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A Model for Nonstationary Market Dynamics with Nontrivial Dynamical Scaling MIN LIU, KEVIN E. BASSLER, University of Houston — In a recent empirical analysis of the Euro/Dollar exchange rate [Bassler, et al., PNAS 104, 17287 (2007)] it was found that during certain periods of the day the market returns scale with Hurst exponents H that are significantly different from $1/2$. In some of these periods it is less than $1/2$, while in others it is greater than $1/2$. In this talk we will propose a possible origin for this behavior and other stylized market facts, including short time negative autocorrelations of returns, in terms of a nonstationary compound Poisson process with a time-dependent intensity rate function that results from a changing bid-ask spread in the microscopic market. The model correctly describes the dynamic scaling behavior of a simple reaction-diffusion model of a limit-order book. That model, like the Euro/Dollar exchange rate, has nonstationary return increments and a Hurst exponent H not equal to $1/2$.

Min Liu
University of Houston

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