



# Time-Series Forecasting Model for Evaluating Secondary School Systems in Senegal: A Reliability Assessment Methodology

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## Abstract

The educational landscape in Senegal has undergone significant changes over recent decades, necessitating robust methodologies for evaluating and forecasting the performance of secondary school systems. A time-series analysis was conducted, employing an autoregressive integrated moving average (ARIMA) model for forecasting future performance trends of secondary school systems based on past enrollment data. The ARIMA model showed a strong correlation with actual enrollment figures, indicating that the model can predict trends with a reliability coefficient of 0.85. This study demonstrates the feasibility and effectiveness of using time-series forecasting to evaluate secondary school systems in Senegal, providing a reliable tool for policymakers and educational planners. The findings suggest further research into incorporating additional variables such as socio-economic factors and technological advancements to enhance the model's predictive accuracy. Secondary schools, Senegal, Time-series analysis, ARIMA, Reliability Model estimation used  $\hat{\theta} = \operatorname{argmin}\{\theta\} \operatorname{sum}_{i \in I} (y_i - f\theta(\xi))^2 + \lambda \operatorname{Vert}\theta\operatorname{rVert}^2$ , with performance evaluated using out-of-sample error.

**Keywords:** *African education, Time-series analysis, Reliability assessment, Forecasting models, Educational evaluation, Econometrics, Hierarchical modelling*

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