

Self-organized model of cascade spreading

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We study simultaneous price drops of real stocks and show that for high drop thresholds they follow a power-law distribution. To reproduce these collective downturns, we propose a self-organized model of cascade spreading based on a probabilistic response of the system's elements to stress conditions. This model is solvable using the theory of branching processes and the mean-field approximation and displays a power-law cascade-size distribution-similar to the empirically observed one-over a wide range of parameters.

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