Thesis Title	Application of Machine Learning for Evaluating Thailand's Economic Complexity
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ABSTRACT

This study investigates Thailand's economic complexity at the subnational level by constructing a panel dataset of 77 provinces across 20 economic activities from 2011 to 2021. The Economic Complexity Index (ECI) is developed using employment data, applying the Location Quotient and Method of Reflection techniques. Fixed-effects panel regression, quantile regression, and generalized additive models (GAMs) are employed to explore the relationship between ECI and two key development outcomes: economic growth and income inequality. The results reveal a nonlinear and distribution-sensitive relationship. While ECI tends to promote economic growth after surpassing a complexity threshold—particularly in provinces with initially lower income levels, its inequality-reducing effect is most pronounced in high-Gini provinces. Clustering analysis is used to group provinces based on economic complexity, income, inequality, and demographic indicators. Among the algorithms tested, K-means clustering performs best, revealing distinct regional development patterns and increasing structural divergence over time. This research advances the literature on economic complexity by integrating machine learning techniques into subnational economic diagnostics and highlights the potential of ECI as a tool for promoting inclusive and region-specific development policies in middle-income countries like Thailand.

Keywords: Economic Complexity Index, Regional Economic Development, Income Inequality, Panel Data Analysis, Fixed Effects Model, Machine Learning, Clustering, Location Quotient, Thailand, Subnational Analysis