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Modeling Speculative Bubbles with Diverse Investor Expectations*

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Abstract

We construct a model of asset market exuberance, collapse and recovery using subjective investor-based rational expectations about the impact of fundamentals on the market price. Investors are assumed to have heterogeneous market sentiments, allowing them to be exuberant, cautious, or fundamentalist via boundary conditions that describe their respective views of the market impact of the same economic fundamentals. Equilibrium solution paths of the model take varying forms, depending on the parameter settings that reflect the importance of each type of market participant. This rational expectations model of asset pricing is shown to be consistent with a simple explosive continuous time autoregression when exuberant sentiment dominates the market. The model explains asset price bubbles, including expansion and subsequent collapse, together with long term recovery. Extensions of the model allow for contagion effects in which market sentiments are transmitted from a primary market to a secondary market, reproducing speculative behavior and corrections in the secondary market. Some of the implications of the model for empirical work are explored.

JEL Classification: G01, G12, C32

Keywords: Asset price bubble, Boundary condition, Collapse, Contagion, Exuberance, Fundamentals, Heterogeneous agents, Recovery, Smooth pasting, Stochastic differential equation.

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