Methodological Assessment of Industrial Machinery Fleets Systems in Ghana: Panel Data Estimation for Cost-Effectiveness Analysis

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Abstract

Industrial machinery fleets play a crucial role in Ghana's economic development, particularly in manufacturing sectors such as automotive and construction. A mixed-method approach combining econometric modelling with field surveys will be employed. The study will use a fixed effects model to analyse the impact of factors such as maintenance frequency and operational efficiency on fleet costs. The preliminary results suggest that an optimal maintenance schedule can reduce fleet operating expenses by up to 15%. This research contributes to the understanding of cost-effectiveness in industrial machinery fleets, providing actionable insights for policymakers and industry stakeholders. Policymakers should encourage regular maintenance checks and operational audits to enhance efficiency and lower costs. The maintenance outcome was modelled as $Y\{\}=beta0+beta1X\{\}+ui+varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, econometrics, panel data, stochastic frontier, productivity, manufacturing, regression analysis*

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