

Inside the black box

Revealing the alternative beta in hedge fund returns

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IN BRIEF

Alternative beta can diversify return sources in the same manner as traditional hedge funds, with greater liquidity and transparency—and at lower cost. “Alt beta” extends beta, the central idea behind index investing. Just as beta seeks systematic exposure to market risk alone—vs. exposure to any particular group of stocks—to generate an investment return, alternative beta seeks to gain systematic exposure to any compensated risk factor.

- Research into alt beta has given investors ever more means to access and capture the structural drivers of hedge fund returns.
- Alt beta strategies capture the premia available in hedge funds by employing hedge fund investment techniques. They invest in individual securities and make use of leverage, shorting and derivatives.
- Alt beta provides a liquid, transparent and investible means of understanding hedge fund exposures. It markedly improves upon the uninvestible hedge fund composites commonly used as benchmarks today.
- Transparent benchmarks raise the bar on active hedge fund management. At the same time, however, they can help pinpoint the causes of hedge fund performance, whether idiosyncratic or systemic.

AUTHORS



Yazann Romahi
Chief Investment Officer
Quantitative Beta
Strategies



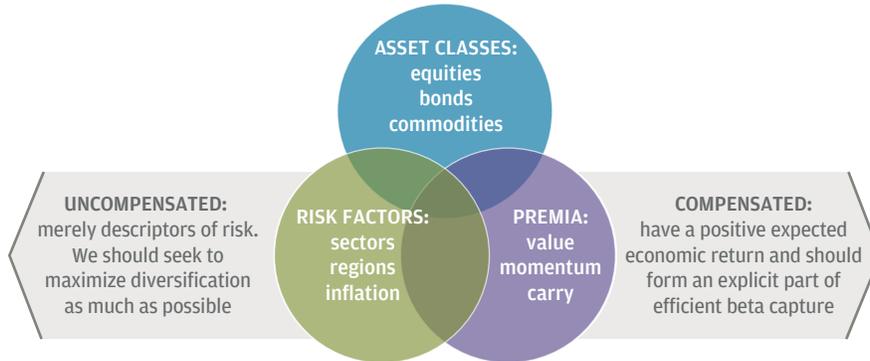
Joe Staines
Research Analyst and
Portfolio Manager
Quantitative Beta
Strategies

THE CONCEPT OF BETA HAS ALREADY TRANSFORMED THE MARKETS, powering the rise of passive investing and reducing the perceived contribution of alpha in active investment returns. Ongoing beta research has further expanded our understanding so that investors today can apply it to what had been a formidable bastion of alpha: hedge fund returns that have historically been attributed entirely to manager skill.

A growing body of research goes beyond merely identifying the portion of investment return resulting from broad market exposure. It decomposes the beta, or premium earned from systematic exposure to any compensated risk factor (**EXHIBIT 1**, next page). We can use this analysis to shed light on hedge fund black boxes, explaining many of their opaque return factors. Understanding these factors allows us to deliver them as direct investments, with heretofore unprecedented transparency and liquidity. Further, as beta's early iteration, index tracking, created more cost-effective access to the equity market risk premium, so too does alternative beta enable cost-effective access to hedge fund premia.

Asset class returns are realized as traditional risk premia, or beta. Alternative beta, like beta itself, compensates for assuming risk. It differs from long-only beta in being constructed from relative returns, holding long positions in compensated risk factors while shorting uncompensated risks.

EXHIBIT 1: A SCHEMATIC TAXONOMY OF INVESTMENT RISK FACTORS



Source: J.P. Morgan Asset Management. For illustrative purposes only.

HEDGE FUND RETURNS EXPLAINED BY ALTERNATIVE BETA PREMIA

Thanks to advances in alternative beta research, we can now specify more of the factors captured by hedge funds. Many of these are compensated risks—their returns are not just coincidental or anomalous but economically justified. They might entail risks unattractive to other investors, or enable behavioral preferences of market participants, or exploit structural features of the market. When we can establish that a factor consistently serves one of these purposes, we call it a premium. A strong rationale; persistence across markets and asset classes; academic consensus; wide use by practitioners; and lengthy out-of-sample performance can all contribute to substantiating a premium’s existence. Our earlier work “The Democratization of Hedge Funds” (Romahi and Santiago¹), describes alternative beta factors, which capture premia, such as momentum, value and carry, among others. The next

section of the current paper (pages 4–5), “Behind the mask: The true face of hedge fund risk premia,” lists the premia identified to date in three of the most common hedge fund styles.

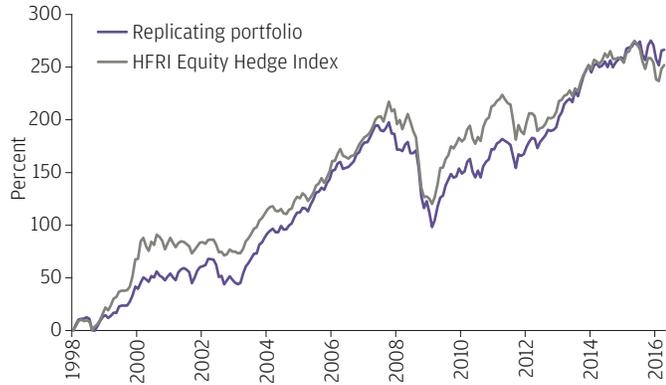
To demonstrate the extent to which alternative beta determines hedge fund returns, we turn to the HFRI indices.* We regress the excess returns of the indices against the corresponding set of alternative and traditional premia detailed in “Behind the mask” to show that we can reproduce the preponderance of hedge fund returns in model portfolios without proprietary techniques or exceptional and irreplaceable fund management wisdom (EXHIBITS 2A–2C, next page). In this, we follow and extend the results from Jaeger and Wagner.² The proportion of variance explained by the replicating portfolios is meaningful, ranging from 0.40 for the global macro style through 0.62 for the event-driven hedge fund style all the way up to 0.79 for equity long-short.

*The Appendix discusses the limitations of using HFRI indices, which are not directly investible, as benchmarks.

Simple premia exposures generate the majority of hedge fund returns

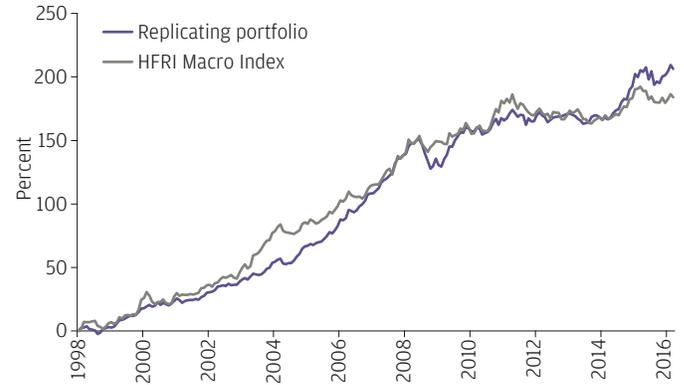
EXHIBIT 2: HFRI INDEX RETURNS PLOTTED ALONGSIDE ALTERNATIVE BETA PORTFOLIOS SCALED TO MATCH INDEX VOLATILITY

2A: CUMULATIVE RETURNS: HFRI EQUITY HEDGE INDEX AND REPLICATING PORTFOLIO



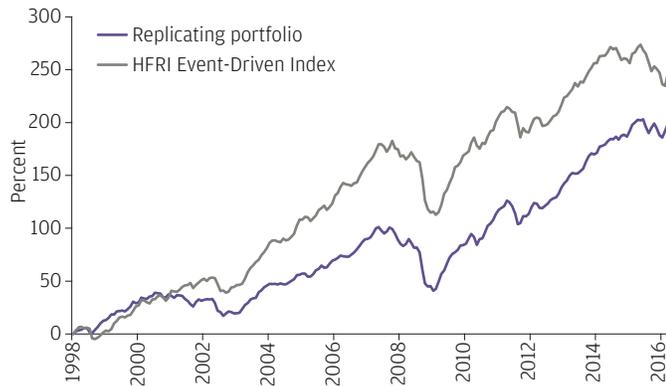
	Replicating portfolio	HFRI Equity Hedge Index
Mean return	7.61%	7.32%
Volatility	9.32%	9.32%
Sharpe ratio	0.52	0.50
Equity beta	0.60	0.52
R ²	-	0.79

2B: CUMULATIVE RETURNS: HFRI MACRO INDEX AND REPLICATING PORTFOLIO



	Replicating portfolio	HFRI Macro Index
Mean return	6.10%	5.91%
Volatility	5.58%	5.58%
Sharpe ratio	0.70	0.58
Equity beta	0.14	0.11
R ²	-	0.40

2C: CUMULATIVE RETURNS: HFRI EVENT-DRIVEN INDEX AND REPLICATING PORTFOLIO



	Replicating portfolio	HFRI Event-Driven Index
Mean return	6.61%	7.08%
Volatility	6.87%	6.87%
Sharpe ratio	0.53	0.63
Equity beta	0.37	0.37
R ²	-	0.62

Source: HFRI, J.P. Morgan Asset Management; data as of March 31, 2016. For illustrative purposes only.

BEHIND THE MASK: THE TRUE FACE OF HEDGE FUND RISK PREMIA

Equity long-short and equity market neutral

The alternative beta in equity long-short and equity market neutral hedge funds is very closely tied to the evolution of the concept of beta itself. In equity beta's formative years, some managers outperformed the capitalization-weighted indices simply by biasing their portfolios to smaller companies or to those with lower price multiples. When academic researchers identified the size and value risk premia attached to these stocks, they raised the alpha bar on active managers (Fama and French³). The factors relevant to equity hedge funds are simply long-short implementations of the factors familiar from long-only equity style analysis:

- **Equity market risk premium:** the average stock return in excess of the risk-free rate; the premium that compensates for assuming market risk.
- **Value:** the difference in return between a basket of stocks with relatively low valuation metrics (such as price-to-book ratio) and those with higher metrics. Behavioral and risk arguments justify the premium's existence (Zhang⁴; Lakonishok, Shleifer and Vishny⁵).
- **Momentum:** the difference in return between a basket of stocks that have recently appreciated in value and those that have depreciated. The momentum premium is widely attributed to equity investors' disposition to sell assets that have appreciated and hold those that have depreciated (Jegadeesh and Titman⁶). It exhibits the negative skew prototypical of a risk premium—with the downside statistically outweighing the probabilities of more positive outcomes.
- **Quality:** the difference in return between a basket of stocks with good quality metrics, such as a robust accruals ratio, stable profitability through business cycles and little leverage, and those with poor quality metrics, such as a high level of accounts receivable relative to cash (Blitz and Vliet⁷).
- **Size:** the difference in return between a basket of stocks of smaller companies and those of large companies, with size determined by market capitalization. Recent research has supported the existence of size premium by examining the performance of smaller stocks net of an inbuilt negative quality bias (Asness, et al.⁸).

Global Macro

Global macro hedge funds hold long and short positions in equity, fixed income, currency and commodity markets. In theory, the global macro style encompasses many diverse styles. The fact that it typically relies on timing market directionality implies a dynamic set of hard-to-model risk exposures. Nevertheless, we find that the following premia—and a material portion of the returns—of the average global macro fund can be replicated:

- **Carry:** Across asset classes, those with characteristically high carry assets generally outperform those with low carry assets. In foreign exchange markets, the carry premium takes the form of the forward rate bias—the tendency of realized exchange rates to fluctuate less than implied by currency forwards; in commodities, it consists of the difference between futures prices and realized spot rates; and in fixed income markets, it's simply differences in, for example, term premia across countries. Each of these can be prone to “unwinding events,” leading to negative skew—the preponderance of downside risk—against which investors require compensation in the form of the premium (Bhansali, et al.⁹).
- **Momentum:** Within a set of assets, momentum strategies go long the best performing assets and short the worst performers. As with carry, momentum can exhibit negative skew and suffer sharp drawdowns during choppy markets (Asness, Moskowitz and Pedersen¹⁰).
- **Trend:** Investing in assets after they appreciate and shorting them after they depreciate. Trend following differs from momentum strategies because it treats each asset in isolation rather than comparing relative returns (Lempérière, et al.¹¹).

BEHIND THE MASK (CONT'D.)

Event-driven

Event-driven hedge funds seek to profit from the price action surrounding changes in capital structure, mergers, divestitures and index recomposition, among other events. We can construct an alternative beta factor for each type of event by systematically entering positions corresponding to that event following its announcement. Although transparent systematic event-driven strategies have developed more recently than either of the other hedge fund styles, those corresponding to merger arbitrage, conglomerate discount arbitrage, share buybacks, index reconstitution arbitrage and equity market exposure explain the majority of the returns to the HFRI Event-Driven Index:*

- **Merger arbitrage:** Buying the target of merger deals and hedging by shorting the acquirer, if necessary. The risk of deal failure pushes equity investors away from merger targets, compensating arbitrageurs for adopting this binary risk (Mitchell and Pulvino¹²).
- **Conglomerate discount arbitrage:** Buying the parent company following the announcement of a spin-off while hedging out the market beta. Excess returns are attributable to behavioral effects, such as anchoring price expectations to the pre-spin-off valuations (McConnell and Ovtchinnikov¹³).
- **Share repurchases:** Buying stock in corporations that are buying back their outstanding shares and hedging the market beta. Related to the equity long-short value premium, share repurchase strategies act as a liquidity provider to the company engaging in such buybacks (Grullon and Michaely¹⁴).
- **Index reconstitution:** Buying additions to an index and selling deletions in advance of reconstitutions compensates for providing liquidity to the growing pool of passive investors, since index tracking forces buying and selling shares to minimize index tracking error (Chan, Kot and Tang¹⁵).
- **Activism:** Activism campaigns present an event risk to the share price. Activist investors capture the premium as a by-product of acquiring a large enough stake in a company to exert control. Beta investors piggyback on their performance by copying their trades (Brav, et al.¹⁶).
- **Post-reorganization equities:** Buying the common stock of companies following their emergence from bankruptcy. The stigma of bankruptcy, plus an exceptionally volatile risk profile, necessitates compensation for investors to overcome their aversion to holding such names (Eberhart, Altman and Aggarwal¹⁷).

* We refer interested readers to another of our white papers, “The Turn of Events” (Chuang and Romahi, 2016).

ALTERNATIVE BETA COMES OF AGE

Early attempts at capturing hedge fund returns in a more liquid and low cost format than that of the typical hedge fund deployed regression-based strategies using traditional indices to duplicate hedge fund performance. The strategies have realized positive results in times when market risk premia have performed well, and they can, to an extent, duplicate hedge fund performance. Ironically, they managed their feats of mimicry mainly because hedge funds don't, on average, hedge out market betas entirely (Asness, Krail and Liew¹⁸). So the first-generation replication portfolios succeeded in a narrow sense by delivering the portion of hedge fund returns attributable to traditional premia, but they failed to fulfill their strategic purpose. Because they invested exclusively in traditional asset indices, they didn't diversify the sources of portfolio risk. Moreover, since the first-generation portfolios were constructed “retroactively,” the time lag in re-creating real-time hedge fund positions could detract from performance.

The early efforts missed the mark because they foreclosed a vital source of alternative beta: the premia to be gained by investing in underlying assets and by going long and short within an asset class. By systematically exploiting premia at the security level, as hedge funds do, alternative beta strategies can capture more of the returns of the three most common hedge fund styles—equity long-short, global macro and event-driven. With their static allocation to premia, the models' apparent success is especially remarkable. Hedge funds employ dynamic strategies and might be expected to vary their average exposures significantly as the investment environment shifts. For individual hedge funds, varying exposures by actively timing premia or taking concentrated positions may indeed generate alpha. At the aggregate level, however, alternative beta represents the returns of the average hedge fund.

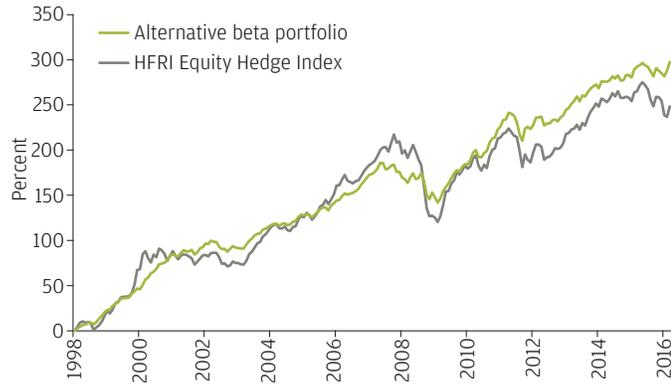
HEDGE FUND INDEXATION AND ALTERNATIVE BETA

As alternative beta becomes more investible, it may have its biggest impact in the form of benchmarks against which to measure hedge fund performance. Looking past the benchmarking function, a diversified set of risk premia can constitute an investment in and of itself, a point we highlighted in our recent paper “Smart Beta: Evolution, not revolution” (Staines and Romahi, 2016).

Alternative beta portfolios can deliver performance comparable to hedge fund averages in a more liquid and transparent fashion—and at lower cost

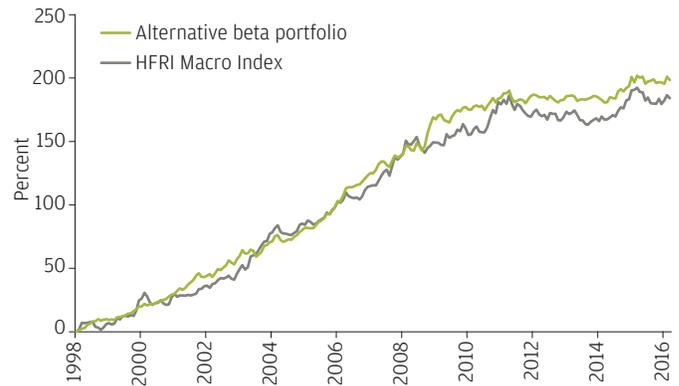
EXHIBIT 3: SIMULATED PERFORMANCE FOR RISK-BALANCED PORTFOLIOS OF ALTERNATIVE BETA PREMIA VS. HFRI INDEX ACROSS THE THREE MOST COMMON HEDGE FUND STYLES

3A: CUMULATIVE RETURNS: HFRI EQUITY HEDGE INDEX AND ALTERNATIVE BETA PORTFOLIO



	Alternative beta	HFRI Equity Hedge Index
Mean return	7.77%	7.32%
Volatility	5.37%	9.32%
Sharpe ratio	0.95	0.5
Equity beta	0.3	0.52
Monthly VaR-5%	2.28%	3.95%
Maximum drawdown	15.40%	30.60%

3B: CUMULATIVE RETURNS: HFRI MACRO INDEX AND ALTERNATIVE BETA PORTFOLIO



	Alternative beta	HFRI Macro Index
Mean return	6.11%	5.91%
Volatility	3.88%	5.58%
Sharpe ratio	0.9	0.58
Equity beta	-0.05	0.11
Monthly VaR-5%	1.28%	1.85%
Maximum drawdown	3.50%	8.00%

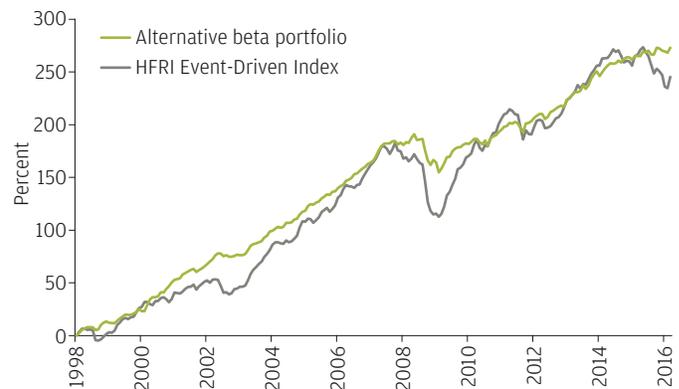
EXHIBITS 3A-3C compare portfolios that target the risk premia within each hedge fund style in backtests over the full length of each style index’s history.* The returns of the model portfolios closely track the index returns, suggesting that, on average, hedge funds merely deliver the risk premia once their fees are taken into account.** Of course, hedge funds’ returns are famously dispersed; a subset of funds will always outperform their index by a wide margin, just as a subset will underperform.

The point is that a robust passive alternative portfolio need not copy the universe of hedge fund managers by overweighting whatever style is popular at any given time. Employing leverage, short selling and derivatives, an alternative beta strategy can capture premia in a purer form, balancing risk among them. In doing so, it can enhance diversification in the same way as a hedge fund and improve a portfolio’s long-term risk-adjusted return profile.

*The backtests we devised to make the case are comparatively robust. They have a low degree of parameterization, make use of conservative assumptions around the cost of transacting and borrowing securities, and rely on a very simple heuristic for strategy selection: whether or not the strategy captures a compensated premium.

**We observe that the HFRI indices do not provide an ideal point of reference. For reasons outlined in the Appendix, they manifest an optimistic performance bias and are uninvestible. In addition, they reflect net-of-fee performance while our backtests cannot take fees into account.

3C: CUMULATIVE RETURNS: HFRI EVENT-DRIVEN INDEX AND ALTERNATIVE BETA PORTFOLIO



	Alternative beta	HFRI Event-Driven Index
Mean return	7.35%	7.08%
Volatility	4.06%	6.87%
Sharpe ratio	1.16	0.63
Equity beta	0.19	0.37
Monthly VaR-5%	1.45%	2.55%
Maximum drawdown	12.40%	24.80%

Source: HFRI, J.P. Morgan Asset Management; data as of March 31, 2016. For illustrative purposes only.

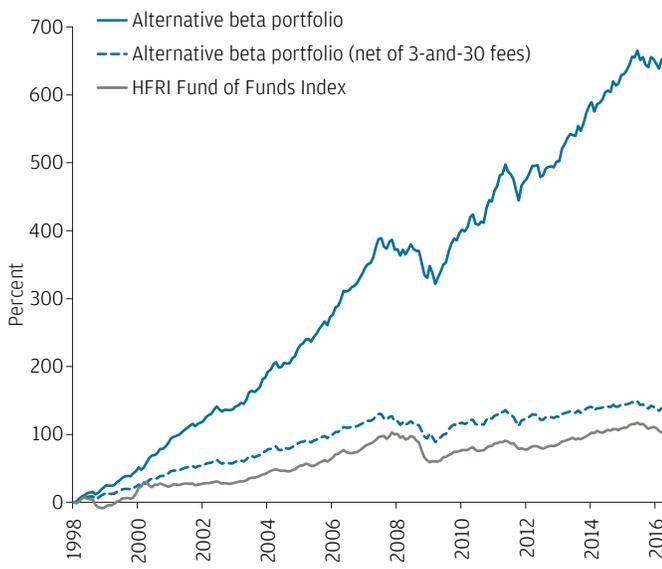
HARVESTING BETA TO PRESERVE ALPHA

As we have moved beyond the narrow definitions of alpha and beta dictated by classical finance theory, we have gained a greater understanding of the underlying drivers of investment returns. Alternative beta indices, constructed from these drivers, will come to serve as benchmarks for hedge fund performance, a trend already in evidence and one we think will only grow. As alternative beta exposures become more tradable, they should increasingly fulfill the primary benchmark criteria, being at once transparent, investible and representative.

The more sophisticated view embodied in the concept of alternative beta will allow more efficient alternative allocations; investors can now assess what premia can be captured systematically at lower cost. Consider, for instance, this compelling hypothetical. If we deduct the standard 2-and-20 hedge fund fee (a management fee of 2% of assets, plus a performance fee of 20% of asset gains) and the hedge fund of funds standard 1-and-10, on an equal-weight combination of our three alternative beta models, we end up with net gains very close to the long-term hedge fund of funds average (**EXHIBIT 4**). It is worth noting in this regard that by our estimate about 50% of assets

The performance of a diversified alternative beta portfolio corresponds closely with the historical HFRI Fund of Funds Index return, less 3-and-30 fees

EXHIBIT 4: ILLUSTRATIVE CUMULATIVE RETURNS: ALTERNATIVE BETA PORTFOLIO, ALTERNATIVE BETA PORTFOLIO NET OF 3-AND-30 FEES VS. HFRI FUND OF FUNDS DIVERSIFIED INDEX



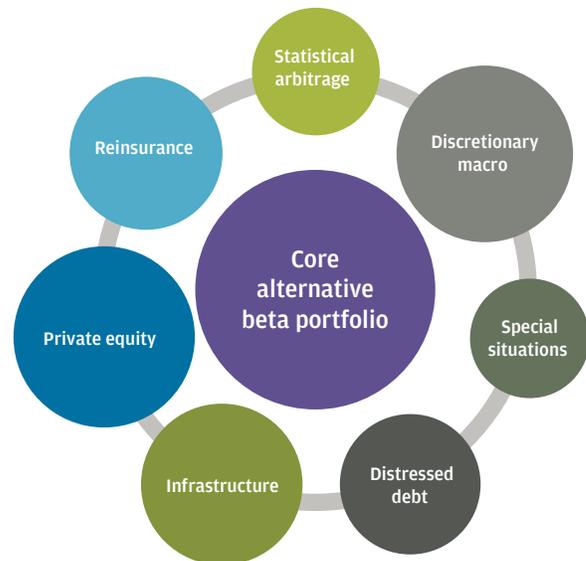
Source: HFRI, J.P. Morgan Asset Management; data as of March 31, 2016. For illustrative purposes only.

ALTERNATIVE BETA AS PART OF A BROAD HEDGE FUND PORTFOLIO

As the component of hedge fund returns attributable to systematic risk premia, alternative beta is not only a replacement for hedge funds but potentially a complement to them. There will always be hedge funds, of course, that generate genuine alpha in excess of alternative beta premia. Even more important, a wide array of hedge fund styles, as shown, derive their return from illiquid sources that alternative beta can't access.

For hedge fund investors seeking pure alpha or accessing illiquidity premia, alternative beta strategies can provide an indispensable tool. Investors with a limited fee or liquidity budget can deploy the strategies effectively in a core-satellite approach with a core allocation to alternative beta and satellite exposures to truly illiquid hedge funds or to funds that have demonstrated an ability to deliver idiosyncratic returns. Even investors who are confident in their ability to find those hedge funds that deliver true alpha may choose to invest in passive alternative beta strategies while they conduct due diligence on active managers. In another significant role, at the very least, alternative beta strategies become a new benchmark against which to measure active hedge funds.

ILLUSTRATIVE EXAMPLE OF AN ALTERNATIVES ALLOCATION COMBINING ALTERNATIVE BETA AS A CORE WITH SATELLITE EXPOSURES TO LESS LIQUID ASSETS AND HIGH CONVICTION MANAGERS



Source: J.P. Morgan Asset Management. For illustrative purposes only.

invested in hedge funds today are invested in relatively liquid styles that lend themselves to systematic capture.

The ability to decompose the drivers of return to explain the portion truly attributable to skill has raised the alpha bar and the burden of proof on active managers to deliver returns beyond risk premia. The greater burden does not imply that alternative beta strategies can completely supplant the diversification and return benefits of traditional hedge funds. If anything, a better understanding of the underlying sources of hedge fund returns can only help active managers with a demonstrated ability to consistently produce genuine alpha due to idiosyncratic skill-based investing.

CONCLUSION: THE COMING OF THE HEDGE FUND BARBELL

In sum, the insights we’ve gained will prove valuable for investors and, perhaps less apparently, for hedge funds actively managed with talent and insight. Investors using alternative beta as a lower-cost, liquid core exposure could spend their illiquidity budgets on satellite exposures to high conviction managers. And for the hedge funds themselves, today’s greater ability to explain the contribution of exposure to risk premia could put overall investment performance in context, whereas historically opacity and lack of clarity around return drivers might have made underperforming hedge funds more vulnerable to a loss of confidence from investors.

Industry observers have suggested that the trend to alternative beta indices could thus bring a degree of “barbell” in its wake. At one end of the hedge fund marketplace, more liquid low-cost alternative beta approaches will proliferate, while at the other end idiosyncratic, illiquid, actively managed hedge fund approaches that do more than deliver premia will thrive. It is a trend that favors savvy investors and skilled managers, but ultimately the aggregate number of hedge funds may well decline as assets gravitate toward the ends of the barbell.

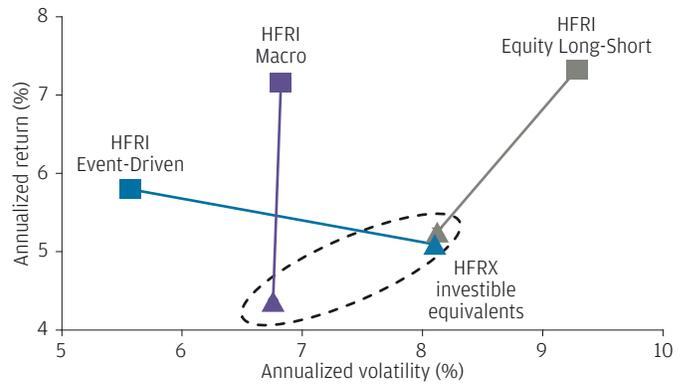
APPENDIX

The difficulties of measuring hedge fund industry aggregate performance are well noted in literature (Fung and Hsieh¹⁹). The coverage of funds is far from universal, and the indices suffer from biases arising from survivorship, backfilling and stale pricing of less liquid assets. HFRI indices lack two qualities in particular that are fundamental to robust index design in that they are neither representative nor investible.

As **EXHIBIT A** shows, the HFRI series has typically shown superior performance to its more investible parallel series, HFRX. In our work, we use the HFRI indices, since these give a longer history for comparison, while recognizing their drawbacks. In fact, because they represent an unachievably optimistic measure of hedge fund performance, the ability of simple strategies to deliver comparable performance with superior liquidity and transparency is even more impressive.

HFRI indices paint a stronger hedge fund performance picture than their investible HFRX equivalents*

EXHIBIT A: HFRI INDICES’ PERFORMANCE VS. HFRX INVESTIBLE INDEX EQUIVALENTS



Source: HFRI, J.P. Morgan Asset Management.

*HFRX series requires that funds be open to investment and have more than \$50 million in assets under management and a 24-month track record.

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