



# Time series properties of an artificial stock market

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## Abstract

This paper presents results from an experimental computer simulated stock market. In this market artificial intelligence algorithms take on the role of traders. They make predictions about the future, and buy and sell stock as indicated by their expectations of future risk and return. Prices are set endogenously to clear the market. Time series from this market are analyzed from the standpoint of well-known empirical features in real markets. The simulated market is able to replicate several of these phenomenon, including fundamental and technical predictability, volatility persistence, and leptokurtosis. Moreover, agent behavior is shown to be consistent with these features, in that they condition on the variables that are found to be significant in the time series tests. Agents are also able to collectively learn a homogeneous rational expectations equilibrium for certain parameters giving both time series and individual forecast values consistent with the equilibrium parameter values. © 1999 Elsevier Science B.V. All rights reserved.

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