

Bringing transparency to commodity markets in India: A real-world mission-critical deployment of R

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Abstract

A key input underlying derivatives markets is reliable spot price information. This is used by traders in their trading strategies, for operationalising cash settlement procedures at exchanges, and for risk management at clearing corporations. However, many spot markets are highly non-transparent where the spot price is not readily observed. A particularly difficult case of this nature are the commodity spot markets in India: these markets are spread over 3.3 million square kilometres, and there is little transparency about their operations.

One useful strategy for obtaining a spot price with such market microstructure, is to poll a panel of dealers. However, since dealers can form cartels and attempt to manipulate the polled price, this requires a robust location estimator based on the polled data. As an example, the LIBOR is calculated using a trimmed mean of quotes for the short-term interest rate, polled from dealers at banks.

This paper describes an effort where a system was setup in India in order to create a benchmark price on commodities that traded futures. Within this system, a million phone calls are made a year, covering over 30 commodities, from across multiple market locations, for quotes that are obtained thrice a day. These polled quotes are then used to calculate the 'adaptive trimmed mean' (ATM), which is the robust estimator used to reduce the impact of possible manipulation.

The paper describes the processes through which data is obtained from across the country, how the ATM for each commodity, and the standard deviation of the ATM, is calculated using R and the boot library, and released in near-realtime as the reference spot rate for any given commodity.

This system of reference rates has led to a substantial improvement in transparency of prices, and has made futures trading possible. These reference rates are used for cash settlement of futures traded on the National Commodity Derivatives Exchange (NCDEX), India's largest commodity futures exchange.

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