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Hedge Fund Contagion

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Summary

Mission of the BNP Paribas Hedge Fund Centres

The mission of the BNP Paribas Hedge Fund Centres is to facilitate, encourage, and sponsor high-level academic research on hedge funds. The Centres also provide outstanding education to students, executives, and investors, and publish objective and independent information on hedge funds, while promoting understanding and awareness of alternative investment strategies. Through excellence in research on alternative investments, the Centres are recognized for their capacity to foster stimulating exchange of opinions, and to develop a knowledgeable and objective information base regarding hedge funds.

The primary objectives of the BNP Paribas Hedge Fund Centre at the Singapore Management University are to

1. conduct and disseminate high quality academic hedge fund research
2. educate finance practitioners and the investor public on hedge funds, and
3. raise the profile of the hedge fund industry in Asia and Singapore

To achieve these goals, the Centre will collaborate closely with its sister centres at the London Business School and HEC. Moreover at all times, the Centre is absolutely committed to the highest ethical conduct and will actively avoid any conflicts of interest with outside parties.

Hedge fund contagion

Melvyn Teo[1]

Abstract

Why do correlations all go to one when economic conditions turn bad? We review the latest research on funding liquidity (the ease with which hedge funds obtain capital) and discuss its implications on the liquidity and valuations of securities held by funds, on subsequent fund performance, and on contagion across hedge fund investment styles.

Asset liquidity and valuation

Shocks to the funding liquidity of hedge funds can affect the asset liquidity (the ease with which assets can be traded) of the securities that they hold. Aragon and Strahan (2010) find that stocks held by hedge funds who primed with Lehman Brothers experienced larger than usual declines in asset liquidity in the fall of 2008 following the collapse of Lehman Brothers. As one of the major prime brokers up till its bankruptcy in September 2008, Lehman Brothers provided custodial services, securities lending services, and financing to its hedge fund clients. Lehman could no longer provide such services when it went under. Because of re-hypothecation, the accounts of many of its hedge fund clients were frozen, making it impossible for these hedge funds to trade or to switch to another prime broker.

Re-hypothecation is the process whereby prime brokers lend securities purchased by hedge funds to other investors. This generates profits for the prime broker and reduces the cost of extending credit, but it also creates counterparty risk for the hedge funds as it makes it difficult for the funds to reclaim their securities in the event that the broker goes bankrupt. As one manager commented, "If you gave your assets to Lehman as collateral and they lent those out, then more than one person has a claim on those assets. Everyone passes around the security, then the music stops, there is one chair to sit on and too many people who want to sit on it."[2] It is therefore unsurprising that Aragon and Strahan (2010) find that the failure rate of Lehman's hedge fund clients doubled after the bankruptcy, relative to funds with similar performance characteristics who primed with other brokers.

One example of a hedge fund that failed is Oak Group. The fund had $22 million in long positions matched with $22 million in short positions, plus $16 million in cash in a margin account. All of those positions were held in Lehman who re-hypothecated the $22 million in long

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[2] See Euromoney, November 2008.

positions. Thus when Lehman keeled over, Oak Group could not regain its securities or its cash, and they became a general creditor of Lehman Brothers. John James, head of Oak Group lamented that “Without those securities, my strategy has been ruined. Had we had the securities and been able to continue trading, we would have been up 6% over the last six weeks.”

As a result of the funding liquidity problems faced by these Lehman clients, the stocks they held experienced large declines in asset liquidity after the bankruptcy. According to Aragon and Strahan (2010), the overall price impact of trades on these stocks rose during that period, as did their bid ask spreads. Since asset liquidity overall dropped sharply for all stocks, their result implies that, relative to other stocks, the stocks held by Lehman-connected hedge funds experienced larger declines in asset liquidity.

Figure 1: The relationship between asset liquidity and Lehman-connected fund holdings

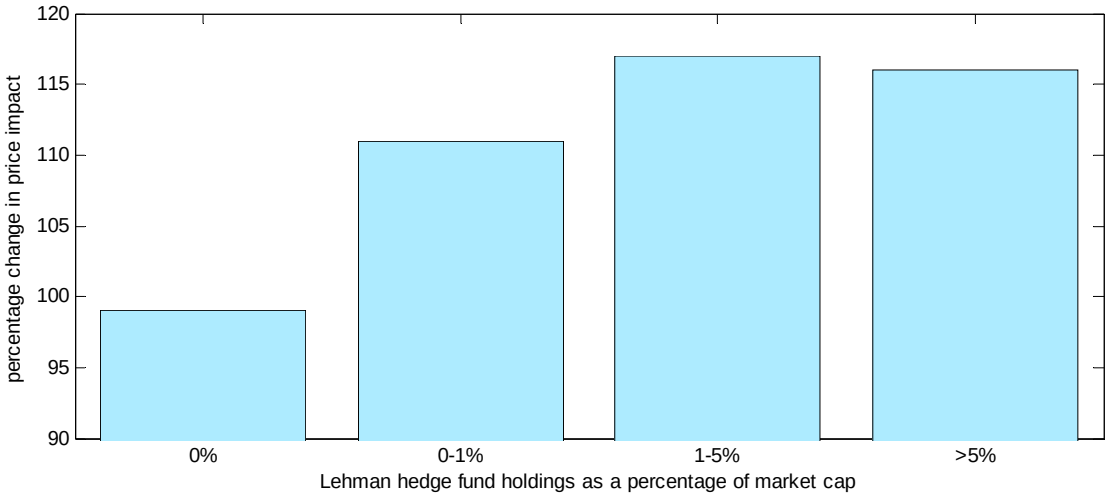


Figure 1, reproduced from Aragon and Strahan (2010), graphs the price impact as a function of the amount of the stock held by Lehman-connected funds, as a percentage of total market capitalization. There is a noticeable upward trend in price impact as we move from stocks not held by Lehman-connected funds to stocks held by the same funds. In the presence of selling pressure in the fall of 2008, this could explain why valuations were so low at the height of the recent subprime financial crisis, at least for stocks held by Lehman-connected funds.

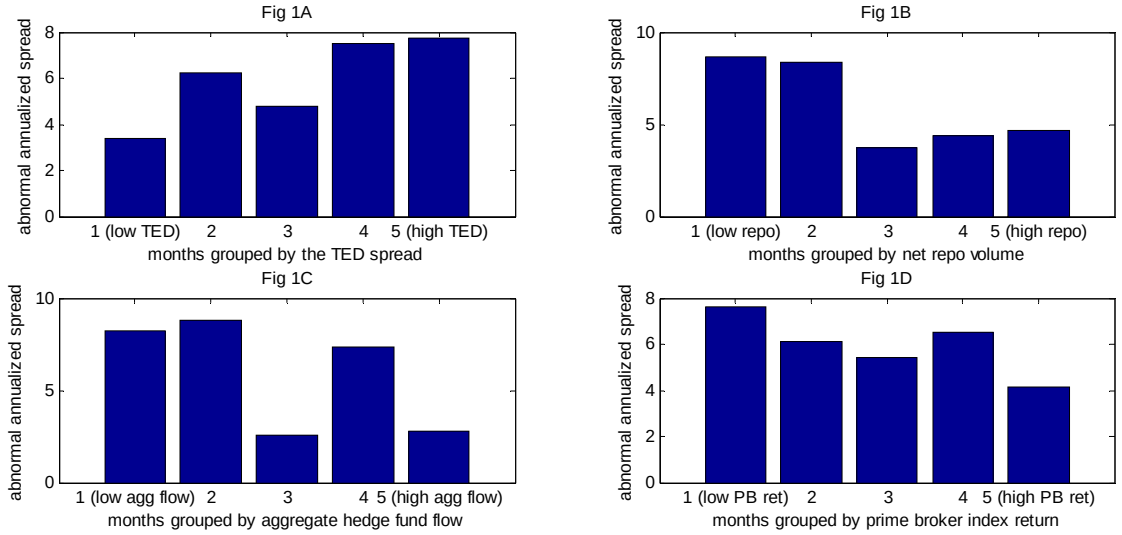
Fund performance

If funding liquidity shocks influence the valuation of securities held by hedge funds then they should also impact subsequent hedge fund returns. Teo (2010) finds that even for the group of purportedly liquid hedge funds that grant favorable redemption terms to their investors, fund flows have a strong impact on subsequent fund returns. Consistent with the idea that hedge funds are forced to sell assets at fire sale prices to cope with investor demand shocks, the effects of fund flow is stronger for outflows, for funds with high exposures to liquidity risk, and when market liquidity is low. For example, the spread in returns between funds with high net

inflows and funds with low net inflows is particularly large in October 1998 when Russia defaulted on the Ruble and triggered a liquidity crunch that decimated Long Term Capital Management. The return difference is also unusually stark in March 2008 with the collapse of Bear Stearns and in September 2008 with the demise of Lehman Brothers.

Shocks to the funding liquidity of individual funds should also be more impactful when aggregate funding liquidity is tight. The intuition is that when funding liquidity is tight, there are few ready buyers when hedge funds need to sell their specialized assets (i.e., convertible bonds or distressed debt) to cater for investor redemptions. In line with this reasoning, Teo (2010) shows that the funds flows are more impactful when the TED spread is wide, net repo purchases are depressed, aggregate hedge fund flows are low, and prime broker stock returns are poor. Figure 2 below illustrates these findings.

Figure 2: How the impact of fund flows varies with aggregate funding liquidity



The TED spread is the Treasury-EuroDollar spread culled from the Federal Reserve website. Net repo volume is the difference between overnight repurchase and reverse repurchase volume constructed from weekly data supplied by Tobias Adrian of the Federal Reserve. Aggregate hedge fund flows is total percentage hedge fund flows. Prime broker stock returns are the equally-weighted stock returns of Goldman Sachs, Morgan Stanley, Bear Stearns, UBS AG, Bank of America, Citigroup, Merrill Lynch, Lehman Brothers, Credit Suisse, Deutsche Bank, and Bank of New York Mellon, adjusted for mergers and bankruptcies. A widening of the TED spread is typically associated with higher borrowing costs. Net repo volume is related to funding liquidity and dealer leverage. Poor performance of prime brokers may translate into higher margins for their hedge funds clients as prime brokers cut down on risk.

Contagion

Brunnermeier and Pedersen (2009) envisage the formation of liquidity spirals where shocks to asset liquidity lead to funding constraints for hedge funds (via investor withdrawals and/or increased margins by prime brokers) that force hedge funds to reduce their leverage. As a result of the deleveraging, asset liquidity worsens leading to more deleveraging. These liquidity spirals affect all assets for which hedge funds are the marginal investors, not just the assets directly affected by the initial shock. Since hedge funds (e.g., multi-strategy funds) often invest in a variety of securities across asset classes, this may explain contagion.

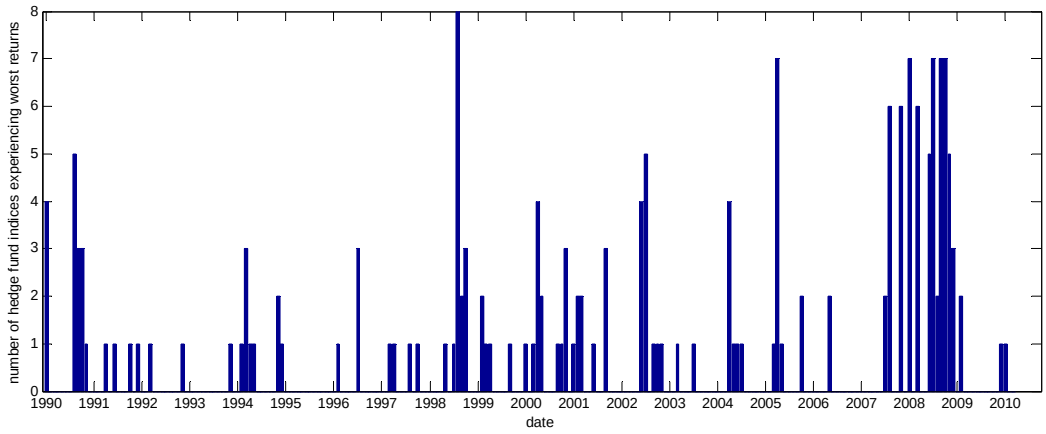
In line with this reasoning, Boyson, Stahel, and Stulz (2010) find that contagion across hedge fund styles is linked to shocks in funding liquidity. They first show using monthly HFR investment strategy[3] index data from January 1990 to October 2008 that the worst hedge fund returns, defined as returns that fall in the bottom 10% of a hedge fund style's monthly returns, cluster across styles. By leveraging on both parametric and non-parametric analyses, they show that the clustering cannot be explained by the risk factors commonly used to explain hedge fund performance.

Specifically, they document using a quantile regression that there is clustering of below the median returns across styles but no clustering of above the median returns. They also find that the probability that any given hedge fund style will deliver a return in the bottom decile (over time) is positively related to the number of *other* hedge fund styles that are having the worst return in the same month. Their analyses suggest that there appears to be correlation in hedge fund returns over and above what one would expect from economic fundamentals alone, at least on the downside. To abstract from risk, they run their tests on hedge fund style returns after filtering away co-variation with the usual hedge fund risk factors, including look back straddles on bonds, currencies, commodities, equities, and short term interest rates. See Fung and Hsieh (2004) and Agarwal and Naik (2004) for a discussion of hedge fund risk factors.

Next, they show that such contagion intensifies following negative shocks to aggregate funding liquidity. For example, when the TED spread widens, net repo volume diminishes, hedge fund net inflows dry up, and prime broker stock index returns fall, contagion across hedge fund investment styles worsen. This suggests that contagion is driven by funding liquidity effects of the kind envisaged by Brunnermeier and Pedersen (2009). Figure 3 illustrates the clustering of the eight HFRI strategy index returns (convertible arbitrage, distress securities, event driven, equity hedge, equity market neutral, global macro, merger arbitrage, and relative value arbitrage). It reveals significant clustering on the downside across hedge fund strategies in August 1998 (Russian ruble default and LTCM crisis), in April 2005 (one month before GM and Ford lost their investment grade ratings), and in 2008 (the collapse of Bear Stearns and Lehman Brothers).

[3] The investment strategies they consider include convertible arbitrage, distress securities, event driven, equity hedge, equity market neutral, global macro, merger arbitrage, and relative value arbitrage.

Figure 3: Clustering of HFRI strategy index returns



Conclusion

Motivated by the recent financial crisis, a growing body of work investigates the impact of funding liquidity on hedge funds and the securities they hold. The main findings distilled from such research are that funding liquidity shocks can impact the performance of hedge funds and the valuation of the securities that they hold. A tightening of aggregate funding liquidity, as in 2008 when banks raised margins and tightened credit in response to the problems they faced in the real estate market, affects many hedge funds at the same time and can contribute to return contagion across funds, and across the securities for which funds are the marginal traders.

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Update on the Centre's Activities

Education

The centre director presented the paper "How liquid are liquid hedge funds?" at a hedge fund conference in Paris on January 28. The conference was jointly sponsored by HEC Paris and CREST.

Research

The centre sponsored paper "Side-by-side management of hedge funds and mutual funds," by Tom Nohel, Jay Wang, and Lu Zheng, has been accepted for publication at the Review of Financial Studies.

The centre sponsored paper "Hedge funds, managerial skill, and macroeconomic variables," by Doron Avramov, Robert Kosowski, Narayan Naik, and Melvyn Teo, has been accepted for publication at the Journal of Financial Economics.

Working versions of these papers are available for download from our research webpage

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For more information regarding the BNP Paribas Hedge Fund Centre at SMU and our upcoming activities, please contact Ms Karyn Tai, centre coordinator (Tel: +65-6828-0933, E-mail: hfc@smu.edu.sg) or visit our webpage at http://www.smu.edu.sg/centres/hfc/index.asp. We look forward to receiving your suggestions and comments.