Endogenous versus exogenous shocks in complex networks: An empirical test using book sale rankings.





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Endogenous Versus Exogenous Shocks in Complex Networks: An Empirical Test Using Book Sale Rankings

D. Sornette, F. Deschâtres, T. Gilbert, and Y. Ageon Phys. Rev. Lett. **93**, 228701 – Published 22 November 2004









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#### **ABSTRACT**

We study the precursory and recovery signatures accompanying shocks in complex networks, that we test on a unique database of the Amazon.com ranking of book sales. We find clear distinguishing signatures classifying two types of sales peaks. Exogenous peaks occur abruptly and are followed by a power law

relaxation, while endogenous peaks occur after a progressively accelerating

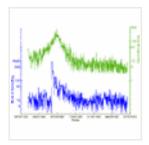
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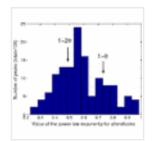
which is slower than for exogenous peaks. These results are rationalized

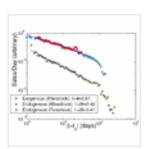
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tively by a simple model of epidemic propagation of interactions with long

implies that the sales dynamics is dominated by cascades rather than by the direct effects of news or advertisements, indicating that the social network is close to critical.







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