The Role of El Niño Southern Oscillation in Commodity Price Movement and Predictability

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Abstract

El Niño Southern Oscillation (ENSO) impacts the supply and, to some extent, the demand for primary commodities. But what are the consequences of this climatic phenomenon for these commodity price dynamics? I consider monthly series of 43 primary commodity prices and sea surface temperature (SST) anomalies in the `Niño3.4` region from January 1980 to December 2016. The SST anomalies serve as a proxy for ENSO, as persistent positive (negative) SST deviations from their historical mean are associated with El Niño (La Niña) events. I apply a family of time-varying smooth transition autoregressive models to account for potentially complex dynamic relationships between SST anomalies and prices. Overall, the estimated nonlinearities bring out more amplified price responses during El Niño events, and at the onset of the ENSO cycle. I find statistically significant linkages between SST anomalies and a subset of agricultural commodity prices. This in-sample fit manifests in a forecasting environment for the commodities produced in the tropics. While I also find some in-sample evidence for prices of selected nonagricultural commodities, e.g., timber and metals, the ability of SST anomalies to predict these commodity prices in an out-of-sample setting is lacking. These findings carry important welfare implications, especially for developing economies that have been historically linked to the behavior of primary commodity prices, and offer valuable insights to policy makers working in areas related to economic growth and foreign aid programs, as well as those concerned with issues of farm income and rural poverty.

Keywords: Commodity Prices, El Niño Southern Oscillation, Nonlinear Dynamics, Time-Varying Smooth Transition Autoregression

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