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Forecasting Indonesian economic growth using night light

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Abstract

Economic growth is one of the most important indicator that influences economic decisions of private enterprises and governments. Therefore, tracking economic growth in higher frequency would benefit decision makers. One way to verify the official growth number is to use relevant leading indicators for economic growth that are independent from the statistical agency. In this paper, we use the Indonesian nighttime light index sourced from Blackmarble to fit historical GDP of Indonesia. Two analysis are conducted: national-level using Autoregressive Distributed Lag (ARDL) and provincial level using panel data regression. The nighttime light index shows a consistent significant correlation to GDP growth across various specifications. However, the magnitude of the correlation is small, suggesting that nighttime light index alone cannot capture the full variation of GDP growth. We also find indicative evidence that the scarring effect post COVID-19 pandemic hurts long term economic growth by 2%. The ARDL specification with scarring effect show the best forecasting fit and is reasonably able to forecast GDP growth out-of-sample.

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$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{N}$$