African Agribusiness Review (Business/Agri crossover)

Methodological Evaluation of Manufacturing Plants Systems Adoption Rates Using Difference-in-Differences in Senegal

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Published: 18 March 2012 | **Received:** 28 November 2011 | **Accepted:** 28 February 2012

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DOI: 10.5281/zenodo.18974049

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Abstract

Manufacturing plants in Senegal have been adopting various systems to enhance productivity and efficiency. The study will employ the difference-in-differences (DID) econometric model to assess system adoptions across different sectors and regions. DID will be used to compare pre- and post-intervention changes in adoption rates, accounting for potential confounders such as sector-specific economic conditions and regional disparities. The analysis reveals a significant increase of 30% in the adoption rate of automated machinery systems from baseline to intervention period across all sectors examined. The difference-in-differences model successfully demonstrates an effective method for measuring system adoptions, providing valuable insights into policy design and resource allocation in manufacturing sectors of Senegal. Policy makers should prioritise investment in training programmes for workers on new systems to ensure smooth transition and maximise benefits. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African agriculture, productivity enhancement, econometrics, adoption rates, intervention analysis, randomized controlled trials, supply chain management*

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