

CASE STUDY

Methodological Evaluation and Panel-Data Estimation of Manufacturing Systems Adoption in Ethiopia, 2000–2026

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ABSTRACT

Background: The adoption of advanced manufacturing systems is critical for industrial development, yet robust methodologies for measuring and forecasting adoption rates in emerging economies are lacking. This case study addresses this gap within the Ethiopian context, where policy initiatives have aimed to modernise the industrial sector.

Purpose and objectives: This study aims to methodologically evaluate the adoption of manufacturing systems in Ethiopia and to estimate adoption rates using panel-data econometrics. The objective is to provide a replicable framework for tracking technological uptake and forecasting future trends within the engineering sector.

Keywords: *Panel-data estimation, Manufacturing systems adoption, Sub-Saharan Africa, Industrial development, Emerging economies, Methodological evaluation*

Article Highlights

- Constructs a longitudinal panel dataset from repeated surveys of Ethiopian manufacturing plants.
- Models adoption using a dynamic binary choice framework with plant-specific and time effects.
- Forecasts continued adoption growth, identifying key infrastructural and skill-related constraints.
- Provides a replicable econometric framework for tracking technological uptake in emerging economies.

Methodological Contribution

This study establishes a novel panel-data estimation framework for measuring and forecasting the adoption of engineering systems in Sub-Saharan Africa, with specific application to Ethiopia from 2000–2026.

This article presents a methodological case study with forecasting implications for industrial policy.

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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