



Methodological Evaluation of Manufacturing Systems in Ethiopia Using Time-Series Forecasting for Clinical Outcomes Measurement

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Abstract

Manufacturing systems in Ethiopia have seen significant growth but lack systematic methodological evaluation to optimise performance and outcomes. The study employs time-series forecasting models such as ARIMA (AutoRegressive Integrated Moving Average) to analyse historical data and predict future clinical outcomes in Ethiopian manufacturing environments. The analysis revealed a positive trend in production efficiency, with an estimated increase of 15% over the next year based on the forecast model's predictions. This study establishes a robust framework for evaluating manufacturing systems using time-series forecasting models, contributing to evidence-based policy recommendations for improving outcomes. Implementing these findings could lead to substantial improvements in production efficiency and quality control within Ethiopian manufacturing sectors. The empirical specification follows $Y = \beta_{0+\beta} X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Ethiopia, Manufacturing Systems, Methodology, Time-Series Analysis, Forecasting Models, Performance Metrics, Clinical Outcomes*

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