



# Bayesian Hierarchical Model for Assessing Cost-Effectiveness in Senegal's Secondary School Systems: A Methodological Evaluation

Seyni Diop<sup>1</sup>, Ibrahima Ndiaye<sup>1</sup>, Mamadou Sall<sup>2,3</sup>

<sup>1</sup> Université Alioune Diop de Bambey (UADB)

<sup>2</sup> Department of Interdisciplinary Studies, Université Alioune Diop de Bambey (UADB)

<sup>3</sup> Institut Sénégalais de Recherches Agricoles (ISRA)

**Published:** 20 August 2012 | **Received:** 29 May 2012 | **Accepted:** 14 July 2012

**Correspondence:** [sdiop@outlook.com](mailto:sdiop@outlook.com)

**DOI:** [10.5281/zenodo.18974078](https://doi.org/10.5281/zenodo.18974078)

## Author notes

*Seyni Diop is affiliated with Université Alioune Diop de Bambey (UADB) and focuses on Energy research in Africa. Ibrahima Ndiaye is affiliated with Université Alioune Diop de Bambey (UADB) and focuses on Energy research in Africa. Mamadou Sall is affiliated with Department of Interdisciplinary Studies, Université Alioune Diop de Bambey (UADB) and focuses on Energy research in Africa.*

## Abstract

The secondary school system in Senegal faces challenges in cost-effectiveness, with significant disparities in resource allocation and student performance outcomes. A Bayesian hierarchical model was employed to analyse data from multiple secondary schools across various regions, incorporating random effects to account for differences in school performance and resource allocation patterns. The analysis revealed that schools with higher initial funding had better student-to-teacher ratios, suggesting a positive correlation between financial investment and educational quality. This study provides insights into the optimal distribution of resources within Senegalese secondary education systems, contributing to evidence-based policy-making. Recommendations for policymakers include allocating funds more equitably across regions and schools based on current performance metrics. The empirical specification follows  $Y = \beta_{0+\beta}^T X + \text{varepsilon}$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** *Geographic, Africa, Bayesian, Model, Hierarchical, Methodology, Economic, Evaluation*

## ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ **REQUEST FULL PAPER**

**Email:** [info@parj.africa](mailto:info@parj.africa)

Request your copy of the full paper today!

## SUBMIT YOUR RESEARCH

**Are you a researcher in Africa? We welcome your submissions!**

Join our community of African scholars and share your groundbreaking work.

**Submit at:** [app.parj.africa](http://app.parj.africa)



Scan to visit [app.parj.africa](http://app.parj.africa)

**Open Access Scholarship from PARJ**

Empowering African Research | Advancing Global Knowledge