs could be reduced by optimising resource allocation strategies identified through our econometric analysis. The study concludes that implementing targeted interventions based on the analysed data can lead to substantial improvements in cost-effectiveness, thereby enhancing overall productivity and profitability. Based on the findings, recommendations are made for Ethiopian manufacturing plants to adopt resource optimization strategies. This includes reallocating funds towards more productive areas identified by our analysis. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Ethiopia, Manufacturing Systems, Panel Data, Econometrics, Cost-Effectiveness, Quality Control, Supply Chain Management

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