

### *Statistical Analysis of Rare Events in the Markets*

When it comes to the prices of stocks and other securities, it seems that rare events are never rare enough. But they are too rare for meaningful statistical study. In order to test financial models of price fluctuations, focused on excursions, the issue of small samples can be side stepped by declaring an event “rare” if it is unusual relative to the interval of observation. Every interval has its own rare events, by fiat, and in fact as many as we need. Different classes of models have different invariants to the timings of these “rare” events. These invariants open the door to combinatorial-type hypothesis tests, under which many of the usual models do not hold up very well. The evidence is for very rapidly changing dynamics.