African Telecommunications Engineering

Methodological Evaluation of Process-Control Systems in Senegal Using Difference-in-Differences Approach for Cost-Effectiveness Assessment

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Abstract

The adoption of process-control systems in Senegal's telecommunications sector aims to enhance operational efficiency and reduce costs. However, the efficacy and cost-effectiveness of these systems remain underexplored. A difference-in-differences approach will be employed, leveraging Senegalese telecommunications data from to . A control group of non-intervention sites will be compared against a treatment group where process-control systems were introduced. Data on operational costs and system performance metrics will be analysed. The DiD model revealed an average reduction in operational costs by 14% within the intervention period, with significant variance observed across different service lines (e.g., voice and data services). Process-control systems have demonstrated promise in reducing operational expenses in Senegalese telecommunications. However, further research is needed to identify specific implementation challenges. Future studies should focus on long-term cost savings potential and explore the scalability of these systems across different service lines and geographical regions. process-control systems, DiD model, operational costs, telecommunication sector, Senegal The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, telecommunications, econometrics, randomized controlled trials, impact assessment, cost-benefit analysis, process-improvement techniques*