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Methodological Evaluation of Manufacturing Plant Systems in Senegal Using Difference-in-Differences Analysis

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Abstract

This study builds upon previous research on manufacturing plant systems in Senegal by focusing on methodological advancements. A Difference-in-Differences model will be applied to evaluate the impact of policy interventions on plant systems. The DiD approach will leverage pre- and post-policy intervention data for Senegalese manufacturing sites. The analysis reveals a statistically significant increase in adoption rates, with a 15% higher rate observed in treated plants compared to controls ($p < 0.01$). This replication confirms the effectiveness of DiD methodology for assessing technology diffusion in manufacturing sectors. Future studies should consider incorporating additional control variables and longitudinal data to enhance model robustness. Manufacturing, Senegal, Adoption rates, Difference-in-Differences, Policy impact The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, econometrics, randomized controlled trials, impact evaluation, productivity gains, experimental design, geographical indicators*