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Quantitative Hedge Fund Selection (Part 2)

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Newsletter of the BNP Paribas Hedge Fund Centre at SMU

Summary

- Mission of the BNP Paribas Hedge Fund Centres
- Quantitative hedge fund selection (part 2) by Melvyn Teo
- Update on the Centre's Activities

Mission of the BNP Paribas Hedge Fund Centre

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

Specifically, 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 academics at the London Business School. 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.

Quantitative hedge fund selection (Part 2)

Melvyn Teo¹

Abstract

Do fund incentives, volatility exposure, and liquidity risk affect fund performance? We show that hedge funds with high performance fees and high water mark provisions tend to outperform those with low performance fees and no high water marks. Moreover, funds that short volatility and embrace liquidity risk deliver significantly higher returns relative to funds that long volatility and eschew liquidity risk. Investors with access to secure capital and managed account platforms may be positioned to take advantage of these performance differences.

How do we construct quantitative tools that can supplement the qualitative due diligence process that most investors rely on to select hedge funds? Such tools arise naturally from understanding the drivers of hedge fund performance. In the last issue of the newsletter, we explored the performance impact of fund size, age, location, and management fees. We showed that smaller, young, and local funds that charged higher management fees tend to outperform. In this installment of the newsletter, we explore the impact of other factors on fund alpha.

Clearly, one factor that can influence fund performance is the structure of the manager's compensation contract. Specifically, performance fees help align fund manager's incentives by allowing managers to directly partake in the upside. Similarly, the high water mark feature act as a disciplinary device by making it harder for managers to earn a performance fee following a bout of poor performance. One can therefore argue that funds with high performance fees and high water mark provisions should have incentives that are more aligned with their investors than funds with low performance fees and no high water mark provisions.

Next, the hedge fund strategy and how it relates to key macroeconomic variables like volatility may also affect fund performance. In his book "When Genius Failed," Roger Lowenstein wrote that there was a natural pool of people and institutions on the buying side when it came to insurance, which is why the price of volatility was often a bit higher than the mathematicians deem was logical. Based on this argument, hedge funds that sold insurance or shorted volatility should on average outperform hedge funds that bought insurance or longed volatility. Fund return exposure to changes in the CBOE VIX index may help forecast durable cross-sectional differences in hedge fund performance.

Along the same lines, the past exposure of hedge funds to liquidity risk may help predict future performance as well. Recent research by Sadka (2010) and Teo (2011) corroborate this view.

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The key assumptions are that hedge fund liquidity risk exposures are fairly durable over time and that there is a significant reward for bearing liquidity risk. Investors who are less susceptible to commingling risk by virtue of their access to secure capital, to managed account platforms, or to hedge funds with locked in capital may be positioned to take advantage of the liquidity risk premium embedded in hedge fund returns.

To explore these issues, we employ the hedge fund dataset used in the last newsletter. Specifically, we merge the Barclayhedge, Eurekaledge, and Asiahedge databases. Barclayhedge and Eurekaledge are global databases that contain both non-Asia focused funds and Asia focused funds. By also including the funds from Asiahedge, we increase our coverage of Asia focused hedge funds. The sample period extends from January 2000 to August 2010. In total, the combined database consists of 16,262 funds of which 3,107 are Asia focused funds and 9,137 stopped reporting returns at the end of our sample period. To adjust for risk, we evaluate the performance of hedge funds relative to the Fung and Hsieh (2004) factor model. The Fung and Hsieh (2004) model includes the excess return of the S&P 500 index, the small cap minus large cap index, the term spread, the default spread, and trend following factors for foreign exchange, bonds, and commodities. The data for the Fung and Hsieh (2004) factors extend to March 2010.

To understand the impact that fund incentives have on fund performance, we sort funds into three groups based on whether they charge performance fees at, above, or below 20 percent per annum. Next, within each group, we further split funds into those that have a high water market provision and those that do not. We report in Figure 1 the risk-adjusted returns of each sub-group over the period January 2001 to March 2010. The results are consistent with the view that performance fees and the high water mark feature help align manager incentives with those of investors. Funds with high performance fees and high water marks outperform funds with low performance fees and no high water marks by close to 5 percent per annum. The cumulative return graphs in Figure 2 indicate that the outperformance of the more aligned manager group is consistent over the entire sample period and cannot be explained by backfill bias. The high water mark results echo those of Agarwal, Daniel and Naik (2009) who show that funds with high water marks outperform those without high water marks by about 2.6% per year.

Figure 1: Managerial incentives and fund performance

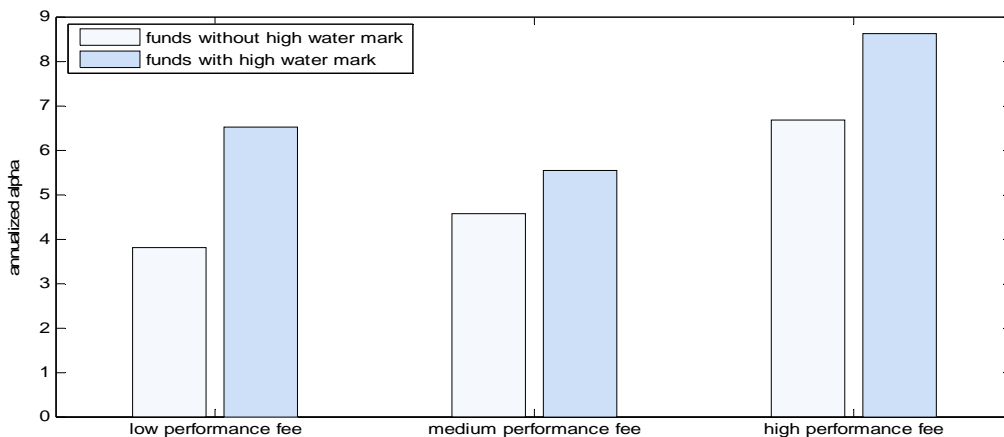
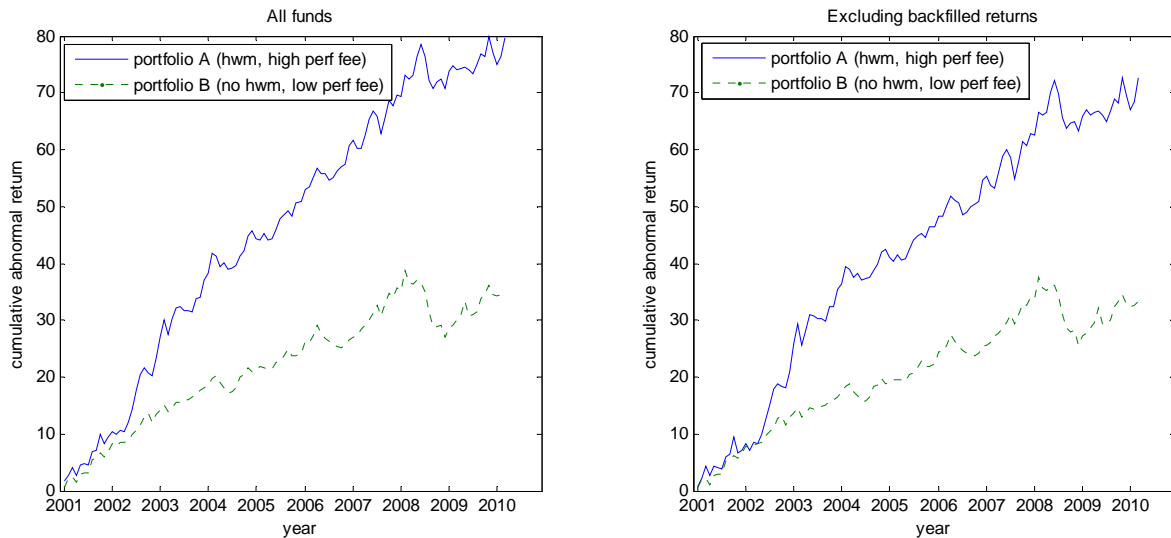


Figure 2: Funds sorted by performance fee and high water marks



What is the impact of volatility exposure on fund performance? Do funds that are short volatility outperform those that are long volatility in the long term? To answer these questions, we sort funds into quintiles every January 1st based on their return exposure to changes in the VIX index over the last 36 months and evaluate their risk-adjusted performance over the next 12 months. Figure 3 illustrates the investment strategy distribution of the long volatility funds (the quintile with the highest exposure to the VIX) and the short volatility funds (the quintile with the lowest exposure to the VIX). Consistent with view, expressed by Fung and Hsieh (2004), that CTAs payoffs resemble those from straddles, the long volatility group is dominated by CTAs. Conversely, there are many more equity long/short funds in the short volatility group.

Figure 3: Investment strategies of funds sorted by return exposure to the VIX

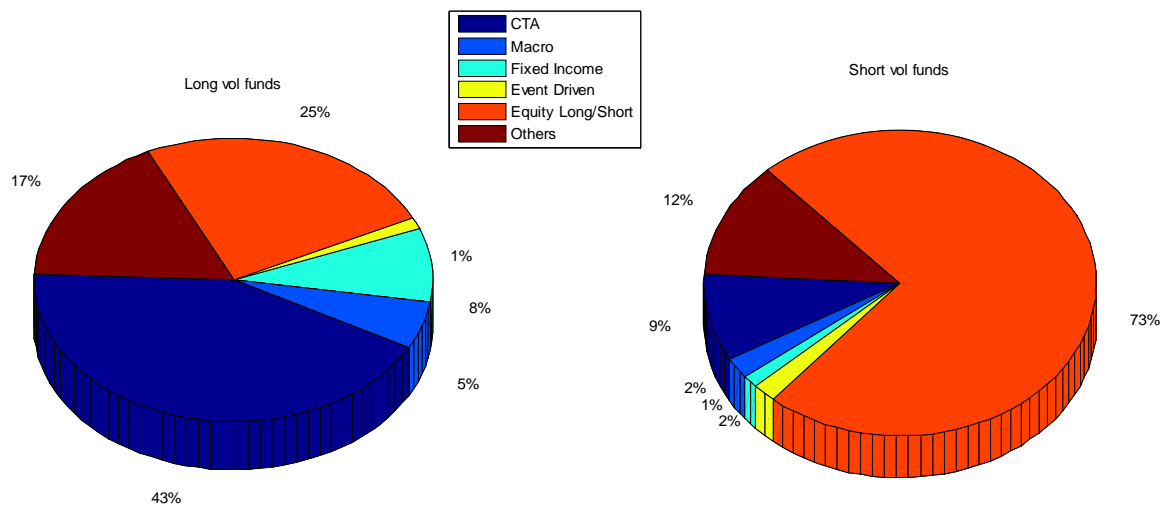


Figure 4 plots the average risk-adjusted return of each volatility exposure quintile. There is a significant return premium for being short volatility consistent with the results of Agarwal,

Bakshi, and Huij (2008). The short volatility quintile outperforms the long volatility quintile by 11.77 percent per year (t -statistic = 3.69) after adjusting for risk. The leftmost subplot of Figure 5 graphs the cumulative return of the extreme volatility exposure quintiles. It indicates that the outperformance of the short volatility portfolio has been fairly consistent between 2003 and 2010. However, as expected there was a dip in performance coinciding with the financial crisis of 2008 during which volatility spiked. Post 2008, the spread between short volatility and long volatility funds increased sharply in line with the fall in the VIX during that period. One concern is that funds in the short volatility portfolio will tend to exit our database more often than funds in the long volatility portfolio as the former may be susceptible to market crashes. To address this, we assume that funds that drop out earn a reasonable return of -10% in the month immediately after they exit and redo the analysis. We find that because funds in the long volatility quintile have a slightly higher chance of exiting the database, the quintile spread widens to 12.37 percent with the adjustment for fund termination. See the rightmost subplot of Figure 5.

Figure 4: Fund exposure to VIX and performance

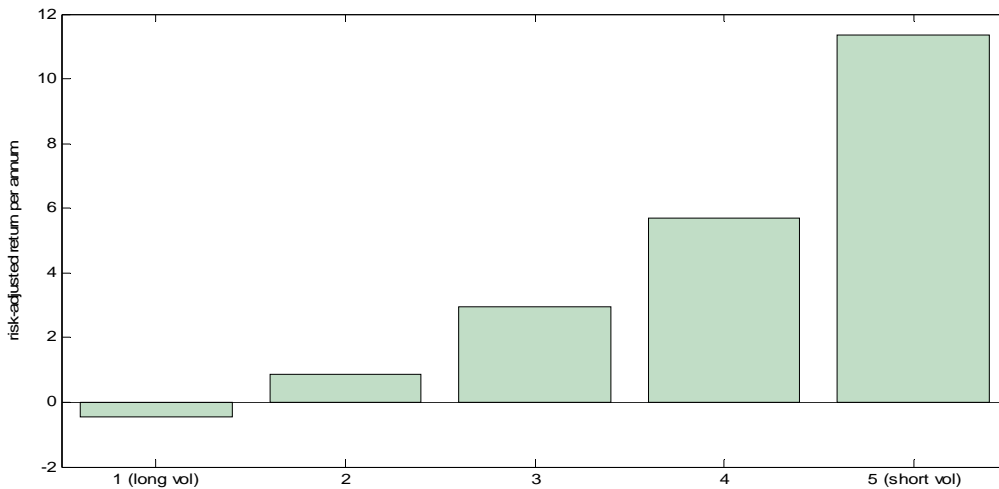
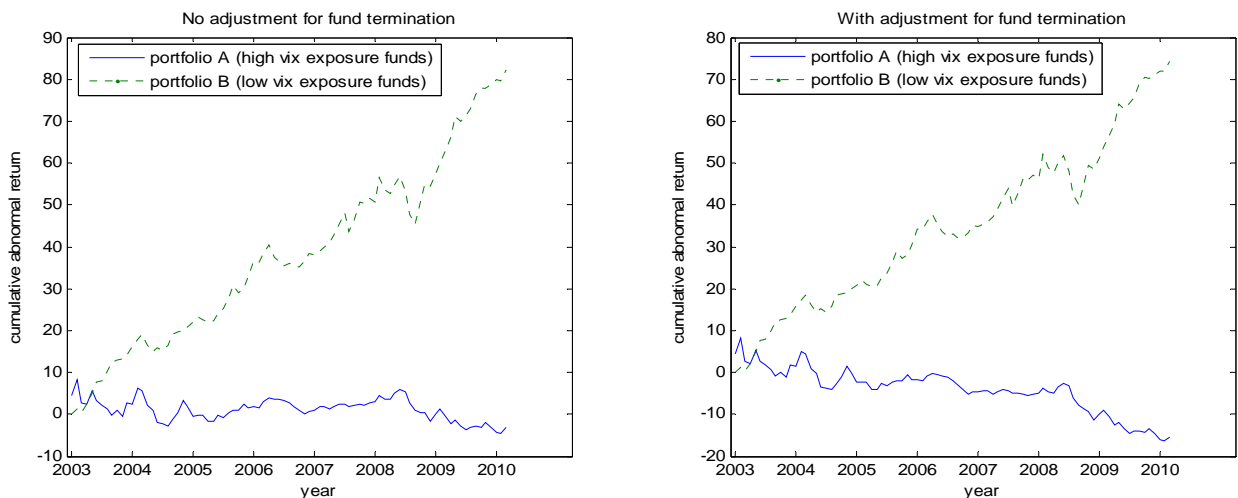


Figure 5: Cumulative risk-adjusted returns of funds sorted by exposure to VIX



Do we find similar patterns in fund performance when sorting on exposure to liquidity risk? To investigate, we sort funds every January 1st based on return exposure to the Pastor and Stambaugh (2003) liquidity innovation measure calculated over the past 36 months.² Figure 6 illustrates the investment strategy distribution of the high liquidity risk funds (the quintile with the highest exposure to the liquidity measure) and the low liquidity risk funds (the quintile with the lowest exposure to the liquidity measure). Even though the correlation between the change in the VIX index and the liquidity innovation measure is only 0.19, there appears to be similarities between the liquidity risk and VIX exposure fund portfolios. Like the high VIX exposure portfolio, the low liquidity risk portfolio features a disproportionate number of CTAs. Like the low VIX exposure portfolio, the high liquidity risk portfolio features a disproportionate number of equity long/short funds.

Figure 6: Investment strategies of funds sorted by liquidity risk exposure

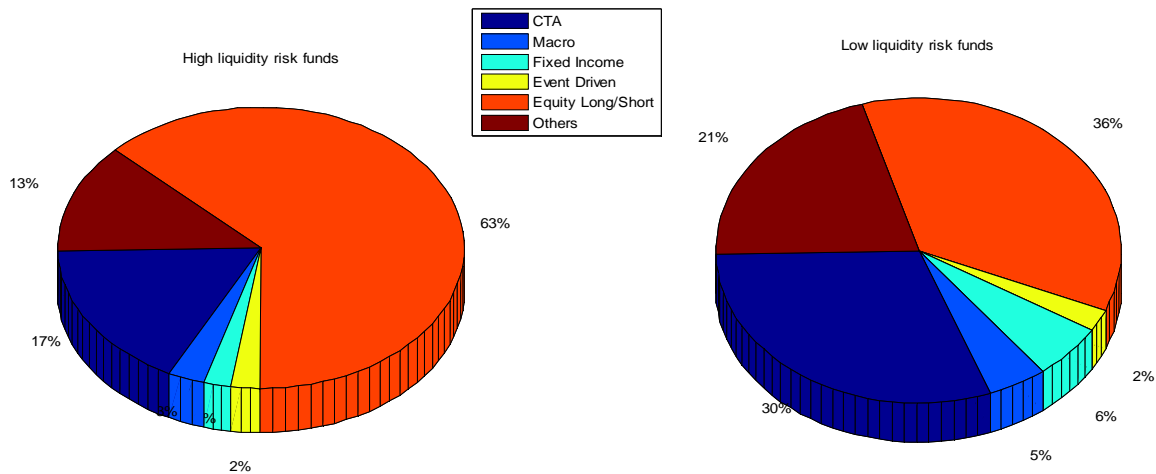
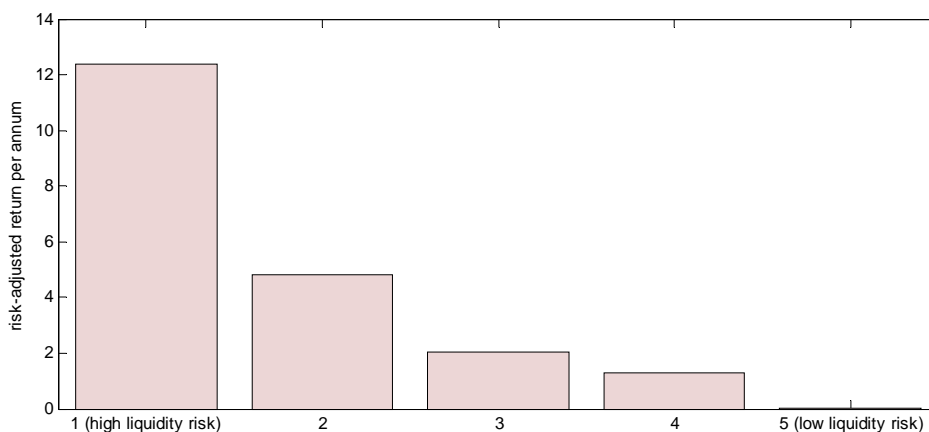


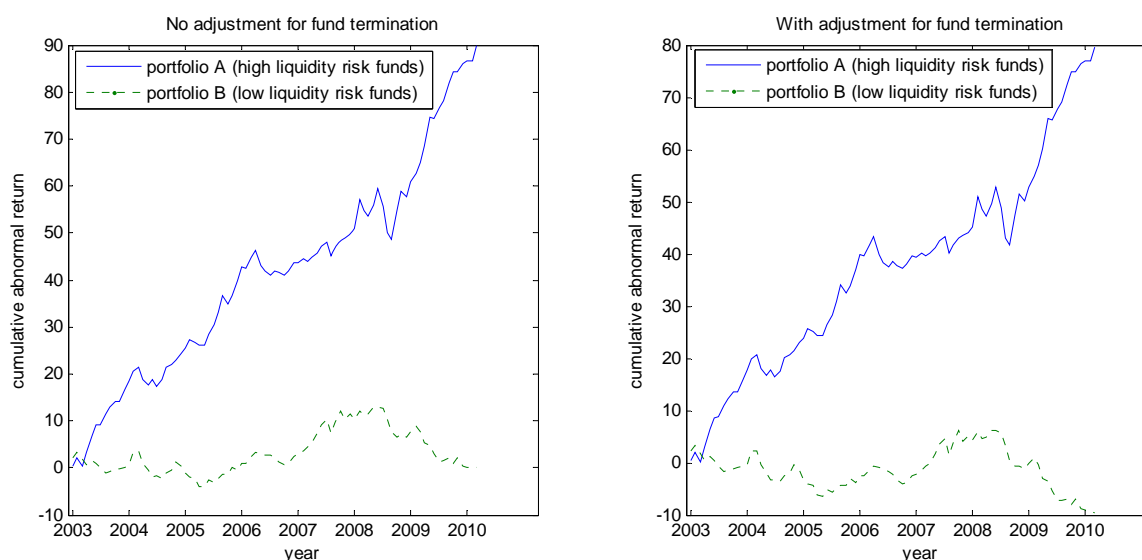
Figure 7: Fund exposure to liquidity risk and performance



² The Pastor and Stambaugh (2003) liquidity innovation measure is based on temporary price changes accompanying order flow. It is available from Lubos Pastor's research website <http://faculty.chicagobooth.edu/lubos.pastor/research/>. As the data for the measure only extends to December 2008, the portfolio sort on 1st January 2010 is based on return exposure to the liquidity measure from January 2007 to December 2008. All the other prior sorts are based on return exposure calculated over the past 36 months.

Figure 7 plots the average risk-adjusted return of each liquidity risk exposure quintile. There is a significant return premium for taking on liquidity risk. The high liquidity risk portfolio outperforms the low liquidity risk portfolio by 12.34 percent per year (t -statistic = 4.24) after adjusting for co-variation with the Fung and Hsieh (2004) factors. The cumulative return graphs in Figure 8 reveals that the high liquidity risk portfolio suffered in 2008 during the financial crisis but recovered sharply in 2009 and 2010. The graphs also indicate that the outperformance survives the adjustment for fund termination. We note that the payoffs (roughly 12 percent per year) for being short volatility or taking on liquidity risk appear to be unusually high between January 2003 and March 2010. Figures 5 and 8 indicate that the spreads widened significantly post 2008. If we focus on the pre 2009 sample, the spreads are modest and more consistent with other studies (Sadka (2010) and Agarwal, Bakshi, and Huij (2009)). It will be interesting to revisit these volatility and liquidity risk sorts going forward.

Figure 8: Cumulative risk-adjusted returns of funds sorted by liquidity risk



Summary

Fund incentives, volatility exposure, and liquidity risk appear to forecast fund performance differentials in a meaningful and durable way. However, it is not always easy to take advantage of such performance differentials. Institutional investors may find it hard to justify to their investment committees why they should invest in funds that charge high performance fees. Successful funds with managerial incentives that are aligned with those of their investors may close their doors to new investors so as to preserve future performance. Investors, wary of commingling risk and redemption gates, may be reluctant to invest in funds that short volatility or that embrace liquidity risk. For these reasons, the patterns in hedge fund performance documented in this newsletter are likely to persist. Therefore, investors with access to secure capital, to managed accounts, and to funds that have locked in capital may be uniquely placed to take advantage of the stark performance differences induced by volatility or liquidity risk exposure.

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Update on the Centre's Activities

Education

The centre hosted a seminar on 12 January with Adam Levinson from the Fortress Macro Fund who spoke about the macro-economy in a G2 world. On 28 February, we organized another seminar with David Frechette from GSAM and Liberty Harbor. David walked the audience through some intriguing examples of how Liberty Harbor invests through a capital structure lens.

The centre director presented his findings on quantitative hedge fund selection at the 4 April CAIA Alternative Investment Roundtable held in Singapore.

Research

The centre director presented the paper "Hedge Funds and Analyst Optimism" on 27 January at the Third Annual Hedge Fund Conference in Paris organized by Lyxor, CREST, and HEC. The paper finds that analyst issue overly optimistic recommendations for stocks predominantly held by hedge funds. In a quid pro quo move, hedge funds ameliorate the reputation cost of a biased recommendation by voting optimistic analysts as all-stars.

Working versions of centre sponsored papers are available for download from our research webpage at <http://www.smu.edu.sg/centres/hfc/research.asp>

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.