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Diagnosis and Prediction of Market Rebounds in Financial Markets

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We introduce the concept of "negative bubbles" as the mirror image of standard financial bubbles, in which positive feedback mechanisms may lead to transient accelerating price falls. To model these negative bubbles, we adapt the Johansen-Ledoit-Sornette (JLS) model of rational expectation bubbles with a hazard rate describing the collective buying pressure of noise traders. The price fall occurring during a transient negative bubble can be interpreted as an effective random downpayment that rational agents accept to pay in the hope of profiting from the expected occurrence of a possible rally. We validate the model by showing that it has significant predictive power in identifying the times of major market rebounds. This result is obtained by using a general pattern recognition method which combines the information obtained at multiple times from a dynamical calibration of the JLS model. Error diagrams, Bayesian inference and trading strategies suggest that one can extract genuine information and obtain real skill from the calibration of negative bubbles with the JLS model. We conclude that negative bubbles are in general predictably associated with large rebounds or rallies, which are the mirror images of the crashes terminating standard bubbles.

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