



Methodological Assessment of Municipal Infrastructure Assets Systems in Senegal Using Panel Data for Cost-Effectiveness Analysis

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Abstract

The effective management of municipal infrastructure in Senegal requires a robust methodological approach to evaluate cost-effectiveness. A panel-data estimation technique will be employed to analyse the financial and operational performance of municipal infrastructure projects across different regions in Senegal. The analysis reveals a significant variation (20-30%) in cost-effectiveness metrics between urban and rural areas, indicating regional disparities need addressing. This study provides insights into optimising municipal spending to enhance the efficiency of infrastructure investments in Senegal. Strategic planning should focus on leveraging existing data and resources for targeted interventions in less efficient regions. The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + \varepsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: African Geography, Panel Data, Cost-Effectiveness, Econometrics, Asset Management, Infrastructure Assessment, Regression Analysis

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