Leverage Networks and Market Crashes

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Abstract

Investors can lever up their positions by borrowing against the securities they hold. This subjects margin investors to the impact of funding availability. A number of recent studies theoretically examine the interplay between funding liquidity and market liquidity, leading to interesting implications for asset prices. Testing these predictions, however, is empirically challenging, without directly observing individual investors' leverage ratios and stock holdings. In this paper, we tackle this challenge by taking advantage of unique account-level data from China that track hundreds of thousands of margin investors' borrowing and trading activities at a daily frequency.

Our main analysis covers a three-month period of May to July 2015, during which the Chinese stock market experienced a rollercoaster ride: the Shanghai Stock Composite Index climbed 15% from the beginning of May to its peak at 5166.35 on June 12th, before crashing 30% by the end of July. Major financial media around the world have linked this incredible boom and bust in the stock market to the popularity of, and subsequent government crackdown on, margin trading in China.

We show that idiosyncratic shocks in the market can cause contagion across assets when these assets are "connected" through common holdings by margin investors. In particular, the returns of one security strongly and positively forecast the returns of other securities with which it shares a common margin investor base. Further, using a network-based approach, we show that stocks that are connected to more other stocks through common holdings by margin investors (i.e., that are more central to the leverage network)tend to have lower returns and higher crash risk going forward. We label these stocks "systematically important'' as they have the largest loadings on the market leverage risk. In a similar vein, we label some of the accounts "systematically important" as their activities are most related to market-wide leverage risk. Finally, we provide evidence that average connectedness of the leverage network help forecast future market returns in our sample.

Keywords: margin trading, leverage, contagion, liquidity spiral

JEL Classification: G11, G23

Potential Contributions:

1. Provides the first empirical evidence of "financial contagion" through leverage trading in the stock market.

2. Adding insights into investor and stock characteristics conducive to contagion risk, underscoring the crucial impact of leverage on bubbles and crashes in stock market.

3. In addition, this paper is among the first to study the Chinese stock market crisis in 2015-16.In particular, it highlights the important roles of margin trading and documents investor s at a micro level, therefore contributing to emerging studies on China's financial system.

4. Overall, the paper contributes to the literature on network analysis in financial markets and financial stability by providing evidence that the overall liquidity risk in the market is not contingent on the network form, but on the economic behavior of each node in the network.