

Classification of Economic Development Stages Using Machine Learning: Insights from Random Forest Regression and K-means Clustering

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Abstract

This study examines the stages of economic development across countries by utilizing a Random Forest Regression model and K-means clustering to categorize countries into distinct groups based on key indicators such as wages, capital stock per employee, export complexity, resource dependence, total factor productivity (TFP), and manufacturing share of GDP. The analysis identifies 16 clusters, providing a nuanced understanding of the pathways to economic growth. Two main routes to increasing income are identified: the non-resource route, which involves enhancing manufacturing and export complexity, and the resource route, which leverages capital stock and resource exports. The study also explores the impact of deindustrialization on these pathways and highlights the importance of adaptive and context-specific policies to navigate the complexities of economic development.

Keywords: Economic growth, stages of economic development, k-means clustering, random forest regression