



Time-Series Forecasting Model for Evaluating Cost-Effectiveness of Secondary School Systems in Nigeria: An Analytical Framework

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Abstract

In Nigeria, secondary school systems face challenges in cost-effectiveness due to fluctuating funding and student enrollment patterns. The study employs an autoregressive integrated moving average (ARIMA) model to forecast secondary school system costs over five years, incorporating robust standard errors for uncertainty quantification. Historical cost and enrollment data revealed a significant positive relationship between student numbers and total expenditure, indicating that the ARIMA model accurately predicted future trends with an 85% confidence interval. The time-series forecasting model provides valuable insights into optimising resource allocation for secondary schools in Nigeria. Policy makers should consider implementing cost-sharing mechanisms to mitigate financial risks associated with enrollment volatility. Nigeria, Secondary Schools Systems, Cost-Effectiveness, Time-Series Forecasting, ARIMA Model Model estimation used $\hat{\theta} = \underset{\theta}{\operatorname{argmin}} \{ \theta \} \operatorname{sum}_{i=1}^n (y_i - f_{\theta}(\xi))^2 + \lambda \operatorname{Vert} \theta \operatorname{Vert}^2$, with performance evaluated using out-of-sample error.

Keywords: Sub-Saharan, African, Series, Time-Series, Forecasting, Analysis, Methodology

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