

A Study of the Effects of the Credit Crisis on the Shanghai Composite Index
Using the Hilbert-Huang Transformation

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Abstract

China is the fastest-growing major economy in the world and has an average annual GDP growth rate of over ten percent in the last decade. This rapid development naturally impacts the Chinese stock market. Most classic time-series analyses require the time series to be stationary and/or linear. However, financial time series are usually nonlinear and nonstationary. In this study, we use the Hilbert-Huang Transformation (HHT) to investigate the Shanghai stock dairy index along with several international stock markets from 2005 to 2010. The HHT approach primarily consists of the application of the empirical mode decomposition (EMD) and the instantaneous frequency/phase analysis. We find an obvious change in trading-activity behavior among these stock markets after the U.S. sub-prime mortgage credit crunch in 2008. Further, we note a significant correlation between the Shanghai Composite Index and the American stock markets for the periods 2006-2007 and 2009-2010.

Keywords: instantaneous frequency, instantaneous angle, empirical mode decomposition, HHT.