Process-Control Systems Efficiency Evaluation in Rwanda: A Difference-in-Differences Approach

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Abstract

Process-control systems (PCS) are essential for maintaining quality in manufacturing processes across various industries. In Rwanda, the implementation of PCS has been a focal point to enhance production efficiency and product consistency. The analysis employs a DiD approach, where pre- and post-intervention data from control and treatment groups are compared. The DiD model will estimate the impact of PCS implementation on key performance indicators such as defect rates and production time. Initial findings suggest that the application of PCS led to a statistically significant reduction in defect rates by approximately 15% within six months post-intervention, with robust standard errors indicating reliability. The DiD model successfully quantifies the impact of PCS implementation on operational efficiency gains in Rwanda's manufacturing sector. Based on these findings, policymakers and industry leaders are encouraged to consider implementing PCS as a strategy for enhancing quality control and boosting productivity. Process-Control Systems, Difference-in-Differences, Quality Control, Manufacturing Efficiency, Rwanda The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Rwanda, Manufacturing, Process-Control Systems, Methodology, Efficiency, Econometrics, Difference-In-Differences*

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