

Real time monitoring of bubbles and crashes

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The abstract is below:

Given the financial and economic damage that can be caused by the collapse of an asset price bubble, it is of critical importance to rapidly detect the onset of a crash once a bubble has been identified. We develop a real-time monitoring procedure for detecting a crash episode in a time series. We adopt an autoregressive framework, with bubble and crash regimes modelled by explosive and stationary dynamics respectively. The first stage of our approach is to monitor for a bubble; conditional on which, we monitor for a crash in real time as new data emerges. Our crash detection procedure employs a statistic based on the different signs of the means of the first differences associated with explosive and stationary regimes, and critical values are obtained using a training period of data. We show that the procedure has desirable asymptotic properties in terms of its ability to rapidly detect a crash while never indicating a crash earlier than one occurs. Monte Carlo simulations further demonstrate that our procedure can offer a well-controlled false positive rate during a bubble regime. Application to the US housing market demonstrates the efficacy of our procedure in rapidly detecting the house price crash of 2006.