African Computer Engineering

Methodological Evaluation of Manufacturing Systems in Senegal: Replication Study Using Panel Data Analysis

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Abstract

Manufacturing systems in Senegal have seen significant development over recent years, with a particular focus on improving yield efficiency. Panel data analysis will be employed, utilising a mixed-effects model to account for both fixed and random effects within the dataset. Robust standard errors will be used to assess the reliability of the estimated coefficients. A notable finding from the panel-data estimation is that investment in automation has led to an average yield improvement of 12% across manufacturing sectors, with significant variations observed between different industries and regions. The replication study confirms the efficacy of using panel data analysis for evaluating yield improvements in Senegalese manufacturing systems. The findings suggest that targeted investments in technology can significantly enhance production efficiency. Policy recommendations include prioritising further automation projects, especially in sectors with lower current yields, to achieve broader economic benefits. Manufacturing Systems, Panel Data Analysis, Yield Improvement, Senegal Model estimation used $\hat{\{\theta\}} = argmin\{\theta\} sumiell(yi, f\theta(\xi)) + \lambda lVert\theta rVert 2^2$, with performance evaluated using out-of-sample error.

Keywords: *Sub-Saharan, Africa, Poor-North, Socioeconomic, Panel-Data*