# Methodological Assessment of Manufacturing Plant Systems Efficiency in Nigeria Using Quasi-Experimental Design

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## Abstract

Manufacturing plants in Nigeria face challenges related to efficiency gains, which can be influenced by system design and operational practices. A scoping review will be conducted to identify and analyse studies that employed quasi-experimental designs to measure efficiency in Nigerian manufacturing plants. The review will cover literature from to the present. The analysis revealed that while quasi-experimental design is gaining traction, there are inconsistencies in its application across different sectors and time periods within Nigeria. Quasi-experimental designs offer a promising method for assessing efficiency gains but require more rigorous validation and standardisation to ensure consistent results. Standardised guidelines should be developed for the implementation of quasi-experimental design in manufacturing plant studies, particularly focusing on environmental impact assessments. Model estimation used $\hat{\theta} = argmin_{\theta} \, sum_{i} \ell(y_i, f_\theta(\xi)) + \lambda \lVert \theta \rVert_2^2$, with performance evaluated using out-of-sample error.

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