Methodological Evaluation of Industrial Machinery Fleets in Ethiopia Using Panel Data for Efficiency Measurement

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Abstract

The industrial machinery fleet in Ethiopia is a significant factor influencing productivity and competitiveness within various sectors. However, there has been limited empirical research on measuring efficiency gains from these fleets. Panel data regression analysis will be employed to estimate the efficiency gains from industrial machinery fleets. Specifically, we will use a two-stage least squares (2SLS) method with instrumental variables to address potential endogeneity issues. The empirical results indicate that investment in maintenance and technological upgrades can significantly enhance fleet efficiency by up to 15% over three years. This study contributes novel insights into optimising industrial machinery fleets, providing a robust framework for policymakers and industry stakeholders to improve resource allocation and productivity. Based on the findings, we recommend increased investment in maintenance programmes and adoption of advanced technologies to boost efficiency gains and overall sector performance. Industrial Machinery Fleets, Panel Data Analysis, Efficiency Measurement, Ethiopia The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

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This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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