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Methodological Evaluation of Manufacturing Plant Systems in Ghana: Quasi-Experimental Design for Risk Reduction Analysis

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Abstract

Manufacturing plants in Ghana face significant operational risks that can impact productivity and profitability. A quasi-experimental design was employed, comparing pre- and post-intervention data from selected plants. Statistical analysis included regression models with robust standard errors. The preliminary findings suggest that implementing quality control measures reduced operational disruptions by an average of 20% in the experimental group compared to controls. Quasi-experimental designs offer a viable method for assessing risk reduction strategies without controlled experiments, highlighting the importance of robust systems management. Manufacturers should prioritise investment in quality control and employee training programmes as part of their risk mitigation strategies. manufacturing systems, quasi-experimental design, risk reduction, regression analysis The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, econometric, benchmarking, supply chain, robustness, intervention, analytics*

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