JOSEPH CHERIAN

Asia School of Business

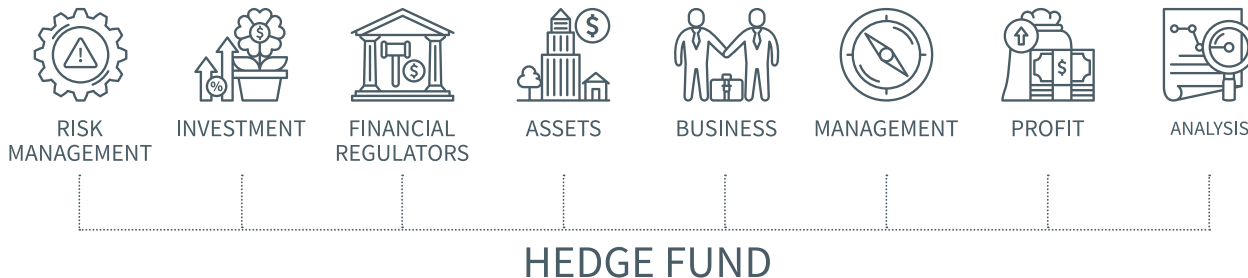# The Return of Beta: Rethinking Hedge Fund Performance

Introduction

This commentary examines whether hedge funds, long considered bastions of alpha generation and diversification – and high costs – have transformed into products that essentially deliver traditional beta exposures. In my 2023 working paper, Cherian, Kon, and Li (henceforth CKL [2023]) my co-authors and I conducted a comprehensive empirical investigation spanning twenty years (2000 – 2020), by using hedge fund strategy indices from both North America and Asia.[1] Through multi-factor regression models and hedge fund clone construction, we demonstrate that a significant portion of hedge fund returns – up to 81% – can be explained by systematic, market-based risk factors and not the much-touted hedge fund manager's unique, alpha-generating skills.

The research challenges the assumption that hedge funds deliver substantial and consistent alpha. Instead, it shows a systematic decline in alpha over time, particularly after the Global Financial Crisis (GFC), with clones replicating hedge fund returns – sometimes even outperforming them during stress periods such as the COVID-19 pandemic. The findings call into question the value proposition of hedge funds, particularly in light of their high fee structures. This CKL (2023) study is unique in that it analyzes hedge fund strategy indices from both North America and Asia.

RISK MANAGEMENT   INVESTMENT   FINANCIAL REGULATORS   ASSETS   BUSINESS   MANAGEMENT   PROFIT   ANALYSIS

HEDGE FUND

Background and Motivation

Hedge funds have traditionally offered investors diversification from traditional long-only asset classes and the promise of "alpha" from sophisticated investment strategies. They have also experienced tremendous growth in assets under management (AUM). Just in 2019, the global hedge fund industry managed approximately USD2.3 trillion in assets, with USD183 billion in Asian hedge funds. According to With Intelligence (Hedge Fund Outlook 2025), the hedge fund industry's AUM is projected to grow from approximately USD4.5 trillion at the end of 2024 to over USD5 trillion by 2028, and reach USD5.5 trillion by 2030. The projected growth of hedge fund industry assets is depicted in Figure 1 below.

Despite this popularity, as depicted by AUM growth, actual hedge fund performance in recent years has disappointed relative to market indices. An adjunct faculty member at the Hong Kong University of Science and Technology (HKUST) even went so far as to boldly write, "Few practices in the business world are as absurd, senseless, irrational, and cynical as the al- location of investments of large public pension funds and endowments. And few fail so often and so predictably to achieve their true objectives. Yet almost all outside the industry – and many inside it – are fooled into believing the opposite." He proceeded to reference news articles that documented clients' growing frustration over the disappointing returns of certain large hedge funds. [2]

The same "Hedge Fund Outlook 2025" report by With Intelligence indicates that an investor could have done slightly better with a low-cost Global 60/40 Portfolio (Equities/Bonds) over a 5-year period from July 2019 to June 2024 as compared to a more expensive diversified hedge fund portfolio (Figure 2).

While Dr. Michael Edesess of HKUST

Figure 1: Projected Growth of Hedge Fund Industry Assets:
Range of Outcomes Based on Differing Compound Annual Growth Rates (CAGRs)

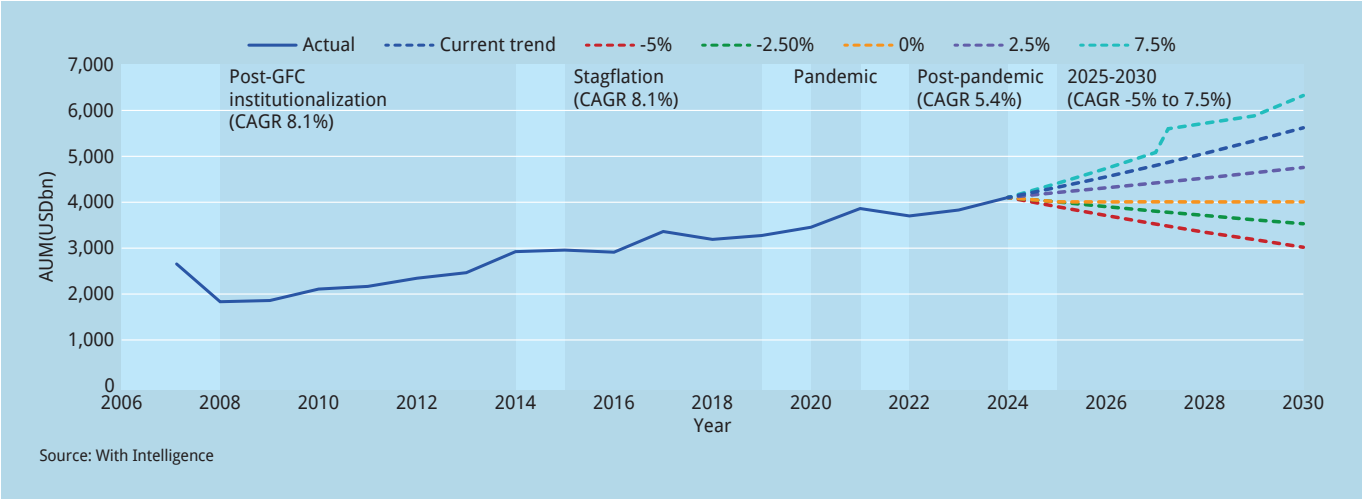

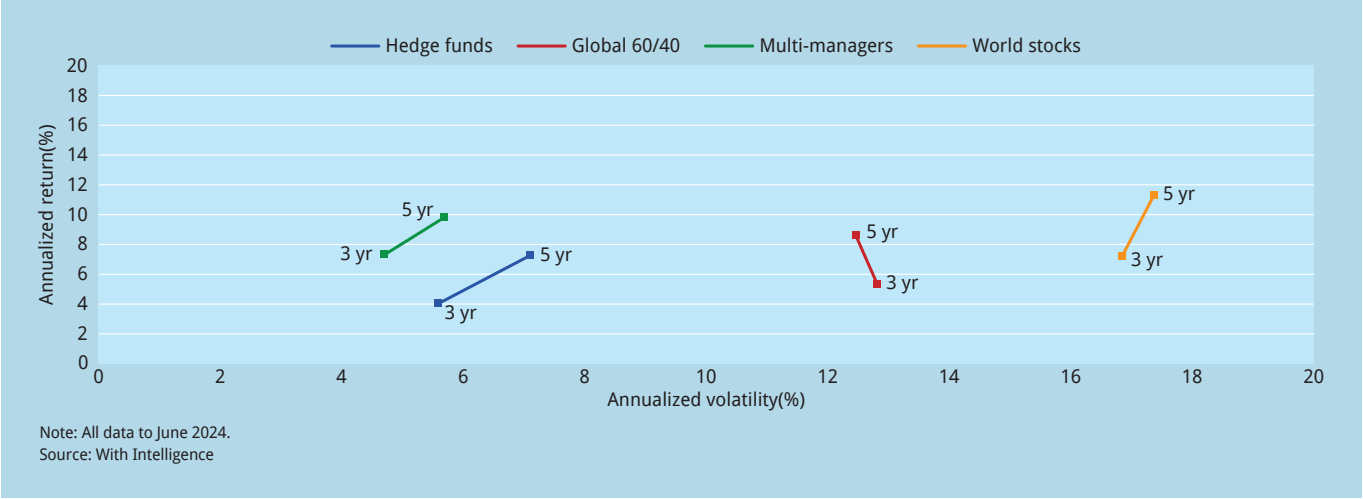Source: With Intelligence

Figure 2: Annual 3-Year and 5-Year Risk-Adjusted Return Comparisons:
Range of 3-Year and 5-Year Return Outcomes Against Their Respective Annualized Volatility

Note: All data to June 2024.
Source: With Intelligence

may be correct on average in his observations, it is important to recognize that there are always two sides to the coin. High-quality hedge funds, such as Citadel, D.E. Shaw Group, and Renaissance Technologies, continue to deliver strong long-term performance on a risk-adjusted basis.

Compounding this negativism is the growing body of research suggesting that hedge fund returns may be replicated through exposure to known risk premia. Additionally, the development of liquid alternatives and hedge fund clones that use exchange-traded instruments challenges the exclusivity of hedge funds' value proposition.

This article situates itself within that debate; assessing whether hedge funds truly generate alpha, or if their performance can be adequately explained using linear and non-linear factor models, which is commonly referred to as "replication" in the hedge fund industry. The current analysis expands on earlier replication studies (e.g., Hasanhodzic and Lo [2007], Fung and Hsieh [2004]), incorporates regional analysis, and conducts a novel event study based on COVID-19. [3,4]

Research Questions and Objectives

The paper is guided by the following core research questions:

1) What are the risk exposures and performance drivers of hedge fund strategies across geographies (North America and Asia)?

2) How have these exposures and return profiles changed before and after the GFC?

3) Do hedge funds deliver manager-specific alpha, or is most of their return attributable to systematic beta exposures?

4) How do hedge fund clones, constructed using public market factors, perform in comparison to actual hedge funds, particularly during extreme market events like COVID-19?

The objective is to empirically test the replicability of hedge fund returns using public market factors and to evaluate the persistence of alpha under dynamic market conditions.

Data and Methodology

CKL (2023) utilize hedge fund strategy indices from Eurekahedge (now a part of With Intelligence) for both North America and Asia. The sample covers ten strategies: Long/Short Equity, Macro, Commodity Trading Advisor (CTA)/Managed Futures, Event Driven, Distressed Debt, Relative Value, Multi-Strategy, Arbitrage, Fixed Income, and the overall Hedge Fund Index.

In an earlier companion study, Cherian, Kon, and Weng (2015) examined the downside risk and loss profiles of hedge funds in North America and Asia. This analysis was conducted to identify significant cross-regional differences and to evaluate whether these disparities have converged or diverged over time. The key finding was that downside risks persist despite hedge funds being marketed as market-neutral strategies. Moreover, Asian hedge funds underperformed their North American counterparts in both rising and declining markets.

The returns in the CKL (2023) study are net-of-fees and denominated in local currencies, spanning January 2000 to March 2020. The study also addresses the known issue of returns smoothing due to illiquidity. Using Durbin-Watson and Ljung-Box tests, autocorrelation is detected in many strategies, particularly Fixed Income and Distressed Debt. CKL (2023) correct for this using Geltner's unsmoothing technique, producing more accurate estimates of volatility and risk.

The multi-factor model includes ten factors: traditional market indices (Equity, Bond, Credit), Fama-French Style factors (Size, Value, Momentum), and non-linear risk factors (DVIX for Volatility, out of the money [OTM] short puts for tail risk, and trend-following indicators). [5] For Asian funds, regional replacements are used for factors such as equity and currency indices.

Regression Analysis and Key Findings

CKL (2023) apply a ten-factor linear regression model across all strategy indices to decompose returns into explained variance (beta exposure) and residual returns (alpha). For most strategies, particularly equity-biased ones, R^2 values are high – up to 86% – indicating that a large portion of returns is explainable via systematic factors.

Long/Short Equity, Fixed Income, and Multi-Strategy funds are significantly exposed to Equity Market, Size, and Credit factors. Distressed Debt funds exhibit high negative beta to Credit, consistent with their exposure to High-Yield Debt. Arbitrage strategies show strong exposures to Volatility and Tail Risk.

Importantly, strategies such as Macro and Managed Futures exhibit low R^2 values (0.03–0.30), supporting their claim to market neutrality. However, rolling window regressions reveal time-varying beta exposures that contradict this neutrality in the short run. For example, North America Macro shows a beta of 0.03 to the S&P500 over the full sample, but the rolling betas range from -0.30 to +0.50.

This discrepancy highlights the need for dynamic rolling correlation-type analysis when evaluating hedge fund strategies' time series of returns.

Figures 3a and 3b present heatmaps of beta exposures for North American and Asian hedge fund strategies, respectively, covering the period from January 2000 to March 2020. Given that the Bond and Credit factors are derived from yield data, their beta magnitudes are expected to be relatively high. Notably, the troughs in the heatmaps reveal particularly negative Credit exposures for North America Fixed Income, North America Distressed Debt, and Asia Fixed Income strategies, with betas nearing -3.0.

Conversely, the peak Bond exposure in the Asia Macro strategy indicates a markedly positive sensitivity to the Bond factor relative to other strategies. Importantly, due to the inverse relationship between bond prices and yields, a more negative beta for the Bond and Credit factors suggests heightened market exposure.

Figure 3a: Heatmap of Intercept (Alpha) and Beta Exposures of North America (NA) Hedge Fund Strategies (Sample period: January 2000 to March 2020)
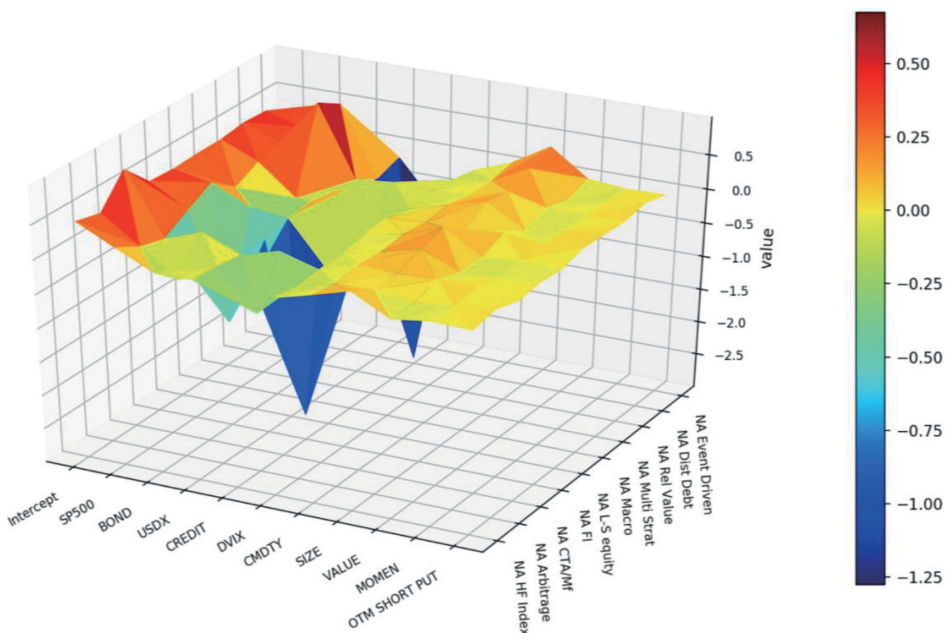
Source: CKL (2023)

Figure 3b: Heatmap of Intercept (Alpha) and Beta Exposures of Asian Hedge Fund Strategies (Sample period: January 2000 to March 2020)
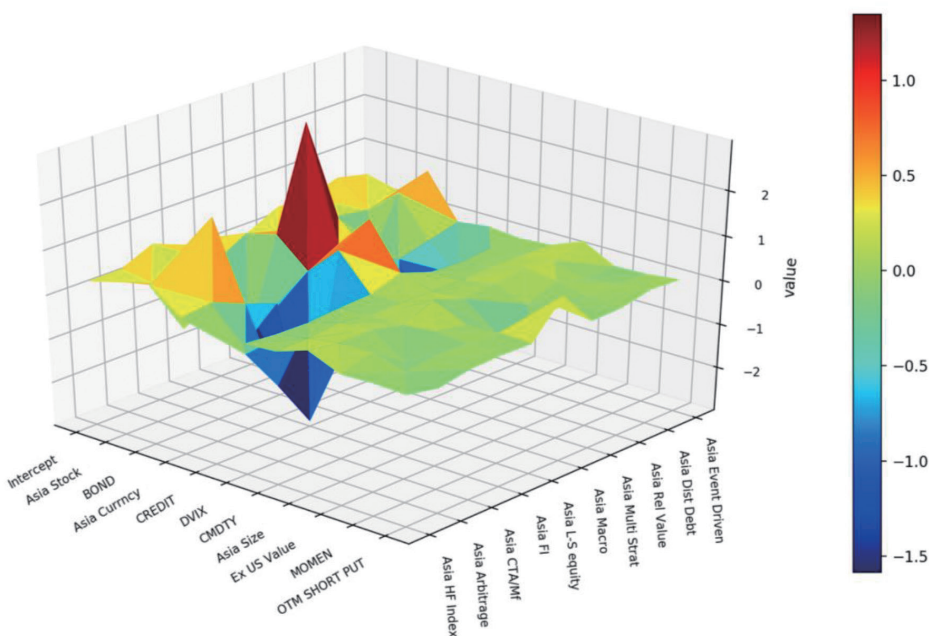
Source: CKL (2023)

Pre–GFC vs. Post–GFC Comparisons

The analysis splits the sample into pre-GFC (2000–2008) and post-GFC (2008–2020) periods. In North America, hedge fund alpha declined substantially across all strategies post-GFC. For instance, Macro strategy's alpha fell from 0.64% to -0.04% on a monthly basis. This decline is attributed to increased transparency, data availability, and the commoditization of macro insights through alternative data.

In Asia, alpha also declined but to a lesser degree. Strategies such as Multi-Strategy and Macro retained modest alpha, possibly due to less crowded markets and lower AUM relative to North America.

Beta exposures also shifted. Equity-focused strategies maintained consistent exposure to Stock and Size, while Fixed Income and Distressed Debt strategies increased sensitivity to bond and credit factors. Event Driven and Arbitrage strategies became more exposed to volatility and tail risks post-GFC.

Out–of–Sample Predictability and Hedge Fund Clones' Performance (Replication)

Two prediction models are tested: one using fixed beta weights (from 2000–2016) and the other using rolling 5-year regression coefficients. The hedge fund clones' out-of-sample performance (2017–2020) is then compared to realized returns, simply to determine if hedge fund clones are good at replicating hedge funds' actual returns.

Table 1 in the Appendix reports the out-of-sample expected return statistics generated by the two proposed clone models, alongside the realized returns of the corresponding hedge fund strategy indices. This is conducted over the period from January 2017 to March 2020. Overall, there

is no compelling evidence that the clones' predicted expected returns differ significantly from the realized returns of their respective hedge fund benchmarks.

In fact, hedge fund clone portfolios, constructed with risk factor weights (no alpha), match or exceed actual hedge fund performance. During the period 2017–2020, rolling clones outperformed actual funds across most North American strategies, with much better Sharpe ratios. This trend holds even when considering the COVID-19 shock in Q1 2020.

In summary, the Table 1 results demonstrate that:
- High correlations (often above +0.90) exist between predicted and realized returns, particularly for fixed-weight clones.
- Rolling-weight clones better capture recent shifts in market dynamics and produce smaller prediction errors.
- Certain strategies (e.g., Macro, CTA) show improved correlation with rolling-weight clones, consistent with their time-varying betas.

Event Study: COVID–19 Pandemic

Using daily clone returns, CKL (2023) go on to conduct an event study around two key dates: the 23 January 2020 Wuhan COVID-19 pandemic lockdown and the 11 March 2020 World Health Organization (WHO)-based pandemic declaration. Clones are compared to market benchmarks (S&P500, MSCI Asia) and to their own historical means.

Table 2, which can be found in the Appendix, presents the 5-day and 10-day cumulative abnormal returns (CARs) for the two selected event dates, calculated as the aggregated CARs over 5 and 10-days surrounding each event. The results indicate that the daily clones underperformed relative to their 1-year historical performance, but outperformed broader equity benchmarks such as the S&P500 and MSCI Asia indices. Regardless of geography, the daily clones – which were able to allocate up to 70% of their positions to non-equity risk factors – were buffered from sharp equity market declines during the pan-

demic by exposures to alternative factors such as Credit, trend-following strategies, and DVIX. These allocations contributed to their relative outperformance during the observed periods.

The key findings from Table 2 are:
- Clones outperformed equity benchmarks during both event study shocks, thanks to diversified exposures.
- North America CTA and Asia Macro clones delivered positive CARs, consistent with their trend-following and volatility strategies.
- Asia clones reacted earlier and more strongly to the Wuhan COVID-19 pandemic lockdown, reflecting better integration with local risk sentiment.

Notably, Asia-focused hedge funds underperformed their respective replication strategies, i.e., clones, during the pandemic. This is attributed to higher redemption activity and more flexible liquidity terms, as many Asian funds allow monthly or even daily redemptions. Clones, unaffected by redemptions, demonstrated greater resilience.

Conclusions and Implications

The CKL (2023) study's results underscore a critical insight: hedge funds are increasingly behaving like high-cost vehicles for delivering traditional beta. The myth of consistent alpha, particularly in North America, is largely dispelled by the data between January 2000 to March 2020. Even "market-neutral" hedge funds engage in short-term market timing.

Hedge fund clone portfolios, constructed using public data, offer comparable or superior performance with greater transparency and lower fees than their corresponding hedge fund strategies. Their strong correlation with actual hedge fund returns, and resilience during crises, make them a compelling alternative for institutional investors.

For asset allocators, the findings suggest a reassessment of the role of hedge funds in diversified portfolios. For policymakers and regulators, the results high-

light the value of greater transparency and standardized risk factor disclosures in alternative investments.

In conclusion, while hedge funds may still offer niche alpha in certain regions or strategies, their overall return profile increasingly resembles traditional beta—with less justification for high fees. The ongoing evolution of alternative beta strategies suggests that the hedge fund industry may need to redefine its value proposition in the years ahead.

Appendix

Table 1: Comparison of Out-of-Sample Expected Returns (Fixed Regression and Rolling Window Regression) versus Realized Returns (Sample period: January 2017 to March 2020)

	Realized Return (AR Adjusted)		Expected Return - Fixed Regression					Expected Return - Rolling Window Regression					Comparison
	Average Monthly Realized Return	Average Monthly S.D	Average Monthly Expected Return	Average Monthly S.D	Average Difference with Realized Return	T-stat of Difference with Realized Return	Correlation – Fixed ER with Realized Return	Average Monthly Expected Return	Average Monthly S.D	Average Difference with Realized Return	T-stat of Difference with Realized Return	Correlation-Rolling ER with Realized Return	Correlation (Rolling Window) - Correlation (Fixed)
NA HF Index	-0.10%	2.22%	0.50%	1.70%	0.60%	(1.33)	**0.96**	0.06%	2.18%	0.16%	(0.32)	**0.96**	-0.002
NA Arbitrage	0.08%	2.00%	0.33%	1.23%	0.25%	(0.65)	0.40	-0.12%	1.99%	-0.19%	(-0.42)	0.54	**0.142 (+)**
NA CTA/Mf	0.06%	0.78%	0.73%	0.89%	0.67% ***	(3.51)	0.40	0.13%	0.75%	0.07%	(0.41)	0.37	-0.032
NA Fixed Income	-0.40%	4.26%	0.58%	1.69%	0.98%	(1.32)	**0.80**	0.34%	1.85%	0.73%	(0.97)	**0.82**	0.023
NA Long/Short Equity	-0.07%	2.57%	0.42%	2.17%	0.49%	(0.89)	**0.98**	0.11%	2.59%	0.18%	(0.30)	**0.98**	-0.006
NA Macro	-0.26%	1.78%	0.69%	0.65%	0.95% ***	(3.08)	-0.41	-0.28%	2.34%	-0.02%	(-0.05)	**0.74**	**1.142 (+)**
NA Multi-Strategy	-0.24%	2.96%	0.51%	1.84%	0.74%	(1.31)	**0.92**	0.03%	2.61%	0.27%	(0.42)	**0.86**	-0.052
NA Relative Value	0.00%	2.37%	0.52%	1.75%	0.52%	(1.08)	**0.68**	-0.09%	3.02%	-0.09%	(-0.15)	0.52	**-0.161 (-)**
NA Distressed Debt	-0.26%	3.45%	0.34%	3.37%	0.60%	(0.77)	**0.72**	-0.35%	3.40%	-0.09%	(-0.11)	**0.65**	-0.067
NA Event Driven	-0.77%	5.10%	0.18%	3.93%	0.94%	(0.90)	**0.90**	0.18%	4.29%	0.95%	(0.88)	**0.87**	-0.033
Asia HF Index	-0.03%	2.55%	0.33%	2.03%	0.36%	(0.69)	**0.89**	0.23%	2.07%	0.26%	(0.49)	**0.81**	-0.080
Asia Arbitrage	-0.12%	3.71%	0.25%	1.18%	0.37%	(0.58)	**0.70**	0.20%	1.32%	0.32%	(0.50)	0.57	**-0.134 (-)**
Asia CTA/Mf	0.03%	1.37%	0.70%	1.32%	0.67% **	(2.18)	-0.09	0.15%	1.53%	0.12%	(0.36)	0.02	**0.112 (+)**
Asia Fixed Income	0.17%	1.44%	0.19%	1.78%	0.02%	(0.05)	**0.88**	0.36%	0.86%	0.19%	(0.68)	0.57	**-0.309 (-)**
Asia Long/Short Equity	-0.08%	2.94%	0.31%	2.10%	0.39%	(0.67)	**0.89**	0.24%	2.39%	0.32%	(0.53)	**0.80**	-0.095
Asia Macro	0.11%	0.68%	0.67%	2.18%	0.57%	(1.53)	-0.08	0.07%	0.91%	-0.04%	(-0.22)	-0.17	-0.083
Asia Multi-Strategy	0.14%	1.31%	0.54%	1.35%	0.39%	(1.28)	0.70	0.30%	1.06%	0.15%	(0.56)	0.47	**-0.230 (-)**
Asia Relative Value	-0.21%	3.69%	0.31%	1.61%	0.52%	(0.80)	0.86	0.37%	1.85%	0.58%	(0.86)	**0.85**	-0.006
Asia Distressed Debt	0.48%	1.96%	0.50%	1.16%	0.02%	(0.06)	0.08	-0.12%	2.64%	-0.60%	(-1.12)	0.14	0.056
Asia Event Driven	0.04%	3.24%	0.45%	1.70%	0.41%	(0.70)	0.87	0.03%	3.04%	-0.01%	(-0.02)	**0.86**	-0.017

Notes: (1) ***, **, * indicates significance at 1%, 5% and 10% level, respectively, indicating significant difference from 0. Bolded represents correlation more than 0.60. (+) represents increase in rolling correlation > 0.1, (-) represents decrease in rolling correlation > 0.1.
(2) S.D stands for standard deviation.
Source: CKL (2023)

Table 2: CAR of Market-Adjusted Excess Returns and Mean-Adjusted Excess Returns around 23 January 2020 and 11 March 2020 (COVID-19) Event Dates

	Market Adjusted Return				Mean Adjusted Return			
	Event Date: 23/Jan/2020		Event Date: 11/Mar/2020		Event Date: 23/Jan/2020		Event Date: 11/Mar/2020	
	10-day CAR	20-day CAR	10-day CAR	20-day CAR	10-day CAR	20-day CAR	10-day CAR	20-day CAR
NA HF Index	-0.75%	-2.85%	9.71%	12.04%	-1.10%	-0.34%	-12.86%	-11.52%
NA Arbitrage	-1.84%	-8.85%	24.01%	24.82%	-2.22%	-6.42%	1.40%	1.18%
NA CTA/Managed Futures	-0.60%	-4.59%	25.85%	27.12%	-0.91%	-2.00%	3.32%	3.64%
NA Fixed Income	-0.07%	-0.55%	12.18%	12.58%	-0.34%	2.10%	-10.32%	-10.84%
NA Long/Short equity	-0.59%	-2.00%	8.12%	10.63%	-0.94%	0.50%	-14.45%	-12.93%
NA Macro	-0.24%	-1.93%	16.72%	18.00%	-0.62%	0.53%	-5.88%	-5.62%
NA Multi-Strategy	-1.38%	-3.43%	5.31%	8.36%	-1.78%	-1.03%	-17.31%	-15.31%
NA Relative Value	-1.33%	-5.38%	7.36%	9.86%	-1.66%	-2.84%	-15.20%	-13.67%
NA Distressed Debt	-2.08%	-2.77%	4.09%	4.03%	-2.34%	-0.09%	-18.40%	-19.36%
NA Event Driven	-0.22%	2.11%	-12.28%	-10.98%	-0.55%	4.65%	-34.84%	-34.51%
Asia HF Index	2.46%	1.47%	7.53%	6.33%	-2.28%	1.58%	-14.41%	-12.97%
Asia Arbitrage	3.34%	-0.75%	10.89%	8.63%	-1.30%	-0.44%	-10.94%	-10.46%
Asia CTA/Managed Futures	3.78%	-0.14%	16.01%	13.00%	-0.80%	0.30%	-5.75%	-5.97%
Asia Fixed Income	3.57%	-0.99%	20.55%	17.56%	-1.04%	-0.62%	-1.25%	-1.48%
Asia Long/Short equity	2.02%	1.51%	6.95%	6.05%	-2.78%	1.51%	-15.05%	-13.35%
Asia Macro	4.25%	-0.16%	21.90%	19.65%	-0.20%	0.51%	0.25%	0.91%
Asia Multi-Strategy	3.76%	2.67%	14.35%	11.99%	-0.86%	3.02%	-7.46%	-7.07%
Asia Relative Value	2.84%	-0.41%	11.69%	11.03%	-1.97%	-0.42%	-10.31%	-8.39%
Asia Distressed Debt	3.65%	0.72%	13.05%	10.72%	-1.04%	0.93%	-8.83%	-8.47%
Asia Event Driven	1.59%	-4.05%	6.84%	6.19%	-3.31%	-4.24%	-15.25%	-13.41%

Source: CKL (2023)
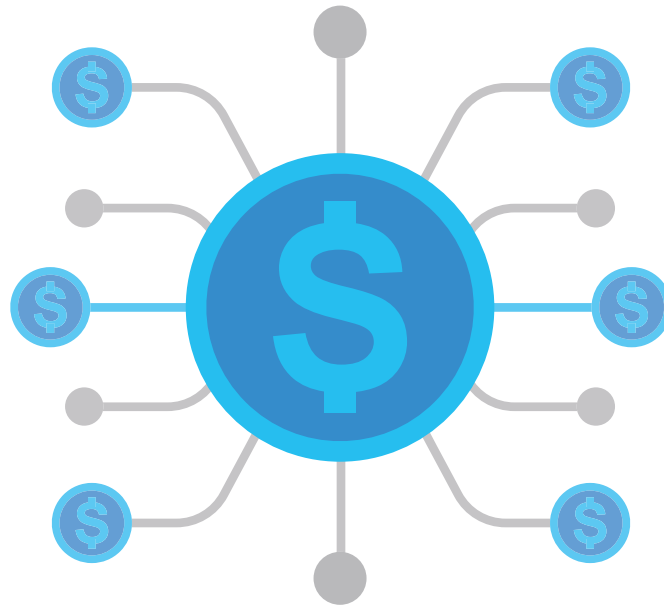
HEDGE FUND

Notes

1 Cherian, Joseph, Kon, Christine and Li, Zi-yun, *Replicas: Have Hedge Funds Re-Res-urrected as Traditional Beta?* (28 February 2023). Available at:
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4 Fung, W. and Hsieh, D. (2004). "Hedge Fund Benchmarks: A Risk-Based Approach." *Financial Analysts Journal* 60, 65–80.

5 DVIX is the first difference of VIX, which is the implied volatility calculated from the most liquid, short-dated S&P500 index option. VIX usually serves as a widely-used market risk aversion indicator.

JOSEPH CHERIAN

Chief Executive Officer, Asia School of Business

Joseph Cherian is the Chief Executive Officer (CEO), President & Dean, and Distinguished Professor at the Asia School of Business (ASB). He was most recently a Visiting Professor of Finance at the Samuel Curtis Johnson Graduate School of Management at Cornell University, where he also served as Executive-in-Residence and as a two-term member – and now Emeritus Member – of the Johnson Dean's Advisory Council.

Previously, Joe was Practice Professor of Finance at the National University of Singapore (NUS) Business School, where he founded and directed the Centre for Asset Management Research & Investments (CAMRI). Before returning to academia, he was Managing Director, Global Head, and Chief Investment Officer of the Quantitative Strategies Group at Credit Suisse Asset Management in New York. In that role, he had direct oversight of more than USD67 billion in global client assets managed using quantitative strategies. He also served on the firm's Global Executive Committee and various senior investment, management, and risk committees within the Asset Management division.

Earlier in his career, Joe held academic appointments in New York and Boston.

He holds a B.Sc. in Electrical Engineering from the Massachusetts Institute of Technology (MIT), and M.Sc. and Ph.D. degrees in Finance from Cornell University.