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Continuous Time Model of Bifurcations and Related Phenomena in Agent-Based Models.

In this brief paper the author will show how a common description of stock prices – the Ornstein-Uhlenbeck process – can be modified so it can explain the bifurcations and related phenomena seen in stock prices when they are modeled by deterministic agent-based modeling.

In particular this paper will use the infinitesimal generators (IG) of diffusion processes to show that at the onset of the initial bifurcation, the standard Ornstein-Uhlenbeck pdf changes and other pdfs come to the fore due to a noise-induced transition. Related phenomena are explained as being either additive or multiplicative noise processes that arise due to the mix of risk-aversion parameters and/or window length.

The paper will also recommend ways its conjecture can be proven (or disproven) empirically. (Received August 19, 2009)