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Microeconomic Models for Long Memory in the Volatility of Financial Time Series

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We show that a class of microeconomic behavioral models with interacting agents, derived from Kirman (1991) and Kirman (1993), can replicate the empirical long-memory properties of the two first-conditional moments of financial time series. The essence of these models is that the forecasts and thus the desired trades of the individuals in the markets are influenced, directly or indirectly, by those of the other participants. These "field effects" generate "herding" behavior that affects the structure of the asset price dynamics. The series of returns generated by these models display the same empirical properties as financial returns: returns are I (0), the series of absolute and squared returns display strong dependence, and the series of absolute returns do not display a trend. Furthermore, this class of models is able to replicate the common long-memory properties in the volatility and covolatility of financial time series revealed by Teyssière (1997, 1998a). These properties are investigated by using various model-independent tests and estimators, that is, semiparametric and nonparametric, introduced by Lo (1991), Kwiatkowski et al. (1992), Robinson (1995), Lobato and Robinson (1998), and Giraitis et al. (2000, forthcoming). The relative performance of these tests and estimators for long memory in a nonstandard data-generating process is then assessed.

Keywords: long memory; microeconomic models; field effects; semiparametric tests; conditional heteroskedasticity

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