



Methodological Evaluation of Manufacturing Risk Reduction Systems in Ghana Using Panel Data Analysis

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Abstract

Manufacturing plants in Ghana are vulnerable to operational risks that can lead to significant financial losses and environmental degradation. A mixed-method approach combining qualitative interviews with quantitative data from 100 manufacturing firms over a five-year period was employed. Panel data analysis using fixed effects models were conducted to account for potential endogeneity and time-invariant variables. The average reduction in operational risks across the studied plants was found to be 25%, indicating that risk mitigation strategies are effective but not uniformly applied. Risk assessment systems have shown promise in reducing operational risks, though there is room for improvement in their consistent implementation and effectiveness. Manufacturing firms should prioritise regular audits and compliance with established safety standards to enhance the efficacy of risk reduction measures. manufacturing plants, risk reduction, panel data analysis, Ghana The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Ghanaian, Manufacturing, Risk, Evaluation, Panel, Analysis, Sustainability

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