



Methodological Assessment and Panel Data Estimation of Secondary School Systems Efficiency in Ghana: An Energy Sector Perspective

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Published: 14 May 2007 | **Received:** 01 January 2007 | **Accepted:** 10 April 2007

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DOI: [10.5281/zenodo.18845446](https://doi.org/10.5281/zenodo.18845446)

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Abstract

This study examines the efficiency of secondary school systems in Ghana within an energy sector context. A stochastic frontier production function model was employed for estimation. The model accounts for inefficiencies in school operations by incorporating technical and scale efficiencies as error terms. The estimated model reveals that the average efficiency score across schools is 70%, with significant variations among districts, suggesting room for improvement in resource utilization. This study provides insights into how energy sector inputs affect school performance, offering a framework to enhance educational outcomes and resource management. School administrators should prioritise resource allocation based on efficiency scores, while policymakers could consider incentives or penalties related to operational efficiencies. Secondary schools, panel data analysis, stochastic frontier model, Ghana, energy sector The empirical specification follows $Y = \beta_{0+\beta}^{-1} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, stochastic frontier, panel data, econometrics, productivity, education, efficiency gains*

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