



Methodological Evaluation of Manufacturing Systems in Ghana Using Difference-in-Differences for Risk Reduction Assessment

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Abstract

Manufacturing systems in Ghana have seen significant investments to enhance productivity and reduce operational risks. A difference-in-differences (DiD) regression analysis was employed to estimate the impact of new manufacturing systems on operational risks. This approach compares changes in outcomes before and after the implementation across treatment and control groups. The DiD model revealed a reduction in operational risk by approximately 15% for the treated group compared to the control group, indicating significant effectiveness in implementing new system methodologies. This study concludes that the difference-in-differences methodology is effective in measuring the impact of manufacturing system interventions on risk reduction. Based on these findings, it is recommended that further investments be directed towards continuous monitoring and adaptation of these systems to maintain their efficacy over time. The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Geographic, Sub-Saharan, Manufacturing, Risk, DiD, Econometrics, Supply Chains, Sustainability

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