



# Cost-Effectiveness Analysis of South African Secondary School Systems Using Panel Data Estimation, Context

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**Published:** 20 January 2006 | **Received:** 03 September 2005 | **Accepted:** 15 December 2005

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**DOI:** [10.5281/zenodo.18826413](https://doi.org/10.5281/zenodo.18826413)

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## Abstract

This study examines the cost-effectiveness of secondary school systems in South Africa by analysing panel data over a five-year period. Panel-data estimation techniques were employed to analyse expenditure data alongside student performance metrics. Robust standard errors were used to account for potential heteroscedasticity in the regression model. The analysis revealed that schools with higher teacher-student ratios experienced a significant decline in academic outcomes, suggesting that resource allocation should be optimised to maintain optimal learning environments. This study provides insights into how cost-effectiveness can be maximised by balancing financial resources and educational quality. School administrators are advised to invest in teacher training programmes while maintaining adequate class sizes to ensure effective teaching practices and student performance. The empirical specification follows  $Y = \beta_{0+\beta} p X + \text{varepsilon}$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** *Sub-Saharan, African, Economic, Structural, Analysis, Regression, Development*

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