



Methodological Evaluation of Manufacturing Plants Systems in Rwanda Using Panel Data for Adoption Rate Measurement

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Abstract

Manufacturing plants in Rwanda are pivotal to the country's economic development. However, their adoption of advanced systems varies widely and is influenced by policy frameworks. The research employs a fixed effects model (FE) to analyse panel data from to , focusing on 50 manufacturing plants across different sectors. Robust standard errors are applied to account for potential heteroscedasticity and autocorrelation. Panel data analysis revealed that the adoption rate of advanced manufacturing systems in Rwanda is significantly influenced by government subsidies (direction: positive), with a proportion of 65% showing increased investment post-subsidy implementation. The study concludes that panel data estimation provides a robust framework for understanding and measuring system adoption rates, offering insights into policy effectiveness. Based on the findings, policymakers should prioritise subsidies as an effective mechanism to encourage further adoption of advanced manufacturing systems in Rwanda. The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + v\epsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Rwanda, Manufacturing Plants, Panel Data, Adoption Rate, Methodological Evaluation, Econometrics, GIS

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