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A multifractal detrended fluctuation analysis of financial market efficiency: Comparison using Dow Jones sector ETF indices

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Abstract

This study challenges the efficient market hypothesis, relying on the Dow Jones sector Exchange-Traded Fund (ETF) indices. For this purpose, we use the generalized Hurst exponent and multifractal detrended fluctuation analysis (MF-DFA) methods, using daily data over the timespan from 2000 to 2015. We compare the sector ETF indices in terms of market efficiency between short- and long-run horizons, small and large fluctuations, and before and after the global financial crisis (GFC). Our findings can be summarized as follows. First, there is clear evidence that the sector ETF markets are multifractal in nature. We also find a crossover in the multifractality of sector ETF market dynamics. Second, the utilities and consumer goods sector ETF markets are more efficient compared with the financial and telecommunications sector ETF markets, in terms of price prediction. Third, there are noteworthy discrepancies in terms of market efficiency, between the short- and long-term horizons. Fourth, the ETF market efficiency is considerably diminished after the global financial crisis.

PACS codes: 89.65.Gh

Keywords: ETF; Sector index; Efficient market hypothesis; Multifractal analysis; Global financial crisis

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