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

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Abstract

We introduce a measure of activity of financial markets that provides a direct access to their level of endogeneity. To this end, we calibrate a self-excited conditional Hawkes process, as opposed to exogenous news. For this, we calibrate the self-excited conditional 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 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 ... as the limit of ...

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