

# Hedge Fund Replication: A Revolution in the Making?

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STUART FIELDHOUSE

**H**edge fund replication is a topic often discussed but not always completely understood.

However, going forward, it certainly looks as if replication strategies will play an increasingly important role in the way large institutional hedge funds approach their hedge fund allocations, and the way funds of funds measure their performance, and levy their fees.

This is a revolution that began in the halls of academia, with the likes of Bill Fung and Narayan Naik at London Business School, and David Hsieh of Duke University. Their analysis of the available data collected by the major hedge fund databases showed that 85% of returns observed by the average fund of hedge funds could be attributed to a collection of risk premia of market returns, rather than the active management skills of the hedge fund portfolio managers. These could include equities, credit, bond market duration and market volatility, all of which can be replicated.

In addition, where alpha was being generated, it was frequently being swallowed by fees. What was needed was a low-cost alternative that could mirror the beta generated by hedge funds (sourcing the return data from the industry databases and replicating it with derivative contracts), allowing investors to more accurately gauge which managers were the true alpha generators in the market.

The underlying philosophy of hedge fund replication is that average hedge fund returns can be achieved at significantly lower cost by constructing portfolios using model-based factor exposures. For many investors, the cost savings coupled with the diversified collection of beta and the avoidance of manager-specific risks can make the synthetic hedge fund option an appealing alternative to direct hedge fund exposure.

## A rules-based approach

Naik at el have argued that hedge fund returns can be separated into alpha and beta components with beta being that part of the return that stems from the assets and strategies held in the portfolio that rise (or fall) in value regardless of the investment decisions of the manager himself. This is based on William Sharpe's original 1992 work on linear factor replication, and Bill Fung's subsequent 1997 proposal that this could be applied to hedge fund returns.

The classic synthetic hedge fund strategy adopts a rules-based approach to simulate the beta component of the return using derivative contracts. This is founded on a factor-based strategy, tracking historical hedge fund returns using liquid assets. A statistical model creates the optimum weightings to emulate the returns of the universe of strategies being tracked. The weightings are updated dynamically as new return information is made available from the various hedge fund databases.

Why not just buy the index? As Bailey Bishop, a Senior Portfolio Manager within SSgA's Structured Products Division, argues in his article in this special report, reported historical average hedge fund returns are an upwardly biased representa-

tion of the returns that are truly available, due to survivorship, selection, incubation and liquidation biases. Some benchmarks, he argues, consist only of the funds that survived, not the entire opportunity set. Funds can be selected for an index because they have performed well, while the failures are removed from the benchmark prior to the true point of their demise. Even in the case of investable hedge fund indices, the investor is unable to capture the returns of those firms closed to new investment.

Hedge fund replication, on the other hand, offers the investor the ability to focus, should he so choose, on the top-performing funds, for instance specifying a top quartile return rather than a larger universe. "This can be tailored on a client-by-client basis," explains Paul Brakke, Head of Global Structured Products at SSgA.

The arrival of replication offerings was perhaps an inevitable response to some fundamental changes occurring in the complexion of the hedge fund industry. "Alpha opportunities have not kept pace with the size of the industry," argues Narayan Naik of the London Business School. "Investors are becoming more sophisticated and have less patience." The hedge fund industry, he points out, has fundamentally changed. Large scale institutional investment has changed the expectation set for hedge fund managers. "Yes, hedge funds try to innovate, but once some strategies become mainstream, the beta component can often be replicated. The more directional it is, the easier it is to capture."

This, he thinks, will lead to lower fees and transaction costs for investors in some 'mainstream' strategies.

## Investors are getting on board

Institutional investors are beginning to wake up to the benefits of hedge fund replication. It was in March of this year that the Universities Superannuation Scheme (USS) in the UK handed a US\$200 million hedge fund replication mandate to SSgA. It is one of the first UK pension funds to recognise the importance of hedge fund replication as part of its overall alternative investment strategy.

"We are convinced of the merits of hedge fund replication as a way of gaining transparent, liquid, and low-cost exposure to the risk premia that drive the majority of hedge fund returns," says Michael Powell, Head of Alternatives at the USS. Independent consultancy JTP Partners worked with Fung and Naik in developing the mandate to meet the specific requirements of the USS. One of the principle concerns for the USS when looking for a replication strategy and designing the parameters of the mandate was mitigating tail risk and significant drawdowns. It looked at traditional measures of risk and returns such as Sharpe ratios, but also focused on higher order moments of the historic returns, such as skew and kurtosis. The attraction of the Fung and Naik approach in particular was the use of look-back straddles to minimise losses during periods of financial market dislocation, such as the past 12 months.

The mandate with SSgA is based on a managed account, giving the USS full transparency on all underlying holdings and transactions. This can involve a significant number of transactions, so JTP Partners has been retained to help with monitoring

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the portfolio, and verifying how effectively SSgA is implementing the strategy and conforming to the USS risk parameters.

Other institutional investors are also waking up to the possibilities: Swedish public pension plan AP7, which has €9 billion under management, recently told delegates at a Stockholm conference that it was halving its allocation to hedge funds because of disappointing returns. Richard Grottheim, AP7's Executive Vice-President, said the same returns could be achieved by investing in the risk factors that tend to drive hedge fund returns.

But beyond performance, there are other factors involved in potentially making the switch to replication. In AP7's case, Grottheim cited 'media risk,' having had exposure to collapsed US hedge fund Amaranth in 2006. As a public scheme, headline risk can sometimes consume more resources to defend (see Amaranth), than simply finding a solution that strips this out. And last year's report by consultancy Casey Quirk backs this up, citing headline risk as the primary reason why non-investors in hedge funds are staying away. Step forward hedge fund replication.

"Return volatility is just one measure of the risk of investing in hedge funds and there are a number of uncompensated risks such as tail risk, liquidity risk and operational risk factors such as fraud, which is exacerbated by lack of transparency," says Powell at the USS. "Purely focusing on risk-adjusted return measures such as Sharpe ratios fails to take account of these additional risk factors and understates the true risk borne by the investor. Hedge fund replication all but eliminates these risks and arguably delivers superior risk-adjusted returns when all risk factors are taken into account."

#### A low risk option

According to SSgA's Brakke, investing in hedge funds can present institutions with a number of fundamental issues to grapple with, including lack of transparency, limited capacity, specific manager-related risks and higher costs. The hedge fund beta strategy, he says, aims to address those concerns. It also offers clients the opportunity to adopt a core/satellite approach to hedge fund investing.

Increasingly, SSgA's clients are insisting on separating investment portfolios into alpha and beta returns. The hedge fund beta strategy alone allows them to make a passive allocation to access beta, and to pay only hedge fund-like fees where they can identify genuine hedge fund alpha producers. SSgA's beta product is called Hedge Fund Beta (in the United States) and Premia Strategy (in Europe), and is aimed at replicating the average performance of a universe of hedge funds through modern indexing techniques based on Messrs Fung, Naik and Hsieh's analysis of the investment returns of hedge funds.

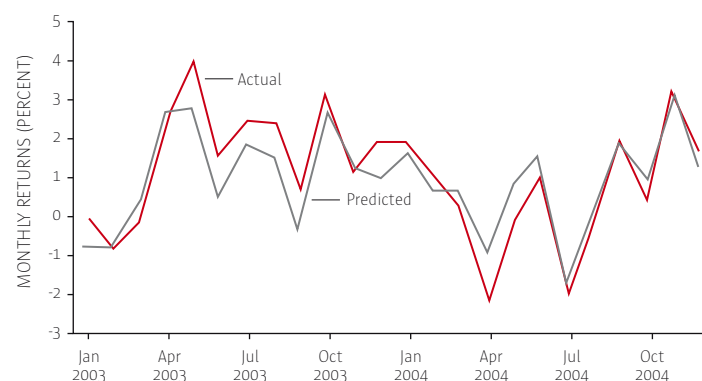
"It is just an additional tool in an investor's tool kit," says the London Business School's Naik. "You could use it to set fees, or form a passive core that could help you to identify and buy talent. With the more transparent separation of alpha and beta, you should be able to prove where a manager is adding value."

This is not to say that institutions won't still invest directly in hedge funds or funds of funds. As Gloria Pilz, founding partner of JTP Partners says, "Those investors who have no, or little, exposure to hedge funds can use replication as a good starting point for their investment into hedge funds and can then add other more specific investments to supplement it." It still means there is a role to play for those managers who can genuinely add alpha to the equation.

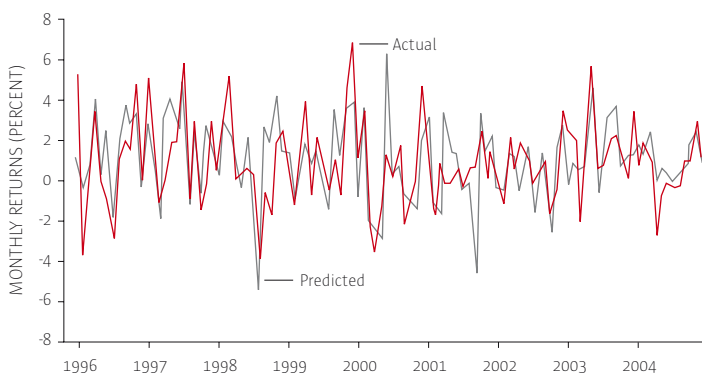
Pilz is echoed by Michael Powell, who says the additional risk factors of hedge fund investing can be mitigated by a robust and comprehensive due diligence process. "We do not see this as a barrier to investing in hedge funds," he adds.

The early success of hedge fund replication is partly being driven by the increased sums of money being allocated to hedge funds by institutional investors, coupled with a natural preference by those investors for a high degree of transparency and liquidity, something that conventional avenues into hedge funds, like funds of funds, do not offer. Indeed, when last year's credit crunch only enhanced liquidity

**Fig.1 Actual and Predicted Returns of Long/Short Equity Hedge Funds, 2003-2004**  
Source: HFR, Datastream. With thanks to the Federal Reserve Bank of Atlanta Economic Review



**Fig.2 Actual and Predicted Returns of HFRI Macro Funds, 1996-2004**  
Source: HFR, BDG, Datastream, CBOT, CME, LIFFE, NYMEX, SFE. With thanks to the Federal Reserve Bank of Atlanta Economic Review



issues within hedge fund portfolios and extended lock-ups in many cases, these concerns only increased.

"The benefit of replication strategies is that they employ only liquid strategies such as equity index futures and therefore do not suffer the liquidity risk of some hedge fund strategies," says Powell at the USS. "Most replication strategies offer at worst weekly liquidity, but the majority offer daily liquidity for investors in significant size transactions. Our most recent mandate with SSgA is a managed account and therefore we own the securities and can liquidate the positions at our discretion."

Although hedge fund replication has been singled out for criticism in some quarters, it has postulated an attractive alternative approach to hedge fund investing for those institutional investors concerned with a range of the common risk and performance issues associated with hedge funds. While smaller investors will be content to purchase off-the-shelf universe-replicating products, those seeking to make large allocations have the scope now to realise a high degree of transparency and risk management control at a lower price than might have been the case in a fund of funds.

And not only that, but replication also offers investors, including funds of funds, a cheap and cost effective means to mirror the beta in more restricted universes, be it particular sub-strategies or quartiles within the existing databases. Although hedge fund replication is still relatively new as a concept that can actively be invested in, it is one that is rapidly gathering steam, and once longer track records are achieved, we can expect further investor interest.

The rest of this report contains a more in-depth analysis of how replication strategies work, penned by SSgA's Bailey Bishop, and a Q&A with the founding partners of JTP. It should offer those considering either a more low-risk approach to hedge fund investing, or other ways of replicating beta in one or more hedge fund strategies, a good starting point for their research.



## PROVIDING BESPOKE ALTERNATIVE INVESTMENTS SOLUTIONS

**JTP Partners LLP** was established in November 2005 and is authorised and regulated in the UK by the Financial Services Authority since January 2006.

**JTP** provides active risk management and investment consultancy services to Institutions investing in Alternative Investments. **JTP** aims to provide practical solutions for institutions investing in hedge funds by designing bespoke portfolios of hedge fund exposure and our processes are based on research conducted by some of the leading academics in the field.

**JTP** works in conjunction with Dr Bill Fung, Dr David Hsieh and Dr Narayan Naik to replicate Hedge Fund Beta, where portfolios of hedge funds are mapped to tradable instruments in order to replicate the drivers of alternative beta returns. These portfolios are tailor made to reflect the desired investment and risk profile of the investor and are actively managed to maintain such profile.

In addition, we also seek to generate Alternative Alpha where the focus is to produce consistent and sustainable alpha returns. We operate a meticulous and thorough due diligence process to identify a suitable portfolio of hedge fund managers. The portfolio is then actively risk managed on a daily basis to maintain the risk profile with the parameters agreed with the investor.

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# A question of choice

JTP Partners says replication will empower hedge fund investors

London-based JTP Partners was established in 2005 to provide an interface between the academics working on hedge fund replication theories, like Bill Fung, Narayan Naik, and David Hsieh, and institutional investors interested in tailored replication products. Apart from the actual construction of portfolios, JTP also offers an ongoing risk management process for its clients. It played a key role in the recent Universities Superannuation Scheme mandate.

Stuart Fieldhouse spoke to founding partners Ross Jones and Gloria Pilz.

**THFJ: How did the idea for hedge fund replication come about?**

**Ross Jones [RJ]:** I ran a dealing room at Gerrard & National for 15 years, and it seemed to me that one of the most important aspects of running a dealing room was to have complete transparency of what your risks were, liquidity in all your positions, and a full understanding of all your operational risks. The same should apply when you invest in hedge funds. One of the biggest worries has to be lack of transparency, lack of liquidity and the operational risks that exist within the traditional methodologies of investing in hedge funds. Historically, I don't think investors have ever been given a choice – they were told 'If you want to invest in our hedge fund, you have to buy shares in our fund'. Reporting mostly consisted of a monthly report showing a pie chart, one that shows the investors exposures as at the end of the month and those exposures might not bear any resemblance at all to the exposures that existed intra-month. I think that's really what brought Bill [Fung] and us together. We had a similar idea of where things should be going. The first thing we spoke to Bill about was the work he was doing to extract *alpha* via active risk management and the operational requirements needed to achieve this.

One of the key tasks was to segregate the *alpha* and *beta* component of the returns, and identify managers that genuinely produce *alpha*. The general market trend, we believe, is that there are fewer and fewer managers who add *alpha*.

**Gloria Pilz [GP]:** Working on isolating the *alpha* component of hedge fund returns led to the idea that if hedge fund returns can be explained by general market exposure, then, conversely, it should be possible to create a basket of general market exposure where the return would look like hedge fund returns. These market exposures can be expressed using commonly traded instruments, which purposely, also address our concerns about transparency and liquidity.

**THFJ: How do you achieve the transparency required for efficient hedge fund replication?**

**GP:** This is done by looking at the returns, rather than any requirement for transparency of the underlying portfolio holdings. In our experience of looking at hedge funds, we found that quite often, how funds are categorised can be quite subjective. At the end of the day, it is not really what you say you are, but how you behave that counts.

**THFJ: Do you see hedge fund replication as a means for new hedge fund investors to get access, or for existing ones to cut down on costs?**

**RJ:** This is not exclusive to potential investors in hedge funds. Hedge fund replication is a relatively new concept but it does have the advantage of being a low cost, transparent and liquid methodology for gaining exposure to hedge fund

risk. I still believe there is cynicism around in terms of the performance of hedge fund replication products and therefore building a credible track record will be important to gaining a wider confidence.

I think there are going to be different types of products going forward and we will see the two distinctive approaches emerge. The majority of the existing products are designed to replicate existing indices and therefore use a top down approach for identifying the risk premia that make up the returns; these will be defined as replication products and will be sold in large volumes. We believe that a lot of the larger institutions will want their own bespoke portfolios of alternative *beta* and therefore will use a bottom up approach, which requires identification of the risk premia that make up the returns of individual hedge fund strategies and a deeper understanding of those strategies. This methodology will be defined as alternative *beta* and also allows additional services such as active risk management and risk monitoring. These two approaches are very different and the fees charged will reflect this: replication will have lower fees, while alternative *beta* will have higher fees.

**THFJ: How did you get involved with the Universities Superannuation Scheme?**

**RJ:** I was aware that the USS already had an existing exposure to alternative *beta* and approached them on the basis that we worked directly with Dr Bill Fung and Dr. David Hsieh who were behind the majority of the original research into the subject. We believed that our approach of allowing the investor to define their investment profile, through a bottom up portfolio construction methodology, would appeal. We also had the ability to offer risk management of the portfolio based on parameters set by the investor and were able to advise on the operational requirements to achieve this.

**GP:** Indeed, the USS had some quite specific ideas about the kind of exposure they wanted and we were able to accommodate their requirements not only in terms of the hedge fund portfolio but also in their ongoing risk monitoring and operational requirements.

**THFJ: Could replication therefore form the core component of a core/satellite approach?**

**RJ:** We believe the core/satellite approach, using a replication strategy as the core, is one of the most effective ways of investing in hedge funds. The professors' research shows that a large majority of hedge fund managers do not in fact provide any *alpha*, and what *alpha* there is quite often disappears in fees, especially if they are accessed via a fund of funds. Those managers that do provide *alpha* consistently are well worth the fees charged and should therefore be part of any balanced portfolio..

**GP:** Those investors who have no, or little, exposure to hedge funds can use replication as a good starting point for their investment into hedge funds and can then add other more specific investments to supplement it. Existing investors who already have hedge fund exposure of some sort might be missing one or two strategies and therefore can gain exposure to those strategies using replication until such time as they find appropriate managers. As the replication approach is a very liquid type of investment, it can also be a very useful cash management tool.

**THFJ: Do you think we'll see a situation where larger institutions will opt for the tailored approach, while private banks and others will be happy to buy an off the shelf product?**

**RJ:** The larger institutions are likely to be driven by their desire to determine their own investment criteria and are therefore more likely to choose the alternative *beta* route. The private banks will tend to go for the off the shelf products and then put some form of wrap around it as fees will be a determining factor.

**GP:** It also depends on how active a risk management role the larger institutions require. There are two sides to the tailored approach: one is designing the portfolio to create the desired exposures, and the other is controlling those exposures, if indeed they want to control them. When we worked with USS, they wanted a managed account because this gave them the transparency and liquidity they were after, at the same time also limiting their operational risk. Control of operational risks is a major concern for many trustees.

**THFJ: Can the parameters of the portfolio be changed on an ongoing basis?**

**RJ:** Yes. An important part of our initial discussions will be based on setting the appropriate risk parameters for the portfolio but these parameters are not set in stone.

**GP:** For example, if the investor wanted to replicate across a range of strategies, you might ask for a specific volatility target. Even in the case where there is no specified target, if the client needed to, we can deleverage very quickly and take some risk off the table.

**THFJ: Is there any alpha to be had out of hedge fund replication?**

**RJ:** Clearly. For example, how good is the model in identifying the risk premia that make up the returns? How good is the database you're using to determine the returns of the various hedge fund strategies? What instruments are used to represent the various risk premia identified? This is quite important, in order to limit the cost of slippage.

Another example would be the choice of which strategies and what leverage to use when constructing the portfolio. We found that the professors' model, with the use of lookback straddles, tend to outperform in times of extreme volatility.

**GP:** If you replicate an average, it implies that you will be replicating the good as well as the ones that are below par. We don't want to replicate the under performers. If the filtering system can identify them, then that is already value added. Also key is looking at the factors. The professors are constantly on the look out for new factors that demonstrate hedge funds are doing something different, and it is very important that you don't miss that. The ongoing research is very, very important.

**THFJ: What does all this mean for fee structures and the traditional fund of funds business model?**

**RJ:** There is going to be a time lag here before this has any major effect. The existing replication products have only been going for one or two years. You could see a mass market replication product with a fee base of as low as 50 basis points, building up to the more bespoke product, almost hedge funds in themselves, somewhere between 1.0% and 1.5%.

**GP:** In terms of fees, if you are successful in replicating the average fund of funds, and after fees you match that fund of funds, where would you rather have your money – in a fund of funds or a replication product? I would suggest a replication product, for the simple reason that replication products have transparency, liquidity and few of the operational risks associated with traditional hedge funds. How much value do you place on the fact that you are not invested in a fund, sometimes with redemption penalty or lock up periods?

**RJ:** Looking at it from a fund of funds point of view, if you believe you have the skill to pick managers, you might see replication as a really useful benchmark. In addition, you might find fund of funds managers using replication in certain strategies to bridge a gap where they do not have available managers that fit their investment criteria, but require exposure to that strategy to meet their desired investment profile.

**THFJ: I know it is still early days for replication strategies, but they sound like they have the potential to really shake up the way the hedge funds sector does business, and the way it charges. Do you agree?**

**RJ:** The industry had the upper hand when there was more money chasing it than there were managers who could take the money. Managers could dictate the terms on which they operated but replication, we believe, challenges the industry to provide value not just in terms of fees charged but also in terms of the way that hedge fund returns are delivered to the investor from a transparency, liquidity and operational perspective.

Ross Jones, CEO and Founding  
Partner of JTP Partners



**GP:** In terms of executing, hedge fund replication mainly uses highly liquid, exchange-traded instruments. This is very different from what constitutes a fund of funds portfolio. We're not delving down into the individual stock level. The replication product is actually seeking to replicate the return and what sort of factors we think can provide these types of returns. Ultimately, these sorts of solutions will give investors a greater degree of control. This industry has been driven by the hedge funds and funds of funds managers up to now. Maybe for the first time it will start to be driven a little bit more by the investors, because they will have more options. That has to be a good thing for the industry as a whole.

### Biographies

**Ross Jones** is the CEO and founding partner of JTP Partners. He began his career in 1977 with Gerrard & National (later the Gerrard Group) and was appointed a director in 1986. His main responsibility was fixed interest market making as CEO of its banking subsidiary. In 1996 he

was elected the inaugural chairman of the London Money Market Association. He also served on the executive committee of GNI Limited, the group's derivatives broking subsidiary, and chaired the group's risk committee. In 2001 Jones was appointed CEO of GNI Fund Management, the hedge fund of funds business. Most recently, he was a director of Athanor Capital Management, which he left to found JTP.

**Gloria Pilz** is the risk manager and founding partner of JTP Partners. She was the Director of Risk and CIO at Bright Capital (formerly GNI Fund Management). She was responsible for managing the portfolio of funds of hedge funds and structured products, including establishing the infrastructure for the funds, and selecting managers. She also oversaw the implementation of the firm's risk systems (it was one of the first fund managers to implement Sungard Panorama). Before Bright Capital Pilz was head of market risk at Daiwa Europe Bank, responsible for proprietary trading and hedge fund seeding. She has also worked as a market maker and prop trader at Chase Manhattan and West Merchant Bank, dealing in a range of different instruments, including equities, and fixed income derivatives.

# Hedge Fund Replication

BAILEY BISHOP, CFA, STATE STREET GLOBAL ADVISORS

A survey of hedge fund administrators estimates that, by December 2007, global hedge fund assets had reached \$4 trillion<sup>1</sup>. According to Hedge Fund Intelligence, which provides hedge fund news and data, global hedge fund assets grew by 27% in 2007 to reach \$2.65 trillion<sup>2</sup>. Regardless of which number is closer to the truth, the growth of hedge fund assets has been nothing short of remarkable.

Accompanying the recent growth in assets has been great interest and curiosity in a new hedge fund strategy called hedge fund replication. Perhaps sceptical of a crowded market chasing fleeting *alpha*, or tired of seeing fees of 2% and 20% of gains taken off the top, institutional investors are becoming increasingly aware of the attractions of hedge fund replication, a strategy designed to generate hedge fund-like returns at substantially lower fees, and with liquidity not traditionally available in hedge funds.

Academic research on hedge fund return attribution has uncovered significant risk premium exposures (or *beta*) in hedge funds. These consist of traditional forms of *beta*, for example equity, credit, term, small-large, value-growth and currency as well as the more exotic forms representing option-based or dynamic trading strategies. Hedge fund replication synthetically reproduces hedge fund or fund-of-funds returns at a low cost through exposure to these *betas*. While replicating hedge fund returns in this manner forgoes the manager-specific excess return potential associated with direct hedge fund investment, for some investors the cost savings, liquidity, and avoidance of manager-specific risk make a synthetic hedge fund *beta* approach an appealing alternative to direct hedge fund exposure. Interestingly, based on a survey conducted in February 2008 by AllAboutAlpha.com and conference producer Terrapinn, the hedge fund industry may not be entirely opposed to this relatively new entrant. The majority of funds of funds respondents see hedge fund replication as a complement to traditional funds. Not surprisingly, hedge funds tended to see the strategy as a competitor.

### Demand for uncorrelated absolute return

Institutional demand for uncorrelated absolute return increased dramatically following the broad equity market decline of 2000-2002, which was accompanied by a sustained decline in bond yields. This perfect storm for investors, which reduced the value of equity-dominated portfolios at the same time as the present value of

liabilities was increasing, underscored the value of uncorrelated sources of return in investors' asset allocations. The mounting demand for uncorrelated absolute return together with the attractive historical return of hedge funds through various market environments has sparked a dramatic growth in the hedge fund industry.

While assets have been growing, average hedge fund returns have declined in recent years, reflecting some of the challenges investors have faced in capturing returns in this area. First, reported historical average hedge fund returns are an upwardly biased representation of the returns that are truly available because of survivorship, selection, incubation and liquidation biases. For example, many of the published returns of hedge funds are not actually achievable because the benchmarks consist of only the funds that have survived to the end of a particular period rather than the full opportunity set of funds throughout the entire period. In addition, funds are often selected because they have performed well, and funds that fail are removed from the benchmark prior to their true point of demise. All of these forms of bias, which are common in many manager databases, simply mean that a naive buyer of hedge funds may do significantly worse than the published benchmarks suggest.

Second, access to the best-performing hedge funds or funds of funds is often limited because funds are closed to new investment. Third, increased competition among hedge fund managers may have reduced the potential to add value in hedge funds. Finally, hedge fund and fund of funds fees as well as incentive fees create an additional return hurdle for the average hedge fund investor.

### Understanding hedge funds

Academic research analysing hedge fund returns and risks can be traced back more than a decade. In the early 2000s, much of the research focused on replicating the return streams of individual types of hedge fund strategies such as trend followers or merger-arbitrage. More recently, research has looked at fund of hedge fund returns. The results have found that fund of hedge fund returns can largely be explained by a few common forms of risk premia (*beta*). Some researchers have also used simple forms of dynamic (or exotic) *beta* to capture the way in which the average hedge fund or fund-of-funds uses dynamic trading strategies such as trend-following or short-volatility approaches. The dynamic *betas* can be

represented in the modelling process as simple trading strategies that mechanically buy and sell options on certain assets as prices rise and fall.

The research suggests that a combination of relatively few forms of both traditional and exotic *beta* can successfully explain most of the return volatility of hedge fund indexes. For example, some models have achieved R-squared statistics (a measure of their predictive power, with 100% being the best) of 80-95% in explaining fund of fund index returns. Fung et al.<sup>4</sup>, for example, use a combination of the following eight forms of *beta* to model HFR's HFRI Fund-of-Fund Index returns.

#### Standard *Betas*:

1. S&P 500®
2. Small-cap premium
3. Term premium
4. Credit premium
5. Emerging Markets equity

#### Dynamic (Exotic) *Betas* (trading strategies capturing non-linear returns):

1. Government bonds
2. Currencies
3. Commodities

Fung et al. were able to explain the majority of fund of funds return variability with a changing basket of these eight forms of *beta*. Research therefore seems to imply that fund of hedge fund-like returns can be achieved with reasonable tracking variance through exposure to readily available, liquid instruments.

#### Replicating hedge fund of funds returns

So, indexing approaches can capture the diversified collection of *beta* that explains the majority of fund of funds index returns. The *beta* exposure can be obtained through low-cost, liquid instruments, with the weights adjusted on a regular basis resulting from periodic regression analysis. As new monthly hedge fund of fund returns are reported, the regression analysis can be re-run to capture changes in broad hedge fund exposure. As mentioned, a hedge fund replication strategy will fail to capture any *alpha* that is present in the fund of funds index returns. However, the research suggests that for the fund of fund index returns there is little, if any, after-fee return in excess of the return implied by the collection of *betas* revealed in the modelling process.

The modelled returns represent what can be achieved with a synthetic hedge fund *beta* strategy. They compare favourably with the returns of fund of funds index strategies that invest in a diversified collection of underlying hedge funds that are open and are considered to be representative of fund of funds allocations. For example, a portfolio of *betas* used in the study by Fung et al. 4, which represents the return of a synthetic hedge fund *beta* strategy, generated an annualised return of 8.7% for the period tested (August 2003 to June 2006). This compares favourably with the reported HFRI Fund of Funds Index return of 8.4%. However, HFR's investable HFRX Equal-Weighted Index generated an annualised return of just 3.7% over the same period. The significant annualised return shortfall of the investable hedge fund products (nearly 5%) is due, in part, to the management fees paid to underlying managers. It also reflects the challenge in identifying skilled hedge fund managers that are open to investors. These same challenges may explain the more widespread decline in hedge fund returns in recent years.

There are now a handful of live hedge fund replication strategies being marketed to investors. Many have similar approaches but there are differences, some material, so investors need to do their homework. The performance of real money managed in this manner has shown results similar to the simulations that have been undertaken. While there have been periods of high tracking, for the majority of months since real monies have been managed, the replication strategies have generated performance with the same sign of, and of similar magnitude to, investable hedge fund indexes.

#### The appeal of synthetic hedge fund *beta*

Since a synthetic approach to capturing hedge fund *beta* avoids both the payment of fees to underlying hedge funds and the hedge fund manager selection challenges, a growing number of institutional investors are choosing to utilise this lower-risk, lower-cost route to hedge fund exposure. There are three primary ways an investor may utilise a hedge fund replication strategy.

The first potential use is as a liquidity vehicle within an investor's overall hedge fund portfolio. This would be a permanent allocation for use in rebalancing. For example, if an investor's overall hedge fund exposure as a percentage of total assets has dropped due to poor performance, adding hedge fund exposure while maintaining liquidity can be achieved very easily through this strategy. Conversely, if hedge funds have performed well relative to other asset classes and the overall exposure is above target at year end, exposure can be reduced via the replication strategy. And even for fund of fund managers, as indicated in the survey referenced earlier, hedge fund replication can be a useful tool for providing liquidity and managing risk exposures and diversification across absolute return strategies.

The second way of utilising hedge fund replication is as a primary source of hedge fund exposure. This may be part of a core-satellite approach, using the hedge fund *beta* strategy as a means of ensuring that an investor gets hedge fund "market" returns. Traditional hedge funds or fund of funds can then be used as a means of searching for *alpha*. This approach is similar to how many investors have embraced the core-satellite or passive and active approaches within their equity exposure.

Lastly, investors can use the strategy solely for temporary purposes. As investors decide, for example, to add hedge fund exposure, a hedge fund replication strategy can be used to get immediate exposure to the asset class while the often lengthy due diligence for traditional managers takes place. Also, just as investors change equity managers from time to time due to poor performance, the need to change hedge fund managers will also arise periodically. A hedge fund replication strategy can be used to maintain equity exposure during the transition. Searching for a new manager may take more time than it takes to get out of a hedge fund, and the liquidity of the old and new manager may not be coordinated, creating the need for a temporary place to "park" the assets.

While the assets being managed in this manner through hedge fund replication are very small relative to the size of the overall asset class, one can expect the proportion to grow as the market matures. Demand for liquidity, return expectations commensurate with cost, and compressed returns are likely to be tailwinds for hedge fund replication. Just as investors utilise passive equity strategies to ensure they capture equity market returns, so too might they turn to hedge fund replication to ensure they achieve, at a minimum, hedge fund "market" returns.

1. HFM Week, December 5th, 2007, 9th biannual HFMWeek Hedge Fund Administrators Survey
2. Hedge Fund Daily, April 17th, 2008, Global HF Assets Climb 27%
3. AllAboutAlpha.com, February 18 th, 2008, AAA Exclusive: Survey contains some surprises about how hedge fund managers now view "hedge fund replication"
4. Fung, William, Hsieh, David A., Naik, Narayan Y. and Ramadorai, Tarun, "Hedge Funds: Performance, Risk and Capital Formation" (July 19 th, 2006). AFA 2007 Chicago Meetings Paper Available at SSRN: <http://ssrn.com/abstract=778124>.

#### May 30th, 2008

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## State Street Global Advisors

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Backed by our history of hands-on experience and our proprietary technology, we draw on our management expertise, cost-effective trading capabilities and dedicated research team to create innovative solutions to address our clients' often complex investment needs. And, with more than 280 investment strategies, our investment vehicles provide exposure to virtually all global markets.

Our active, passive, enhanced and absolute return investment capabilities cover all the traditional asset classes including equities, fixed income, cash and currency. In addition, we've been continuing to expand our range of solutions for investing in alternative assets. Our diversified growth strategies, for example, provide access to alternative asset classes traditionally only accessible by larger investors. The strategies – Diversified Beta and Diversified Beta Plus – utilise our skills as a passive manager to replicate the returns of a broad array of traditional and alternative asset classes to achieve diversification and reduce the volatility of investment returns.

Launched earlier this year, our pioneering hedge fund replication strategy – Premia – is the result of our partnership with the leading academics in the field of hedge fund beta. By identifying the factors and weightings that account for aggregate hedge fund returns, the strategy aims to produce hedge fund-like returns but at a lower cost compared with direct hedge fund investment and without manager-specific risk.

As you'd expect, we also have a wealth of experience in structuring and managing liability-driven investment (LDI) strategies. 'LDI Plus' draws directly on our expertise in diversified growth by splitting pension fund assets into two categories: liability matching and growth. Our Pooled Asset Liability Matching Solution (PALMS) funds seek to immunise capital against inflation and interest rate volatility, while our Diversified Growth strategies seek additional returns to improve a pension scheme's overall funding position.

SSgA's development from its index roots to today's creative approach to alternative investment strategies is marked by our dedication to solid research and rigorous testing. We've developed a comprehensive framework for understanding investor behaviour and identifying alpha sources and continue to invest heavily in proprietary research to maintain and enhance the performance of our existing strategies and support new product development.

Combining SSgA's global reach – we have 27 offices and 11 investment centres across five continents – and our local market expertise with State Street's industry

presence and resources enables us to focus single-mindedly on designing and delivering competitive investment strategies and integrated solutions to our institutional clients worldwide, across virtually every asset class, capitalisation range, investment approach, region, and style.

1. Pensions and Investments' 2007 Money Managers Survey, May 2008
2. SSgA, 31 March 2008

## JTP Partners LLP

JTP Partners LLP was established in 2005 and is authorised and regulated by the Financial Services Authority. We provide consultancy and risk management services to institutional investors investing in alternatives investments. We provide practical solutions for institutions investing in hedge funds via a bottom-up approach, appraising their needs and requirements on a case by case basis.

The two founding partners bring together over 45 years of experience in the finance industry, with hands on experience in trading, portfolio management, establishing managed accounts, operational control and risk management. We believe that absolute returns can be delivered efficiently, whilst maximising transparency, liquidity and minimising operational risks.

We work together with investors to develop bespoke portfolios of hedge fund exposures using methodology based on the research conducted by some of the leading academics in the field. We work in conjunction with Dr Bill Fung, Dr David Hsieh and Dr Narayan Naik in designing the portfolios, to reflect the investment objective and risk appetite of the investors.

Our approach to alternative beta allows hedge fund-like returns to be delivered cost effectively, with emphasis on transparency, liquidity and without manager-specific risks associated with fund investments. The portfolio can be managed via a managed account specifically set up for the investor. We can further provide risk monitoring services to ensure that the pre-set risk parameters of their accounts are not breached. This enables our clients to identify and resolve any issues at an early stage.

Hedge fund beta, whilst representing mean hedge fund returns, should be complemented by further investments in hedge fund managers who generate alpha. We have developed a rigorous and structured process to evaluate managers on a qualitative and quantitative basis. The focus is not only on performance, but the source and sustainability of that performance. We also thoroughly analyse their structure, with emphasis on operational and risk controls. This service is available to investors for either existing or potential managers they wish to add to their portfolios.

Our on-going commitment to research and development, together with our dedication to client servicing, enable us to provide a truly bespoke and personal service to investors in alternative investments.

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