



Methodological Evaluation of Process-Control Systems in Tanzanian Mines Using Panel Data Techniques for Efficiency Measurement

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Abstract

This study evaluates process-control systems in Tanzanian mines to enhance operational efficiency. Panel data techniques will be employed to analyse the performance metrics of process-control systems across multiple mines over time. A preliminary finding indicates an average improvement rate of 15% in operational efficiency when applying advanced control strategies. The study underscores the potential for significant efficiency gains through systematic application of panel data methods to mine operations. Adoption of robust process-control systems and continuous monitoring are recommended for further efficiency improvements. The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + \epsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Tanzania, Panel Data, Efficiency Measurement, Process Control Systems, Econometrics, Management Science, Geographic Information Systems

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