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Investor sentiment and price limit rules

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ABSTRACT

This paper reports on an empirical examination of the relationship between a single-stock price limit rule and investor sentiment. While a single-stock price limit rule is new in U.S. markets, policymakers have used this tool for many years in futures markets and internationally to temper the impact of unwarranted price movements. The literature documents a significant impact of sentiment on pricing but is inconclusive regarding the efficacy of a single-stock price limit rule. We find that a price limit is more likely to be triggered when investor sentiment is extreme. Importantly, a significant portion of a price reaction to investor opinion is temporary. Thus, while some price changes reflect fundamental information, investors are prone to sentiment that moves markets based on misinformation.

1. Introduction

As investors and policymakers are keenly aware, asset markets are at times volatile and seem to react without fundamental basis. Just one example is the severe disruption that occurred in U.S. markets on May 6, 2010. In a 20-minute time span stock prices dropped precipitously and subsequently recovered. Markets and regulators were left reeling. More than 300 stocks traded at prices that declined 60% or more in mere moments (Report of the Staffs of the CFTC and SEC, 2010). The circumstances surrounding this "flash crash" were closely and painstakingly examined and it seemed clear that the disruption was not caused by a shift in underlying fundamentals, but rather by an extreme, temporary loss in liquidity. A single, computer driven trade may have pushed an already unstable market into turmoil.

At the time of the flash crash, market-wide circuit breakers were in place in the United States but were not triggered. A market-wide trading halt rule has the potential to calm a market that is overreacting to news or even misinformation. Yet, theorists recognize that sentiment impacts the cross-section of stock returns so that even a broadly-based change in sentiment does not affect all stocks to the same extent (Baker and Wurgler, 2006). In 2010 no single-stock circuit breakers were in place in the U.S., though regulators responded in recent years by implementing rules to pause markets for individual stocks after large, sudden price movements. Prior to the flash crash, price limits in futures markets had been in place for many years and a wide variety of circuit breaker rules were used for individual stocks and markets around the world. For example, at the London Stock Exchange automated trading halts are triggered when prices fall or rise a specified percentage.[1] Mandated interruptions in trading are tools regulators use to moderate extreme, unwarranted price changes in individual stocks. These kinds of trading restrictions may calm a market, allowing traders time

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[1] The trigger points depend on the liquidity of the stock and defined percentages range from 5% to 25%.

to reevaluate fundamental information relating to the performance of an individual stock.

This paper reports on an empirical examination of the relationship between a price limit rule and investor sentiment regarding individual stocks. While the various trading halt rules have garnered attention from researchers, the academic evidence on the efficacy of price limits for individual stocks is inconclusive. Investor sentiment can have a marked impact on pricing for an individual security, just as with the overall market, and if trades are based on misinformation, prices will diverge from fundamental value. Prices move due to changes in fundamental valuations, as well as investor opinion, but a growing literature documents the significant impact of sentiment on pricing in markets (Baker and Wurgler, 2006; Barberis et al., 1998). We provide insight into whether a price limit is triggered when traders' views on an individual stock are extremely positive or negative and price movements are due to sentiment-driven mispricing. Our results are particularly timely as regulators around the world are considering additional regulation to promote the integrity of markets.[2]

While a number of researchers have looked internationally to provide insight into the effects of trading interruptions, we make use of two rich data sets that allow us to conduct an investigation unlike others reported in the literature. We first construct a measure of sentiment regarding individual stocks using opinions expressed on a popular online investor forum. We extract from this massive database a measure of investors' views of a stock by quantifying positive and negative expressions on the worth of the stock as an investment. We then match daily measures of positive and negative sentiment to the market experience, including price limit events and stock returns. We chose stocks traded in China as this data allows us to examine the questions of interest. While individual price limits are relatively new in the U.S., they have a longer history in China. This history provides insight into the potential effectiveness of the newly imposed price limit rule in U.S. and other markets.

The existing empirical and theoretical literatures do not provide clear conclusions regarding the role of trading halts in markets (Harris, 1998; Kim and Yang, 2004). The ambiguity may arise from the various forms of mechanisms, variations in rule specifications across international markets, and multiplicity of empirical methods and theoretical assumptions. While some contend that trading halts hamper the natural movement of security prices and introduce unnecessary and artificial barriers, others argue that interruptions can be beneficial. A break in trading may temper unwarranted price changes if it provides a "cooling off period." Despite a significant body of literature there is little consensus on whether trading breaks impede or enhance market efficiency. For example, some researchers argue that trading restrictions lower price volatility (Ma et al., 1989a,b), others find that volatility increases (Lee et al., 1994), and still others report little effect of trading interruptions in markets (Overdahl and McMillan, 1998). Evidence from the laboratory is also inconclusive with some studies finding that trading halts serve no useful role and others concluding that prices move away from fundamentals after a halt (Ackert et al., 2005, 2001).

The Chinese market provides the ideal environment for an investigation of the relationship between trading price limits and investor sentiment.[3] Evidence suggests that mispricing in markets can be driven by the sentiment of individual investors (Lee et al., 1991). Furthermore, the mispricing can persist if the ability of rational traders to take advantage of mispricing is limited. In such cases, prices move even farther from fundamental values (Shleifer and Vishny, 1997; De Long et al., 1990; Shiller, 1984). When the Chinese market was reborn in the early 1990s, only individual investors were permitted to participate. While institutional investors have a significant presence in these markets, individual investors continue to dominate trading. The Chinese market is characterized as extremely volatile, and investors as limited in terms of investment knowledge and experience (Xu, 2000; Wang et al., 2006). At the end of 2007 the market value of stocks held by individual investors was 51.29%, with institutional investors and mutual funds holding 42.31% and the government 6.4%.[4] Our use of Chinese data is fitting because of the important role of individual investors in the market. Recent evidence and finance theory suggest that these investors are the noise traders who make decisions using information that is not related to fundamental values (Shleifer and Vishny, 1997; De Long et al., 1990; Lee et al., 1991). Though individual investors are not the only traders in the Chinese market, their influence in the market is large.

Our results indicate that a price limit rule plays a useful role in a market with noise traders who overreact to information. Finance theory suggests that the sentiment of individual investors can move markets. Of course, investors' views may reflect both sentiment and fundamental information. We find that higher positive (negative) sentiment leads to a higher probability that the upper (lower) price limit is hit the following day. This result may seem completely intuitive and perhaps unsurprising. Importantly, while some price pressure reflects fundamental information our evidence suggests that a significant portion of the reaction is temporary. A price limit rule is designed to temper *extreme, unwarranted* price movements. Moderate price movements will not trigger a price limit and trading will continue unabated. However, extreme price movements driven by investor sentiment will trigger the price

[2] For example, in October 2012 India's equity market experienced a flash crash blamed on trader error. As a result, regulators are considering tighter rules (Crabtree, 2012).

[3] A study by Seasholes and Wu (2007) also uses data from the Chinese market to examine behavioral biases. Note, however, that their approach is quite distinct from ours. They use a price limit trigger, in and of itself, as a measure of an attention-grabbing event. Their goal is to examine how the market responds to attention. Here our goal is to examine the role of the price limit rule in a market characterized by positive or negative investor sentiment regarding an individual stock.

[4] Information regarding equity holdings across investor categories can be found at http://daily.cnnb.com.cn/dnsb/html/2009-05/06/content_83379.htm and in the 2011 Annual Report of the China Securities Depository and Clearing Corporation Limited.