HEDGE FUNDS-HOW MUCH EXPOSURE SHOULD YOU HAVE?

By
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How much hedge fund exposure is appropriate for a large-scale investment program like a pension fund? The answer: it depends. While that response might seem at first unsatisfying, it is a typical response when one is trying to optimize an objective subject to a number of constraints. Fischer Black, co-creator of the Black-Scholes option pricing model, gave a similar answer when asked "what is the correct benchmark hedge ratio for a currency hedging program?" He said it wasn't zero nor was it 100% -- instead, the answer lay somewhere in between. Black's response points to the major difficulty faced by large-scale investors trying to determine an accurate benchmark hedge ratio: setting up the correct analytical framework to create a solution.

When all is said and done, coming up with the right level of hedge fund exposure should really be the last factor considered in the process. However, this is not typically case. Including a fund of funds in a mean variance optimizer with a collection of asset classes will give you one answer every time: invest 100 per cent of the assets in the fund of funds. Is this answer correct? To find out, it is useful to start at the beginning and view the allocation question from the bottom up.

Sources of alpha

Probably the best starting point is to ask the question, "What are the sources of alpha?" As much as people like to mystify and "myth-ify" hedge funds, the answer for them is akin to other kinds of investment:

- Security selection;
- Security mispricing;
- Market timing; and,
- Trade execution.

As with a traditional long-only manager, picking the right securities to either buy or sell is a matter of judicious selection. If there is a positive return after subtracting the effect of the market, then value (alpha) has been added.

Security mispricing is also a key part of the alpha equation. Often similar securities deviate in price from one another. By simultaneously selling the rich security and buying the cheap one, an investor can take advantage of the mispricing to make a profit through arbitrage.

Next comes market timing, which by strict statistical interpretation, is not a source of alpha. However, its effect is the same relative to the performance of a buy and hold portfolio. Simply put, an investor either avoids or shorts markets that are falling and invests in markets that are rising. Successfully implemented, this will create a source of value added.

Finally, trade execution is a source of alpha often overlooked by asset managers. However, it is certainly important to traditional passive managers and consequently, it should be no surprise that they are the ones who seem most able to add alpha through trade execution. For example, if two investors are trading the same security in the same amount, the one with the higher return will be the investor who trades more cheaply. Having large trade volume and access to large liquidity pools greatly helps to reduce execution costs, a common feature among passive managers.

Perspective on the asset-liability equation

Now that we've looked at sources of alpha, let's stand back a little further and look at how actuaries calculate liabilities. When doing so, they determine among other things a valuation rate of interest. This interest rate, which represents the long-term earning power of the invested assets, is derived from weighting a number of asset class returns in a proportion that is consistent with the funding needs of the liabilities.[1]

At the start, the actuary makes no assumptions about returns other than what markets have historically provided. At the same time, they do not take into account active management. Consequently, the sponsoring agent could set up an investment program that mirrors the asset class weightings employed by the actuary and be reasonably confident that the long term funding needs of the plan will be met[2].

From here, it is up to the sponsor of the plan to consider the question of active management. The ability to add some value over the assumptions used by the actuary has a very powerful impact on the cost of funding the liabilities[3] Traditionally this has meant taking on active management risk to generate alpha through the use of balanced or specialty managers. A major difficulty with this approach lies in separating what risks are responsible for the returns that are being generated**.** Endless numbers of articles have been written on every aspect of this subject.

Below is the standard return generation equation employed in the capital asset pricing model (CAPM).

$$R_p = \alpha + \beta R_m + \varepsilon \qquad \text{……. 1.}$$

Regrouping the terms for greater clarity, we have

$$R_p = \beta R_m + \alpha + \varepsilon \qquad \text{…….. 2.}$$

where R_p is the return of the portfolio, R_m is the excess return of the market, β is the exposure to the market, and thus βR_m is the portfolio excess return derived from the

[1] A young pension plan with a young labour force with few if any retirees will have more equity exposure and a higher valuation rate of interest than an older, established pension plan with many retirees.
[2] There will be funding shortfalls and surpluses in the short term but actuaries use smoothing techniques to prevent all but the most extreme market events from precipitating extra contributions to the plan funding.
[3] In an average final average, defined benefit plan, a 1% increase in average investment performance has the effect of reducing the ongoing cost of funding liabilities by approximately 12%.

market, α is the return that is derived from unique elements like stock picking, and ε is the error term necessary to balance the equation with "unexplained" sources of return[4]. By regrouping the terms in equation (2), we have the returns that are derived from the market and the returns that are unique (often referred to as alpha, though this is not entirely accurate).

Market returns versus alpha

It is difficult to split up these sources of returns statistically when looking at an active manager in the traditional, long-only sense, though reasonably close approximations can be made[5]. When looking at this equation, one of the natural questions that arises is, "how would the investment process be changed if an investor could acquire these sources of return independently"?

The advent of deep, liquid derivatives markets for popular market benchmarks like the S&P500 Index began to give this question an answer. Synthetic indexes soon became the rage as investors bought exposure to say the S&P500 Index through futures and held the dollar value of the exposure in Treasury Bills. This was the equivalent to investing the dollars in an index fund. These so-called passive investors independently acquired one of the elements of portfolio return shown in equation (2).

$$R_p = \beta R_m \qquad \text{……. 3.}$$

The value of β in this equation is by definition equal to 1. The error term associated with indexing is, for all practical purposes, equal to zero because indexers are passionate about reducing the tracking error to as small a number as possible.

Continuing the thought of deconstructing a portfolio return into its two major elements, if an investor simply desired alpha, the portfolio would look as follows:

$$R_p = \alpha + \varepsilon \qquad \text{…….. 4.}$$

Equation (4) is a skill-based portfolio because the return is entirely based upon alpha generation through the management of idiosyncratic risk. When hedge funds entered the consciousness of investors, they became the source of alpha, though other sources existed before they became popular[6]. Assuming for the moment that hedge funds are sources of pure alpha, how would the portfolio (equation (2)) be reconstructed?

Portfolio return = index fund + fund of funds

[4] In MPT terminology, α is the return derived from idiosyncratic risk.
[5] The closer the manager's return distribution is to normal, the more accurate the calculation. However many of these return distributions are decidedly non-normal, rendering the calculation spurious.
[6] For example timber, real estate, managed futures and private equity were readily available sources.

This process, often called portable alpha, recreates the traditional actively managed portfolio but now the investor has explicit control over its elements[7]. In particular, the investor can decide how much it wishes to invest in each element and what risks are represented therein.

The asset class misnomer

With all the pieces necessary to do traditional asset allocation, we can now return to the starting point. Except that now there is a difference. In the case of the above examples, when consultants and large investors are doing their risk/reward analysis, risk budgeting and setting the asset allocation exposure, they are employing historical asset class returns in their optimizers. This means that all the numbers are crunched in the standard mean variance framework, which has a very restrictive underlying assumption that all return distributions are normal. When trying to determine how much exposure to hedge funds should be included in the asset management program, they are including their return histories in the same exercise. This is a mistake.

The error lies in the assumption being made that hedge funds are an asset class. They are not. They use the same asset classes as traditional investments, but in different ways. They are investment strategies in the same manner that a long-only, mid-cap, value, U.S. equity manager is practicing a strategy within the equity asset class.

The second assumption is that their return distributions are normal**.** They are not. In fact, in many cases, they differ vastly from normal distributions. Mean variance analysis and all the related statistics, like Sharpe ratios, are incapable of providing correct information.

This faulty view has caused inappropriate methodologies to be applied when determining the amount of hedge fund exposure. Often investors and/or their consultants treat hedge funds like an asset class when trying to carve out an allocation. In doing so, they fall into the trap described above.

So how does one set the proportion allocated to hedge funds? As noted at the outset, that number could be anywhere from zero to 100%, based on a number of factors:

- How comfortable the investor is with hedge funds;
- The structure being employed;
- The amount of risk in the form of leverage embodied in the structure;
- The risk transparency available;
- Etc, etc

In other words, a cases where hedge funds are a new strategy being considered, the investor is likely to start small and increase the allocation as their comfort-level rises and their expectations are met.

[7] A fund of funds is used because a single hedge fund is equivalent to a single stock portfolio, a very undiversified portfolio.

This is done through a destruction-reconstruction exercise, or portable alpha. First you determine the asset class(es) in which you wish to have this new form of active management. Then you analyze the amount of risk you wish to add to an index fund through exposure to hedge funds and compare it to what you previously had with your active manager(s) in that asset class, if that is a reasonable benchmark. This will more accurately get you where you want to go. Just what number this is, depends on the investor.

For example, if the investor put say 85% of its previous equity exposure into an index fund and the remaining 15% into funds of funds, it could recreate the risk reward profile it previously had. But as an investor became increasingly comfortable with hedge funds, it would be quite possible to see 100% of the previously actively managed equity fully indexed and 30% in hedge funds creating a leveraged situation.

Alpha and hedge funds

This commentary would be incomplete without some discussion of the nature of alpha generation and its relation to hedge funds to provide even more perspective on this issue.

The nature of alpha is a subject that has not been fully explored. We know a few things. It is transitory in that it comes and goes. It is also susceptible to dilution as this is a natural consequence of economic processes. Alpha is more abundant in newly developing than in mature instruments and it is more profuse after shocks to the financial system or individual securities or markets.

Hedge funds are often tagged as sources of pure alpha. Let's look at his notion. Going back to equation (4),

$$R_p = \alpha + \varepsilon \qquad \text{……. 4.}$$

We noted there was a term ε, representing unexplained sources of returns. If hedge funds were pure sources of alpha, this term would be small indeed. However, this is often not the case. In fact, it is large enough that we can postulate a return generating process embodied in this residual term[8].

$$\varepsilon = \theta_1 R_{m1} + \theta_2 R_{m2} + \theta_3 R_{m3} + \ldots + \varsigma \qquad \text{..... 5.}$$

This says that residual term, ε, represents other market risks (R_{mi}) embodied in the portfolio. These market risks may be first order, such as exposure to large cap equities or corporate bonds. Or they may be more complicated, second order market effects like credit spreads and volatility. Whatever the risks are, they are included in the performance of the hedge fund(s). Market risks are cheap to acquire and should not demand the fees that alpha-generating processes do. They also add undiversifiable risk to the portfolio.

[8] This means that the model is mis-specified and should include the terms displayed in equation (5).

Consequently, if the process to be followed is one of deconstruction and reconstruction as outlined, the investor needs to have as pure a form of alpha as possible or the management of risk will be difficult and, ultimately, counterproductive. And he will be overpaying on the fee account[9].

Measuring pure alpha

As more sophisticated large-scale investors become involved with hedge funds the demand for purified alpha will increase. It has already begun in some sophisticated quarters with early signs of success, but it begs the final questions of this paper: what are the characteristics of pure alpha and against what should it be measured?

The industry has been badly misled by the self-reported, grossly biased, peer group indices and their marketing driven, index funds currently in fashion[10]. They are inappropriate measures against which to judge alpha.

If we consider an arbitrage of two securities wherein one is mispriced, the arbitrage should be conducted risklessly. The cost of doing the arbitrage is the risk free rate. Therefore the arbitrage would not be undertaken unless there is at least the expectation that the risk free rate can be earned. Otherwise, the investor would leave his money in Treasury Bills. This clearly points to the risk free rate being the benchmark against which to judge pure alpha strategies.

The characteristic of pure alpha should be a zero correlation with any other investment. Deviation from zero, whether positive or negative, implies a measure of dependence. Dependence implies impurity. A portfolio of pure alpha, which probably only exists in theory, should have a very low volatility close to that of the risk free rate. Studies of the best funds of funds validate this characteristic.

In conclusion, once investors understand that hedge funds are not an asset class and therefore should not be given an allocation as if they were one, it becomes easier to initiate the process of integrating an allocation into an investment program through a portable alpha approach. This involves an extra step compared to how they integrated active managers into their investment program previously. In the end, the answer to the question "how much" really depends on an analysis that is conducted in the appropriate framework.

[9] These thoughts are thoroughly explored by Alex Ineichen in his report entitled The Critique of Pure Alpha.

[10] This state of affairs can be directly linked to decisions made by the SEC years ago with respect to marketing hedge funds in the US. An excellent paper has recently been written by Malkiel and Saha pointing out the large weaknesses in these self reported indices.

References

Black, Fischer. 1990. "Equilibrium Exchange Rate Hedging". Journal of Finance 45 No. 3 (July): 899-907

Ineichen, Alexander M. 2005. "The Critique of Pure Alpha". UBS Investment Research, AIS Report (March 2005)

Malkiel, Burton and Saha, Atanu. 2005. "Hedge Funds: Risk and Return". Working Paper, Princeton University.