Financial Bubbles with a minority game setting

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It is commonly known in economics that markets follow both positive and/or negative trends, crashes and bubble effects. In general a strong positive trend is followed by a crash, a famous example of these effects were seen in the recent crash on the NASDAQ (April 2000) and prior to the crash in the Hong Kong market which was associated with the Asian crisis in the early 1994. In this paper we use real market data into the minority game with different payoff functions and a non--linear super exponential model for bubbles to speculate financial bubbles to predict the location of financial bubbles. We also see how by changing the payoff function in the minority game one can get the price function to follow the dynamics of the real market.

Path integrals in fluctuating markets with a multifractal random walk model

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It is well established that volatility has a memory of the past, moreover it is found that volatility correlations are long ranged.
As a consequence the volatility cannot be characterized by a single correlation time. Recent empirical work suggests that the volatility correlation function of various assets actually decays as a power law.
Moreover the volatility fluctuations are found to be close to log normal. An interesting class of multifractal models, where the log-volatility is a Gaussian random variable with a correlation function that logarithmically decays in time, has been proposed. In other words the multifractal random walk (MRW) model is a continuous time limit of stochastic volatility, where the log-volatility correlations decay logarithmically. In this paper we show that it is possible to insert the MRW model into a path integral formalism, we then derive the path integral for the MRW and we present the formulas for option pricing for this model.