

Hedge funds – An introduction

1. INTRODUCTION*

Hedge funds have shown remarkable growth as an asset class over the past few years, with an estimated \$1 trillion in assets under management in 2004, and this figure expected to double in the next five years (HFR Report, 2004). The term “hedge fund” has its roots in the idea that high net-worth investors are more interested in protecting themselves from downside risk (i.e. hedging) than the conventional theories of risk and return might suggest. Unlike traditional unit trusts, which tend to be “long only” and measure performance against index type bench marks, hedge funds actively transact, seeking only positive returns, and to do so engage in short selling, derivative products and leveraged positions.

Alfred Winslow Jones is attributed with starting the first hedge fund. In 1952 Winslow changed his general partnership fund into a limited liability partnership (LLP), such that it was exempt from SEC regulations and therefore able to transact using a wider selection of investment instruments. The organizational form of a LLP partnership is still the norm. Typically the managers act as general partners, with significant personal investments in the funds, and earn a performance related fee¹. Over the ensuing years, the number of similarly structured “hedge funds” grew, and attracted large amounts of both positive and negative publicity; none so much as the Long Term Capital Management (LTCM) fund.

LTCM was the brain-child of John Meriwether, a former Salomon Brothers arbitrage trader, and included as partners two Nobel economics laureates, Robert Merton and Myron Scholes. The fund was heavily orientated around quantitative techniques to minimize downside risk and by 1998, five years after it was founded, LTCM managed more than \$120bn on a capital base of only \$4,8bn through leveraged positions (Maslakovic, 2004). In September 1998 the Russian debt crisis resulted in LTCM losing 90% of its market capitalization. The US Federal Reserve coordinated an unprecedented private rescue of LTCM by 14 financial institutions in an effort to stabilize global financial markets.

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¹In South Africa the normal fee structure is 1% of assets under management and 20% of profits. The asymmetric nature of such an incentive scheme, which is essentially an embedded put option (Fung & Hsieh, 1999), is itself controversial.

Whilst LTCM's spectacular demise slowed the growth of hedge funds, the effect was temporary. Hedge funds continued to attract individual investors impressed by the risk/return performance, and by 2002, 30% of assets in hedge funds were from pension funds, endowments and foundations². This was despite hedge funds not being permitted, as a consequence of their limited regulation, to directly solicit funds, their high fee structure, poor transparency and disclosure and the “lockup”³ requirements common in most funds.

2. OPTIMAL PORTFOLIO THEORY

The traditional portfolio theory of Markowitz (1952), Lintner (1965) and others, describes a point on an efficient frontier as the “market portfolio”. Theorists argue that the tangential line falling through the risk-free rate represents the optimal combinations of the risk-free rate and the market portfolio for all investors. In the construction of the efficient frontier, most analysts assume a number of constraints in the optimization process. For example, no “short” positions are permitted, no single security can comprise more than X percent of the portfolio composition and a minimum of Y securities are required in any portfolio. If these constraints, particularly the constraint of short-positions are relaxed, a significant improvement in the efficient frontier can be achieved, essentially because of an expanded universe of securities. Furthermore, if leverage⁴ is permitted, the so-called ‘capital allocation line’ (CAL) can be extended beyond the market portfolio, as shown in Figure 1.

Figure 1, constructed using weekly data from December 2000⁵ to September 2004, shows the mean weekly return against the standard deviation of weekly returns for the ALSI 40 constituents (red dots) on the Johannesburg Securities Exchange (JSE). The conventional (long-only) efficient frontier has been constructed (blue line) on an *ex-post* basis, and the

²Since 1999, the CalPERS has allocated 6% of its assets to alternative investment classes such as hedge funds (BARRA RogersCasey 2001).

³Most hedge funds specify an initial lockup period of between 6 months and 5 years, during which the investment cannot be withdrawn.

⁴When talking about leverage, we must be careful not to distinguish between borrowing cash and borrowing equities. To move along the CAL, past the optimal portfolio, one borrows cash. To expand the long-only efficient frontier, one borrows equities. If we borrow scrip and not cash, we are still leveraged. We forget that when we buy equities, we are also selling cash.

⁵December 2000 marked the commencement of the SATRIX40, a derivative investment counter devised by the JSE to mimic the ALSI 40 index.

optimal portfolio is shown (blue dot). The performance of the Satrix40 itself (white dot), which simply reflects the market capitalization weighted average of all 40 constituents, falls well below the efficient frontier. Figure 2 shows the constituents of the optimal portfolio.

Figure 1 also shows the impact of constraints on the efficient frontier. Unit trusts, for example, are restricted to investing a maximum of 5% of their fund value in any particular security (10% for a stock having a market capitalisation more than R2bn). This has the effect of worsening (reducing return and increasing risk) the efficient frontier and optimal portfolio (brown). There are benefits to this however. By placing such constraints on the portfolio, a wide holding of different shares is ensured and this also limits the down-side

risk. In addition to the efficient frontier, it is possible to plot the entire risk reward space. The lower boundary of this represents the worst-case (inefficient) frontier (thin brown line). It can be seen that the whole risk-return 'playing field' is significantly narrowed, and even a poorly constructed unit trust has a significantly curtailed downside than would be the case if the 5%/10% constraint did not exist. Figure 3 shows the constituents of the optimal portfolio for a unit trust. It is clear from Figure 3 that the 5%/10% constraint imposed upon unit trusts makes the equity investment decision mostly a binary decision: "are we in or out of a particular share". Once the fund manager decides s/he wants to include the share in the portfolio, s/he ought to (as a general rule) invest the maximum permissible amount.

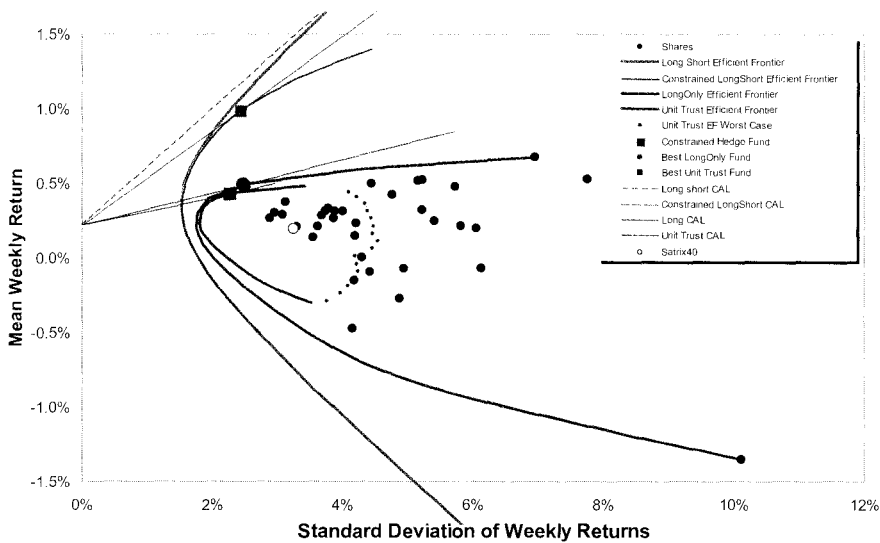


Figure 1: The risk-return map using weekly data from the ALSI 40 constituents from December 2000 to September 2004. The *post-hoc* optimal portfolios and efficient frontiers are shown for unconstrained long-short, constrained long-short, long (only), unit trust portfolios.

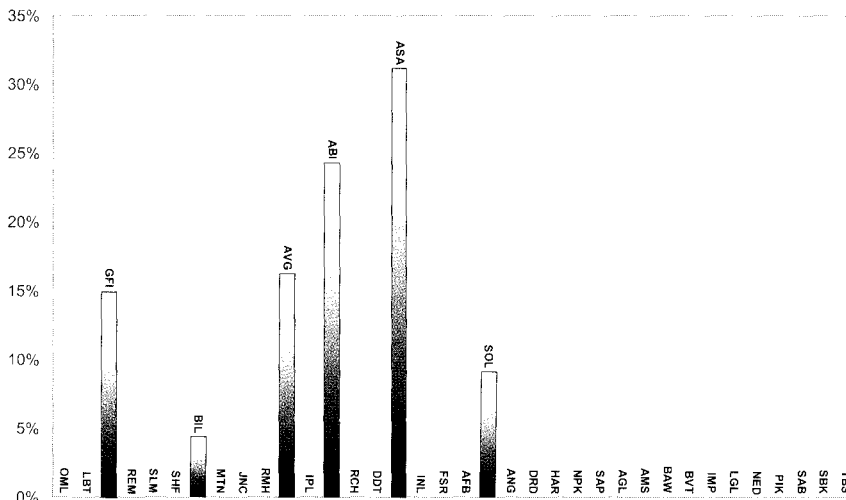


Figure 2: Long only constituents – no constraints. The optimal long-only portfolio consists of only six equities, and with more than 30% in Absa.

Also shown in Figure 1 is the efficient frontier for a long-short equity hedge fund (purple). As can be clearly seen, this offers considerably superior performance over the long-only efficient frontier – as well a much bigger “playing field” of risk return space and therefore potentially more downside risk. The constituents of the optimal long-short portfolio are shown in Figure 4 below.

Figure 4 shows the weighting of securities which comprise the optimal long-short portfolio. As can be observed, approximately half the securities reflect negative weights, i.e. are sold short. Furthermore, the percentages held of each security reflect a level of gearing on the capital investment. To achieve this, the

long stocks are offered as security against the short positions and the cash received from the short positions used to purchase additional (long) securities. However, the degree of short selling (i.e. more than 80% of the value of the fund in each of FSR and NED) is impractical. As we noted earlier, most fund trustees would be concerned about such high concentrations in any particular share, and this would equally apply to short sales. Even a small percentage of short sales in the portfolio can make a significant difference though. If short selling is constrained to no more than 2% (for example) in any single security, a sub-optimal but more realistic, efficient frontier results – as shown in Figure 1 (green).

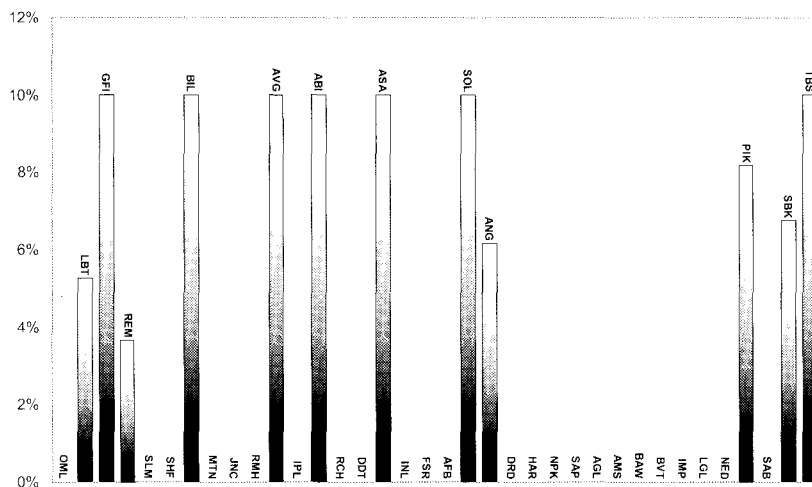


Figure 3 Long only constituents – with unit trust constraints (i.e. <5%/10% in any one security). This constraint effectively reduces the equity investment decision to a binary one.

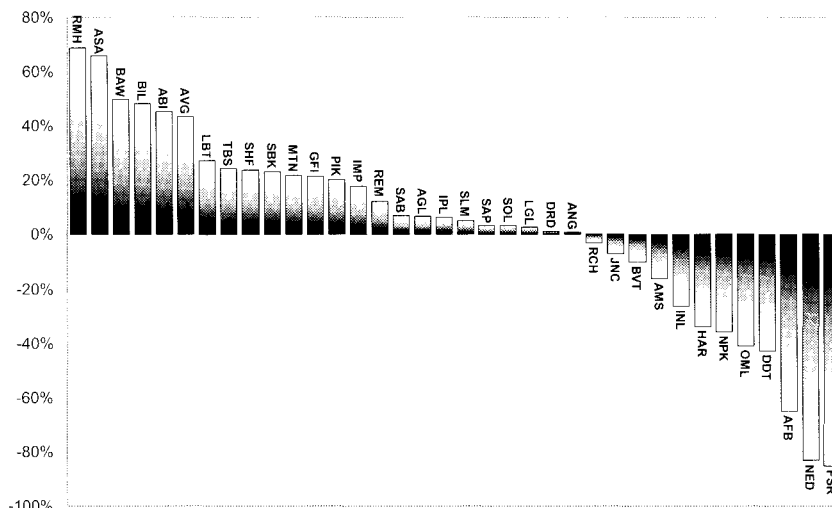


Figure 4 Long-short constituents - without constraints. The funds generated by the short positions enable the fund to be geared to in excess of 450% with gross exposure of 1000%.

Unit trust regulators and their trustees typically prohibit short positions and leveraging of the fund in the belief that these are unnecessarily risky strategies. Figure 1, however, suggests that this is not necessarily the case; equivalent (or better) returns can be achieved with lower risk – although it must be noted that the 'playing field' of returns is bigger both on the upside and on the downside for hedge funds.

One obvious problem is the practicality of a strategy which requires short positions in scrip for considerable periods of time. Interestingly, the volume and liquidity of the scrip lending industry has made this possible for hedge funds. Many large institutional funds, which hold (only) long positions in securities, are prepared to lend their portfolios' scrip through an investment bank or broker in return for a fee and on the provision of adequate security. Hedge fund managers, provide the necessary security in the form of marketable securities⁶, pay the required fee⁷, borrow the scrip and then sell it to achieve their desired short positions.

From the lenders' perspective, there are obvious problems with a strategy which involves lending scrip in the certain knowledge that it will fuel supply and therefore reduce the asset price, at least in the short term. However, it can also be argued that investors who have a long-term positive view on the stock, and who were planning to hold it anyway on the strength of good long-term fundamentals, will earn an additional premium from the lending fee. Indeed, there are strong arguments supporting investors with long-term horizons (most life insurers and unit trusts in South Africa for example) to ignore short-term volatility in the quest for greater long-term performance.

To further support short selling, hedge fund investors argue that there is little difference between the normal (long) transaction of paying cash to purchase a security which might earn a positive or negative return and a "short" transaction which involves investing a similar amount of cash⁸ and a margining process to borrow a security which might earn a negative or positive return. The only real difference is that in the long transaction the maximum loss is 100% whereas it could (potentially) be more than this in the short transaction, were the asset price to more than double.

3. STRATEGIES

Hedge fund managers use two main strategies to achieve their absolute return targets *viz*: market timing (or directional) and the non-directional (or positive

⁶A cash deposit of 105%, or gilts worth 110%, or top 40 shares worth 115% is required.

⁷This is currently around 0,75% and has halved over the past five years.

⁸An advantage of selling short is that the cash deposited as security earns interest, enhancing the return.

alpha) approach. The market timing approach involves taking a view on a security (or more commonly an asset class) and either purchasing or shorting the asset based on the view. Several studies have examined the risk, return and accuracy requirements for successful market timing (Waksman, Sandler, Ward and Firer, 1997; Firer, Grey, Sandler, and Ward, 1996; Firer, Ward and Sandler, 1992; Firer, Sandler and Ward, 1992; Firer, Ward and Teeuwisse, 1987). In particular, these studies show that successful timing strategies require superior forecasting ability. In addition, shorter review periods (i.e. one month versus quarterly) can significantly enhance returns, particularly with the use of derivatives and futures instruments to reduce transaction costs.

In contrast, the non-directional approach is an arbitrage strategy, eliminating systematic risk and exploiting market anomalies with simultaneous short and long positions in similar assets (Fung & Hsieh, 1999). Both of these strategies will produce low correlations to the market index, and depending on the skill of the fund manager, superior performance. Table 1 below shows the *ex-ante* performance of US hedge funds over the 10 year period ending March 2001.

As can be seen from Table 1, all the hedge fund strategies produced superior performance to more conventional strategies if measured using a Sharpe ratio⁹, although the ten year investment period is too short to be conclusive.

Table 1 also shows the performance of an index of "fund of hedge funds" – i.e. portfolios of hedge funds assembled into a single unit. In South Africa there are 14 such funds, each with between three and nine investments in other hedge funds, to diversify risk and provide a single point of entry.

4. HEDGE FUNDS IN SOUTH AFRICA

An estimated 70 hedge funds operate in South Africa with assets in excess of R7bn. The oldest of these is only 60 months, and 60% of these funds have been in existence for less than 24 months (Nedcor, 2004). The performance of an index of South African hedge funds is summarized in Table 2 below.

Table 2 reflects an excellent risk-return performance from hedge funds over the 43 months under consideration; hedge funds achieved more than double the return of the ALSI index and had significantly better Sharpe ratios. Although the period under consideration is too short to be conclusive, this result accords with the literature.

⁹The Sharpe ratio measures the excess return (over the risk-free) divided by the standard deviation of returns over the investment period. The higher the Sharpe ratio the better the risk adjusted performance of the security or portfolio.

For illustrative purposes, it is possible to construct an optimal hedge fund by analyzing the co-variance matrix of returns and allowing (constrained) short selling. Figure 5 below shows the *ex-post* performance of the optimal (constrained to 2% short sales) hedge fund against the performance of the Satrix40, the optimal unit trust fund and the optimal long-only portfolio using the ALSI40 constituents from December 2000, all on a buy-and-hold basis.

Table 1: Investment performance of US hedge funds. The table shows the annualized return, risk (as measured by standard deviation) and the Sharpe ratio for different arbitrage strategies over the 10 year period ending March 2001. With two exceptions, the hedge fund strategies all out-perform the benchmarks

Strategy/Characteristic	Return (%)	Risk (%)	Sharpe Ratio
HFRI Merger Arbitrage	14, 0	3, 5	2, 46
HFRI Convertible Arbitrage	13, 0	3, 3	2, 28
HFRI Equity Market Neutral	10, 9	3, 4	1, 66
HFRI Statistical Arbitrage	11, 1	3, 7	1, 59
HFRI Equity Hedge	20, 7	9, 2	1, 58
HFRI Distressed Securities	15, 3	6, 1	1, 57
HFRI Macro	18, 3	9, 1	1, 38
HFRI Fund of Funds	10, 9	6, 4	0, 89
Long Bond Aggregate	8, 0	3, 7	0, 80
S&P 500	14, 4	13, 7	0, 70
HFRI Fixed Income Arbitrage	8, 2	4, 9	0, 64
MSCI EAFE	6, 2	14, 7	0, 15
MSCI (Emerging Markets Free)	4, 9	23, 1	0, 12
HFRI Short Selling	2, 3	22, 8	0, 00
90 day Treasury Bills	5, 0	0, 3	0, 00

5. Conclusion

Although hedge funds are likely to remain an “alternative investment”, their growing significance in size and low correlation to the other asset classes means that investors should consider allocating a portion of their portfolio into hedge funds. Finally, despite the impressive risk-return performance statistics of hedge funds, it must be remembered that (for certain strategies) bad hedging decisions could result in far worse results than would have been possible for a more constrained portfolio of long only or unit trust type investment decisions.

Table 2: The performance of South African hedge funds in terms of an equally weighted index over 43 months ending July 2004, net of fees. The table shows higher returns at lower levels of risk, albeit for a very short period

	Nedbank Hedge fund Index	FTSE/JSE All Share Index
Annualised Return (%)	24, 4	10, 4
Standard Deviation (%)	7, 9	20, 6
Sharpe Ratio	0, 46	0, 03
Sortino Ratio	0, 82	0, 05

Source: Nedcor Hedge Fund Survey, 2004

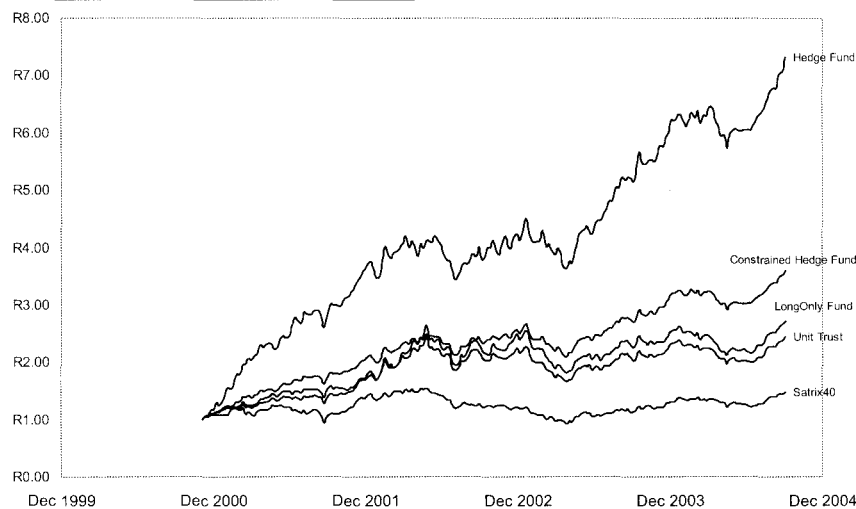


Figure 5: Ex-post performance of R1 invested in four funds having progressively restrictive weightings. The market cap weighted Satrix40, by definition, underperformed both the optimal long-only portfolio and the optimal unit trust portfolio. The long-short hedge fund significantly out-performed all other strategies.

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