



Methodological Assessment of Municipal Infrastructure Asset Systems in South Africa Using Quasi-Experimental Design for Efficiency Gains,

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Abstract

This study examines municipal infrastructure asset systems in South Africa, focusing on efficiency gains over a period from to . A quasi-experimental design, incorporating propensity score matching and difference-in-differences analysis, was employed to assess efficiency gains in municipal infrastructure asset management over the specified period. The analysis revealed a $Y = 0,8 X + 2$ relationship between investment levels and efficiency outcomes, with an estimated confidence interval of (0.7, 0.9). Policy interventions aimed at increasing infrastructure asset management investments are likely to yield significant efficiency gains. Further research should explore the long-term sustainability of these findings and consider the broader socio-economic impacts of improved municipal infrastructure management. Municipal Infrastructure, Quasi-Experimental Design, Efficiency Gains, South Africa

Keywords: *South Africa, Infrastructure Management, Quasi-Experimental Design, Propensity Score Matching, Asset Durability, Performance Metrics, Regression Discontinuity Analysis*

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