

## Report Type

Mid Term Award Report

## Full Name

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## Faculty/Department

CERF

## Project Title

Noisy Rational Bubbles

## Project Abstract

This project explores the implications of asymmetric information and investor flows on asset prices. Through history, asset prices occasionally rose spectacularly and then fell sharply and often dramatically. Existing literature on speculative bubbles usually attributes such extreme price behavior to speculation by investors. However, while existing models focus on specific aspects of these episodes, nearly all of them leave the description of dynamics of asset prices incomplete. Another notable phenomenon accompanying "bubble-like" episodes, that has been largely ignored in the literature, is a massive inflow of new investors. This research project seeks to fill these two gaps in the existing literature. I develop a theory to show how speculation by rational, but imperfectly informed investors, together with an endogenous influx of new investors, can lead to a period of rapid run-up in asset prices that is then followed by either a crash or a prolonged downturn. After this, I further explore various implications. One novel element in my theory is uncertainty about the average precision of information. This can be applied to discuss earnings manipulation and firm valuation. Another direction I am working toward is to use the data on options to empirically test the model.

## Activities and Achievement

This theory has several layers, first how bubbles arise in the equilibrium, then how prices rise and fall and also what is the role played by each element in the model. The whole theory is very complicated to be explained clearly. Thus in the past few months, I have been working on this and the latest version of the paper is available on the SSRN now. The main results can be summarized as follows. My paper develops a theory of asset price dynamics during bubble-like episodes. In the model, noise trading breaks the winner's curse and leads to overpricing. Over time, investors gradually learn and asset prices tend to fall toward the fundamentals. Importantly, however, investors also update their expectation about the average precision of new information. This mechanism works to drive prices farther away from the intrinsic value. Finally, my model also allows for gradual investor inflows greatly amplifying predicted price movements. Numerical simulations show the model can produce various bubble-like events. Now I am working on the two applications and I expect to have two more papers soon.

## Dissemination

The revised theory paper is available on the SSRN. I have recently submitted it to the Journal of Finance, and various academic conferences. I plan to do the same for the next two papers.

My theory paper shows that controlling uncertainty and investor flows are equally important for policy makers to curb bubbles. The next two papers help detect bubbles and the behavior of earnings manipulation.

## Outputs

#### Major Difficulties and Any Other Issues

Initially I tried to use analysts' forecast to construct investors' belief dispersion, but for most stocks especially small stocks, only a few analysts follow them, so the result is very noisy. Now I start to try options.

#### Web Links

<http://ssrn.com/abstract=2663561>

#### Additional Information

#### Declaration

Details of relevant outputs of this award have been submitted to the CERF Database and details of any ensuing outputs will be submitted in due course.

#### Signature - Main Award Holder

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