



University of Pittsburgh
January 3, 2007

Quantitative Behavioral Finance



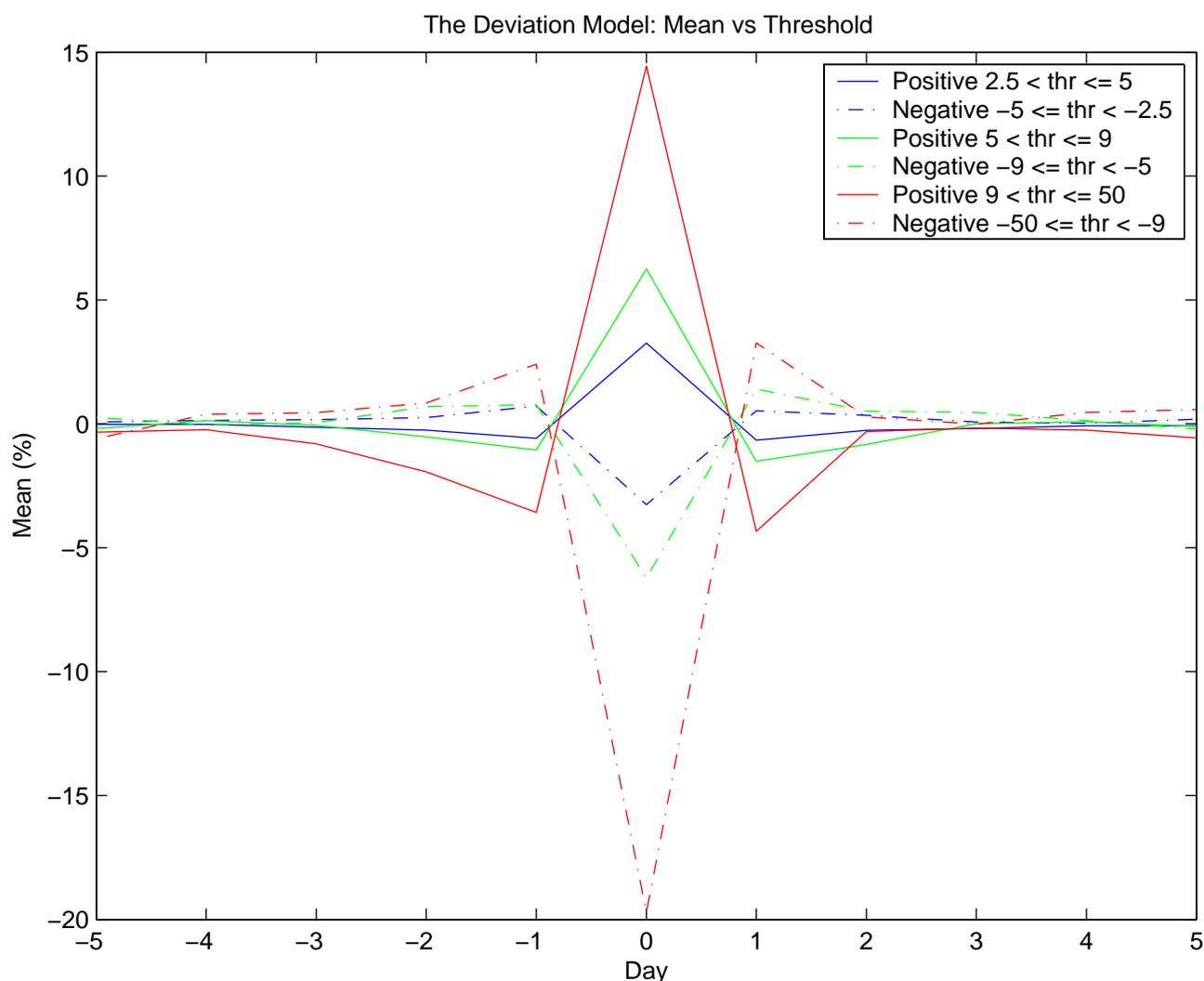
Forthcoming Publications
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Quantifying overreaction.

While there has been a great deal of excitement about over-reaction and under-reaction, two questions remain key:

1. How do we distinguish between the two?
2. How do we quantify these effects for profitable trading?

In a paper to be published in *Quantitative Finance*, Duran and Caginalp use a set of NYSE stocks to obtain some answers and ideas for trading. Many behavioral concepts are difficult to quantify due to the “noise” inherent in the changes in valuation. To overcome this problem they use a



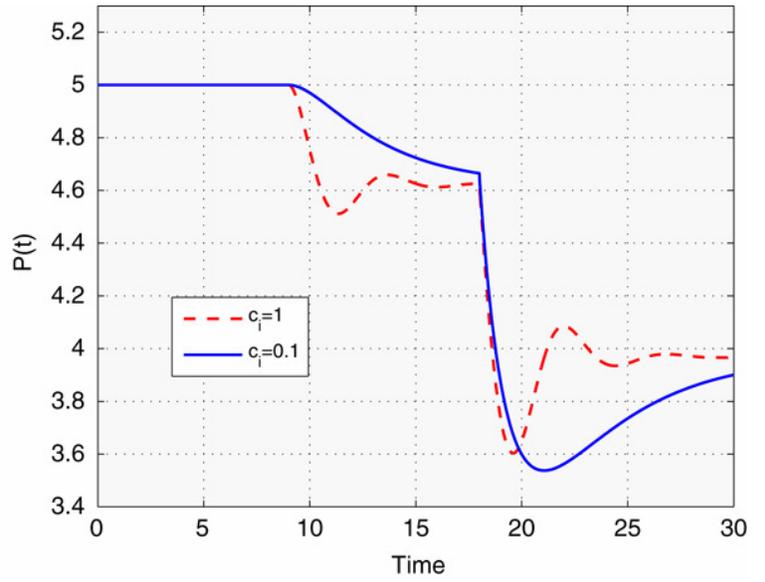
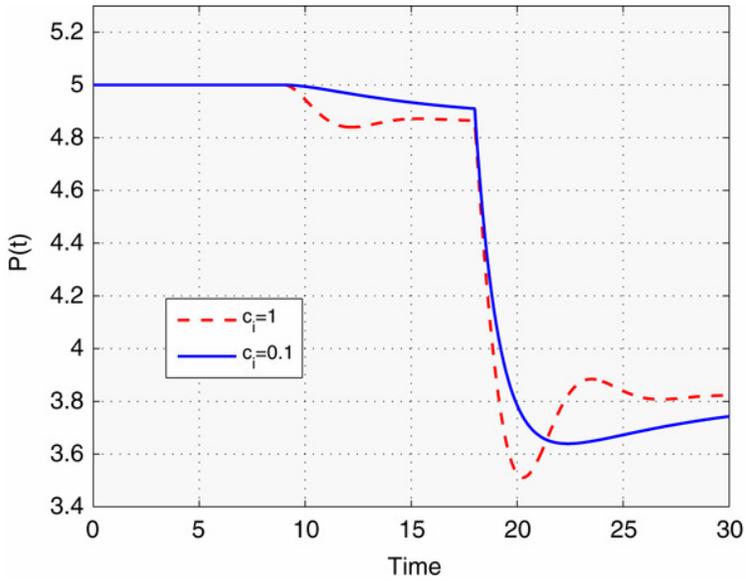
large data set (about 150,000 points) consisting of closed-end funds, where the net asset value (NAV) is known. By subtracting out the valua-

tion and examining the days in which the relative difference between the two is significant they conclude that there is an overreaction that is high significant in terms of trading.

More surprising is the fact that there is a precursor before such days when a large deviation occurs between the trading price and the NAV.

What is the effect of a share buyback or secondary offering on market?

Classical finance gives us a trivial answer: with infinite capital for arbitrage, there should be no effect on price. Practitioners know that this is not the case. Caginalp and Merdan study this problem theoretically using differential equations and the assumption of finite assets. In a paper to be published in Physica D, they compute the decline in price due to a new issue under a range of hypotheses. They consider a typical situation of an announcement that there will be a secondary offering followed by the entry of these shares into the marketplace. A typical evolution in the absence of other factors corresponds to the figure below.



The solid blue line shows the evolution for a situation in which there is little momentum trading compared with the dashed red line.



Why does bull market end, and how do we know we are near the end?

In a recent study, Caginalp and Ilieva use experimental asset markets to test the hypothesis that excess cash (sometimes called liquidity by the investment community) in the hands of momentum traders is the fuel behind a bubble.

This study, which will appear in the *J. of Economic Behavior and Organization*, focuses on separating the traders based upon the bids and asks they submit. With this separation and a two group version of the asset flow difference equations one can determine the coefficients for momentum and fundamental trading.

The data analysis does indeed confirm that the momentum traders have lower cash positions as prices near their peaks, while the opposite is true for those focusing on fundamentals.

Of course, in an experimental setting the scientist has the advantage of being able to track the identities of the traders. Extrapolating from these results, one could use the same difference equations and estimate using available data the cash positions of the momentum players versus the fundamentalists.

The study uncovered other interesting phenomena. The classification is for each period based on the bids/asks in the recent periods. While some economists would expect participants to gradually “learn” to trade on fundamentals, it turns out that some of those who had been trading on fundamental value in fact “learn” to seek much higher profits, and become momentum traders.



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Titles of papers discussed in this newsletter:

“Overreaction Diamonds: Precursors and Aftershocks for Significant Price Changes,” (A. Duran and G. Caginalp), to appear in *Quantitative Finance*.

“The Dynamics of Trader Motivations in Asset Bubbles,” (G. Caginalp V. Ilieva), to appear in *Journal of Economic Behavior and Organization*.

“Asset Price Dynamics with Heterogeneous Groups” (G. Caginalp and H. Merdan), to appear in *Physica D*.

Related recent papers:

“Nonlinear Price Evolution,” *Quarterly of Applied Mathematics* 63, 715-720, (2005).

“Data Mining For Overreaction in Financial Markets” (with A. Duran) *Proceedings of the Ninth IASTED International Conference Software Engineering and Applications* November 2005, Phoenix, AZ.

Other papers can be found in the web sites:

www.pitt.edu/~caginalp

<http://ssrn.com/author=328612>