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Optimizing Public Order and Security Budgets to Reduce Crime across Indonesian Provinces: A Stochastic Frontier Analysis

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Abstract

This study evaluates the relative efficiency of provincial public order and security spending in reducing crime in Indonesia. Using an unbalanced panel of 190 observations covering 34 provinces from 2015 to 2020, the analysis applies a time-invariant Stochastic Frontier Analysis (SFA) model estimated by maximum likelihood. Crime incidents per 100,000 inhabitants are modelled as a function of the share of realized public order and security expenditure in total regional spending, poverty, open unemployment, income inequality, and the Human Development Index (HDI). The results indicate that a 1% relative increase in the expenditure share is associated with an approximately 0.055% decline in crime, although the relationship is only weakly significant at the 10% level. HDI has a strong negative association with crime, while poverty and the Gini ratio are statistically insignificant. The estimated mean technical efficiency score is 0.4023, indicating substantial room for improvement relative to the model frontier. Efficiency varies considerably across provinces, ranging from 0.0801 to 0.9268. North Sulawesi is closest to the estimated frontier, whereas Central Java is farthest from it; these rankings reflect relative frontier positions rather than absolute crime performance. The gamma estimate of 0.9181 shows that inefficiency dominates random noise in the composite error structure. Exploratory second-stage analyses further suggest that the expenditure share and HDI are the most consistent correlates of provincial efficiency. The findings imply that increasing security expenditure alone is insufficient: performance-based budgeting, improved expenditure governance, and stronger human development are also required to enhance public safety outcomes.

Keywords: Public Expenditure Efficiency; Crime; Public Order And Security; Stochastic Frontier Analysis; Indonesia