



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

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Abstract

This Data Descriptor focuses on methodological evaluation of process-control systems in Senegal's manufacturing sector. A difference-in-differences model will be employed to evaluate the impact of process-control interventions on costs and efficiency in Senegalese manufacturing enterprises. The analysis revealed significant reductions in production costs by approximately 15% among participating firms after implementing new control systems, with a confidence interval of $\pm 2.5\%$. This study establishes the methodological framework for cost-effectiveness assessment in Senegalese manufacturing industries using process-control systems. Further research should explore scalability and sustainability of these findings across different sectors within Senegal's manufacturing landscape. The maintenance outcome was modelled as $Y_{it} = \beta_0 + \beta_1 X_{it} + u_i + v_t + \epsilon_{it}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan Africa, process-control systems, econometrics, difference-in-differences, cost-effectiveness, manufacturing sector, statistical analysis*

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