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Financial markets as nonlinear adaptive evolutionary systems

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Abstract

Recent work on complex adaptive systems for modelling financial markets is surveyed. Financial markets are viewed as evolutionary systems between different, competing trading strategies. Agents are boundedly rational in the sense that they tend to follow strategies that have performed well, according to realized profits or accumulated wealth, in the recent past. Simple technical trading rules may survive evolutionary competition in a heterogeneous world where prices and beliefs coevolve over time. The evolutionary model explains stylized facts, such as fat tails, volatility clustering and long memory, of real financial series. Although our adaptive belief systems are very simple, they can match the autocorrelation patterns of returns, squared returns and absolute returns of 40 years of S&P 500 data. Some recent laboratory work on expectation formation in an asset pricing framework is also discussed.

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