HEDGE FUND INDICES

Boosting beta returns by diversifying risk exposure

There are many strategies to take into account when investing in hedge funds and, by spreading their exposure across a diverse range and against bond and equity indices, investors can use alternatives to optimise reduction of portfolio risk, as well as gain additional alpha

The truth universally acknowledged, when it comes to hedge funds, is that they boost a portfolio's alpha, or risk-adjusted returns. But it is equally true, if less well known, that using alternatives can be a way of optimising beta – or diversifying exposure to risk. This is the idea behind using hedge funds as equity or bond diversifiers.

"When you buy a hedge fund, you buy some alpha, but you also buy exposure to some specific risks," explains Alain Dubois, chairman of Lyxor Asset Management. "You have exposure to the market but also to specific betas such as credit spread, volatility and correlation." The point, he says, is to diversify these exposures.

It is all too easy just to group hedge funds together, as providing returns uncorrelated to equities or bonds. But in fact the five main strategies – equity market neutral, convertible arbitrage, long/short equity, CTA (commodity trading adviser) global and event driven – have a complex set of correlations among themselves, and against the main bond and equity indices. These are shown in table one.

This means that the thinking investor can use alternatives to optimise reduction of portfolio risk, as well as gain additional alpha. Appropriate strategies can be constructed to provide the optimal exposure diversification for the various combinations of equity and bonds in a portfolio.

There is more to this process than to straightforward asset allocation between the mainstream asset classes, or to diversifying by sector or geography. The aim is to identify a combination of strategies with the most contrasted risk profile compared to those of the traditional assets held by an investor – a process which involves not just reduction of portfolio volatility but also of extreme bond or equity portfolio risks.

Dubois: diversify your exposures

Too often, the mix of conflicting betas in a standard multi-strategy fund will not optimise diversification, and so will fail to reduce risk optimally. Far more effectively, benchmarks for equity and bond diversifiers can be established using mathematical techniques.

When it comes to bond diversification, the best strategies are:

- Convertible arbitrage
- Equity market neutral
- Event-driven
- Long/short equity

For equity diversification, the best strategies are:

- Convertible arbitrage
- CTA Global
- Equity market neutral

But how exactly are these strategies to be combined, and the benchmarks to be drawn-up?

ALL ABOUT INDICES

Invest in hedge funds, and the chances are that it will be through a hedge fund of funds. This is a way of cutting the dangers of putting all of an investor's eggs into one unregulated basket, as well as allowing the experts (the multi-managers) to do the fund selection.

But it can also be a way – often under considered – of utilising a manager's potential to combine styles. Hitherto, this has not been done so well as it might. Academic studies have suggested that alternative funds perform inconsistently and that fund of fund managers have been ineffective in combining styles and funds to create regular outperformance (see table three).

Enter hedge fund indices – a way for investors to calculate the "normal" returns associated with the different strategies. The idea is that these indices are stable in terms of beta and, thanks to extensive research, representative of the returns and risks associated with the five main alternative investment strategies - a combination which renders them perfect for asset allocation between strategies over the long term.

Rather than focus on past performance (which is, as we have seen, potentially unsteady), a good

Table one: hedge fund strategies and underlying risk factors

	Bond parameters						
Alternative strategies	**Term spread**	**Variation of term spread**	**Credit spread**	**Variation of credit spread**	**Bond return**	**Hist Vol. of bond returns**	**3-month T-Bill**
Equity market neutral	–		+	–	++		++
Convertible arbitrage			– –				
Long/short equity		– –	–				
CTA global			+	+++	– –		
Event driven			– –				
	Equity parameters						
Alternative strategies	**Implicit volatility (VIX)**	**Variation of imp. vol. (VIX)**	**Value versus growth**	**Variation of value vs growth**	**Small-cap vs large-cap**	**Variation of small-cap vs large-cap**	**S&P 500 return**
Equity market neutral		+			+	+	+
Convertible arbitrage		+					+
Long/short equity	+	+	++		+++		+++
CTA global	+	–					–
Event driven	+	–			++		++

For the period January 1997 to December 2004: The non-investable Edhec Alternative Indexes are used for the five hedge fund strategies. These historical return series have been corrected for auto-correlation. The procedure for establishing factor values has two stages: 1. Univariate regression for each factor. 2. Multivariate regression for factors with a signifi cant coeffi cient in stage 1.•A + sign indicates that the strategy is long the risk factor (i.e. the strategy benefi ts from an upward move of the factor).•A – sign indicates that the strategy is short the factor (i.e. the strategy benefi ts from a downward move of the factor).•The ++ or -- and +++ or --- signs indicate medium and high amplitudes of the long or short positions.• Shaded boxes show factors which are not signifi cant in the univariate analysis.Note that only exposures to risk factors relating to bonds and equities in hedge fund strategies are indicated in the table since contrasting exposures are used to optimise the diversifi cation achieved by alternative investments

index will aim to guarantee investors a normal return associated with the real risks of the relevant strategy.

So how is such an index to be developed? In two stages. Firstly, by picking funds based on principal component analysis (using mathematical techniques to reduce a complex system of a correlations to a smaller, more manageable, number of dimensions). Secondly by allocating funds by an optimisation method, which essentially replicates the principle component for each strategy.

ASSET ALLOCATION

Given the indices, how should asset allocation proceed? What is the best way to combine them to get the appropriate diversification? It depends, as Mr Dubois points out, on the investor's overall asset allocation. For a portfolio of, say, 70 per cent in bonds and 30 per cent in shares, there will be an optimal combination of the five strategy indices to diversify risk; for an investor with 50-50 in each, the combination will be different.

A shrewd inter-strategy asset allocation process will be based on two core ideas. Firstly, that it is hard to estimate precisely the future returns of financial assets. One way around this is to focus on minimising risk, rather than optimising the risk-return profile, thereby avoiding the problem of inaccurate estimates.

Secondly, given that hedge funds do not follow a normal distribution, the risk measure used has to be more general than just volatility – it has also to accommodate extreme risks.

Asset allocation, in other words, should be determined by minimising a value at risk indicator which takes into account the non-normal distribution of strategy returns, by including extreme risk factors skewness and excess kurtosis.

However, conveniently and mathematically interestingly, there is a short cut to working out the correct combination for every single portfolio. It turns out, according to Mr Dubois, that the optimal proportion, as a combination of the equity diversifier benchmark and the bond diversifier benchmark (that is, the strategy mix suited to an all-equity portfolio and that for an all-bonds portfolio), will be roughly equivalent to the split of the overall portfolio between equities and bonds.

AVOIDING THE PITFALLS

Using hedge funds has, traditionally, carried the problem of operational risk management. Levels of hedge fund regulation are low, and the industry remains immature with respect to certain procedures: calculating price and net asset value, client reporting, controlling compliance with investment rules. It has, moreover, an immature risk management infrastructure and low liquidity levels.

The result? Each year, many hedge funds will incur heavy losses, or vanish altogether, and for reasons entirely unconnected with their financial management. According to research from Edhec and Capco, some 41 per cent of hedge fund failures are down to misrepresentation; 30 per cent are due to fraud or misappropriation of funds. Inadequate

Table two: performance of first quartile funds of hedge funds from one year to the next

1st quartile (best FoHFs)	25%	4.47%
2nd quartile	25%	5.15%
3rd quartile	25%	5.88%
4th quartile	25%	9.56%
	1st year	2nd year

Average figures for 2000-2001, 2001-2002 and 2002-2003 The ranking criterion is the return of each fund over the respective period. "Single hedge funds": breakdown by quartile of 283 individual hedge funds in the first quartile in 2000 (January 2000 to December 2000), for each of the following three years.Source: CISDM hedge fund database. "Funds of Hedge Funds": breakdown by quartile of 102 individual hedge funds in the first quartile in 2000 (January 2000 to December 2000), for each of the following three years. Source: AAC funds of hedge funds database

technology or processes accounts for 6 per cent of failures, and trading outside the mandate for 14 per cent. No wonder investors are wary.

The way round this is to create a fund platform, combining a number of products from a number of providers, with an infrastructure specifically designed to control the five main operational risk factors:

- Compliance
- Valuation
- Reporting
- Risk management
- Reconciliation

Essentially, operations carried out by fund managers should be entirely transparent, and the overall platform should have effective control of risk.

More specifically, an effective infrastructure would involve a four-part risk-management process. Firstly, managers (selected only after a strict process of due diligence), should be given a mandate which clearly defines their investment universe and risk limits. Secondly, fund managers should be expected to replicate their fund's asset allocation in the overall platform.

On top of this, risk control and weekly net asset value calculations should be carried out, independent of the fund managers. Finally, the overall platform should retain the option of sacking a fund manager at any point, especially one who fails to comply with the investment rules, or has unexplained variations in performance.

The strategies behind the diversification

Effective equity or bond diversification relies on strategic combinations of five main alternative investment strategies. But what exactly do these strategies involve?

Long/short equity

This, probably the most generally familiar of the strategies, involves taking long and short positions on stocks, according to whether they are expected to go up or down. Usually, fundamental analysis is used to calculate the positions for equities considered over- or undervalued by markets. The manager, essentially, takes advantage of market anomalies by using gearing, or the ability to sell short.

Market neutral equity

Again, this does what it says on the tin. Similar investment strategies to those in long-short equity are used, but with the aim of balancing long and short positions to end up with an overall position neutral in relation to the benchmark index. This can mean neutral in terms of beta (that is, on the basis of factor analysis of market risk) or, at a more basic level, in terms of arithmetical equality of purchases and sales of stocks (so-called dollar neutrality).

Convertible arbitrage

Convertible arbitrage involves neutralising equity risk by buying a company's convertible bond whilst short-selling its equities. It does not rule out betting on volatility trends, or on interest or credit risks related to the bond. The idea is to exploit the price anomalies associated with a complex hybrid product that includes both a bond and an option component.

Event driven

Event driven strategies exploit certain special situations by using complex stock valuation models, arbitrage and/or analysis of how likely such situations are to arise.

Such funds can be grouped into three main kinds: merger/acquisitions, distressed securities and hybrids, which can invest more generally in all securities of issuers in special situations, including both merger/acquisitions and distressed securities.

CTA Global Directional

This term covers a diverse range of funds in terms of style and markets (they might invest in commodities, currencies, interest rates or equities). What they have in common is that, using a high level of gearing, they take long or short positions based on predictions of market trends, or on the evolution of major economic figures.