

Outline

Information

Quantifying reflexivity in financial markets: Toward a prediction of flash crashes

Vladimir Filimonov*

Didier Sornette†



PDF

► Share ▾

Phys. Rev. E **85**, 056108 – **Published 9 May, 2012**

DOI: <https://doi.org/10.1103/PhysRevE.85.056108>

Export Citation

Am score 13

Citations 219

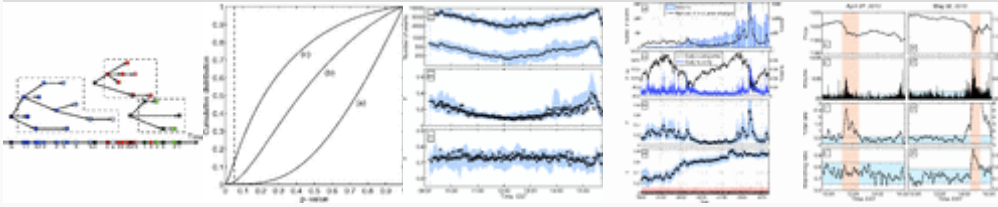
Show metrics ▾

Abstract

We introduce a measure of activity of financial markets that provides a direct access to their level of endogeneity. This measure quantifies how much of price changes is due to endogenous feedback processes, as opposed to exogenous news. For this, we calibrate the self-excited conditional Poisson Hawkes model, which combines in a natural and parsimonious way exogenous influences with self-excited dynamics, to the E-mini S&P 500 futures contracts traded in the Chicago Mercantile Exchange from 1998 to 2010. We find that the level of endogeneity has increased significantly from 1998 to 2010, with only 70% in 1998 to less than 30% since 2007 of the price changes resulting from some revealed exogenous information. Analogous to nuclear plant safety measures concerned with avoiding “criticality,” our measure provides a direct quantification of the distance of the financial market from a critical state defined precisely as the limit of diverging trading activity in the absence of any external driving.

This site uses cookies. To find out more, read our [Privacy Policy](#).

I Agree



References (Subscription Required)



- ▼
- Authors ▼
- Referees ▼
- Librarians ▼
- Students ▼
- Connect ▼



I Agree

[Publication](#)[Information](#)[Agreement](#)[Feedback](#)[Rights](#)[Policies &](#)[Usage Statistics](#)[Open Access](#)[Practices](#)[Your Account](#)[Policies &](#)[Referee FAQ](#)[Practices](#)[Guidelines for](#)[Tips for Authors](#)[Referees](#)[Professional](#)[Outstanding](#)[Conduct](#)[Referees](#)

ISSN 2470-0053 (online), 2470-0045 (print).

©2025 American Physical Society. All rights reserved.

Physical Review E[™] is a trademark of the American Physical Society, registered in the United States, Canada, European Union, and Japan. The *APS Physics logo* and *Physics logo* are trademarks of the American Physical Society. Information about registration may be found here. Use of the American Physical Society websites and journals implies that the user has read and agrees to our Terms and Conditions and any applicable Subscription Agreement.