

Fitting the Log Periodic Power Law to financial crashes: a critical analysis

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A number of papers claim that a Log Periodic Power Law (LPPL) fitted to financial market bubbles that precede large market falls or 'crashes', contain parameters that are confined within certain ranges. The mechanism that has been claimed as underlying the LPPL, is based on influence percolation and a martingale condition. This paper examines these claims and the robustness of the LPPL for capturing large falls in the Hang Seng stock market index, over a 30-year period, including the current global downturn. We identify 11 crashes on the Hang Seng market over the period 1970 to 2008. The fitted LPPLs have parameter values within the ranges specified post hoc by Johansen and Sornette (2001) for only seven of these crashes. Interestingly, the LPPL fit could have predicted the substantial fall in the Hang Seng index during the recent global downturn. We also find that influence percolation combined with a martingale condition holds for only half of the pre-crash bubbles previously reported. Overall, the mechanism posited as underlying the LPPL does not do so, and the data used to support the fit of the LPPL to bubbles does so only partially.

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