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THE LOW-DOWN ON HEDGE FUNDS: RE-EXAMINING THE EAST-WEST DIVIDE¹

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Executive Summary

We analyze the downside risk and loss profile of hedge funds in North America and Asia so as to identify any significant differences between these two geographic markets, as well as to see how the differences have converged or diverged over time. We also attempt to understand the drivers of performance that differentiate Asian versus North American hedge funds. In our downside-risk analysis of 2,631 North American hedge funds and 994 Asian hedge funds obtained from Eurekahedge and spanning a period from January 1995 to February 2013, we find that the Event-driven based group of investment strategies for both geographic regions display better performance characteristics as compared to the other investment strategy groups, both on a risk-return as well as downside risk basis. Furthermore, the more diversified funds, such as multi-strategy hedge funds, do not necessarily perform better on a downside risk basis as compared to the single manager strategies. Asian hedge funds, after a period of lackluster performance around the Asian Financial Crisis, have improved their risk-adjusted performance remarkably since, particularly during the recent Global Financial Crisis where their loss profile is almost on par with their North American peers. “Onshore” funds, i.e., funds where the manager is located in the same investment geography, have slightly worse loss profiles compared to “offshore” funds. This applies to both Asian and North American funds, and is contrary to extant academic literature evidence that managers with geographic proximity to their investment universe have better risk-adjusted performance than other hedge fund managers.

1. The current state of the hedge fund industry

According to Eurekahedge, 2013 was an excellent year for the hedge fund industry, which recorded US\$100 billion of performance-based gains – its best since 2010. Global hedge fund assets also reached

¹ This paper is an updated and extended version of an unpublished manuscript by Joseph Cherian and William Weng titled, “The Risk and Loss Profiles of U.S. Hedge Funds” (2001).

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a new record high at the end of 2013, where Asian hedge fund assets grew by 16% to reach US\$147 billion of the US\$2 trillion total global hedge fund industry's AUM. At the same time, the population of Asian hedge funds increased with 143 launches and 108 closures, bringing the total number of funds to 1,333. To date, North American hedge funds continue to exhibit strong performance with both performance-based gains and net asset inflows recorded.

Increasing flows of assets to hedge funds and the growing pool of funds are strong signs of renewed interest in hedge funds as an asset class, but also spell out higher competition amongst funds - average hedge fund management and performance-based fees for new launches dropped to 1.4% and 16.0%, respectively, in 2013. The overall reduction in management and performance-based fees suggest that investors are becoming more selective and demanding when making their investment commitments, especially when facing a seemingly booming hedge fund industry.

2. Our research focus

As academic researchers and investors tend to focus their analysis on the risk and return of hedge funds, our primary focus in this current analysis, given we witnessed three important financial crisis during our sample period, is on the **downside risk and loss profile of hedge funds**. In addition, we aim to compare and contrast the performance of North American and Asian hedge funds to identify any differences between these two geographic markets as well as to see how the differences have converged or diverged over time. The analysis covers the time period from January 1995 to February 2013, which includes the Asian Financial Crisis, the Dotcom Crisis as well as the Global Financial Crisis, during which periods investors' aversion for investment losses had indeed heightened. The following research questions form the framework for our analysis:

- a. What are the downside risk profile characteristics of a typical North American or Asian hedge fund?
- b. What investment strategies have performed well over time and why?
- c. Are there any drivers of performance that differentiate Asian versus North American hedge funds?

This preliminary discussion of our findings covers the general profile of North American and Asian hedge funds. The 14 investment strategies specified in the dataset are classified into 6 broad groups based on the type of investment or trading strategy employed so as to detail the 12-month loss distribution of a typical hedge fund strategy group.³ We also isolate the loss distribution for a typical hedge fund across the three aforementioned financial crises: the Asian Financial Crisis (July 1997 – Dec 1998), the Dotcom Crisis (Jan 1999 – Dec 2001) and the Global Financial Crisis (Jan 2008 – Dec 2009). A further refinement of the analysis is conducted by observing the impact of lock-up, leverage, redemption restrictions, domicile, and vintage on hedge fund loss distributions.

³ For definitions of hedge fund investment strategies by EurekaHedge, please refer to the Appendix.

3. Overall risk and return characteristics of North American and Asian hedge funds

Using data from EurekaHedge North American and Asian Hedge Fund databases, we selected funds with *at least* 60 months of reported returns to be included in the analysis universe. This was to ensure that we have sufficient data points for the drawdown analysis. We should note that our universe contains both dead and live funds as limiting the universe to live funds only would increase the *survivorship bias* of the analysis.

So as to have reasonable sample sizes for our statistical analysis, the 2,631 North American hedge funds and 994 Asian hedge funds in our sample were grouped by investment strategy into six broad trading strategy groups in line with the CAIA classification of hedge fund strategies.⁴ Funds in the 'Others' category were disregarded for the strategy group analysis. The six trading strategy groups are Group 1 (G1) - "Event-driven", Group 2 (G2) - "Long-short Equity", Group 3 (G3) - "Macro and Managed Futures", Group 4 (G4) - "Multi Strategy", Group 5 (G5) - "Relative Value" and Group 6 (G6) - "Value".⁵ Long-short equity is the prevalent investment strategy for funds within both datasets, accounting for 38.6% of North American hedge funds and 45.0% of Asian hedge funds. In terms of fund size, the smallest fund group was Macro and Managed Futures in North America, with a median fund size of USD18.5 million in North America and Long-short equity with a median fund size of USD28 million in Asia. The North American Multi Strategy group had the highest median fund size of US84 million while in Asia the Event Driven group had the largest median fund size at USD102 million. Tables 1a and 1b in the Appendix provide the summary characteristics of the hedge funds in both universes by strategy group.

While the risk-return profile of hedge funds is not the primary focus of our research, it is still an important performance and quality metric of a hedge fund and one that is still heavily used by fund managers, academics, investors and investment consultants. The risk-return profile was measured at the strategy group level by taking the median monthly return divided by the median monthly standard deviation of the funds as the measure of risk. The scatter plots of this statistic are plotted in Charts 1a and 1b in the Appendix. The group of Value hedge funds, which employ a long-only, value-based investment approach with a focus on rigorous, in-depth fundamental analysis of securities, were positioned in the upper right quadrant for both geographies, indicating they are associated with high risk and return. Whereas, and unsurprisingly, the Relative Value strategy group, which encompasses Fixed Income and Relative Value strategies, were in the lower left quadrant, with low risk and return. All the rest of the strategy groups were spread between those two extremes in the risk-reward spectrum. Of the 6 groups, G1, i.e., the group of Event-driven funds consisting of Arbitrage, Event driven, Distressed debt and Diversified debt strategies, appears to "strike the balance" between risk and return in both Asia and North America by offering higher risk-adjusted returns compared to almost all the other groups.

4. The downside risk of North American and Asian hedge funds

⁴ For the CAIA classification of hedge fund strategies, please refer to the Appendix.

⁵ For the detailed grouping please refer to Table 1 in the Appendix

The first statistic we report here is the average hedge fund's downside risk. The average hedge fund's downside risk can be thought of as follows: if one were to randomly select a hedge fund from the sample over a certain holding period and at a particular probability level, what would the maximum downside decline be? This was measured over durations of 1 month, 3 months and 6 months, and for probability levels of 1%, 5%, 10%, 25% and 50%. To read the loss distribution of an individual North American hedge fund correctly, the statistic of "-20.710" with a duration of 1 month at the 1st percentile level indicates that based on the sample universe, 1% of North American hedge funds declined in value by a maximum of 20.71%. Alternatively, with 1% probability, an average North American hedge fund would decline by a maximum of 20.71% in value within a month over our sample period. The results are summarized in Tables 2a and 2b in the Appendix.

While the overall downside risk profile of Asian funds is worse than that of North American funds, the maximum difference between the two downside risk profiles is 1.48%. However, when the 12-month maximum declines of the hedge funds were separated out by strategy group, as detailed in Tables 3a and 3b in the Appendix, we found the Macro and Managed Futures group performed better in Asia compared to North America, while the Multi Strategy and Value groups had better performance in North America. The remaining groups had similar performance across both geographies.

Within the respective geographies Long-short equities and Macro and Managed Futures funds were the North American stragglers, while in Asia Long-short Equity and Value funds underperformed relative to their peers. Several trends across the investment strategies stand out:

1. The Long-short Equity groups were consistently more volatile with a worse downside risk profile across both North America and Asia compared to most of the other strategy groups.
2. The Event-driven and Relative Value strategy groups had better downside risk performance in both North America and Asia.
3. Contrary to popular belief, the loss profile of the more diversified Multi Strategy funds is not less risky compared to the other single manager investment strategies.

We next compare the performance of hedge funds during the various financial crises, namely the Asian Financial Crisis (July 1997 – Dec 1998), the Dotcom Crisis (Jan 1999 – Dec 2001) and the Global Financial Crisis (Jan 2008 – Dec 2009). While Asian hedge funds underperformed North American hedge funds during all three financial crises, we also see the disparity between the drawdowns decreasing with the passage of time. The difference between the 6 month drawdown at the 50th percentile of North American and Asian hedge funds decreased from 0.945% during the Asian Financial Crisis to 0.05% during the Global Financial Crisis, while at the 1st percentile level it had decreased from a difference of 14.38% to 3.13%. This, coupled with the fact that the Asian Financial Crisis was much worse for Asian hedge funds compared to the GFC, indicates that Asian hedge fund managers have become better at managing downside risk.

When the performance of hedge funds during the three respective financial crises is separated by strategy, we observe that:

- a. During the Asian Financial Crisis, most Asian hedge fund strategy groups underperformed their corresponding North American counterparts with the exception of the Event-driven strategy group.
- b. Drawdowns during the Dotcom crisis for both North American and Asian hedge funds were not as bad as those during the Asian Financial Crisis.
- c. During the GFC, Asian hedge fund declines were mostly in line with or better than North American hedge funds. The Asian hedge fund strategies that outperformed their corresponding North American counterparts were the Event-driven, Macro and Managed Futures and Relative Value strategy groups.⁶

5. The effect of hedge fund characteristics on loss distribution profiles

When the hedge funds are classified according to their characteristics or restrictions, such as lock-up or leverage we are able to identify or validate assumptions such as, “hedge funds which employ leverage would have better loss distribution profiles because additional restrictions are placed on leveraged funds by their lenders”. We examined the 12-month maximum loss distribution of hedge funds based on lock-up, leverage, redemption restrictions, domicile, and vintage across the entire time period of the analysis and arrived at the following preliminary observations, which correspond to Tables 5 – 9 in the Appendix:

- a. **Lock-up** is the amount of time in which the investor is not able to withdraw his investment from the fund without paying a penalty. This reflects the sometimes illiquid nature of hedge fund investments from the investor’s perspective. However, lock-up is important to the hedge fund manager because it ensures that the pool of funds available for investment is stable, and the fund is somewhat protected from large unexpected investor redemptions during periods of subpar performance. Our dataset was classified into the following lock-up categories: less than 1 year, 1 year, more than 1 year and no lock-up for this analysis.

We find that the downside distribution for hedge funds with no lock-up restriction did not differ significantly as compared to hedge funds with lock-up restrictions. In Asia, the longer the lock-up period, the less severe is the downside loss profile of the hedge fund. In contrast, North American funds with more than 1 year lock-up periods had the worst maximum 12 month decline of their group.

- b. **Leverage** and unleveraged funds were approximately equal in number in both our datasets - funds which had not disclosed their leverage status were excluded from the analysis. While

⁶ See Tables 7a and 7b in the Appendix for results.

there were no significant differences in the loss distribution profile of leveraged and unleveraged funds in North America, unleveraged funds in Asia had more negative loss distributions compared to leveraged funds, as much as 4.97% lower in maximum 12 month decline at the 1st percentile level. This may reflect additional performance restrictions that are imposed on leveraged funds within Asia, where leverage is harder to take on compared to the North American market.

- c. **Redemption restrictions** serve to protect the hedge fund's liquidity and AUM from sudden investor withdrawals. Funds were classified into: 1 day, 1 week, 1 month, quarterly, semi-annually, and 1 year periods. Funds with more than 1 year redemption restrictions are excluded from our analysis due to insufficient number of funds in North America and Asia. Approximately 80% of funds in our sample were classified as having either 1 month or quarterly redemption restrictions for both geographies, an increase in proportion compared to the findings of Cherian and Weng [2001], who reported 40% of their North American sample as having the same characteristic. There were no significant differences in the loss distributions of these two redemption restriction periods, but funds with 1 day and 1 week redemption restriction periods had more negative performance compared to those in longer restriction period.
- d. **Domicile** measures the offshore/onshore effect of the hedge fund manager, i.e., do managers in America running Asian funds ("offshore" funds) have riskier downside profiles compared to managers in Asia running Asian funds ("onshore" funds)? In North America, we observe that most managers are onshore. Only 12.2% of American funds are listed as offshore funds, as compared to Asia, where 63.7% of Asian hedge fund managers are categorized as offshore entities. Onshore funds have slightly worse loss profiles compared to offshore funds in both geographies, particularly for Asian hedge funds, which is contrary to the academic evidence that managers with geographic proximity have better risk-adjusted performance, i.e., hedge funds with a physical presence (head or research office) in their investment region outperform other hedge funds.⁷
- e. **Vintage**, or the length of time the fund has been in operation, measures the downside profile of hedge funds with 5 – 10 years, 10 – 15 years and more than 15 years of manager experience. Funds with more than 15 years of experience, measured in number of reported periods, have more negative loss profiles except at the 50th percentile, where in both North America and Asia they marginally outperform their peers. However, this statistic may be skewed by the fact that these funds are weighted down by their losses during all three of the financial crises.

5. Conclusion

⁷ See "The Geography of Hedge Funds" by Melvyn Teo, *Review of Financial Studies*, 2009, 22(9), pp 3531-3561.

The ability of Asian hedge fund managers in mitigating downside risk has improved since the mid-1990's, but in general, they have yet to match the skill of North American hedge fund managers. During initial screenings of potential hedge funds to invest in, it is more important for investors to reflect on the hedge fund strategies being considered, whether in North America or Asia, as well as the length of lock-up they are willing to commit to compared to redemption restrictions. Some consideration should also be given to potential existing home bias of managers, particularly for Asian hedge funds.

Appendix

Table 1: Grouping of Hedge Fund Investment Strategies

| Groups | Number of funds | |
|----------------------------------|-----------------|------------|
| | North American | Asian |
| Group 1 "Event-driven" | 445 | 73 |
| Arbitrage | 206 | 18 |
| Distressed debt | 82 | 17 |
| Diversified debt | 7 | 9 |
| Event Driven | 150 | 29 |
| Group 2 "LS Equities" | 1015 | 447 |
| Long Short Equities | 1015 | 447 |
| Group 3 "Macro and Mf" | 606 | 92 |
| Macro | 128 | 41 |
| CTA/Managed Futures | 478 | 51 |
| Group 4 "Multi str" | 186 | 92 |
| Multi-Strategy | 186 | 92 |
| Group 5: "Relative value" | 239 | 87 |
| Fixed Income | 165 | 59 |
| Relative Value | 74 | 28 |
| Group 6 "Value" | 75 | 179 |
| Bottom-Up | 42 | 102 |
| Dual Approach | 10 | 43 |
| Top-Down | 6 | 16 |
| Value | 17 | 18 |
| Total | 2566 | 970 |

Table 1a: Summary statistics of North American hedge funds by investment strategy group

| Strategy | No. of funds | Median fund size, US\$m | Average fund size, US\$m | Median # months reported | Median monthly return, % | Median monthly Standard Deviation | Median (monthly return/ std dev) |
|------------------|--------------|-------------------------|--------------------------|--------------------------|--------------------------|-----------------------------------|----------------------------------|
| | | | | | % | % | |
| G1 "Evt-drvn" | 445 | 64.0 | 302.2 | 108 | 0.800 | 2.661 | 0.303 |
| G2 "LS Eq" | 1015 | 28.0 | 110.8 | 100 | 0.775 | 4.017 | 0.198 |
| G3 "Macro/Mf" | 606 | 18.5 | 130.2 | 103 | 0.510 | 4.506 | 0.111 |
| G4 "Multi Strgy" | 186 | 84.0 | 583.2 | 106 | 0.780 | 2.914 | 0.308 |
| G5 "Rel Value" | 239 | 62.0 | 498.9 | 94 | 0.700 | 2.306 | 0.316 |
| G6 "Value" | 75 | 38.0 | 110.3 | 101 | 0.965 | 5.035 | 0.216 |

Table 1b: Summary statistics of Asian hedge funds by investment strategy group

| Strategy | No. of funds | Median fund size, US\$m | Average fund size, US\$m | Median # months reported | Median monthly return, % | Median monthly Standard Deviation | Median (monthly return/ std dev) |
|------------------|--------------|-------------------------|--------------------------|--------------------------|--------------------------|-----------------------------------|----------------------------------|
| | | | | | % | % | % |
| G1 "Evt-drvn" | 73 | 102.0 | 407.9 | 79 | 0.700 | 2.674 | 0.267 |
| G2 "LS Eq" | 447 | 33.0 | 110.5 | 87 | 0.660 | 4.374 | 0.171 |
| G3 "Macro/Mf" | 92 | 38.0 | 158.4 | 86.5 | 0.505 | 3.460 | 0.126 |
| G4 "Multi Strgy" | 92 | 38.0 | 183.6 | 89.5 | 0.790 | 3.259 | 0.248 |
| G5 "Rel Value" | 87 | 62.0 | 1213.4 | 87 | 0.380 | 1.480 | 0.324 |
| G6 "Value" | 179 | 38.0 | 162.7 | 98 | 0.900 | 6.459 | 0.146 |

Chart 1a: Median monthly return vs Median standard deviation for North American hedge fund investment strategy groups

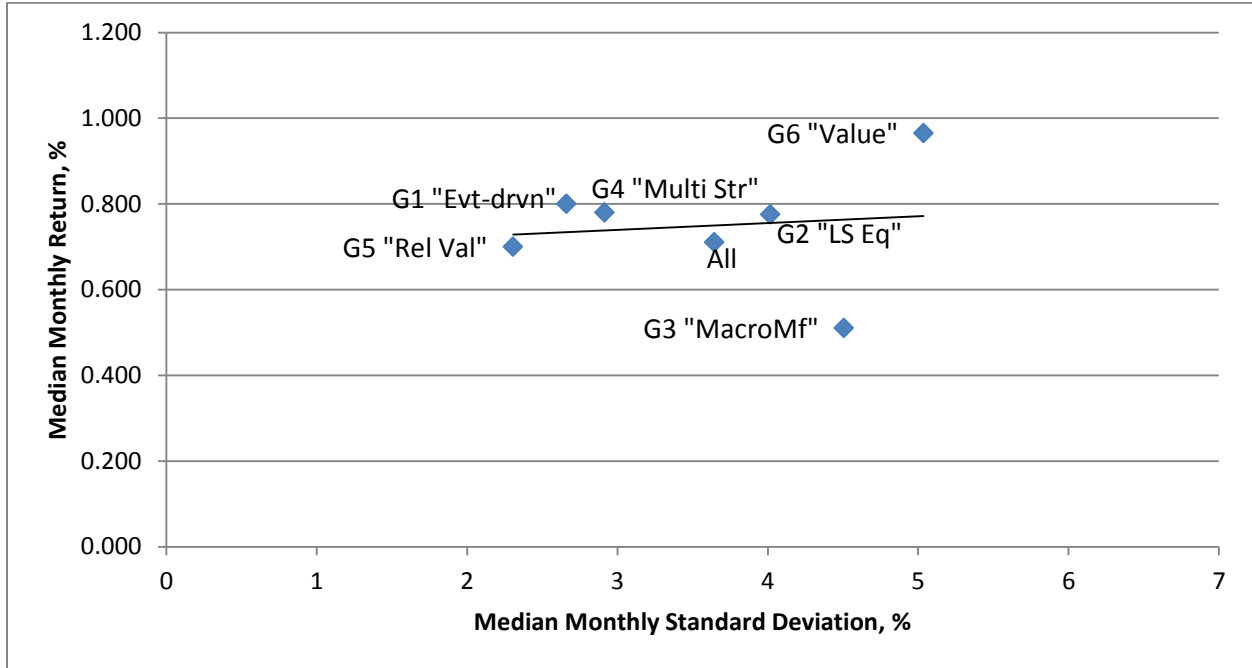


Chart 1b: Median monthly return vs Median standard deviation for Asian hedge fund investment strategy groups

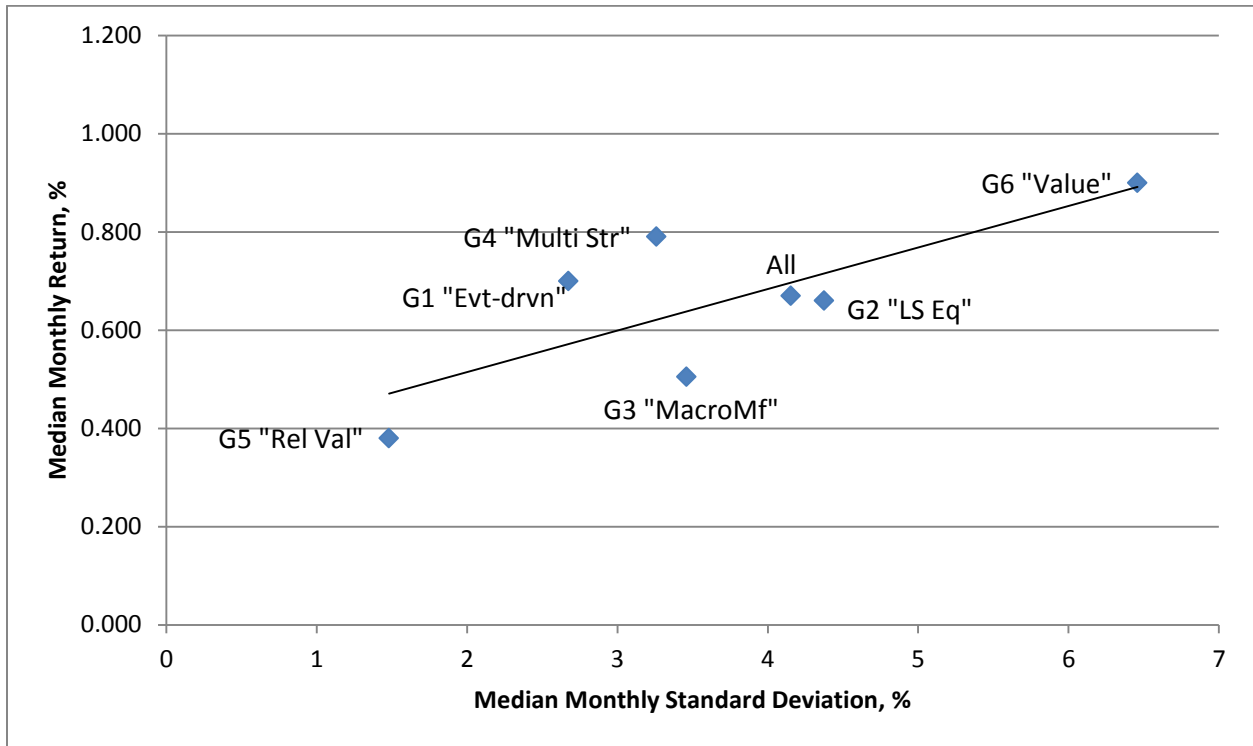


Table 2a: The loss distribution of an individual North American hedge fund

| Duration | 1st percentile | 5th percentile | 10th percentile | 25th percentile | 50th percentile |
|----------|----------------|----------------|-----------------|-----------------|-----------------|
| 1 Month | -20.710 | -9.940 | -6.220 | -2.240 | 0.020 |
| 3 Month | -21.970 | -10.500 | -6.600 | -2.420 | 0.030 |
| 6 Month | -22.400 | -10.550 | -6.650 | -2.470 | -0.010 |

The statistic “-20.710” at the upper-left corner of Table 2a is read as follows: based on the sample universe, 1% of North American hedge funds declined in value by a maximum of 20.71%

Table 2b: The loss distribution of an individual Asian hedge fund

| Duration | 1st percentile | 5th percentile | 10th percentile | 25th percentile | 50th percentile |
|----------|----------------|----------------|-----------------|-----------------|-----------------|
| 1 Month | -20.760 | -10.670 | -6.930 | -2.610 | -0.020 |
| 3 Month | -22.608 | -11.200 | -7.180 | -2.770 | -0.030 |
| 6 Month | -23.883 | -11.630 | -7.500 | -2.900 | -0.050 |

Table 3a: The loss distribution of an individual North American hedge fund by investment strategy group

| Strategy | No. of funds | Maximum 12 month decline | | | | |
|------------------|--------------|--------------------------|----------------|-----------------|-----------------|-----------------|
| | | 1st percentile | 5th percentile | 10th percentile | 25th percentile | 50th percentile |
| G1 "Evt-drvn" | 445 | -16.390 | -6.830 | -4.120 | -1.500 | 0.020 |
| G2 "LS Eq" | 1015 | -22.490 | -11.190 | -7.390 | -3.070 | -0.050 |
| G3 "Macro/Mf" | 606 | -24.919 | -12.800 | -8.420 | -3.420 | 0.020 |
| G4 "Multi Strgy" | 186 | -16.700 | -7.710 | -4.820 | -1.950 | -0.050 |
| G5 "Rel Value" | 239 | -15.635 | -6.342 | -3.653 | -1.320 | -0.020 |
| G6 "Value" | 75 | -21.476 | -12.198 | -8.350 | -3.800 | -0.160 |

Table 3b: The loss distribution of an individual Asian hedge fund by strategy

| Strategy | No. of funds | Maximum 12 month decline | | | | |
|------------------|--------------|--------------------------|----------------|-----------------|-----------------|-----------------|
| | | 1st percentile | 5th percentile | 10th percentile | 25th percentile | 50th percentile |
| G1 "Evt-drvn" | 73 | -13.141 | -6.337 | -3.954 | -1.610 | -0.030 |
| G2 "LS Eq" | 447 | -21.710 | -11.070 | -7.540 | -3.180 | -0.130 |
| G3 "Macro/Mf" | 92 | -18.494 | -9.920 | -6.600 | -2.715 | 0.040 |
| G4 "Multi Strgy" | 92 | -20.370 | -9.499 | -5.920 | -2.195 | -0.080 |
| G5 "Rel Value" | 87 | -15.018 | -5.790 | -3.270 | -1.110 | -0.050 |
| G6 "Value" | 179 | -26.894 | -15.700 | -11.050 | -5.090 | -0.070 |

Table 4a: Loss profiles of North American and Asian hedge funds across various financial crises

| North American Hedge Funds | | | | | | Asian Hedge Funds | | | | | |
|--|--------------------------|----------------|-----------------|-----------------|-----------------|--|--------------------------|----------------|-----------------|-----------------|-----------------|
| Duration | Maximum 12 month decline | | | | | Duration | Maximum 12 month decline | | | | |
| | 1st percentile | 5th percentile | 10th percentile | 25th percentile | 50th percentile | | 1st percentile | 5th percentile | 10th percentile | 25th percentile | 50th percentile |
| Asian Financial Crisis (July 1997 - Dec 1998) | | | | | | Asian Financial Crisis (July 1997 - Dec 1998) | | | | | |
| 1 Month | -27.670 | -13.248 | -8.370 | -2.920 | 0.150 | 1 Month | -33.674 | -18.850 | -10.872 | -4.120 | 0.090 |
| 3 Month | -29.140 | -13.906 | -8.730 | -3.200 | 0.110 | 3 Month | -39.480 | -20.802 | -13.428 | -5.035 | -0.220 |
| 6 Month | -28.349 | -13.480 | -8.940 | -3.640 | -0.250 | 6 Month | -42.731 | -23.478 | -15.746 | -7.483 | -1.195 |
| Dotcom Crisis (Jan 1999 - Dec 2001) | | | | | | Dotcom Crisis (Jan 1999 - Dec 2001) | | | | | |
| 1 Month | -25.120 | -12.160 | -7.840 | -2.800 | -0.010 | 1 Month | -27.378 | -14.386 | -9.682 | -3.650 | -0.090 |
| 3 Month | -25.041 | -12.700 | -8.150 | -3.030 | -0.040 | 3 Month | -27.529 | -15.058 | -10.000 | -3.843 | -0.170 |
| 6 Month | -24.261 | -12.220 | -7.690 | -2.690 | 0.060 | 6 Month | -23.770 | -12.746 | -8.356 | -3.250 | -0.090 |
| Global Financial Crisis (Jan 2008 - Dec 2009) | | | | | | Global Financial Crisis (Jan 2008 - Dec 2009) | | | | | |
| 1 Month | -24.608 | -12.032 | -7.810 | -2.930 | 0.010 | 1 Month | -25.431 | -14.430 | -9.640 | -3.310 | 0.030 |
| 3 Month | -29.090 | -14.130 | -8.700 | -2.970 | 0.110 | 3 Month | -29.772 | -17.100 | -10.440 | -3.420 | 0.060 |
| 6 Month | -33.136 | -14.870 | -8.970 | -3.120 | 0.170 | 6 Month | -36.269 | -18.260 | -11.140 | -3.730 | 0.120 |

Table 4b: Loss profiles of North American and Asian hedge funds across various financial crises, by investment strategy group

| North American Hedge Funds | | | | | | Asian Hedge Funds | | | | | |
|--|--------------------------|----------------|-----------------|-----------------|-----------------|--|--------------------------|----------------|-----------------|-----------------|-----------------|
| Strategy | Maximum 12 month decline | | | | | Strategy | Maximum 12 month decline | | | | |
| | 1st percentile | 5th percentile | 10th percentile | 25th percentile | 50th percentile | | 1st percentile | 5th percentile | 10th percentile | 25th percentile | 50th percentile |
| Asian Financial Crisis (July 1997 - Dec 1998) | | | | | | Asian Financial Crisis (July 1997 - Dec 1998) | | | | | |
| G1 "Evt-drvn" | -16.390 | -6.830 | -4.120 | -1.500 | 0.020 | G1 "Evt-drvn" | -9.407 | -5.355 | -4.036 | -2.285 | -1.105 |
| G2 "LS Eq" | -22.490 | -11.190 | -7.390 | -3.070 | -0.050 | G2 "LS Eq" | -43.365 | -23.170 | -18.704 | -8.320 | -2.640 |
| G3 "Macro/Mf" | -24.919 | -12.800 | -8.420 | -3.420 | 0.020 | G3 "Macro/Mf" | -37.003 | -16.024 | -9.134 | -3.285 | 0.110 |
| G4 "Multi Strgy" | -16.700 | -7.710 | -4.820 | -1.950 | -0.050 | G4 "Multi Strgy" | -46.839 | -28.005 | -20.132 | -7.870 | -1.100 |
| G5 "Rel Value" | -15.635 | -6.342 | -3.653 | -1.320 | -0.020 | G5 "Rel Value" | -20.084 | -12.444 | -7.532 | -3.180 | -0.690 |
| G6 "Value" | -21.476 | -12.198 | -8.350 | -3.800 | -0.160 | G6 "Value" | -54.166 | -29.645 | -22.468 | -11.210 | -4.000 |
| Dotcom Crisis (Jan 1999 - Dec 2001) | | | | | | Dotcom Crisis (Jan 1999 - Dec 2001) | | | | | |
| G1 "Evt-drvn" | -11.983 | -5.490 | -3.460 | -1.298 | -0.020 | G1 "Evt-drvn" | -8.780 | -3.902 | -2.419 | -1.178 | 0.005 |
| G2 "LS Eq" | -25.350 | -13.132 | -8.490 | -3.260 | 0.380 | G2 "LS Eq" | -19.400 | -9.820 | -6.350 | -2.570 | 0.100 |
| G3 "Macro/Mf" | -25.854 | -13.950 | -9.888 | -4.490 | -0.335 | G3 "Macro/Mf" | -28.499 | -13.252 | -9.374 | -3.540 | -0.140 |
| G4 "Multi Strgy" | -17.259 | -7.970 | -5.166 | -1.850 | 0.030 | G4 "Multi Strgy" | -18.080 | -9.010 | -5.580 | -1.920 | -0.130 |
| G5 "Rel Value" | -17.524 | -7.570 | -4.600 | -1.630 | -0.150 | G5 "Rel Value" | -11.094 | -6.368 | -4.281 | -1.570 | -0.185 |
| G6 "Value" | -21.488 | -12.323 | -8.095 | -3.468 | 0.300 | G6 "Value" | -23.705 | -14.353 | -9.525 | -3.990 | 0.685 |
| Global Financial Crisis (Jan 2008 - Dec 2009) | | | | | | Global Financial Crisis (Jan 2008 - Dec 2009) | | | | | |
| G1 "Evt-drvn" | -30.740 | -14.854 | -9.860 | -4.100 | -0.430 | G1 "Evt-drvn" | -18.964 | -11.100 | -7.516 | -3.330 | -0.420 |
| G2 "LS Eq" | -29.440 | -16.200 | -11.130 | -4.960 | -0.790 | G2 "LS Eq" | -28.800 | -16.480 | -11.230 | -4.960 | -0.780 |
| G3 "Macro/Mf" | -27.435 | -13.130 | -8.340 | -3.213 | 0.130 | G3 "Macro/Mf" | -18.880 | -10.160 | -6.840 | -2.790 | 0.160 |
| G4 "Multi Strgy" | -21.432 | -11.599 | -7.728 | -3.220 | -0.480 | G4 "Multi Strgy" | -24.615 | -13.165 | -8.240 | -3.285 | -0.520 |
| G5 "Rel Value" | -21.959 | -10.865 | -6.400 | -2.250 | -0.040 | G5 "Rel Value" | -21.882 | -9.473 | -5.140 | -1.490 | -0.075 |
| G6 "Value" | -32.930 | -18.562 | -13.778 | -7.280 | -1.800 | G6 "Value" | -32.762 | -22.563 | -17.106 | -9.190 | -2.530 |

Table 5a: The loss distribution of a North American hedge fund by lock-up period

| Lock up period | Number of funds | Maximum 12 month decline | | | | |
|------------------|-----------------|--------------------------|----------------|-----------------|-----------------|-----------------|
| | | 1st percentile | 5th percentile | 10th percentile | 25th percentile | 50th percentile |
| Less than 1 year | 101 | -23.550 | -10.732 | -6.224 | -2.040 | 0.010 |
| 1 year | 597 | -20.900 | -10.135 | -6.540 | -2.530 | -0.020 |
| More than 1 year | 75 | -28.830 | -13.780 | -8.650 | -3.200 | -0.065 |
| None | 1799 | -21.459 | -10.440 | -6.640 | -2.510 | -0.020 |

Table 5b: The loss distribution of an Asian edge fund by lock-up period

| Lock up period | Number of funds | Maximum 12 month decline | | | | |
|------------------|-----------------|--------------------------|----------------|-----------------|-----------------|-----------------|
| | | 1st percentile | 5th percentile | 10th percentile | 25th percentile | 50th percentile |
| Less than 1 year | 29 | -29.904 | -15.442 | -9.752 | -3.625 | -0.100 |
| 1 year | 80 | -24.942 | -12.619 | -8.388 | -3.068 | -0.040 |
| More than 1 year | 24 | -18.744 | -10.116 | -6.260 | -2.720 | -0.190 |
| None | 854 | -22.459 | -11.404 | -7.510 | -2.930 | -0.070 |

Table 6a: The loss distribution of a North American hedge fund by leverage status

| Leveraged | Number of funds | Maximum 12 month decline | | | | |
|-----------|-----------------|--------------------------|----------------|-----------------|-----------------|-----------------|
| | | 1st percentile | 5th percentile | 10th percentile | 25th percentile | 50th percentile |
| Yes | 1200 | -22.544 | -10.750 | -6.717 | -2.470 | -0.020 |
| No | 1365 | -20.968 | -10.220 | -6.580 | -2.540 | -0.010 |

Table 6b: The loss distribution of an Asian edge fund by leverage status

| Leveraged | Number of funds | Maximum 12 month decline | | | | |
|-----------|-----------------|--------------------------|----------------|-----------------|-----------------|-----------------|
| | | 1st percentile | 5th percentile | 10th percentile | 25th percentile | 50th percentile |
| Yes | 435 | -19.809 | -9.777 | -6.240 | -2.370 | -0.080 |
| No | 550 | -24.776 | -12.680 | -8.510 | -3.450 | -0.070 |

Table 7a: The loss distribution of a North American hedge fund by redemption period

| Redemption period | Number of funds | Maximum 12 month decline | | | | |
|-------------------|-----------------|--------------------------|----------------|-----------------|-----------------|-----------------|
| | | 1st percentile | 5th percentile | 10th percentile | 25th percentile | 50th percentile |
| 1 day | 112 | -23.017 | -11.830 | -7.620 | -2.900 | -0.100 |
| 1 week | 204 | -25.299 | -11.998 | -7.415 | -2.650 | -0.020 |
| 1 month | 1130 | -21.678 | -10.470 | -6.710 | -2.580 | -0.010 |
| Quarterly | 968 | -20.610 | -9.860 | -6.230 | -2.350 | -0.020 |
| Semi annually | 57 | -21.361 | -10.848 | -6.976 | -2.820 | 0.060 |
| 1 year | 83 | -19.630 | -10.026 | -6.341 | -2.360 | 0.040 |
| More than 1 year | 8 | -45.019 | -20.136 | -12.702 | -4.290 | -0.030 |

Table 7b: The loss distribution of an Asian edge fund by redemption period

| Redemption period | Number of funds | Maximum 12 month decline | | | | |
|-------------------|-----------------|--------------------------|----------------|-----------------|-----------------|-----------------|
| | | 1st percentile | 5th percentile | 10th percentile | 25th percentile | 50th percentile |
| 1 day | 94 | -23.806 | -12.299 | -8.513 | -3.300 | -0.040 |
| 1 week | 122 | -26.543 | -13.465 | -8.900 | -3.170 | -0.070 |
| 1 month | 573 | -22.259 | -11.010 | -7.180 | -2.880 | -0.090 |
| Quarterly | 168 | -21.654 | -10.823 | -7.126 | -2.780 | -0.050 |
| Semi annually | 5 | -21.397 | -11.573 | -7.825 | -3.100 | -0.230 |
| 1 year | 4 | -10.537 | -5.113 | -3.182 | -1.540 | 0.060 |
| More than 1 year | 0 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Table 8a: The loss distribution of a North American hedge fund by domicile status

| Domicile | Number of funds | Maximum 12 month decline | | | | |
|----------|-----------------|--------------------------|----------------|-----------------|-----------------|-----------------|
| | | 1st percentile | 5th percentile | 10th percentile | 25th percentile | 50th percentile |
| Onshore | 2313 | -21.670 | -10.550 | -6.710 | -2.550 | -0.020 |
| Offshore | 320 | -20.987 | -9.710 | -6.260 | -2.290 | -0.040 |

Table 8b: The loss distribution of an Asian edge fund by domicile status

| Domicile | Number of funds | Maximum 12 month decline | | | | |
|----------|-----------------|--------------------------|----------------|-----------------|-----------------|-----------------|
| | | 1st percentile | 5th percentile | 10th percentile | 25th percentile | 50th percentile |
| Onshore | 361 | -24.344 | -12.910 | -8.580 | -3.450 | -0.055 |
| Offshore | 633 | -21.668 | -10.840 | -7.060 | -2.700 | -0.070 |

Table 9a: The loss distribution of a North American hedge fund by vintage

| Experience (#reported periods) | Number of funds | Maximum 12 month decline | | | | |
|--------------------------------|-----------------|--------------------------|----------------|-----------------|-----------------|-----------------|
| | | 1st percentile | 5th percentile | 10th percentile | 25th percentile | 50th percentile |
| 5 - 10 years | 1669 | -21.508 | -9.840 | -6.130 | -2.320 | -0.050 |
| 10 - 15 years | 696 | -20.700 | -10.310 | -6.660 | -2.530 | 0.010 |
| More 15 years | 268 | -23.156 | -12.030 | -7.970 | -3.058 | 0.050 |

Table 9b: The loss distribution of an Asian edge fund by vintage

| Experience (#reported periods) | Number of funds | Maximum 12 month decline | | | | |
|--------------------------------|-----------------|--------------------------|----------------|-----------------|-----------------|-----------------|
| | | 1st percentile | 5th percentile | 10th percentile | 25th percentile | 50th percentile |
| 5 - 10 years | 758 | -22.388 | -11.140 | -7.290 | -2.780 | -0.090 |
| 10 - 15 years | 192 | -22.188 | -11.370 | -7.570 | -3.040 | -0.050 |
| More 15 years | 44 | -27.758 | -14.770 | -9.800 | -4.300 | 0.060 |

Eurekahedge Investment Strategies (www.eurekahedge.com)

The following strategic mandates have been applied to the main Mizuho-Eurekahedge Index in order to create strategic subsidiaries such as the Mizuho-Eurekahedge Asia/Pacific ex Japan All Strategies Index.

Arbitrage

Involves the purchase of an asset followed by immediate resale, exploiting pricing inefficiencies in a variety of situations in similar or different markets. It is usually regarded to have low risk, but this may differ depending on the circumstances. The most basic form of arbitrage is triangle arbitrage, where an asset is being sold at two different prices at different markets. Such gaps are often closed off almost instantly. Merger arbitrage takes place following M&A announcements as funds may purchase stocks of the target company and short the stocks of the acquiring company. Capital structure arbitrage involves taking advantage of pricing anomalies among different securities issued by the same or related firm. For example, a fund might go long on a high yield bond and short the stock of the company. Given the nature of opportunities pursued, returns tend to be market neutral.

CTA/Managed Futures

Invests in commodity futures, options and forex contracts either directly or through a Commodity Trading Advisor who is registered with the Commodities Futures Trading Commission.

Distressed Debt

Invests in the debt of companies that are sick, bankrupt or in the course of a turnaround at deep discounts. Given the nature of these securities, there is selling pressure in the market as many of the institutional investors cannot own below investment grade securities. This results in lower demand, coupled with the negative publicity of a bankruptcy filing, leading to an undervaluation which this strategy is trying to capitalise on.

Event Driven

Exploits opportunities in specific situations, such as mergers, public offerings, leveraged buyouts or hostile takeovers, and is generally unaffected by the movements in the market or trends. They need not necessarily be limited to any particular investment style or asset class. One example of an event driven arbitrage strategy is merger arbitrage, distressed debt, or more generally speaking, distressed securities.

Fixed Income

Invests in fixed income securities (long, short or both) and/or fixed income arbitrage (exploiting pricing anomalies in similar fixed income securities) opportunities, usually along with the use of leverage. For this strategy, they may focus on interest rate swaps, forward yield curves or mortgage-backed securities.

Long/Short Equity

Attempts to hedge out market risk by investing on the long (buy then sell as prices rise) as well as short (borrow, sell and buy as prices go down, and settle the loan) side of the equity markets. The fund's net exposure to the markets is reduced if not completely hedged out, owing to the short-selling. Managers shift from stocks of small values to that of large ones, resulting in a tilt in the net long or short position to gain returns. Absolute returns are accentuated by such use of leverage and may also make use of options and futures. Note that this strategy is different from a true equity market neutral strategy. The key difference lies in the fact that the manager is betting that one stock will do better than the other relatively, regardless of the general market movement.

Long-only Absolute Return Funds

Funds that employ an absolute return strategy but by focusing only on the long side of the markets they invest in. Any of the following investment styles may be used:

a. Bottom-up/ Value

A value-based investment approach. Managers are predisposed to and focus on stock selection and conduct in-depth, rigorous fundamental analysis of individual securities. Additional effort is made to find mispricing opportunities (undervalued assets) and growth companies via company visits and scrutiny of accounting practices.

b. Top-Down

Managers base their holding decisions largely on country, region and sector selection, credit creation and other major macro considerations. Portfolios typically consist of a blend of debt and equity. Rigorous tests of businesses are also conducted, in similar fashion to bottom-up, although growth is the manager's priority.

c. Dual Approach

A mixture of bottom-up and top-down – the best illustration of a combination of securities selection and asset allocation. Emphasis is on stock-picking with a macro overlay.

d. Diversified Debt

The manager aims to capitalise on expectations of credit improvement in one or more distressed, high-yield, sovereign, corporate and bank debts. Profitability depends on credit spread tightening. Convertible bonds (equity) can also be held.

Macro Funds

A top-down strategy that tracks and profits from global macro-economic directional shifts or changes in government policies. This, in turn, affects foreign currencies/economies, interest rates and commodities. Managers using this strategy are usually involved in all kinds of markets, such as equities,

bonds, etc. The use of leverage (and derivatives, in particular) accentuates the impact of market movements on fund performance.

Multi-Strategy

Adds a further layer of diversification to asset allocations (as opposed to merely diversifying across asset classes) by investing in more than one of the strategies described here. To loosely analogize, a multi-strategy fund would be the single-manager fund equivalent of a fund of hedge funds. The volatility for this strategy is considered to be variable.

Relative Value

This is an overarching classification and encompasses all strategies that use pair-trading, leverage in a variety of securities and aim to hedge out market risk. For instance, fixed income arbitrage, capital structure arbitrage and long/short equities are all technically relative value strategies.

CAIA Classification of Hedge Fund Strategies⁸

- I. Macro and Managed Futures Funds
 - a. Macro
 - b. Managed Futures
- II. Event-Driven Hedge Funds
 - a. Activists
 - b. Merger Arbitrage
 - c. Distressed
 - d. Event-Driven Multistrategy
- III. Relative Value Hedge Funds
 - a. Convertible Arbitrage
 - b. Volatility Arbitrage
 - c. Fixed Income Arbitrage
 - d. Relative Value Multistrategy
- IV. Equity Hedge Funds
 - a. Long-short
 - b. Market neutral
 - c. Short Selling
 - d. 130-30 Funds
- V. Funds of Funds
 - a. Fund of Funds

⁸ CAIA Level I: An Introduction to Core Topics in Alternative Investments, Chapter 11: Introduction to Hedge Funds