

## **Hopf bifurcation and chaos analysis of a discrete delay dynamic model for a stock market**

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The time evolution of prices and saving in a stock market is modelled by a discrete delay nonlinear dynamical system. The proposed model has a unique and unstable steady state, so that the time evolution is determined by the nonlinear effects acting out the equilibrium. The analysis of linear approximation through the study of the eigenvalues of the Jacobian matrix is carried out in order to characterize the local stability property and the local bifurcations in the parameter space. If the delay is equal to zero, Lyapunov exponents are calculated. For certain values of the model parameters we prove that the system has a chaotic behaviour. Some numerical examples are given for justifying the theoretical results.

**Keywords:** dynamic models, bifurcation, Lyapunov exponents, stock market.