

Nonstationary Increments and Casualty in the Aluminum Market

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Abstract : McCauley, Bassler, and Gunaratne show that integration I(d) processes as used in economics and finance do not necessarily produce stationary increments, which are required to determine causality in both the short term and the long term. This paper follows their lead and shows I(d) aluminum cash and futures log prices at daily and weekly intervals do not have stationary increments, which means prior causality studies using I(d) processes need to be re-examined. Wavelets based on undifferenced cash and futures log prices do have stationary increments and are used along with transfer entropy (versus cointegration) to measure causality. Wavelets exhibit causality at most daily time scales out to 1 year, and weekly time scales out to 1 year and more. To determine stationarity, localized stationary wavelets are used. LSWs have the benefit, versus other means of testing for stationarity, of using multiple hypothesis tests to determine stationarity. As informational flows exist between cash and futures at daily and weekly intervals, the aluminum market is efficient. Therefore, hedges used by producers and consumers of aluminum need not have a big concern in terms of the underestimation of hedge ratios. Questions about arbitrage given efficiency are addressed in the paper.

Keywords : transfer entropy, nonstationary increments, wavelets, localized stationary wavelets, localized stationary wavelets

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