

## Arbitrage deep dive

12-month review to October 2022

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### In summary

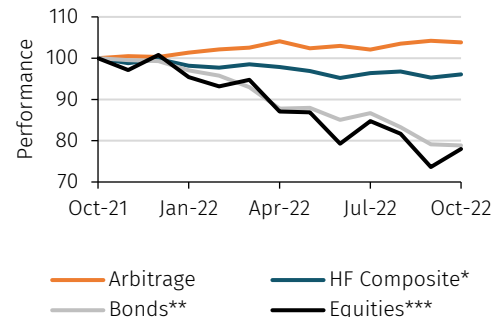
- The period under review includes 'the worst cross asset selloff since 1981' with simultaneous declines across equities, commodities, corporate and government bonds.
- In the 12 months through October 2022, arbitrage funds delivered an average return of +3.8%.
- Performance relative to the rest of the hedge fund universe was significantly above average, with arbitrage the fourth strongest performing master strategy in the 12 months through October 2022.
- On a risk-adjusted basis, when looking at the last three years, the arbitrage strategy has delivered a Sharpe of 1.6, with only the multi-strategy funds outperforming (+2.4).
- Tail protection was the best performing arbitrage sub-strategy, generating an asset weighted net return of +10.2%.

\*HF Composite = Aurum Hedge Fund Data Engine Asset Weighted Composite Index.  
 \*\*Bonds = S&P Global Developed Aggregate Ex Collateralized Bond (USD).  
 \*\*\*Equities = S&P Global BMI.

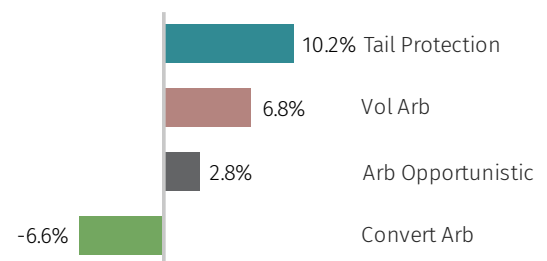
All figures and charts use asset weighted net returns unless otherwise stated. All Hedge Fund data is sourced from Aurum Hedge Fund Data Engine.

For definitions on how the Strategies and Sub-Strategies are defined please refer to <https://www.aurum.com/hedge-fund-strategy-definitions/>, and for information on index methodology, weighting and composition please refer to <https://www.aurum.com/aurum-strategy-engine/>.

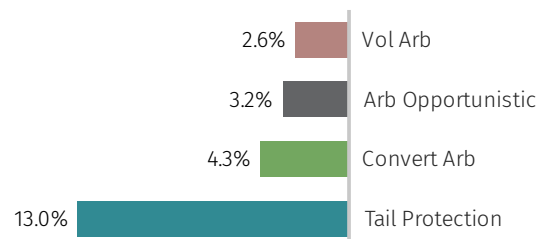
### MASTER STRATEGY vs INDICES NET RETURN



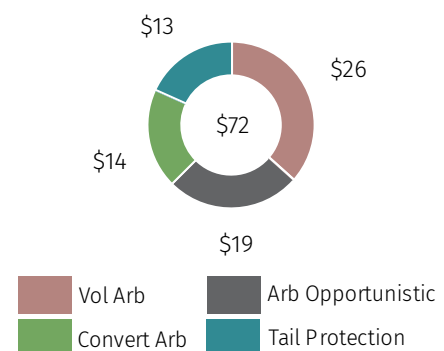
### SUB-STRATEGY NET RETURN (1 YR)



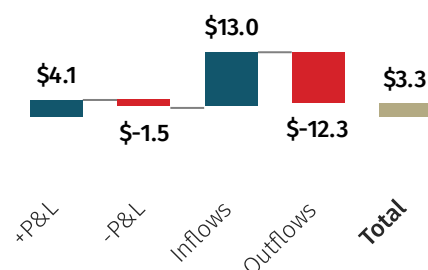
### VOLATILITY (1 YR)



### AUM (\$BN)



### AUM CHANGE \$BN (1 YR)



## Performance

The period under review includes ‘the worst cross-asset selloff since 1981’<sup>1</sup> with simultaneous declines across equities, commodities, corporate and government bonds. Over the last 12 months, both global equity and global bond indices are down well over 20%, while the broader hedge fund universe is down nearly 4%<sup>2</sup>. In spite of this exceptionally challenging environment, the returns of arbitrage hedge funds have been strong on a relative basis; it has been observed that the strategy tends to perform best during the most challenging months for risk assets.

In the 12 months through October 2022, arbitrage funds delivered an average return of +3.8%. The master strategy was positive 8 out of the last 12 months, with the worst monthly drawdown occurring in May 2022 (-1.6%) when all of the Arbitrage sub-strategies were negative. None of the remaining down months were less than -1% in magnitude.

**Arbitrage funds delivered an average return of +3.8%, while the hedge fund universe in general has struggled amidst market volatility, down 3.9%**

The most significant selloffs in both global bonds and global equities occurred in April (-5.6% and -8.1% respectively), June (-3.3%, -8.7%), August (-3.9%, -3.6%) and September (-5.0% and -9.9%) and yet all four months saw strong performance for the arbitrage strategy, particularly April and August, with April (+1.5%) returns were primarily driven by strong performance from tail protection and volatility arbitrage strategies, while August (+1.4%) saw positive returns from all underlying sub-strategies, with both the opportunistic and convertible arbitrage sub-strategies delivering outsized positive performance relative to the rest of the year.

Performance relative to the rest of the hedge fund universe was significantly above average, with arbitrage the fourth strongest performing master strategy in the last 12 months (page 6). Only macro (+4.4%), multi-strategy (+9.4%) and quant (+13.7%) strategies have outperformed arbitrage. The hedge fund universe in general has struggled amidst market volatility, down 3.9%, with those strategies that typically carry more beta to risk assets such as long-biased, equity long/short, event (particularly activist) and credit strategies all negative over the period.

The underlying arbitrage sub-strategies have themselves seen some significant dispersion in performance; tail protection strategies drove the lion’s share of the 12 months’ of positive returns, with assistance from volatility arbitrage funds. Opportunistic arbitrage funds’ returns were more muted while convertible arbitrage detracted from aggregate performance.

### NET RETURN OF MASTER AND SUB STRATEGIES (1 YR)

	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	YTD	1 YR
<b>Arbitrage</b>	<b>0.5%</b>	<b>-0.2%</b>	<b>1.1%</b>	<b>0.8%</b>	<b>0.4%</b>	<b>1.5%</b>	<b>-1.6%</b>	<b>0.6%</b>	<b>-0.9%</b>	<b>1.4%</b>	<b>0.7%</b>	<b>-0.4%</b>	<b>3.5%</b>	<b>3.8%</b>
Tail Protection	1.5%	-2.9%	2.4%	2.2%	0.8%	5.1%	-2.8%	4.8%	-4.4%	2.4%	6.3%	-4.6%	11.9%	10.2%
Vol Arb	0.8%	0.4%	2.1%	1.0%	0.7%	1.6%	-0.3%	0.4%	-0.5%	0.2%	0.1%	0.3%	5.6%	6.8%
Arb Opportunistic	0.2%	0.3%	0.5%	0.4%	0.5%	0.9%	-1.8%	-0.2%	-0.2%	2.3%	-0.1%	0.2%	2.3%	2.8%
Convert Arb	-0.3%	0.3%	-0.8%	-0.4%	-0.4%	-0.9%	-2.7%	-1.7%	0.7%	1.6%	-2.4%	0.0%	-6.7%	-6.6%
<b>HF Composite*</b>	<b>-1.2%</b>	<b>1.0%</b>	<b>-1.6%</b>	<b>-0.5%</b>	<b>0.8%</b>	<b>-0.7%</b>	<b>-1.0%</b>	<b>-1.7%</b>	<b>1.2%</b>	<b>0.4%</b>	<b>-1.5%</b>	<b>0.8%</b>	<b>-3.7%</b>	<b>-3.9%</b>
<b>Bonds**</b>	<b>-0.5%</b>	<b>-0.2%</b>	<b>-2.3%</b>	<b>-1.3%</b>	<b>-2.9%</b>	<b>-5.6%</b>	<b>0.2%</b>	<b>-3.3%</b>	<b>1.9%</b>	<b>-3.9%</b>	<b>-5.0%</b>	<b>-0.3%</b>	<b>-20.6%</b>	<b>-21.1%</b>
<b>Equities***</b>	<b>-2.9%</b>	<b>3.8%</b>	<b>-5.3%</b>	<b>-2.4%</b>	<b>1.7%</b>	<b>-8.1%</b>	<b>-0.2%</b>	<b>-8.7%</b>	<b>6.9%</b>	<b>-3.6%</b>	<b>-9.9%</b>	<b>5.9%</b>	<b>-22.6%</b>	<b>-22.0%</b>

### Sub-strategy performance

Perhaps unsurprisingly, given the negative performance of risk assets and associated spikes in volatility over the last 12 months, it is tail protection that is the best performing arbitrage sub-strategy, generating an asset weighted net return of +10.2%. The sub-strategy has performed particularly well year to date, up just under 12%. This is in stark contrast to the prior 12-month period, where the sub-strategy was down over 10%. Tail hedging strategies typically look to give investors exposure to potential pay-out profiles that are positively convex in nature given a certain event (such as significant market down-moves and/or in response to spiking volatility levels or funding-stress). The strategy appeared to ‘do its job’, posting the strongest positive returns during the worst months for risk assets (January, April, June, August and September), while struggling during those months where markets rallied and volatility levels fell (e.g. December, July, and October in particular).

**Tail protection appeared to ‘do its job’, posting the strongest positive returns during the worst months for risk assets**

<sup>1</sup> Source: Bloomberg news, 31<sup>st</sup> August, <https://www.bloomberg.com/news/articles/2022-08-31/bulls-starved-in-august-amid-worst-cross-asset-selloff-since-81>

<sup>2</sup> HF Composite

Performance from volatility arbitrage funds has been reasonable over the last 12 months (+6.8%). This sub-strategy covers funds that look to generate absolute returns, irrespective of the market environment. However, underlying funds can, in aggregate have long, short or neutral biases to volatility and the tendency to which these shift can vary significantly between funds. Over the last 12 months, much like the tail protection strategy, volatility arbitrage funds have delivered their strongest returns during periods of elevated market volatility and stress, although with a greater consistency (up 10 out of 12 months) than the tail protection strategy (up 8 out of 12 months).

Opportunistic arbitrage sub-strategy performance was more muted (up 2.8% over the last 12 months and positive in 8 out of 12 months) with only two months delivering an absolute return figure of a greater magnitude than 1% (down 1.8% in May and up 2.3% in August). The strategy still managed to generate positive performance during the most volatile and difficult months for markets.

Convertible arbitrage was the only sub-strategy to deliver negative performance for the 12 month period (-6.6%) and was also the least consistent, down 8 out of the 12 months. Funds struggled to monetise the dislocations arising from the elevated market volatility as credit spreads widened, underperforming the broader hedge fund universe.

## Longer-term performance

In order to get a better representation of the strategy, it is best viewed over a cycle taking into account multiple time-horizons. As shown on [page 6](#), when viewed over the last ten years, the arbitrage peer group is actually the worst performing of the master hedge fund strategies, compounding at just 2.5% p.a. Comparatively over this time period, equities have attained a compound annual return of 5.9% while, due to their exceptionally negative performance in 2022, global bonds have shifted to a negative compound annual return. On shorter time perspectives (five and three years), only multi-strategy and event strategies outperform equities and bonds, with arbitrage strategies comfortably outperforming the broader hedge fund universe over the same periods.

**Opportunistic and convertible arbitrage funds have the highest Sharpe ratios relative to the other sub-strategies (+1.2 and +0.79). Outperforming Other master fund strategies with the exception of Multi-strategy and Arbitrage master strategy**

On a risk-adjusted basis, when looking at the last three years, the arbitrage strategy has delivered a Sharpe ratio of 1.6, with only the multi-strategy master strategy outperforming (+2.4).

Delving into the arbitrage sub-strategies on a three-year look-back, opportunistic and convertible arbitrage funds have the highest Sharpe ratios relative to the other sub-strategies (+1.2 and +0.8), while tail protection funds were the bottom performers (+0.3). Opportunistic and convertible arb funds also outperformed other master hedge fund strategies from a risk-adjusted perspective. It's also interesting to note ([page 12](#) chart on 5-year cumulative returns) how the opportunistic and convertible arbitrage sub-strategies' performance appears inverse to the performance of the tail-protection sub-strategy, suggesting that there may be 'short-tail'-like characteristics to funds in these sub-strategies. This is consistent with the intuition that many of the funds in these areas are looking to capture alpha as spreads 'revert', but can become exposed when spreads widen under periods of stress. At the same time, tail protection strategies are typically positioned long volatility or positioned to benefit in the event of spread widening.

## Alpha extraction

The arbitrage master strategy indicates a low beta (close to zero) to both bonds and equities ([page 8](#)) over the last three years, although there is some significant dispersion across the sub-strategies. Unsurprisingly, tail protection strategies have exhibited negative beta, while areas such as opportunistic and convertible arbitrage show some modest positive beta to risk assets (but still less than the broader hedge fund universe). Volatility arbitrage (typically a strategy run in a more neutral fashion) also exhibits close to zero beta to equities and bonds.

When reviewing the relative proportion of P&L generated by the strategy over the last ten years, it indicates that alpha drives the vast majority of overall returns, with a small level of beta exposure a marginal detractor to overall aggregate performance and 'risk free' constituting a material proportion of overall returns.

As alluded to above, strategies such as convertible arbitrage and opportunistic arbitrage exhibit positive alpha generation (37% and 67% of total returns over the last ten years) although convertible arbitrage has also exhibited a material attribution from beta. Volatility arbitrage has actually had a negative P&L attributable to beta, with alpha and the risk-free component driving the positive returns.

Tail protection is interesting to review. Over the last ten years, the statistical relationship suggests that overall returns are dominated by the consistent negative beta exposure, which has seen the strategy lose money over the time period – not a surprise given that the strategy is set up to benefit from down markets. The returns attributable to beta are negative but given the recent market falls the negative directional beta exposure has been accretive to overall strategy performance. The strategy has also exhibited some modest positive performance attributable to alpha.

## Performance dispersion

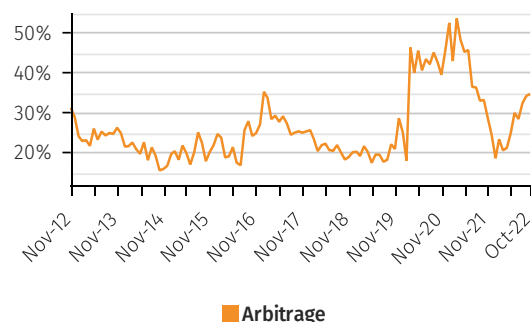
Not all managers were able to equally capitalise on the opportunity set of the past year. Rolling 12-month dispersion (showing the difference between top and bottom deciles) has unsurprisingly increased significantly over the period under review, capturing, in part, factors such as the significant dispersion widening between tail protection and the other sub-strategies.

The top decile of the arbitrage space delivered over 20%, while the bottom detracted -15%. This current dispersion spread of 35% is as high as at any point of the last ten years (outside of the COVID-19 crisis).

Tail protection strategies in the rolling 12 months (as of October 2022) are at ~40% dispersion, the highest of the underlying sub-strategies; volatility arbitrage at 35%. Convert arb dispersion is the lowest (15%).

What is clear is that across all strategies dispersion remains at relatively elevated levels compared to the last ten years, driven by a more volatile market environment. The dispersion within areas such as tail protection is particularly interesting. The bottom decile of tail protection funds for example, have actually detracted over 10% in the last year. Clearly allocators to such funds will be extremely disappointed that such products have totally failed to protect capital in precisely the kind of environment in which they reasonably expected them to perform. In fact, the bottom quartile of tail protection strategies have delivered close to zero returns, while the top quartile and top decile delivered over 20% and 30% respectively. Once again, the headline figures only reveal so much, highlighting the significant added value that comes from individual manager/fund selection. Similar stories are also evident in volatility arbitrage, where some managers have been able to capitalise on an environment of higher realised volatility, while others have experienced large drawdowns – this fact would be somewhat obfuscated if one were to focus only on the relatively muted mean and median returns and low aggregated volatility figure.

### 10<sup>th</sup> – 90<sup>th</sup> PERCENTILE 12M ROLLING NET PERFORMANCE SPREAD



## Assets and flows

Arbitrage is the smallest of the master hedge fund strategy groupings monitored by the Aurum Hedge Fund Data Engine as measured by AUM. The strategy accounted for \$72bn of ~\$2,916bn combined monitored industry AUM as at the end of October (or just under 2.5% of industry assets). The AUM of the master strategy rose by \$3.3bn, a combination of net inflows (+\$0.7bn) and net profits (+\$2.6bn). The number of arbitrage funds monitored rose from 107 to 118. The AUM is highly concentrated in a relatively small number of funds.

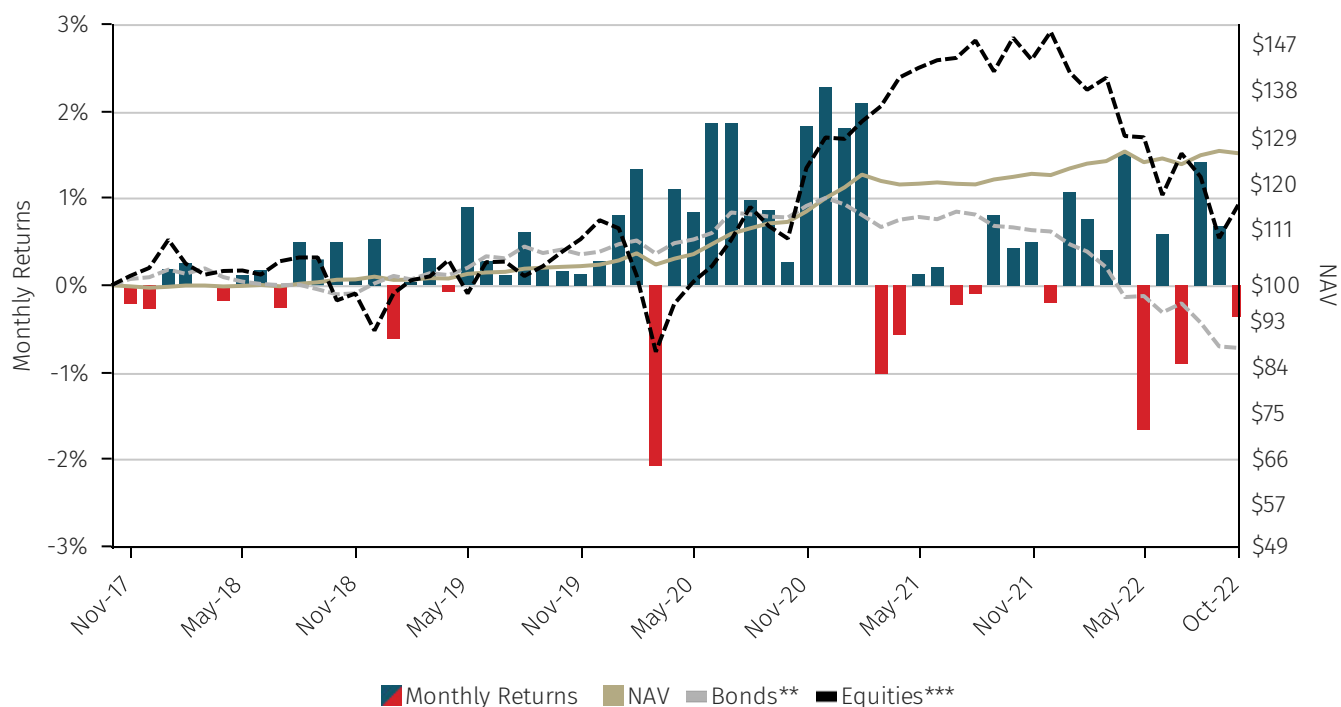
The largest sub-strategy is volatility arbitrage (\$26.4bn), which was also the strategy with the largest number of individual funds (42). Volatility arbitrage saw the most significant increase in AUM relative to the other arbitrage sub-strategies, with just over half the increase attributable to net inflows. Convertible arb funds saw modest net inflows, but the sub-strategy still shrunk as these were not enough to offset the losses. Opportunistic arbitrage saw the most significant outflows, partially offset by modest P&L gains. Nearly 100% of the increase in assets in tail protection has come from positive P&L in the last 12 months.

## Terms

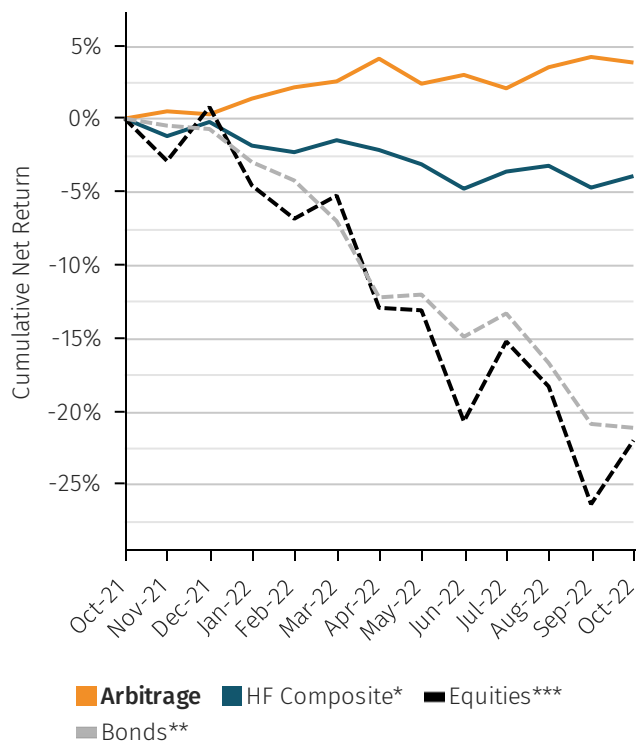
The median liquidity terms for arbitrage is monthly with 30 days' notice, with a weighted average redemption total of 109 days ([page 18](#)). This implies that those funds with a greater asset base have more onerous liquidity terms than their smaller counterparts. Opportunistic arbitrage funds have the least liquid terms with a weighted average redemption total of 145 days. This is not surprising given that this is the categorisation that contains the widest breadth of potential sub-strategy/trade implementation types, from the highly liquid, to relatively illiquid OTC, special situations and/or credit oriented capital structure arbitrage trades. Overall arbitrage liquidity terms have not changed materially in the last year.

# Master strategy performance

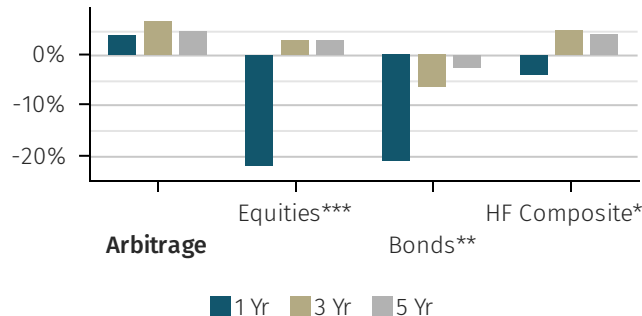
## NET MONTHLY RETURN (5 YR)



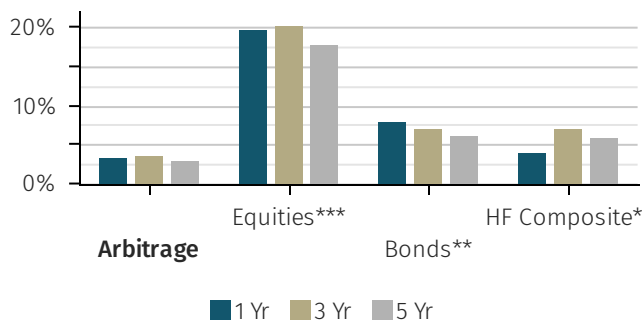
## COMPARATIVE RETURN VS HF COMPOSITE (1 YR)



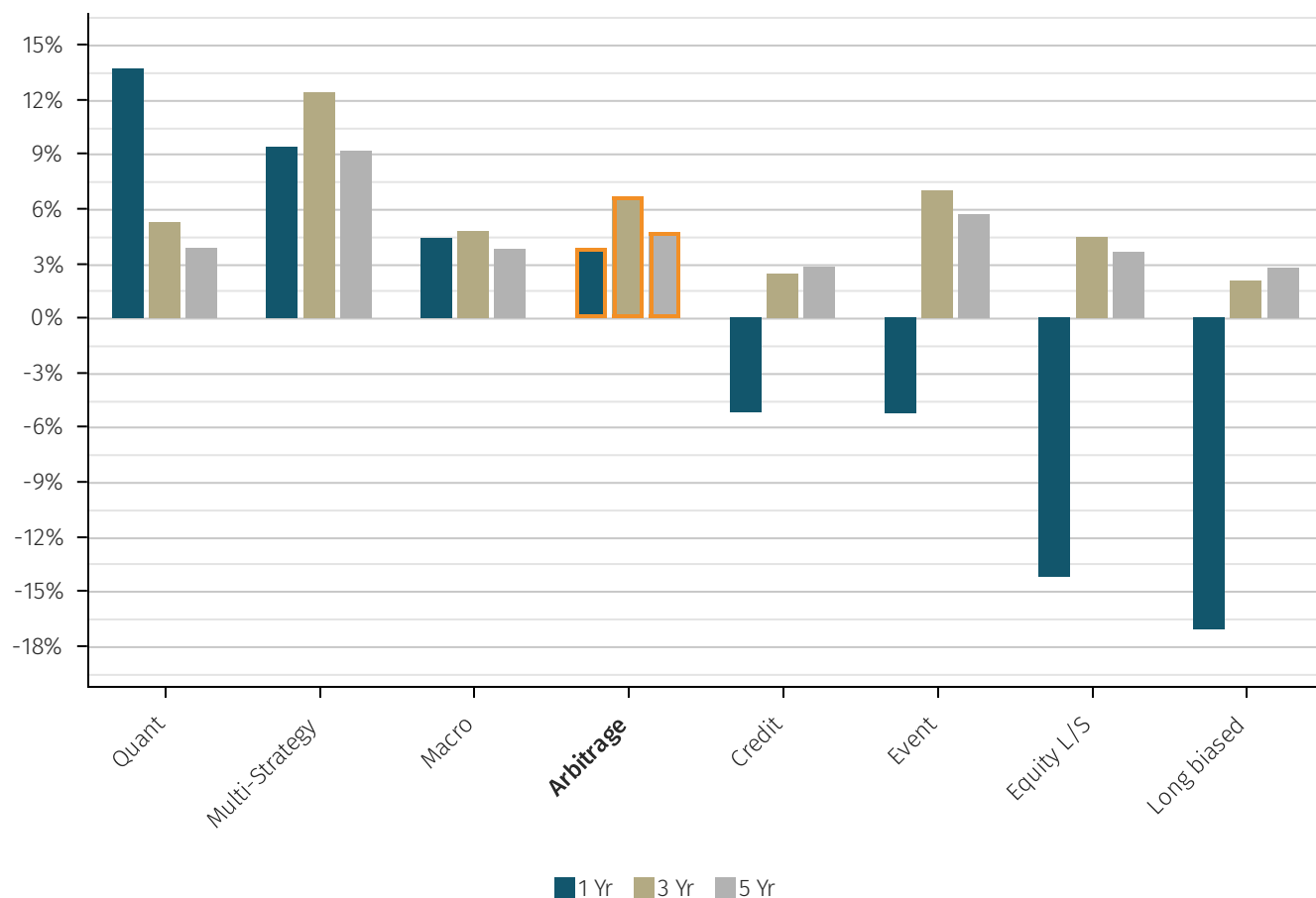
## NET RETURN (ANNUALISED)



## VOLATILITY (ANNUALISED)



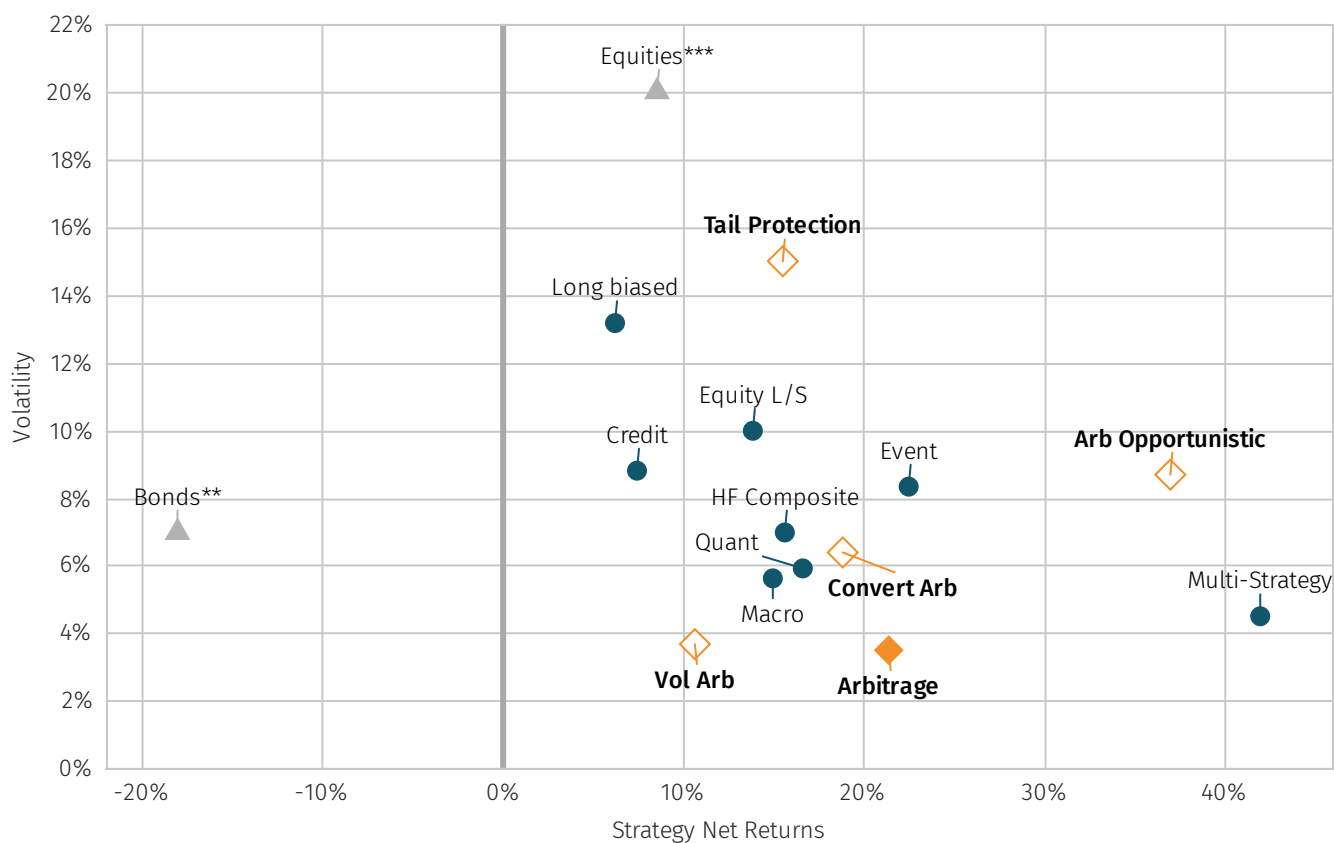
## MASTER STRATEGY NET ANNUALISED RETURNS



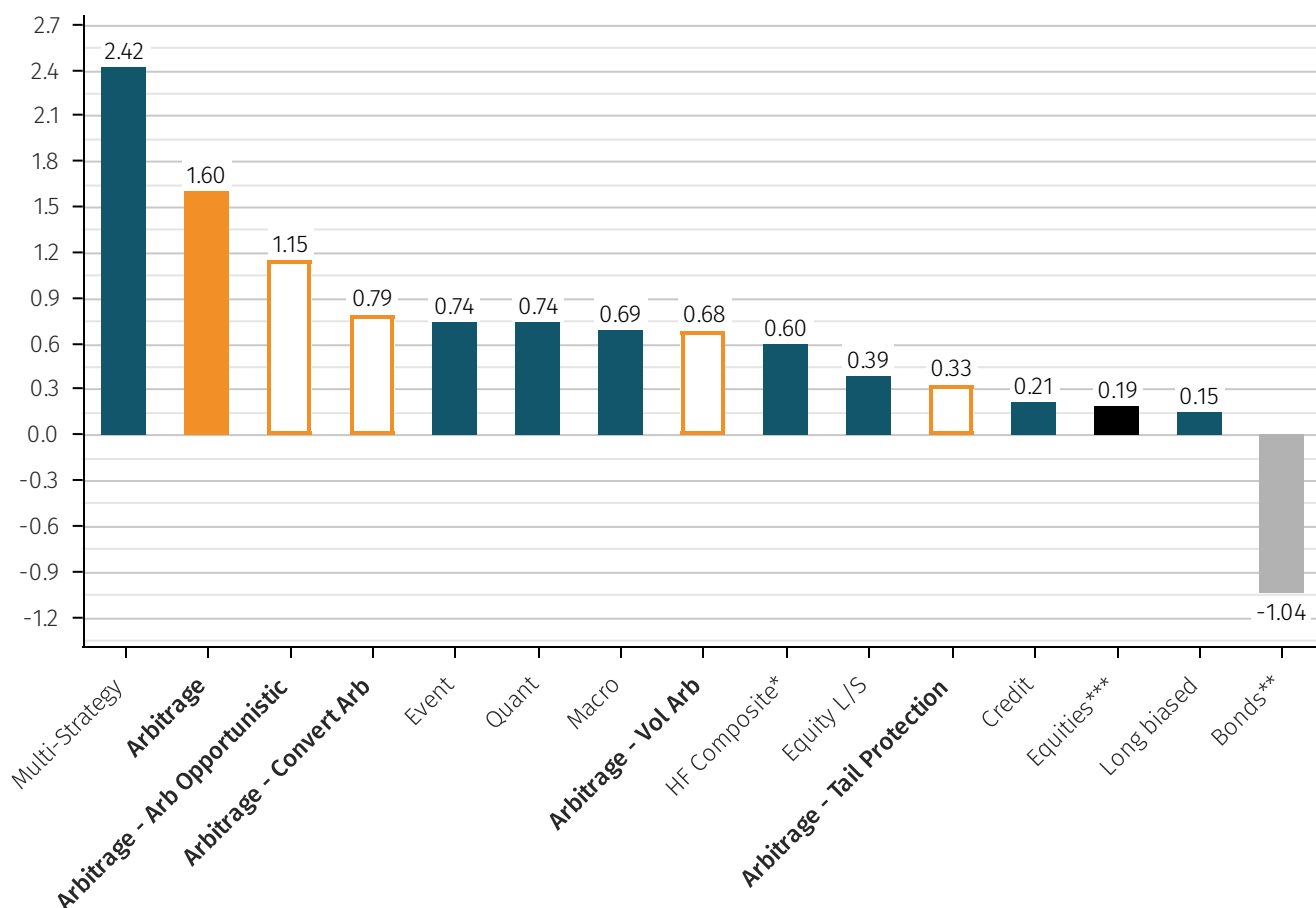
## MULTIPLE PERIOD – HIERARCHICAL ANNUALISED NET RETURN

1 YEAR	3 YEAR	5 YEAR	10 YEAR
<b>Quant</b> 13.7%	<b>Multi-Strategy</b> 12.4%	<b>Multi-Strategy</b> 9.1%	<b>Multi-Strategy</b> 8.4%
<b>Multi-Strategy</b> 9.4%	<b>Event</b> 7.0%	<b>Event</b> 5.7%	<b>Event</b> 6.0%
<b>Macro</b> 4.4%	<b>Arbitrage</b> 6.7%	<b>Arbitrage</b> 4.7%	<b>Equity L/S</b> 5.3%
<b>Arbitrage</b> 3.8%	<b>Quant</b> 5.3%	<b>HF Composite*</b> 4.1%	<b>HF Composite*</b> 4.7%
<b>HF Composite*</b> -3.9%	<b>HF Composite*</b> 5.0%	<b>Quant</b> 3.8%	<b>Credit</b> 4.0%
<b>Credit</b> -5.2%	<b>Macro</b> 4.8%	<b>Macro</b> 3.8%	<b>Quant</b> 3.9%
<b>Event</b> -5.2%	<b>Equity L/S</b> 4.4%	<b>Equity L/S</b> 3.6%	<b>Long biased</b> 3.8%
<b>Equity L/S</b> -14.2%	<b>Credit</b> 2.4%	<b>Credit</b> 2.8%	<b>Macro</b> 3.2%
<b>Long biased</b> -17.1%	<b>Long biased</b> 2.0%	<b>Long biased</b> 2.7%	<b>Arbitrage</b> 2.5%

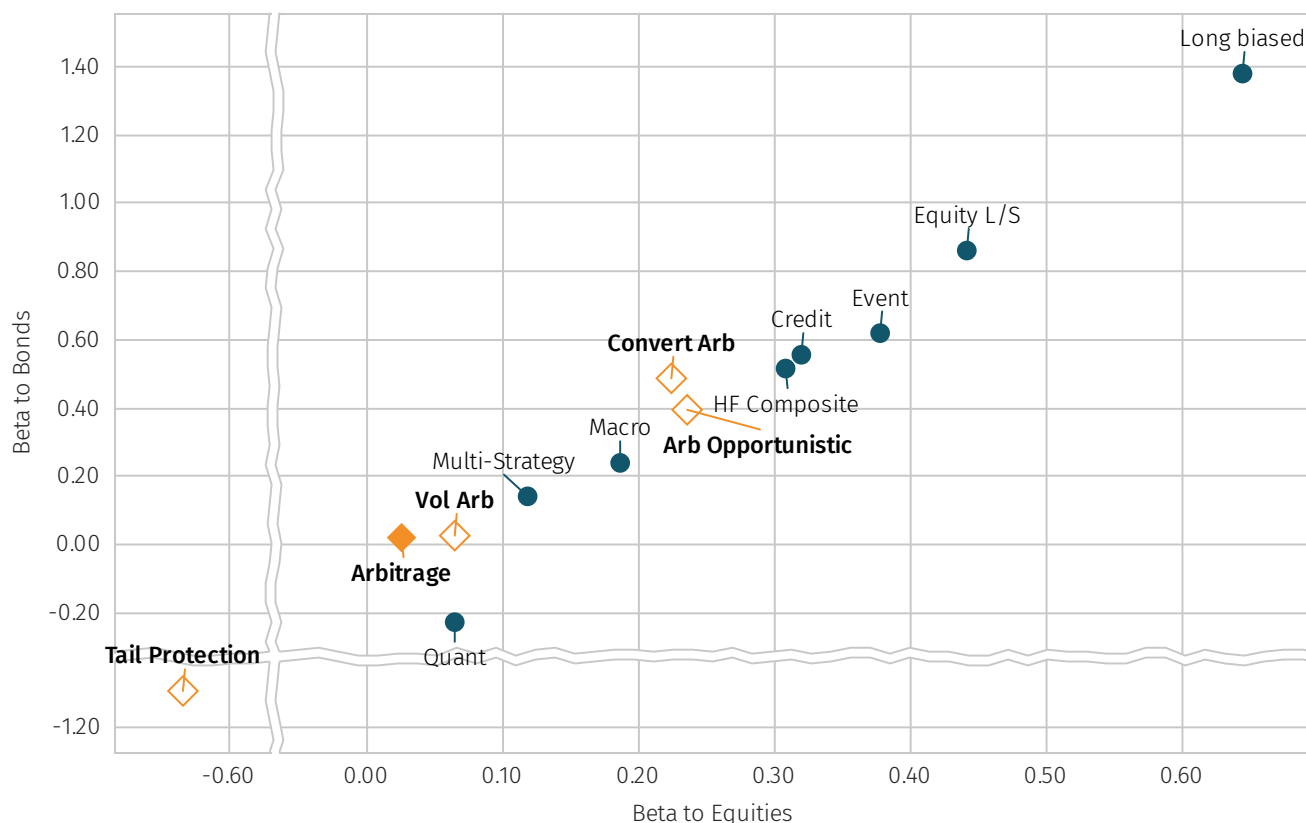
## STRATEGY NET TOTAL RETURN VS ANNUALISED VOL (3 YR)



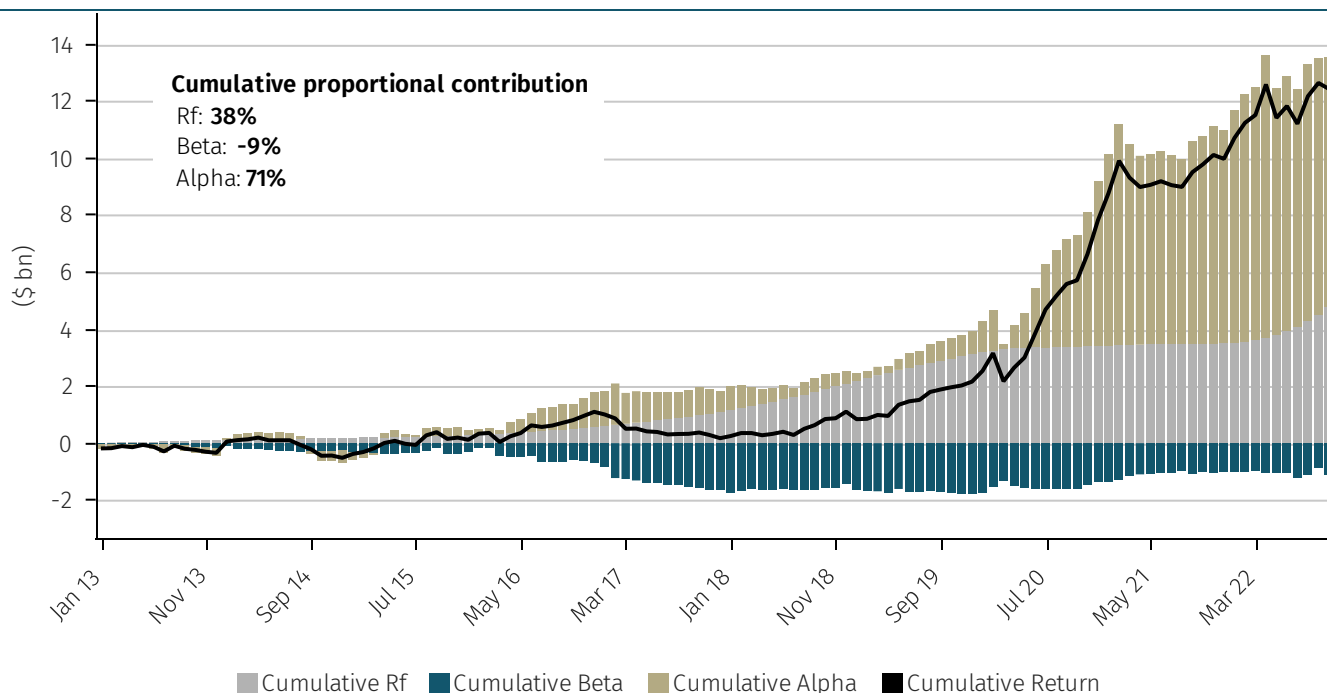
## SHARPE RATIO BY HEDGE FUND STRATEGY (3 YR)\*



## STRATEGY BETA TO BONDS AND EQUITIES (3 YR)



## MASTER STRATEGY - DECOMPOSING DOLLAR PERF. INTO ALPHA, BETA AND RISK FREE (RF) COMPONENTS



These charts decompose the Hedge Fund Composite dollar returns into beta, alpha and risk free ("Rf") components, as follows:  $\alpha = \text{actual return} - R_f - \beta * (\text{market return} - R_f)$ .

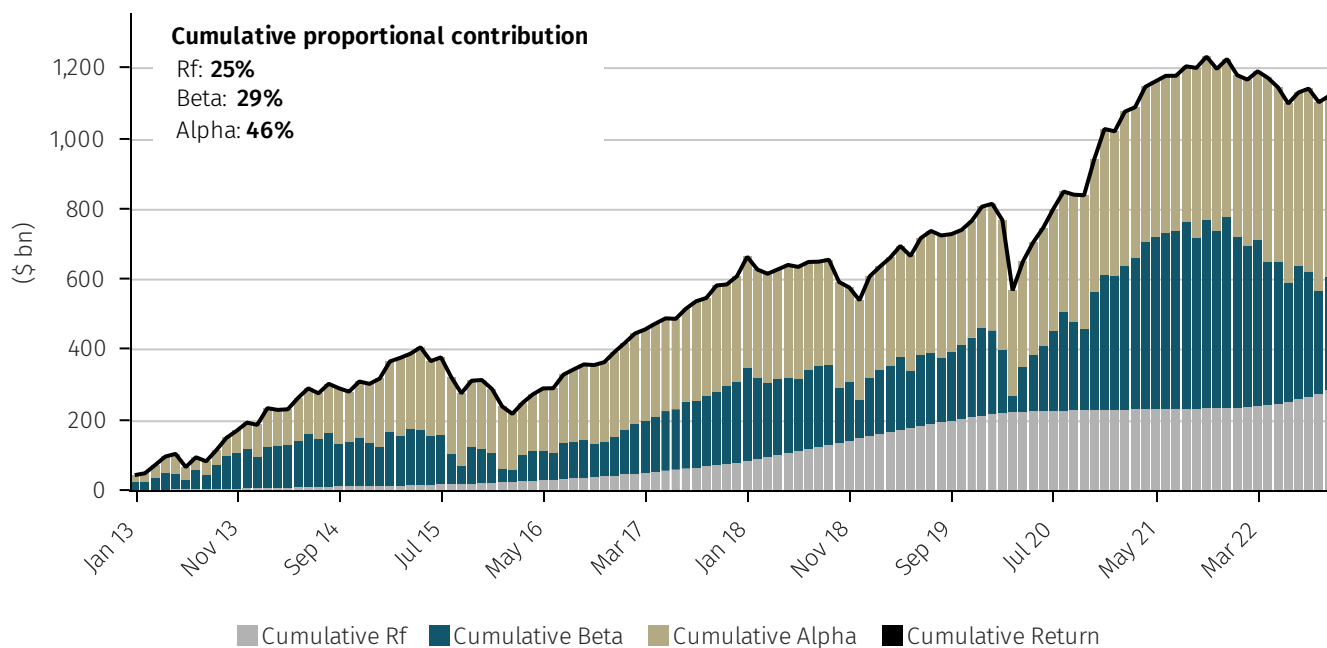
Where  $R_f$  is the risk free rate as defined by a rolling 3m USD Libor, where market return is that of S&P Global BMI ('the market index') and where beta has been calculated with respect to each underlying fund observed on a 24m rolling basis to the market index. The monthly alpha, beta and  $R_f$  components are then applied to each underlying fund's dollar performance for a particular month, and then at a master strategy or industry level the individual fund dollar contributions are aggregated up.

For note, beta can be negative in certain cases, creating negative dollar attributions. These are offset by corresponding positive alpha contributions.



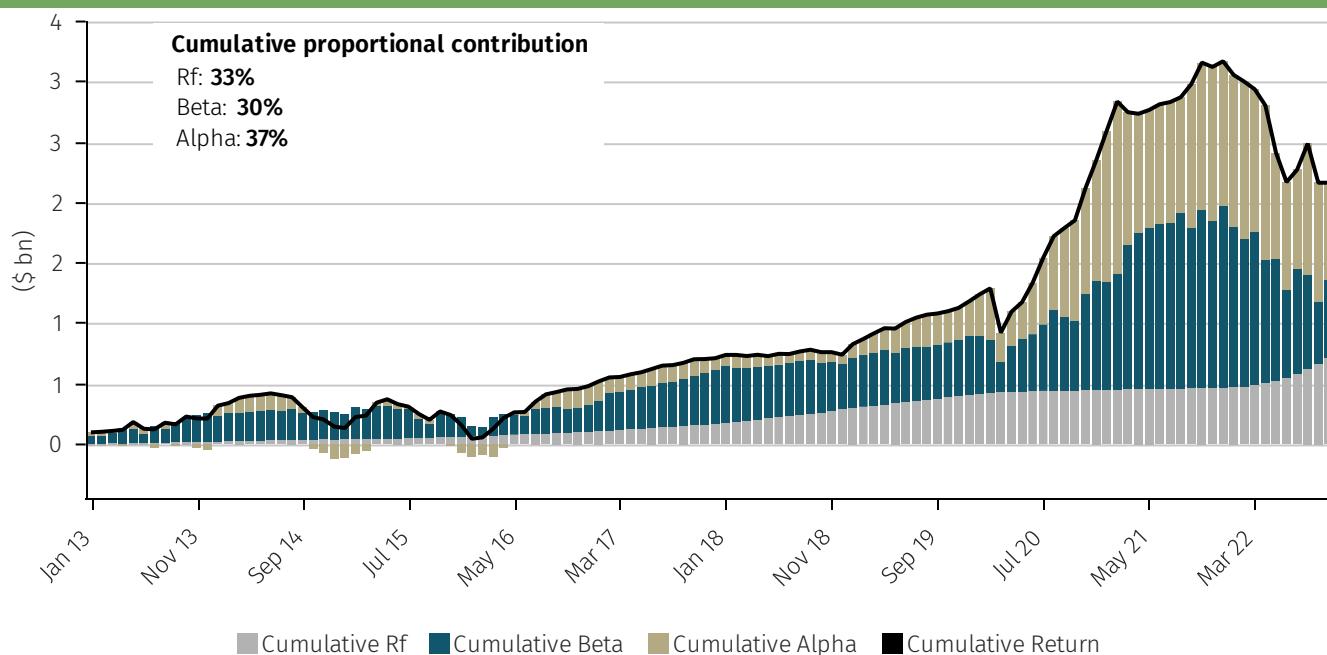
## HF COMPOSITE\* - DECOMPOSING DOLLAR PERF. INTO ALPHA, BETA AND RISK FREE (RF) COMPONENTS

### HF Composite\*

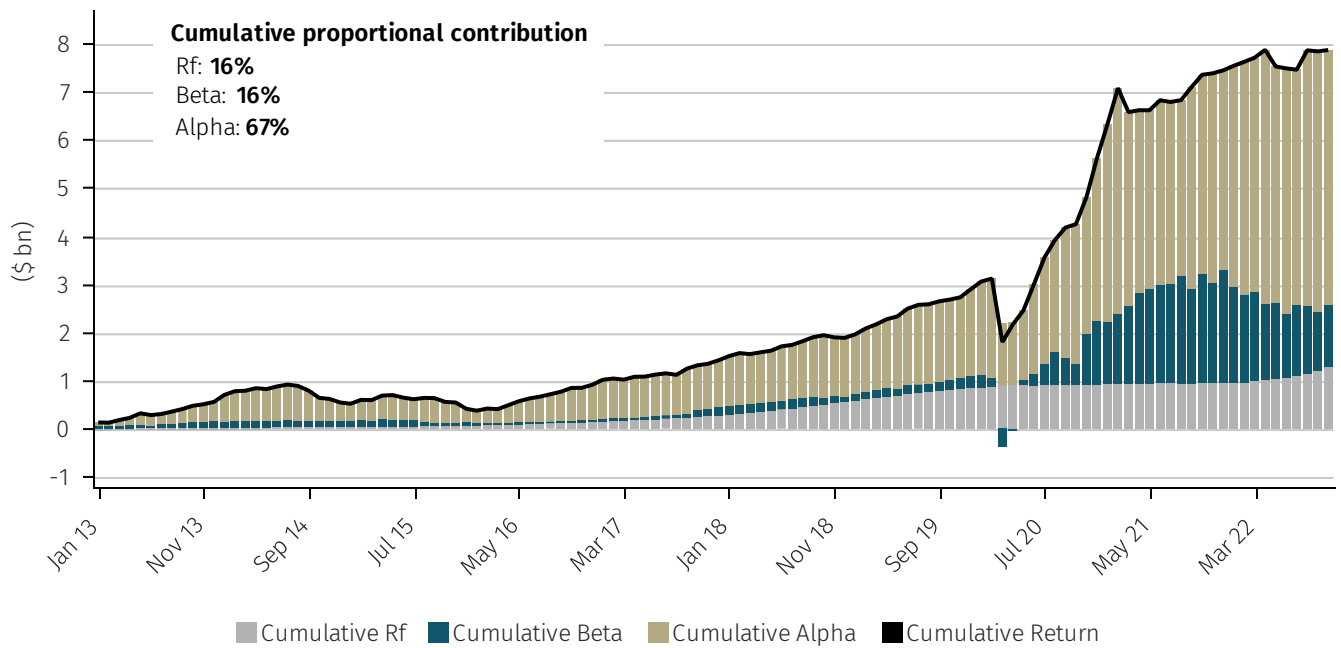


## SUB-STRATEGY - DECOMPOSING DOLLAR PERF. INTO ALPHA, BETA AND RISK FREE (RF) COMPONENTS

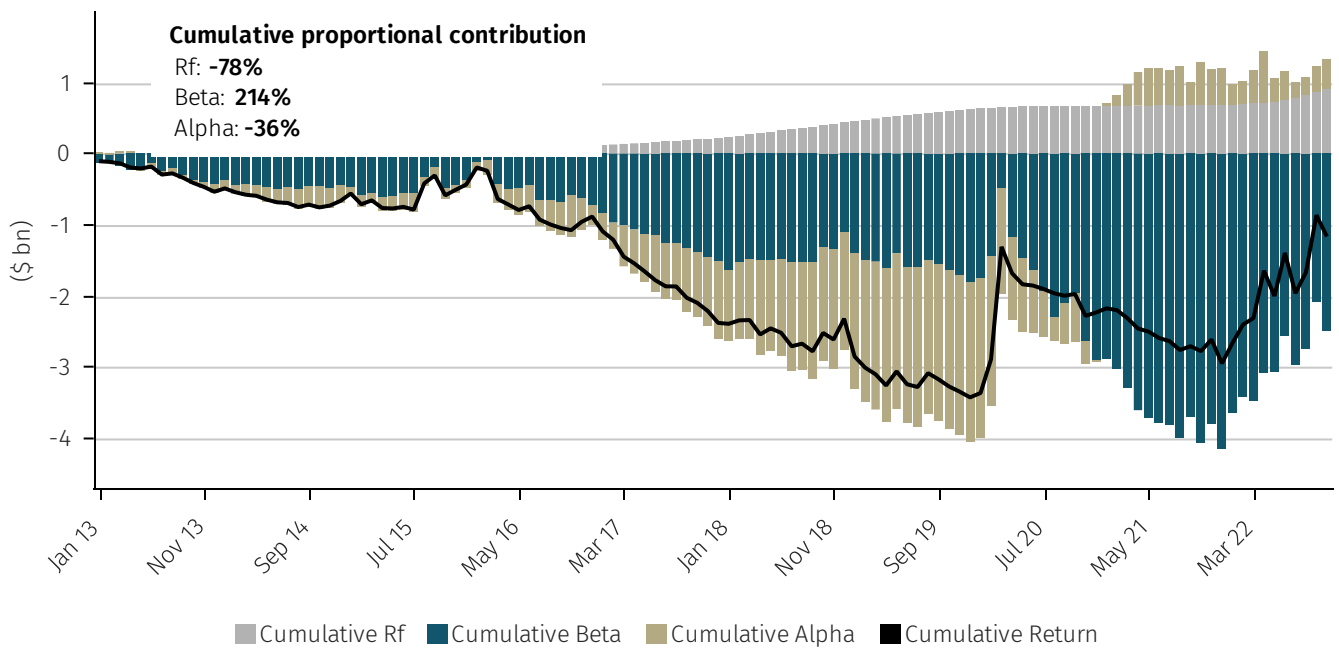
### Convert Arb



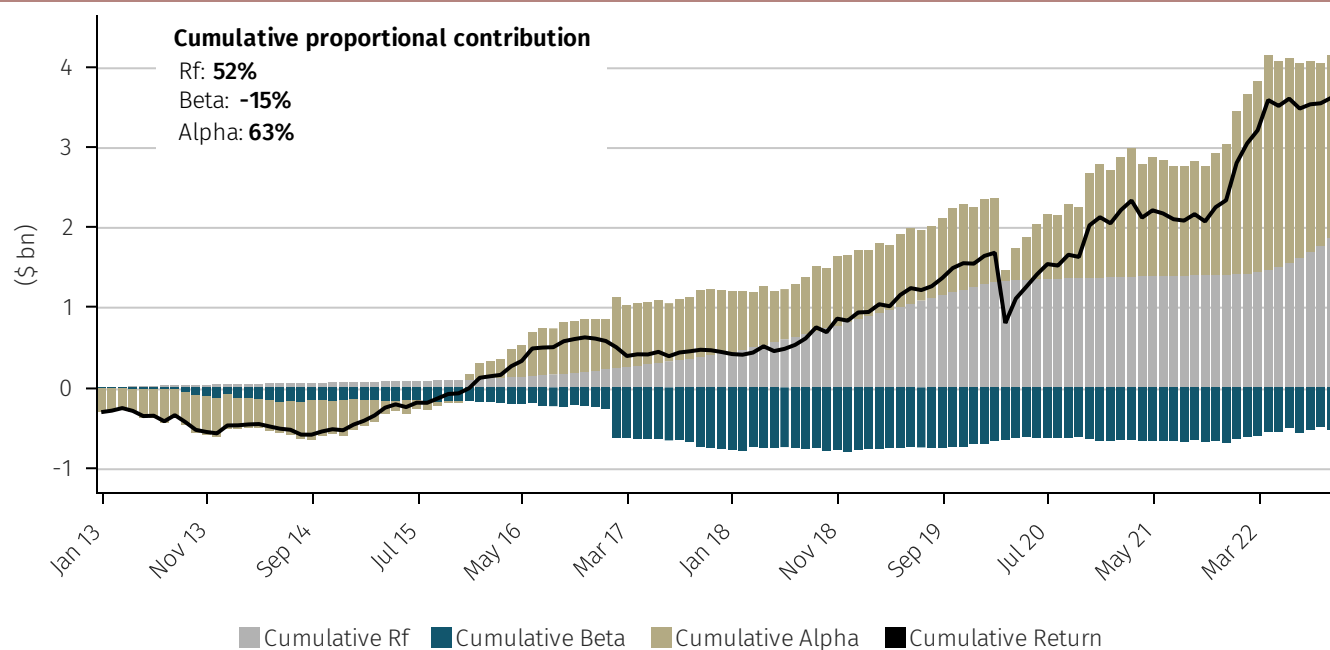
## Arb Opportunistic



## Tail Protection

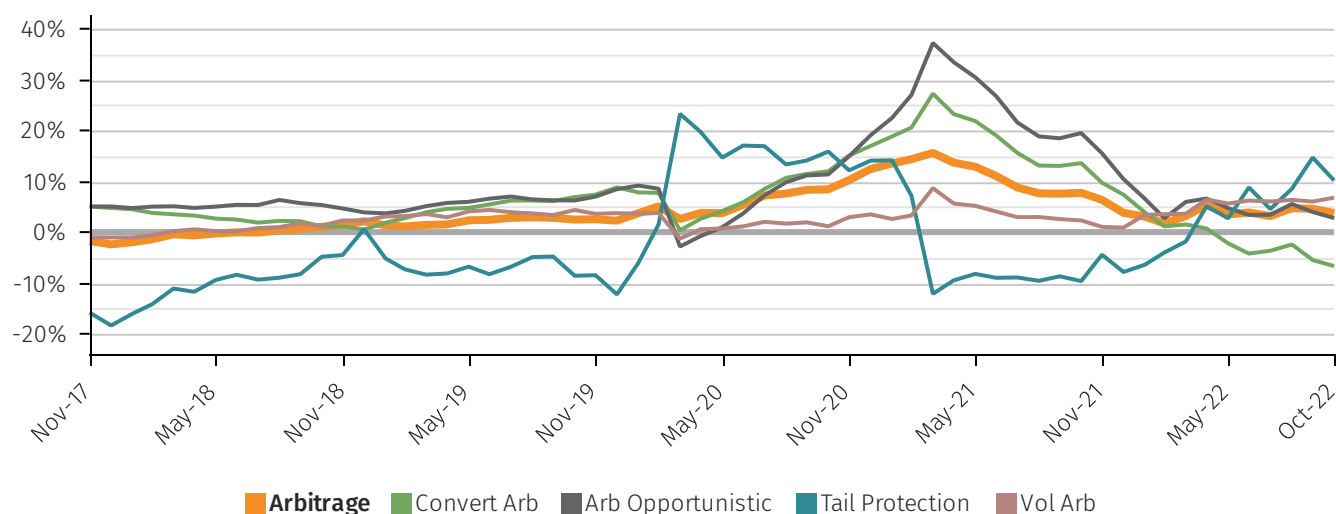


## Vol Arb

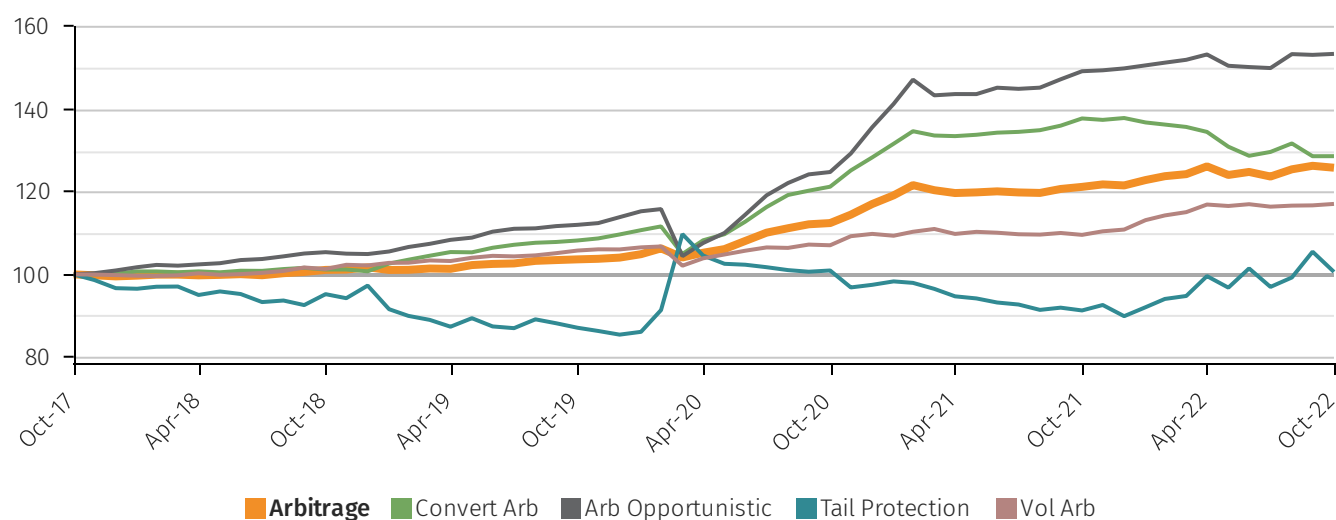


## Sub-strategy performance

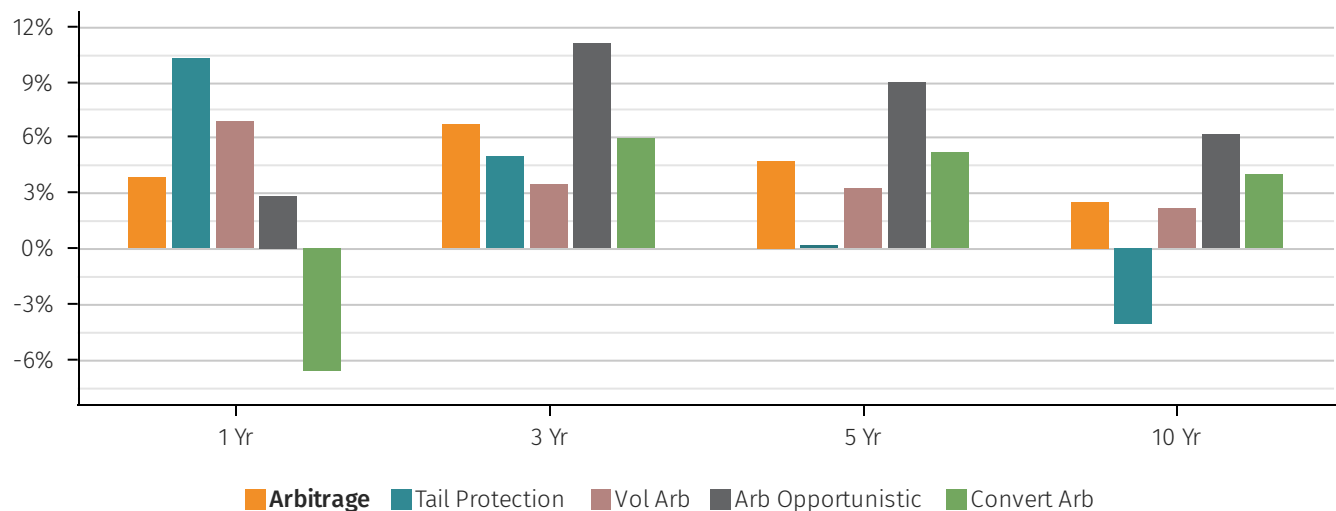
### ROLLING 12 MONTH NET RETURN (5 YR)



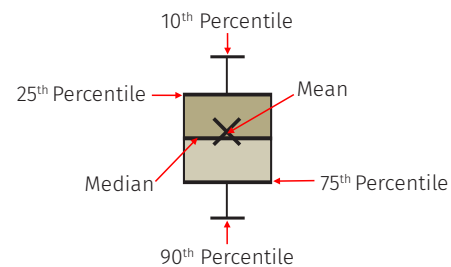
### CUMULATIVE NET RETURN (5 YR)



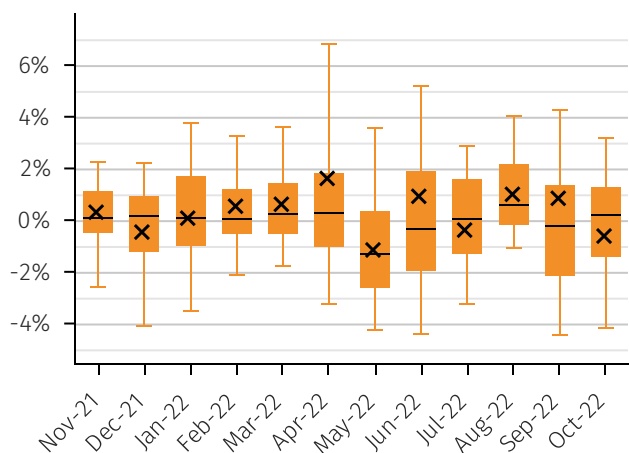
### COMPOUND RETURN (ANNUALISED)



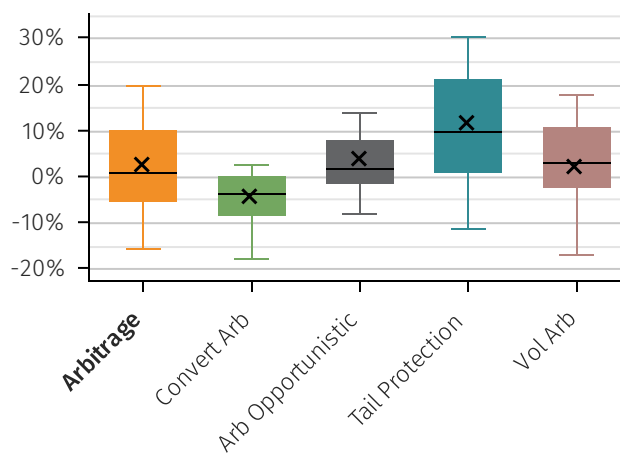
## Performance dispersion



MASTER STRATEGY NET RETURN DISTRIBUTION

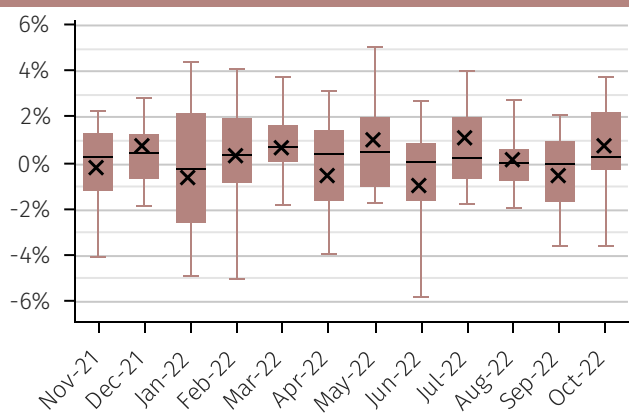


SUB-STRATEGY NET RETURN (1 YR)

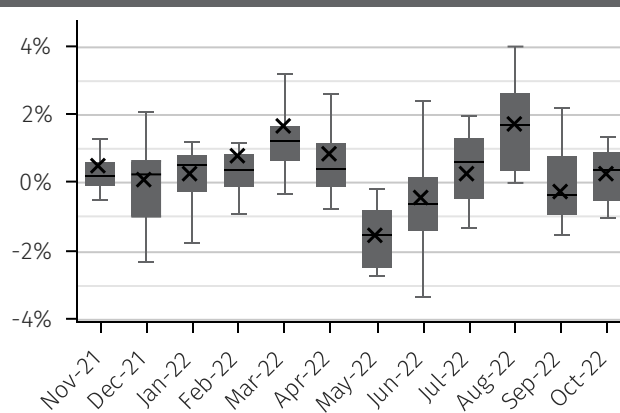


SUB-STRATEGIES NET MONTHLY RETURN DISTRIBUTION

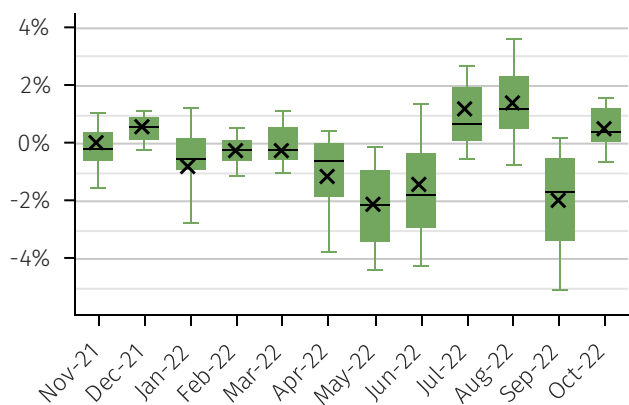
Vol Arb



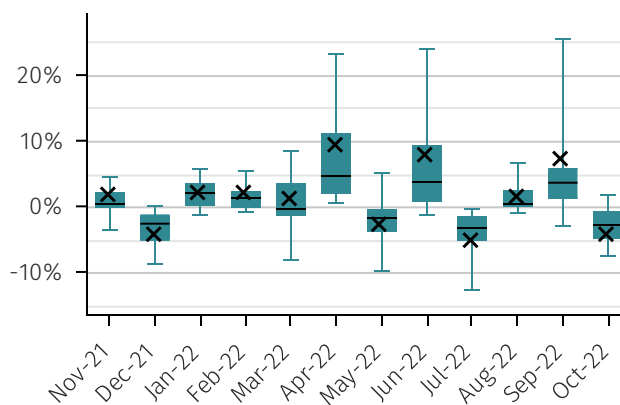
Arb Opportunistic



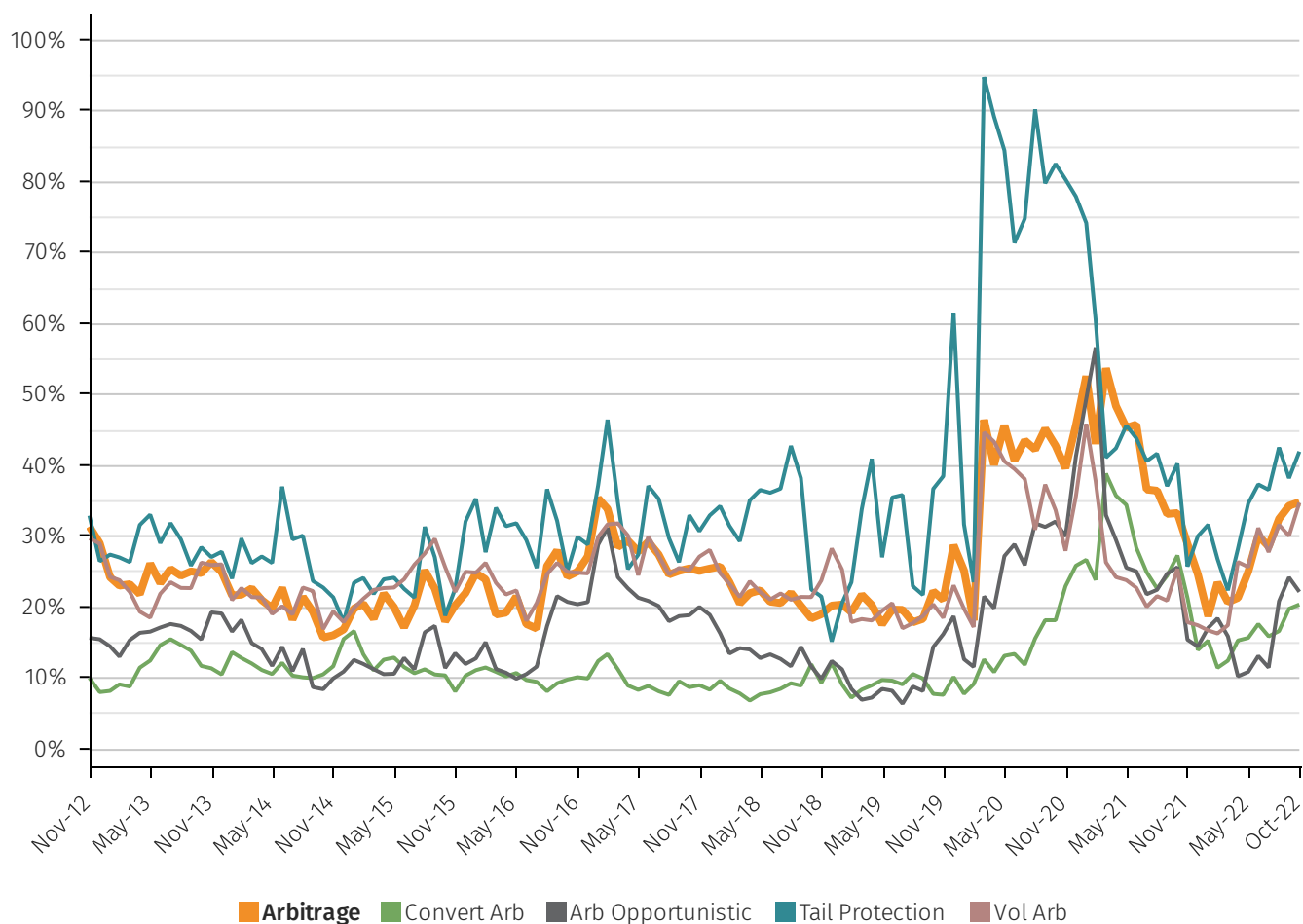
Convert Arb



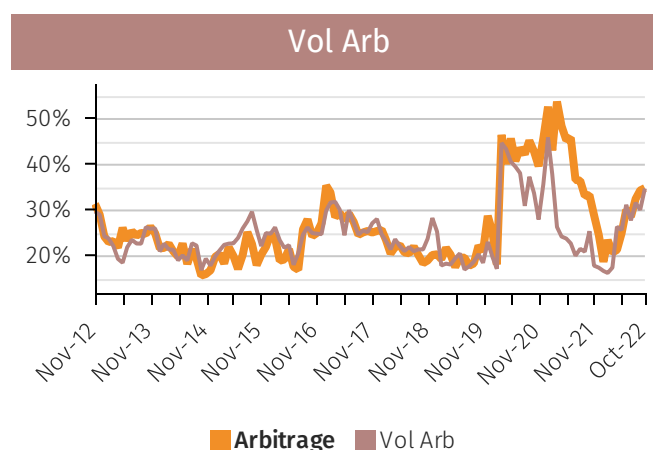
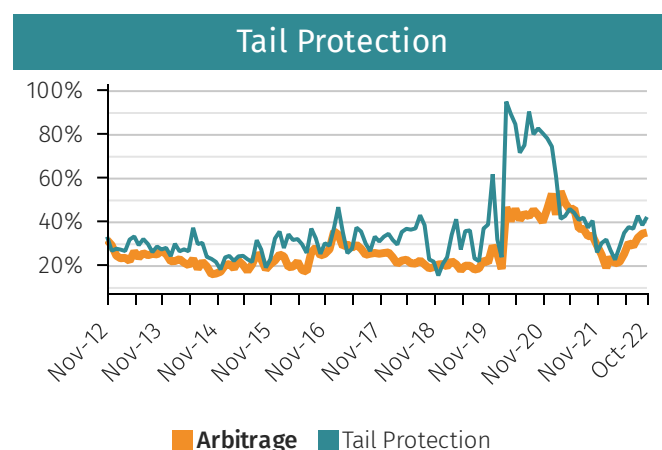
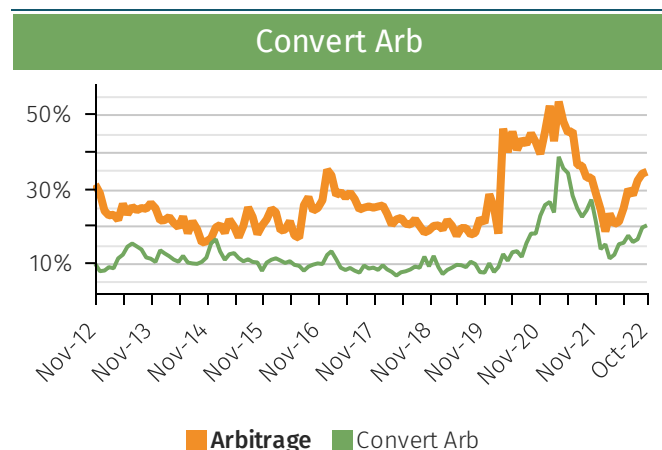
Tail Protection



## 10<sup>th</sup> – 90<sup>th</sup> PERCENTILE 12M ROLLING PERFORMANCE SPREAD

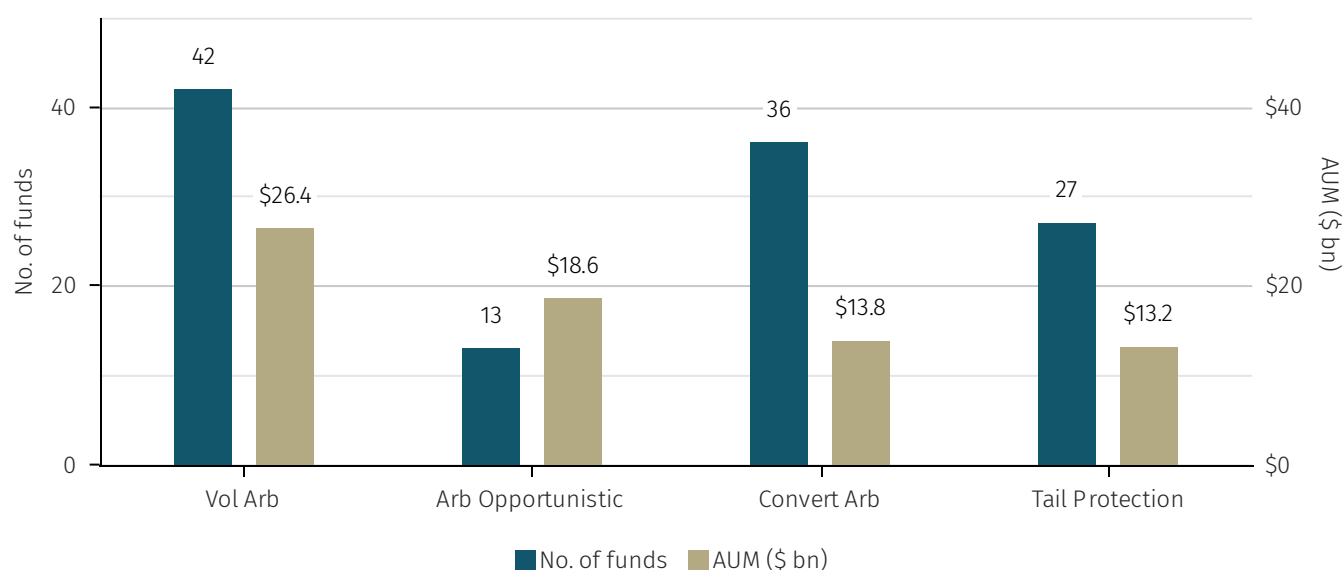


## 10<sup>th</sup> – 90<sup>th</sup> PERCENTILE 12M ROLLING PERFORMANCE SPREAD - SUB STRATEGY VS MASTER STRATEGY

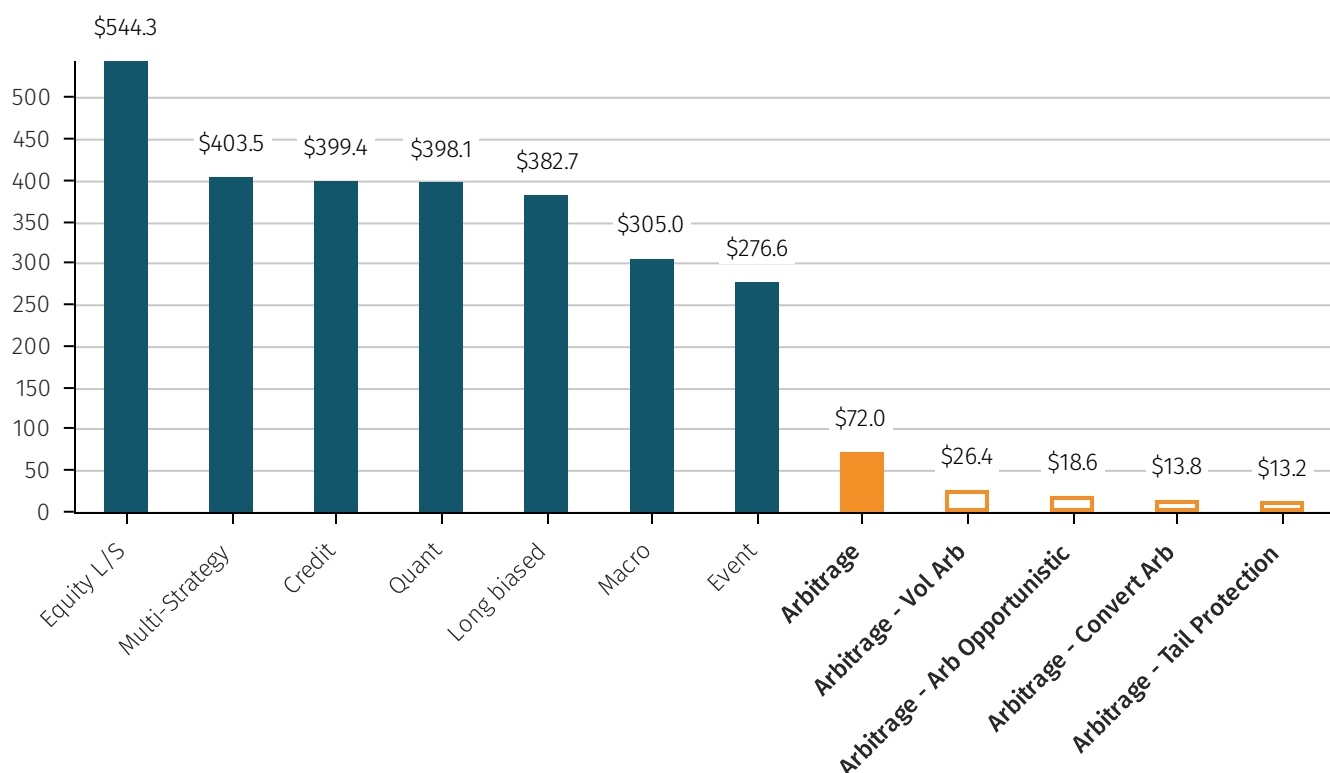


## Assets, flows and fees

### NUMBER OF FUNDS AND AUM BY SUB-STRATEGY



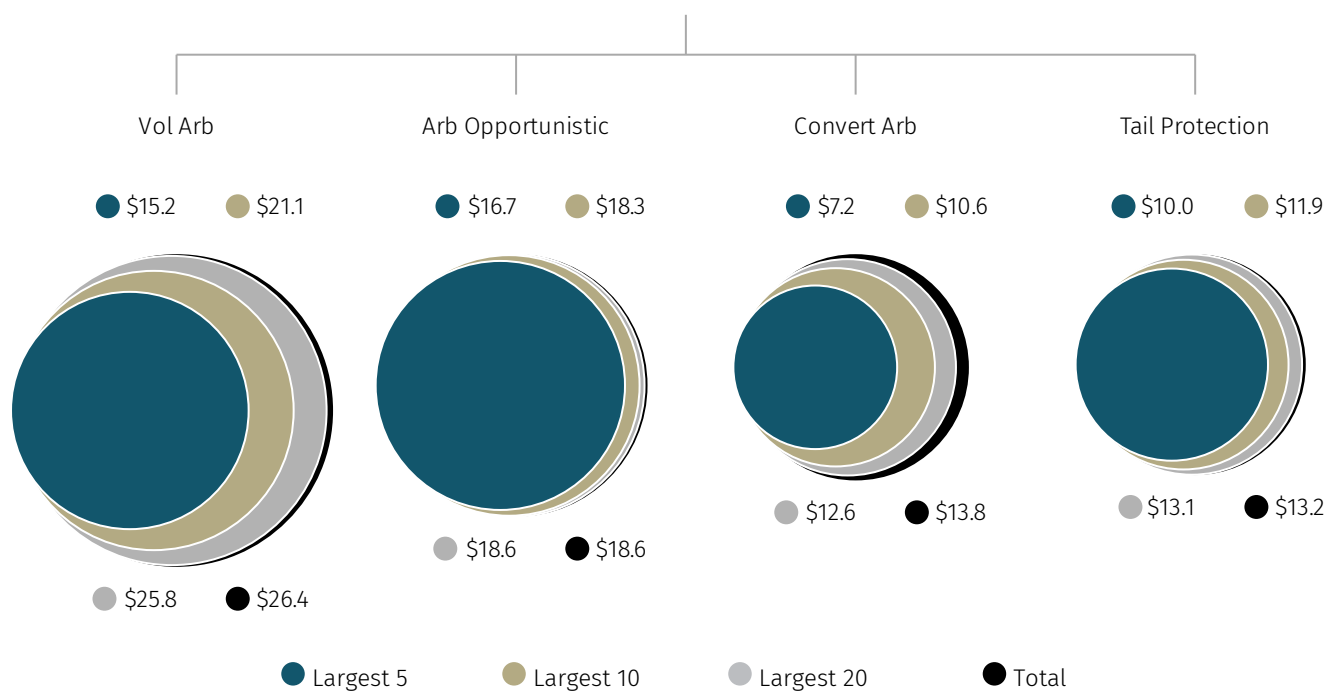
### AUM OF MASTER STRATEGY – OCTOBER 2022 (\$ BN)



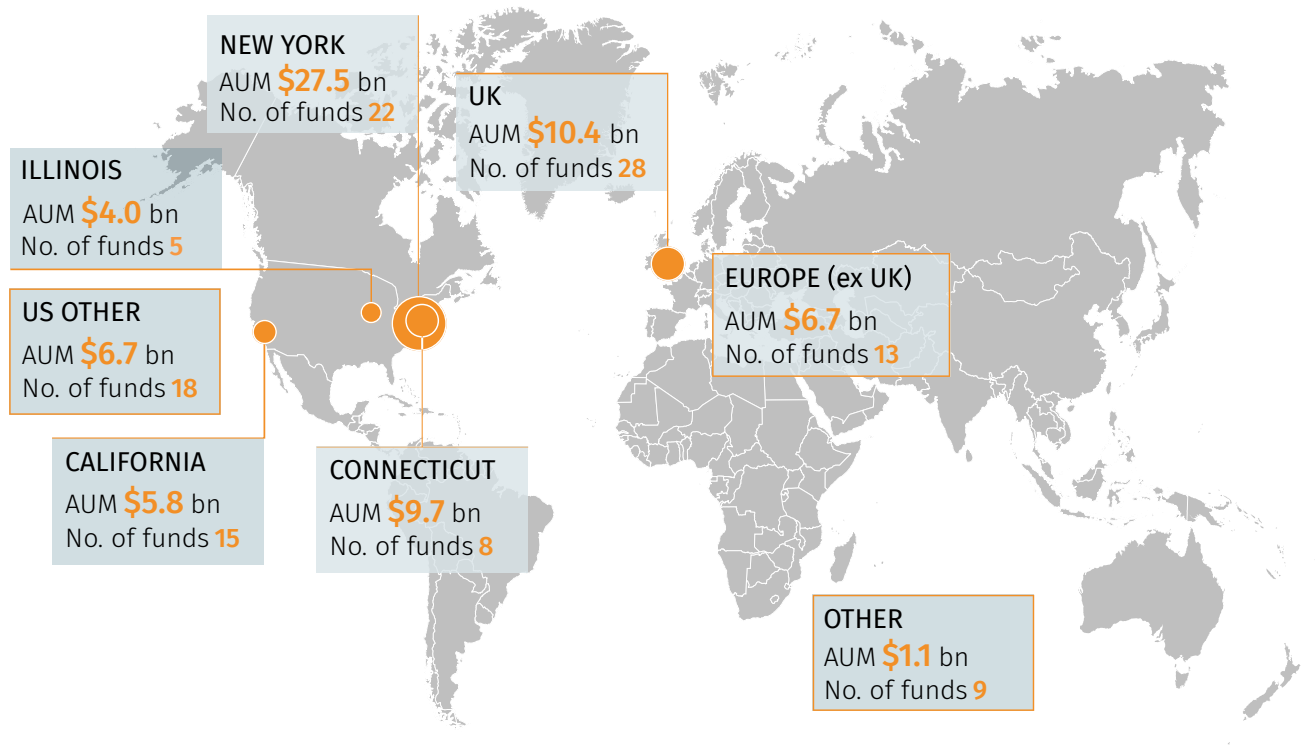


## SUB-STRATEGY FUND CONCENTRATION (\$ BN)

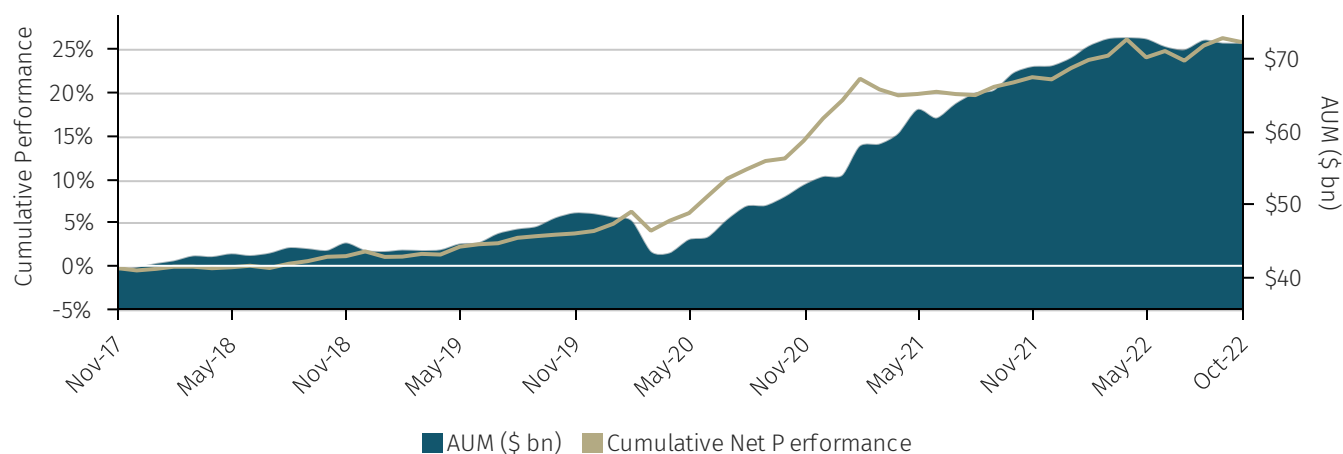
### Arbitrage



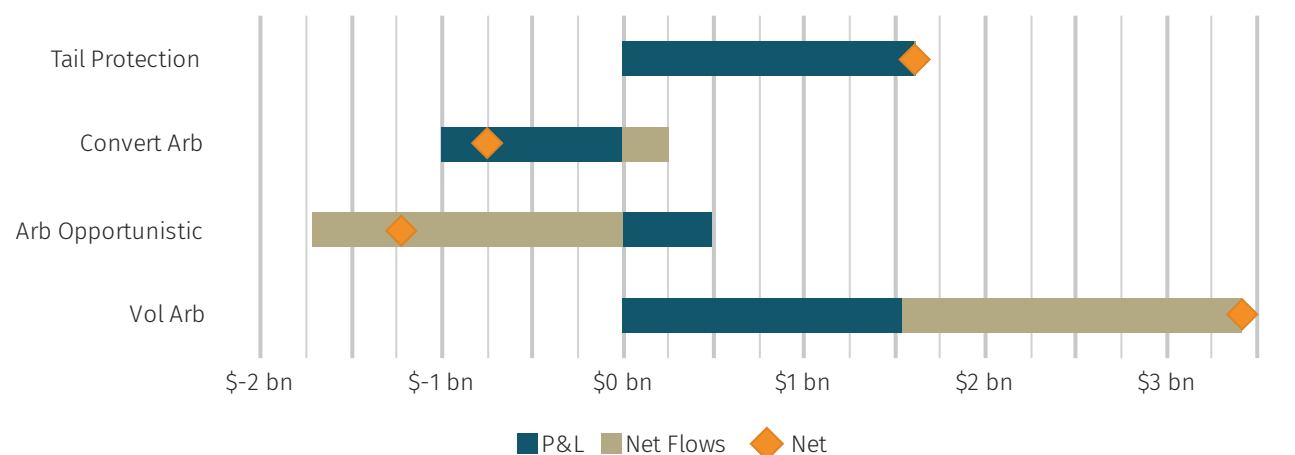
## ASSETS UNDER MANAGEMENT BY LOCATION\*



## MASTER STRATEGY ASSETS (5 YR)\*



## 12-MONTH CHANGE IN AUM BY SUB-STRATEGY



## TERMS AND CONDITIONS

	Median redemption notice (days)	Median redemption frequency	Weighted avg. redemption total (days) <sup>1</sup>	Weighted avg. management fee	Weighted avg. performance fee
<b>Arbitrage</b>	<b>30</b>	<b>Monthly</b>	<b>109</b>	<b>1.47%</b>	<b>19.39%</b>
Arbitrage – Convertible bond	45	Quarterly	114	1.30%	17.83%
Arbitrage – Opportunistic	60	Quarterly	145	1.30%	21.32%
Arbitrage – Tail protection	30	Monthly	55	1.48%	16.13%
Arbitrage – Volatility arbitrage	25	Monthly	92	1.72%	19.45%

<sup>1</sup>Weighted Avg. Redemption Total (Days) is the weighted average of both redemptions notice days and redemption frequency days.

# Definitions

## Arbitrage

Master strategy: Strategies that look to benefit from mispricings of the same instrument/asset or closely related instruments.

The strategy covers the following areas: convertible bond arbitrage, tail protection, volatility arbitrage or opportunistic trades, including but not limited to other areas such as capital structure arbitrage, ETF arbitrage or arbitrage of other closely related instruments.

## Arbitrage - Convertible bond

Traditionally the strategy looks to isolate mispriced components of convertible bond ('CB') securities in order to capture a return to fair value. CBs essentially consist of a bond plus an embedded call option on the equity. Key valuation components relate to the credit (bond component) and the volatility (option and equity component). Those components other than the component believed to be mispriced are typically hedged in order to isolate the mispricing.

## Arbitrage - Tail protection

Strategies that explicitly look to benefit from tail events (large market moves to the downside), typically either in the form of large spikes in volatility (either from implied or realised volatility), or from significant moves in the underlying spot price (long gamma) or a particular asset. Some tail protection strategies also look to benefit from sudden/large moves in spread relationships, which are typically tight, but which can move to extremes during periods of stress.

## Arbitrage - Volatility arbitrage

Traditionally the strategy looks to identify the mispricing of volatility. Funds may incorporate exposure to factors such as implied volatility, dividends, skew, term structure and correlation. Funds may be biased short, long or neutral to Greek exposures such as delta, vega and gamma.

## Arbitrage - Opportunistic

Strategies that look to benefit from inconsistent/mispricing of the same instrument/asset or extremely closely related assets. Opportunistic arbitrage strategies typically have the flexibility to trade across multiple areas, but tend to specialise in a combination of volatility trading, convertible bonds and capital structure arbitrage trades. But they may also focus on other niche areas in order to capitalise upon perceived mispricing. The narrow arbitrage focus is why they are better considered as part of arbitrage, rather than in the broader multi-strategy classification.

## Bond and equity indices

The S&P Global BMI and S&P Global Developed Aggregate Ex Collateralized Bond (USD) Total Return Index (the “S&P Indices”) are products of S&P Dow Jones Indices LLC, its affiliates and/or their licensors and has been licensed for use by Aurum Research Limited. Copyright © 2021 S&P Dow Jones Indices LLC, its affiliates and/or their licensors. All rights reserved. Redistribution or reproduction in whole or in part are prohibited without written permission of S&P Dow Jones Indices LLC. For more information on any of S&P Dow Jones Indices LLC’s indices please visit [www.spdji.com](http://www.spdji.com). S&P® is a registered trademark of Standard & Poor’s Financial Services LLC and Dow Jones® is a registered trademark of Dow Jones Trademark Holdings LLC. Neither S&P Dow Jones Indices LLC, Dow Jones Trademark Holdings LLC, their affiliates nor their third party licensors make any representation or warranty, express or implied, as to the ability of any index to accurately represent the asset class or market sector that it purports to represent and neither S&P Dow Jones Indices LLC, Dow Jones Trademark Holdings LLC, their affiliates nor their third party licensors shall have any liability for any errors, omissions, or interruptions of any index or the data included therein.

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## Note regarding decomposition returns

Please note that the charts and figures which reference the decomposition of dollar performance into alpha, beta and risk free components only use data from January 2013, unlike other charts and figures which use data for the full 10 year period, namely August 2012. This variance in time period used to present data is due to there being insufficient data to accurately construct a decomposition for the period of August 2012 to December 2012.

# AURUM

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