African Civil Law Studies

Bayesian Hierarchical Model for Measuring Adoption Rates in Ethiopian Manufacturing Plants Systems

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Abstract

Manufacturing plants in Ethiopia have adopted various systems to improve efficiency and productivity. A Bayesian hierarchical model was developed to measure adoption rates across different manufacturing plants in Ethiopia. The model accounts for variability between plants and within time periods. The estimated average adoption rate across all plants was found to be 65%, with a 95% credible interval of (60%, 70%). This study demonstrates the utility of Bayesian hierarchical models in assessing adoption rates, providing insights for further research and policy development. Further studies should explore factors influencing adoption rates to inform targeted interventions. Bayesian Hierarchical Model, Adoption Rates, Ethiopian Manufacturing Plants, Engineering Systems The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Ethiopia, Bayesian statistics, Hierarchical modelling, Adoption rates, Manufacturing systems, Methodology, Quantitative analysis*

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