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### How Liquid are Liquid Hedge Funds?

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# Newsletter of the BNP Paribas Hedge Fund Centre at SMU

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## Summary

- Mission of the BNP Paribas Hedge Fund Centres
- How Liquid are Liquid Hedge Funds?, by Melvyn Teo
- Update on the Centre's Activities

## 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.

# How Liquid are Liquid Hedge Funds?

Melvyn Teo<sup>1</sup>

## Abstract

Many hedge funds impose minimal share restrictions and allow investors to redeem on a monthly basis or better. We find that there is significant variation in the liquidity risk exposure of these “liquid” funds. Within this group of funds, those that embrace liquidity risk outperform those that eschew liquidity risk by 4.86 percent per year. As a consequence of the liquidity risk exposure, funds experiencing outflows subsequently earn lower returns than funds receiving inflows. The effects of flows are more pronounced for funds employing leverage, for funds with high liquidity risk exposure, and during a liquidity crunch. These results underscore the importance of funding liquidity (the ease with which traders can obtain capital) and shed light on the asset-liability mismatch in the hedge fund industry.

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## Introduction

During the recent financial crisis, investors were surprised when many hedge funds, following a bout of poor performance, invoked a little known clause in their investment management contracts and raised gates to stanch capital outflows.<sup>2</sup> Redemption gates allow hedge fund managers to limit the percentage of fund capital that can be redeemed by investors at any point in time. Fund managers argue that gates protect investors as they allow fund managers to liquidate in an orderly fashion and avoid selling assets at fire sale prices. Investors contend that fund managers, especially those who continue to levy management fees on gated capital, care more about business continuity than about investor protection.

Motivated by these events, we ask whether there is an asset-liability mismatch in the industry. In other words, is there a mismatch between the liquidity that hedge funds say they can provide to investors and the liquidity of their underlying portfolios? We focus on hedge funds that allow for redemptions on a monthly basis or better<sup>3</sup>. These hedge funds provide a fertile ground to search for instances when funds over promise in terms of liquidity.

To analyze hedge fund performance and liquidity, we employ a merged TASS and HFR dataset which features monthly fund return, monthly assets under management, and annual fund characteristics information. The sample period starts in January 1994 and ends in December

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<sup>1</sup> Melvyn Teo is Associate Professor of Finance and Director, BNP Paribas Hedge Fund Centre at the Singapore Management University. E-mail: [melvynteo@smu.edu.sg](mailto:melvynteo@smu.edu.sg). I benefitted from discussions with Bill Fung and Narayan Naik. Yan Qiu provided excellent research assistance.

<sup>2</sup> See “Hedge Funds Make It Hard To Say Goodbye,” The Wall Street Journal, 10 April 2008, and “Hedge Fund Withdrawals Accelerate: November Demands From Investors Deepen the Worst Year on Record,” The Wall Street Journal, 8 December 2008.

<sup>3</sup> We also impose the condition that the fund redemption notice period is less than or equal to a month.

2008. In total, there are 12,502 funds in the data sample. After removing the duplicate share classes, we are left with 8,871 funds, of which 3,099 funds have stopped reporting returns, as of December 2008. Roughly half of the funds in our universe, i.e., 4,127 funds, offer favorable redemption terms.

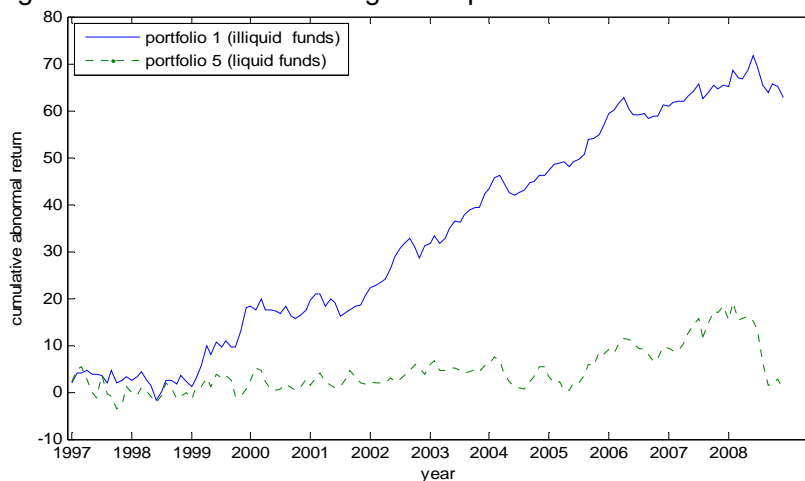
### Market liquidity and hedge funds

Just how liquid are these purportedly liquid hedge funds? To answer this question, we group funds into quintiles every January based on their past market liquidity<sup>4</sup> risk exposure and evaluate their returns over the next 12 months. We find that there exists significant variation in the market liquidity of these “liquid” funds. To measure liquidity risk exposure, we use fund exposure<sup>5</sup> to the Pástor and Stambaugh (2003) liquidity factor, a measure of market-wide liquidity that is based on temporary stock price changes accompanying order flow. As shown in Table 1, the return spread between hedge funds that embrace liquidity risk (Portfolio 1) and hedge funds that shun liquidity risk (Portfolio 5) is 4.86 percent per year.

Table 1: Portfolio sorts on liquidity risk exposure

Portfolio	Excess Ret. (pct/ year)	t-stat of excess return	Alpha (pct/ year)	t-stat of alpha
Portfolio 1 (high liquidity risk exposure)	6.74	3.19	5.23	2.53
Portfolio 2	5.01	3.55	4.09	3.18
Portfolio 3	2.43	1.99	1.30	1.26
Portfolio 4	3.47	2.10	2.92	2.14
Portfolio 5 (low liquidity risk exposure)	1.88	0.73	0.04	0.02
Spread (1-5)	4.86	2.73	<b>5.19</b>	2.67

Figure 1: Performance of hedge fund portfolios sorted on market liquidity



<sup>4</sup> In this study, we differentiate between market liquidity (the ease with which assets can be traded) and funding liquidity (the ease with which traders obtain capital).

<sup>5</sup> Fund loadings on the liquidity factor are estimated using past 36 months of return data and in the presence of the augmented Fung and Hsieh (2004) factors.

When we evaluate performance relative to an augmented Fung and Hsieh (2004) factor model, we find that the spread cannot be explained by risks related to the equity market, the fixed income market, trend following strategies, and option based<sup>6</sup> strategies. After considering these risks, the spread is still 5.19 percent per year. As shown in Figure 1, most of the spread is driven by the performance of the illiquid hedge fund portfolio, which appears to be harvesting a liquidity risk premium.

### The effects of fund flow

From the discussion thus far, it is clear that there exists significant variation in the liquidity risk profiles of apparently liquid hedge funds. Funds exposed to greater liquidity risk earn higher returns. But what are the other implications of such liquidity risk exposure on fund investors? Does liquidity risk exposure engender problems for hedge funds when investors deploy and redeem capital?

To investigate, we group hedge funds into quintiles every month based on fund flow in the last month. The returns on these quintile portfolios during the next month are linked across months to form a single return series for each portfolio. We then evaluate the returns of these portfolios and report the results in Table 2. We find that last month's fund flow has a positive effect on fund returns the next month. Hedge funds attracting large subscriptions (Portfolio 1) subsequently outperform hedge funds experiencing large redemptions (Portfolio 5) by 3.00 percent per year.

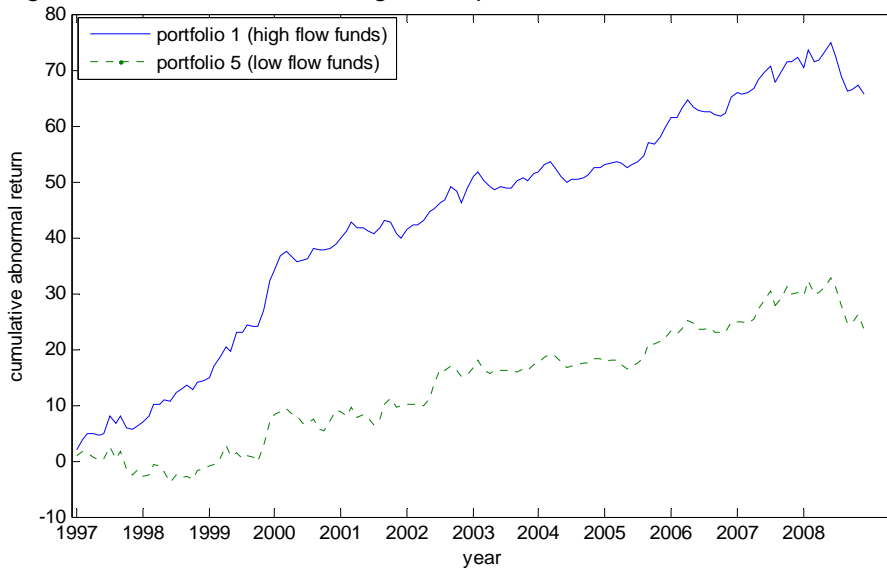
Table 2: Portfolio sorts on fund flow

Portfolio	Excess Ret. (pct/ year)	t-stat of excess return	Alpha (pct/ year)	t-stat of alpha
Portfolio 1 (high flow)	6.55	3.40	5.47	3.48
Portfolio 2	4.08	2.41	2.64	2.14
Portfolio 3	4.02	2.33	2.97	2.15
Portfolio 4	3.84	2.45	3.06	2.38
Portfolio 5 (low flow)	3.55	1.84	1.97	1.26
Spread (1-5)	3.00	3.57	<b>3.50</b>	3.35

Of course, funds experiencing redemptions may scale back on risk to reduce volatility and preserve capital. Lower risk-taking may explain the inferior returns of the funds in portfolio 5. However, after adjusting for exposure to the usual hedge fund risk factors, the spread is still 3.50 percent per year. It is unlikely that risk shifting lies at the root of our results. Figure 2 plots the cumulative risk-adjusted returns of the extreme quintile portfolios from the sort on fund flow. It indicates that the cumulative spread has increased steadily between 1994 and 2008.

<sup>6</sup> The option based factors are derived from the Agarwal and Naik (2004) model and were generously provided by Narayan Naik.

Figure 2: Performance of hedge fund portfolios sorted on fund flow

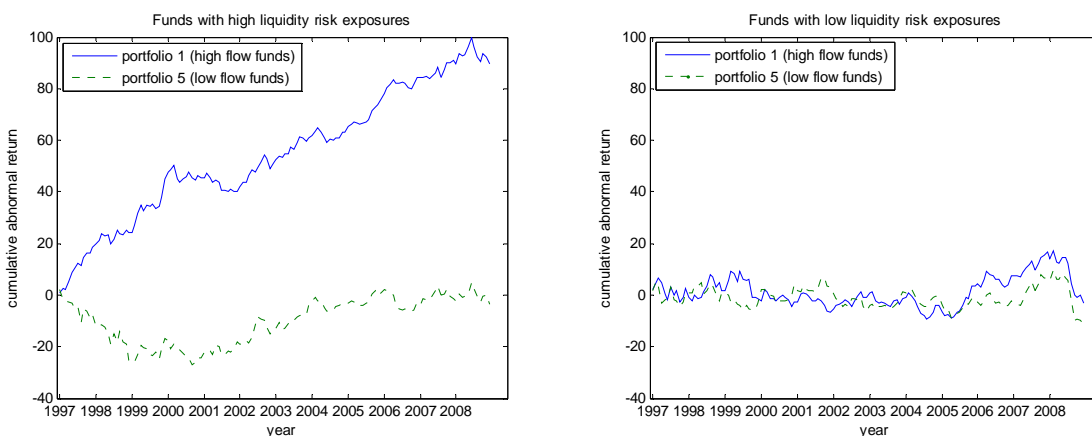


### Funding liquidity and hedge funds

If our flow portfolio spreads are linked to funding liquidity issues, then it seems reasonable to posit that they should be more pronounced for funds with greater liquidity risk exposures and when market liquidity is low. Brunnermeier and Pedersen (2009) argue that under certain conditions the effects of market liquidity and funding liquidity can be mutually reinforcing and lead to liquidity spirals.

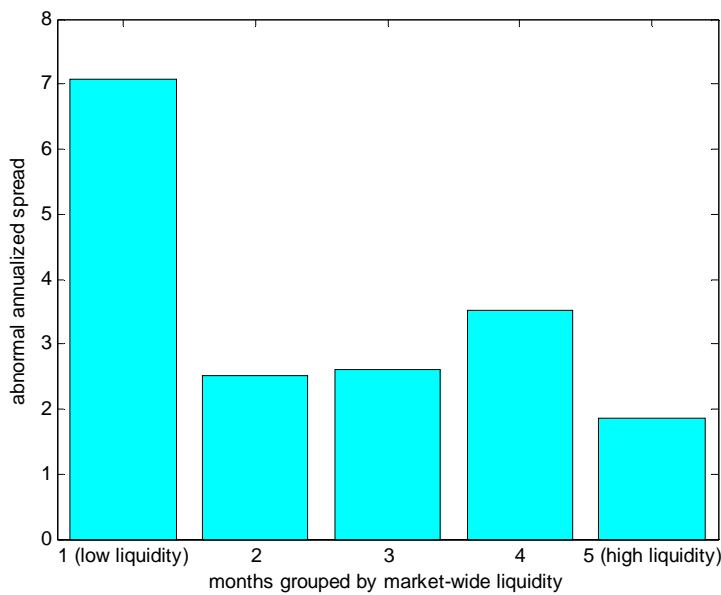
Consistent with this view, we find that the flow portfolio spread is significantly greater within the group of funds with high liquidity risk exposure than within the group of funds with low liquidity risk exposure. Specifically, for funds that embrace liquidity risk, the flow portfolio alpha spread is an impressive 7.74 percent per year while for funds that eschew liquidity risk, the corresponding spread is only 0.68 percent per year. Figure 3 illustrates the stark differences between these two sets of funds.

Figure 3: Variation in the flow portfolio spread across funds



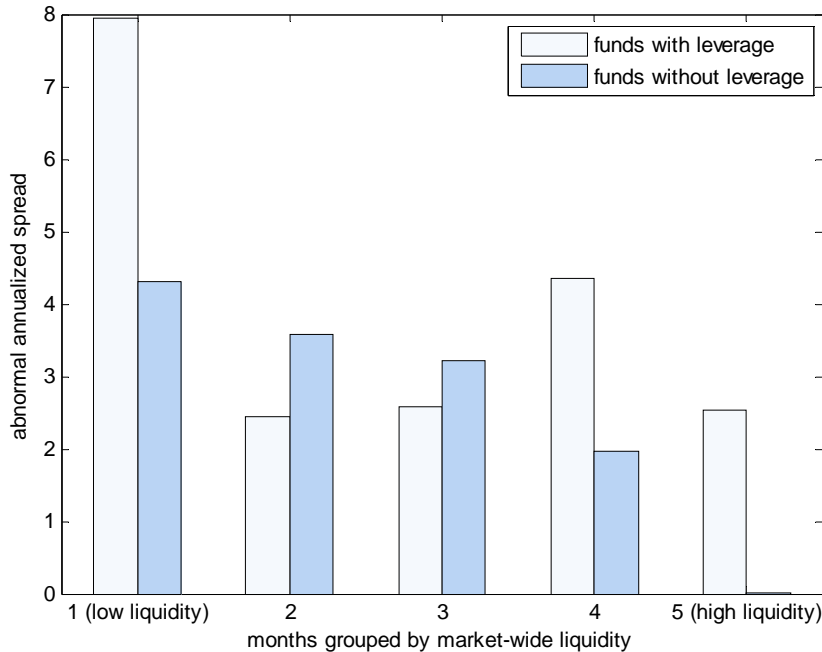
Market liquidity shapes not just the variation in flow impact across funds but also the variation in flow impact over time. When we group the sample months into five states based on market liquidity and graph in Figure 4 the flow portfolio spreads for each state, we find that the effects of fund flow are especially strong when market liquidity is low. As illustrated in Figure 4, during months when market liquidity is at its lowest (e.g., in October 1997, at the height of the Asian financial crisis, in September 1998, following the Russian Rouble default, and in September 2008, which coincided with the collapse of Lehman Brothers and the near bankruptcy of AIG) high flow funds subsequently outperformed low flow funds by 7.07 percent per year. This spread is also more than twice as large as the spreads for the other months.

Figure 4: Variation in the flow portfolio spread over time



Leverage is another factor that compounds the effects of funding liquidity. Given the same dollar outflow, funds that employ leverage will have to liquidate a greater dollar value of assets than funds that forgo leverage. Brunnermeier and Pedersen (2009) argue that levered speculators are susceptible to a margin spiral if margins are increasing in market illiquidity. In a margin spiral, a funding shock to speculators lowers market liquidity, leading to higher margins, which tightens speculators' funding constraints further, and so on. We show in Figure 5 that when market liquidity is low, leverage amplifies the impact of fund flow on future fund returns. This suggests that the cocktail of high leverage, low market liquidity, and investor redemptions concocted in 2008 was extremely detrimental to hedge fund performance.

Figure 5: Leverage, market liquidity, and funding liquidity



Collectively, the findings in this section lend support to the view that funding liquidity concerns are important for hedge funds. The performance of funds that offer generous redemption terms suffers following outflows. These funding liquidity effects are heightened for levered funds, for funds exposed to greater liquidity risk, and during times of low market-wide liquidity.

## Conclusion

The use of gates by hedge funds has severely dented investor confidence. According to a recent Bank of New York Mellon and Casey Quirk survey<sup>7</sup>, up to 57 percent of hedge fund investors are unlikely to re-invest in fund managers that gated them. The results from our study suggest that fund managers had valid reasons for raising gates. By erecting gates, hedge funds can prevent further flow-induced deterioration in fund performance. Gates are particularly helpful during a liquidity crunch, when markets are bereft of liquidity. However, ex-ante, having the option to raise gates may ironically encourage hedge funds to take on more liquidity risk than they should, creating an asset-liability mismatch.

## References

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<sup>7</sup> “The Hedge Fund of Tomorrow: Building an Enduring Firm,” Bank of New York Mellon and Casey Quirk, April 2009.



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## Update on the Centre's Activities

### Education

We hosted a seminar on distressed investing on 8 May. The speaker, Mr Anurag Das, was managing director at Kingstreet, a US hedge fund manager with US\$ 16 billion under management focusing on credit long-short and event driven situations. Anurag established and led the Singapore Kingstreet office to cover opportunities across Asia, including Japan and Australia. Recently, Anurag left Kingstreet to set up Rain Tree Capital, a special situations fund.

At the seminar, Anurag explained the different stylistic approaches to distressed investing and used a few examples, including Enron, to provide a window into the different skills, techniques, and perspectives employed to exploit the various opportunities in the distressed arena. Given the growing interest in the distressed space and Anurag's excellent credentials, we were not surprised that the seminar was oversubscribed. Over 70 practitioners and students attended the talk.

### Research

A call for academic research papers and proposals was placed on the Social Science Research Network ([www.ssrn.com](http://www.ssrn.com)) on 15 May. The submission deadline is 31 July 2009.

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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](mailto: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.