Uncertainty in long-term forecasting: State space modeling of crude steel production in Japan

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Abstract

Crude steel production (CSP) is an important economic variable used to estimate carbon dioxide emissions from the industrial sector. This study develops a state space model of Japan's CSP based on time series data from 1970 to 2014, and provides long-term forecasts until 2060. A state space model is a statistical model with time-varying parameters. I found that time series data of Japan's CSP contain a hidden trend which cannot be explained by some major economic variables (e.g. real GDP). This hidden trend follows a stochastic process, and creates large uncertainty in the long run. Although Japan's CSP appears stable, it is risky to believe that the current production level will be sustained.

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