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Speculative dynamics and price behavior in the Shanghai Stock Exchange

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ABSTRACT

This article examines the extent to which the trading behavior of heterogeneous investors manifests in stock price changes of asset portfolios which constitute the Shanghai Stock Exchange. There are three major findings that materialize. Firstly, reliable statistical evidence of a negative relation between the conditional first and second moments of the return distributions of stock prices lends support to the volatility feedback effect. Secondly, 'feedback', or momentum-type investors, are not present in this market as is often detected from the daily price changes of other industrialized markets. Finally, trade volume as a proxy for 'information-driven' trading suggests that such investors play a statistically significant role in stock price movements. Parameter estimates from this latter group of investors imply that a rise in stock prices from a high volume trading day is more likely than a rise resulting from a low volume trading day.

1. Introduction

This article examines the extent to which the trading behavior of heterogeneous investors manifests in stock price changes of asset portfolios which constitute the Shanghai Stock Exchange. Using a range-based autoregressive asymmetric volatility model to capture the time-series dynamics of conditional market volatility, we provide an econometric framework to capture the possible impacts of 'rational' mean-variance optimizers, 'feedback' investors and 'information-driven' investors. Thus far inferences

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regarding the presence of such heterogeneous investors albeit inconclusive have been derived from industrialized and mature stock markets.

Broadly speaking, there are at least two predominant schools of thought on the statistical distribution of stock price movements. The number of followers for each school has shifted over the years whereby such shifts become ostensibly more pronounced during recessionary times and episodes of economic misfortune. The classical school of thought that has shaped much of the work in applied econometrics and asset pricing subscribes to the notion that stock price changes follow a random walk and are normal or Gaussian (Bachelier, 1900; Mandelbrot, 1963; Fama, 1965; Malkiel, 2003; inter alia). Consistent with this notion, it is believed information diffuses unrestrictedly to all market participants allowing them to compete fairly and equitably. This setting is the underpinning for the efficient market hypothesis and justifies the 'rational' practice of portfolio mean-variance optimization (Markowitz, 1952).

Rejecting the aforementioned, the second school of thought cites practical reasons why arbitrageurs are constrained in their ability to correct asset mispricing and argue heterogeneous investors impact stock price movements via the various technical, trend-chasing or portfolio insurance strategies that are actively in use by so many different types of investors (Cutler et al., 1990; De Long et al., 1990; Sentana and Wadhwani, 1992; Shleifer and Vishny, 1997; Abreu and Brunnermeier, 2003). Unlike the efficient market school of thought, there is a greater degree of opinion dispersion here as to the distributional dynamics of price changes. This is because heterogeneous investors, such as those mentioned earlier, drive stock prices in unpredictable ways. Investors trading on subjective criteria, rather than objective statistical measures such as mean and variance, reach investment decisions on the basis of unobservable and inherently unquantifiable parameters. Insomuch as information drives the behavior of investors and arrives to the market with varying degrees of proportion, one can justify the replacement of the classical Gaussian distribution with the mixture of distributions hypothesis as an explanation of stock price changes (Clark, 1973; Epps and Epps, 1973; Tauchen and Pitts, 1983).

Behavioral explanations in academic literature have gained more acceptance and support especially in times of market upheaval. As Shiller (2000) indicates, we are experiencing today much more volatility which has little to do with shifts in stock market fundamentals. Likewise, many authors, some of whom are prominent psychologists, find that investors systematically make biases in their judgments, over-react to information instead of conducting careful deliberation, and make decisions on the basis of what their peers are doing (Tversky and Kahneman, 1974; inter alia). Koutmos (2012a) argues that such behavioral explanations are receiving more scrutiny because it is becoming more self-evident that the classical asset pricing paradigm of portfolio formation on the basis of mean and variance is not sufficient in uncovering a statistical relation between risk and return on asset portfolios. This possibly stems from our fallacious tendency to overlook heterogeneous groups of investors especially in asset pricing paradigms that seek to describe variations in expected stock returns. The Merton (1980) intertemporal capital asset pricing model focuses exclusively on mean-variance optimizers as a source for stock price variation.

In light of the aforementioned, this article extends the intertemporal capital asset pricing to integrate the heterogeneous behavior of these rational mean-variance optimizers, feedback investors and information-driven investors. As already mentioned, and in accordance with the efficient market hypothesis, the first group of investors are 'rational' in the sense that they trade on the basis of mean and variance whereby their expected returns rise in the presence of greater market volatility (Merton, 1980).

The second group are feedback investors who buy and sell on the basis of past prices. If they are positive feedback investors they buy during price upswings and sell during price declines. Such behavior may manifest from bandwagon effects and herding, the use of stop-loss orders which induce selling after price declines, margin-call induced selling, or momentum-type technical strategies designed to catch incipient price trends. Conversely, negative feedback trading entails buying during price declines and selling during price appreciations.

Finally, the third group of investors are information-driven in the sense that their buying and selling investment decisions are based on an exogenous set of factors and not necessarily mean and variance considerations or previous price movements. Instead, they may be influenced by the arrival of news such as press releases and other corporate announcements. Trade volume thus varies through