An Introduction to Hedge Funds

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Abstract

This report was originally written as an industry white paper on Hedge Funds. This paper gives an overview to Hedge Funds, with a focus on risk management issues. We define and explain the general characteristics of Hedge Funds, their main investment strategies and the risk models employed. We address the problems in Hedge Fund modelling, survey current Hedge Funds available on the market and those that have been withdrawn. Finally, we summarise the supporting and opposing arguments for Hedge Fund usage.

A unique value of this paper, compared to other Hedge Fund literature freely available on the internet, is that this review is fully sourced from academic references (such as peer reviewed journals) and is thus a bona fide study.

This paper will be of interest to: Hedge Fund and Mutual Fund Managers, Quantitative Analysts, “Front” and “Middle” office banking functions e.g. Treasury Management, Regulators concerned with Hedge Fund Financial Risk Management, Private and Institutional Investors, Academic Researchers in the area of Financial Risk Management and the general Finance community.

Key words: Hedge Funds, risk management, risk measurement, regulation.

1. Introduction and Outline

According to the European Central Bank [Gar05], the Hedge Fund industry is growing rapidly with a total of US $1 trillion worth of assets under their control globally. A Hedge Fund’s size is typically less than US $100 million, with nearly half under US $25 million [Gar05]. They represent a small percentage of the asset management industry (see [Gar05]) yet they exert a disproportionately massive influence on the financial and economic sector in relation to their size (see Fung [FH00a]). This is due to Hedge Funds generally using dynamic and leveraged trading strategies, which is in contrast to Mutual Funds that typically engage in buy-and-hold strategies. Thus it is apparent
Hedge Funds have a significant influence in financial markets, yet knowledge of them is relatively little.

In this paper we introduce Hedge Funds, attempting to firstly propose a definition for Hedge Funds as no common consensus has yet been agreed within the Finance community. We then explain the common investment strategies applied by Hedge Funds e.g. event driven, long-only investment. In the next section, we survey the main risk models applied to analysing Hedge Funds whilst also discussing the difficulties in actually measuring Hedge Fund risks. Finally we finish by surveying current Hedge Funds available on the market and famous Hedge Funds that have been withdrawn.

It is important to note that knowledge and performance of the Hedge Fund industry is guarded with substantial secrecy. Consequently, the quality of information used in any Hedge Fund study, can never be as good as those for other investment products e.g. Mutual Funds (see Fung [FH00a], Fung [FH99a], Do et al. [DFW05]).

2. Introduction to Hedge Funds

   Within the investment industry, many fund types exist: Hedge Funds, investment trusts, unit trusts etc... yet the term Hedge Fund has no explicit definition. In fact the European Central Bank states in its report on Hedge Funds [Gar05] that no common Hedge Fund definition exists. Defining a Hedge Fund is in fact more problematic than it appears. To appreciate the difficulty in defining a Hedge Fund, it is instructive to know its brief history.

2.1. Brief History of the Hedge Funds Industry

   According to Fung [FH99a], the first ever Hedge Fund was formed by Albert Wislow Jones in 1949, so called as the main investment strategy was to take hedged equity investments. By hedging (the act of removing risk in some investment by taking an investment in another (typically related) investment) Winslow was able to eliminate some market risks.

Hedge Funds then became first well-known after an article in Fortune(1966) mentioning Jones’s fund significantly outperforming other Mutual Funds [FH99a]. Although this article initiated wide interest in Hedge Funds, their popularity diminished as it fell victim to the bear markets of 1969-70 and 1973-4. A decade later (1986), interest was revived by Robertson’s infamous Tiger Fund [FH99a], which achieved compound annual returns of 43% for 6 years after all expenses. Fung in [FH99a] corroborates
the impact that the publicity of Robertson’s Fund had on the Hedge Fund industry by showing the rapid expansion of Hedge Funds and CTA funds (commodity trading advisor funds (similar to Hedge Funds)) from 1985-97.

With numerous Hedge Fund investors and the fact that Hedge Funds were virtually unregulated compared to other funds, a multitude of new Hedge Fund trading strategies evolved, including the use of derivatives e.g. options. Now all these funds came to be known as Hedge Funds yet many of them were using investment strategies beyond simply “hedging” that A Winslow first employed (see [Gar05] for more details). To complicate matters further, as Hedge Fund strategies developed so also did funds other than Hedge Funds begin employing Winslow’s equity hedging strategy, thus hedging was no longer unique to Hedge Funds. Today, the word “hedge” in Hedge Funds has become a misnomer, more of a historical hangover from Alfred Winslow rather than a description.

2.2. A Definition of Hedge Funds

As the European Central bank states [Gar05]:

“there is no common definition of what constitutes a Hedge Fund, it can be described as an unregulated or loosely regulated fund which can freely use various active investment strategies to achieve positive absolute returns”.

As the European Central Bank implies, a Hedge Fund is difficult to define partly because of a lack of clarity of agreement on its term and also due to its diverse trading spectrum. They are typically characterised by high leveraging, derivatives trading and short selling compared to Mutual Funds. One way of defining a Hedge Fund is by comparing the similarities and differences with Mutual Funds. In a sense Hedge Funds are similar to any other portfolio investment in 3 respects:

• they are funded by capital from investors, rather than bank loans or other sources of capital;

• they invest in publicly traded securities e.g. equities and bonds;

• the capital is “managed” or invested by expert fund managers.

The key differences between Hedge Funds and Mutual Funds lies in the degree of regulation, the level and variety of risky investment strategies. Whereas Mutual Funds are required to adhere to strict financial regulations, including the types and levels of
risks, Hedge Funds are free to pursue virtually any investment strategy with any level of risk.

Secondly, Hedge Fund investors are typically high net worth individuals or institutional investors e.g. pension funds \cite{Gar05}, partly because Hedge Funds typically require high minimum investment amounts. A graph taken from the European Central Bank \cite{Gar05} shows the composition of Hedge Fund investors from 1992-2004.

Mutual funds on the other hand, are typically targeted at the general public and will accept any investor who can meet the minimum investment amount. Hedge Funds in fact are banned from advertising and in some cases the investors are required to be “accredited”.

A third key difference is the fund portfolio composition. As Fung \cite{FH99a} states, the majority of Mutual Funds are composed of equities and bonds. Hedge fund portfolio compositions are far more varied, with possibly a significant weighting in non-equity/bond assets e.g. derivatives.

A fourth key difference is that the historical return characteristics and distribution of Hedge Funds tend to differ significantly from Mutual Funds. For example, Capocci et al. \cite{CH04} and Getmansky \cite{GLM04} demonstrate that Hedge Funds empirically display serial correlation in returns. According to Brown \cite{Bro01}, Hedge Funds do not perform significantly better than most investment funds; Hedge Funds between 1989-95 earned 300 basis points below the S&P 500. However, other studies conclude that
Hedge Funds produce excess market returns (see [CH04], [DFW05]). A graph below from [Gar05] gives the performance of Hedge Funds compared to key indexes. The CSFB/Tremont index is a Hedge Fund index, the “equivalent” of the FTSE-100 for UK stocks.

2.3. Hedge Fund Performance Benchmark Targets

With Mutual Funds only 1 type of performance benchmark typically exists; the fund is expected to match or excel a particular index e.g. FTSE-100 index, S&P 500 index. This is an example of a relative return target, which some Hedge Funds adopt as their benchmark. However for Hedge Funds another benchmark exists called absolute return targets.

An absolute return target is the typical benchmark choice for Hedge Funds and is the opposite of relative return. It is a fixed return target and the fund is expected to match/excel it regardless of the overall market performance. Hedge fund managers use two main approaches to achieve absolute return targets: Market Timing and the Non-Directional approach.

Market Timing
this approach takes positions by anticipating the market trend or direction (either
moving up/down). This approach potentially offers high returns, as demonstrated by Georg Soros in his Quantum Fund when speculating on the British Pound in 1992.

Non-Directional

An example of Non-Directional is A.Winslow’s Hedge Fund; it is a fund that eliminates some market risks, hence it can be considered non-directional, whilst also benefitting from relative price movements of assets. According to Fung [FH99a], the non-directional approach has evolved over the last decade and is continuing to develop.

2.4. Hedge Fund Organisation

Hedge Funds typically prefer to concentrate their efforts on the key activity of maximising investment return, so non-essential operations are outsourced e.g. “back office” functions. Actual trading transactions too are outsourced to “Prime Brokers”. Prime brokers are banks or securities firms, offering brokerage and other financial services to large institutional clients e.g. Pension Funds. It is also worth noting that Hedge Funds typically reside “offshore” to take advantage of more favourable tax treatments and regulations.

2.5. Fund of Hedge Funds (FOHF)

A Fund of Hedge Funds is simplistically a Mutual Fund that invests in multiple Hedge Funds e.g 15-25 different Hedge Funds, furthermore F3 funds or fund of FOHF also exist. All these funds provide diversification benefits and a method of investing in Hedge Funds without requiring the skill to personally assess Hedge Funds individually. Also, FOHF normally have significantly lower minimum investment levels compared to a standard Hedge Fund, thus increasing investment access to the general public.

3. Hedge Fund Investment Strategies

The investment strategies employed by various Mutual funds are well documented, ranging from value investing to buying growth stocks, with each having particular risk and return implications. On the contrary, Hedge Fund investment strategies are far less well documented and the variety of strategies are greater than for Mutual Funds. Consequently, there is no widely accepted categorisation of Hedge Fund strategies, for example, Stonham in [Sto99b] identifies 14 Hedge Fund strategy categories whereas Fung [FH99a] only has 7.

We now describe the 7 main Hedge Fund investment strategies as given by Fung [FH99a], which in turn are taken from MAR (Managed Account Reports (one of the
oldest sources of global managed futures information). The advantage of applying such strategy categorisation is that different Hedge Fund return characteristics can be explained by them (see FH99a).

3.1. Event Driven

An event driven strategy means a position is taken to take advantage of price moves arising from new market information release or events occurring. A good example of such a strategy is to capitalise on merger and acquisition announcements, which cause the target company’s share price to rise. An example is given below; Mark’s and Spencer’s share price rose on announcement of a takeover by Philip Green at the end of May 2004.

3.2. Global

The Global strategy is an all-round category for funds that invest in assets beyond those based in their home market. Other than that, no more specific technique is associated with this. A typical example would be a Hedge Fund investing in an emerging market such as India.

3.3. Global/Macro

The Global/Macro strategies utilise macroeconomic analysis to capitalize on asset price changes that are strongly linked to macroeconomics e.g. currencies, bonds, stock indices, and commodities. As the name implies, this strategy is applied on a global
scale. For example, George Soros Quantum Fund reputedly made US$1 billion in 1 day on September 1992 by speculating the British Pound would exit the European Exchange Rate Mechanism.

3.4. Market Neutral

Market neutral investment refers to funds that hedge against market risk factors, thereby becoming "neutral" to the market. This strategy profits by speculating on relative price movements between assets or indexes. Examples of this method include long-short equity, stock index arbitrage, fixed income arbitrage. A good example of the long-short equity method is the classic 1949 A.W. Jones Hedge Fund, who took long and short positions in equities.

3.5. Sector

Sector Hedge Fund investing concentrate on investing in specific sectors e.g. airlines, telecoms, utilities sectors etc... . The investment instrument itself can be a variety of types e.g. short selling, long and leveraged positions.

3.6. Short Selling and Long-Only

Short selling and long-only Hedge Funds are those funds which will only invest by shorting or going long respectively.
4. Hedge Fund Risk Models

The necessity for Hedge Fund risk modelling and management originates from 2 areas:

- Hedge Funds experiencing some of the greatest losses ever witnessed by the investment community;
- new regulatory pressure enforcing more stringent Hedge Fund risk management.

Firstly, Hedge Funds have been responsible for numerous catastrophic losses, causing them to completely collapse and initiate a contagion effect by affecting numerous economic and financial sectors. The most notorious example of such a catastrophic loss being the Long Term Capital Management Hedge Fund, which lost US$2.1 Billion [Sto99b] and almost brought down the entire US financial system.

Secondly, as already mentioned, Mutual Funds are tightly regulated whereas Hedge Funds face little regulation. However, as Hedge Funds have gained public attention and therefore more investment interest, this along with spectacular Hedge Fund disasters have prompted increased Hedge Fund regulation.

It was not until after the 1997 Asian Currency Crisis though that regulators became interested in regulating Hedge Fund activities [FH00a]. The IMF (International Monetary Fund) initiated a study on the market influence of Hedge Funds by Eichengreen [ES98]. This study described Hedge Funds activities and the potential problem of the market impact of Hedge Funds.

Moreover in 2004, the Securities and Exchange Commission now required Hedge Fund managers and sponsors to register as investment advisors under the Investment Advisor’s Act of 1940. This greatly increases the number of requirements placed on Hedge Funds e.g. keeping records and creating a code of ethics. For more information on SEC regulation visit the SEC website [http://www.sec.gov/].
| Date     | Entity                                                                 | Report                                                                 | Description                                                                                                                                                                                                 |
|----------|------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Jan. 1999 | Basel Committee on Banking Supervision (BCBS)                         | Banks’ Interactions with Highly Leveraged Institutions (HLIs)          | The aim of the reports was to encourage prudent management of risks generated from banks’ interactions with highly leveraged institutions.                                                                     |
| Mar. 1999 | ISDA 1999 Collateral Review (ISDA)                                    | ISDA 1999 Collateral Review (ISDA)                                    | Measures to reduce risks associated with collateralisation were suggested.                                                                                                                                     |
| Mar. 1999 | Institute of International Finance (IIF)                              | Report of the Task Force on Risk Assessment                            | The report made recommendations on how to improve counterparty risk management practices and suggested a possible format for regulatory reporting relating to HLIs.                                                   |
| Apr. 1999 | US President’s Working Group on Financial Markets (PWG)               | Hedge Funds, Leverage and the Lessons of LTCM (Corrigan report)       | Review of the near-collapse of LTCM and the analysis of further sources of remaining systematic vulnerabilities. Recommendations include increased transparency through enhanced disclosure of hedge funds. |
| June 1999 | Counterparty Risk Management Policy Group I (CRMPG)                   | Improving Counterparty Risk Management Practices (Corrigan report)    | The report made recommendations on how to improve counterparty risk management practices and suggested a possible format for regulatory reporting relating to HLIs.                                                   |
| Nov. 1999 | International Organization of Securities Commissions (IOSCO)          | Hedge Funds and Other HLIs                                            | Focus on risk management issues relating to securities firms and the need for greater transparency in the hedge fund sector.                                                                                  |
| Jan. 2000 | BCBS                                                                   | Banks’ Interactions with HLIs: Implementation of Basel Committee’s Sound Practices Paper | Issues which need further work were identified – for example, measurement of potential future credit exposures.                                                                                              |
| Feb. 2000 | A group of five of the largest independent hedge fund managers        | Sound Practices for Hedge Fund Managers                               | Response to PWG Report, addressing the PWG recommendation to develop and publish sound practices for risk management and internal controls.                                                                     |
| Apr. 2000 | Financial Stability Forum (FSF)                                        | Report of the Working Group on HLIs                                   | The report concentrated on systemic risk posed by HLIs and their impact on market dynamics. Measures enhancing prudent firm behaviour and market discipline were brought forward.                                |
| Mar. 2001 | BCBS and IOSCO                                                         | Review of Issues Relating to HLIs                                     | Senior managers have reinforced their oversight of HLI activities, and information flows from HLI have improved. Competitive pressures should not erode credit standards.                                             |
| Mar. 2001 | FSF                                                                    | Progress in Implementing the Recommendations of the Working Group on HLIs | Strengthened counterparty risk management and regulatory oversight acknowledged, but counterparty risk measurement and stress tests need further work. Disclosure by HLIs has slightly improved, but the progress remains inconsistent. |
| Apr. 2001 | Multidisciplinary Working Group on Enhanced Disclosure                | Final Report to BCBS, Committee on the Global Financial System (CGFS) of the G-10 Central Banks, International Association of Insurance Supervisors (IAIS), IOSCO | The report seeks to improve the state of financial disclosures and to promote a level playing-field in disclosure for all financial intermediaries, irrespective of the type of activities. |
| Aug. 2002 | UK’s Financial Services Authority (FSA)                               | Hedge Funds and the FSA (Discussion paper No. 16)                     | The FSA has initiated an evaluation of the current regulatory framework of hedge fund activities.                                                                                                                  |
| Aug. 2002 | Alternative Investment Management Association (AIMA)                 | Guide to Sound Practices for European Hedge Fund Managers             | The FSA has initiated an evaluation of the current regulatory framework of hedge fund activities.                                                                                                                  |
| Mar. 2003 | UK’s FSA                                                               | Hedge Funds and the FSA: Feedback Statement on Discussion Paper No.16 | The decision was that no amendments to the current UK regulatory framework of hedge fund activities are required.                                                                                          |
We now describe some of the quantitative risk models employed in modelling Hedge Fund risks.

4.1. Markowitz’s Portfolio Theory

Markowitz’s Portfolio Theory (from hereon MPT) is typically applied to assets/portfolios whose return probability distributions approximate to a Normal distribution. Although this approximation is not strictly correct for Hedge Funds, it is still a workable risk model. In fact Fung and Hsieh in [FH99b] apply it to rank Hedge Fund performances.

Markowitz proposed a portfolio’s risk is equal to the variance of the portfolio’s returns. If we define the weighted expected return of a portfolio $R_p$ as

$$ R_p = \sum_{i=1}^{N} w_i \mu_i, \quad (1) $$

then the portfolio’s variance $\sigma_p^2$ is

$$ \sigma_p^2 = \sum_{i=1}^{N} \sum_{j=1}^{N} \sigma_{ij} w_i w_j, \quad (2) $$

where

- $N$ is the number of assets in a portfolio;
• $i, j$ are the asset indices and $i, j \in \{1, ..., N\}$;

• $w_i$ is the asset weight, subject to the constraints:

\[
0 \leq w_i \leq 1,
\]

\[
\sum_{i=1}^{N} w_i = 1;
\]

• $\sigma_{ij}$ is the covariance of asset $i$ with asset $j$;

• $\mu_i$ is the expected return for asset $i$.

MPT also introduces the idea of an efficient frontier. For a given set of funds or assets available to invest in, an upper concave boundary exists on the maximum portfolio returns possible as risk or variance increases. Furthermore this concave relation between risk and return incorporates the theory of expected utility concavely increasing with risk.

Notice that MPT shows that some funds can perform lower than the risk free rate. Naturally one wishes to choose the market portfolio which maximises return for a given level of risk/volatility as shown.
4.2. CAPM (Capital Asset Pricing Model)

Capocci and Hubner [CH04] state that in the 1980s CAPM and its variants (e.g. Jensen’s measure) were applied to Hedge fund risk measurement. The CAPM model, based on MPT, was invented by Sharpe [Sha64]:

$$ R_a = R_f + \beta (R_m - R_f) + \varepsilon, $$

where

- $R_a$ is expected return of an asset;
- $R_f$ is the risk-free rate of return;
- $R_m$ is the expected market return;
- $\varepsilon$ is the error term;
- $\beta = \frac{\sigma_{am}}{\sigma_{mm}}$;
- $\sigma_{am}$ is the market and asset’s covariance;
- $\sigma_{mm}$ is the market’s variance.

The CAPM model is applied generally in finance to determine a theoretically appropriate return of an asset. It presumes that investors must be compensated for investing in a risky asset in 2 ways 1)time value of money and 2)risk itself. The time value of money is accounted for by the risk-free rate $R_f$ whereas the return from risk arises from $\beta (R_m - R_f)$. The term $(R_m - R_f)$ represents the expected risk premium, which is the return obtained above the risk-free rate for investing in a risky asset. The beta term can be considered the ”sensitivity” of the asset’s risk to market risk (both measured by variance). Consequently more ”sensitive” assets ought to produce higher returns by CAPM. The graph below shows how asset return is linearly related to beta and that no beta implies a risk-free rate of return.
4.3. Sharpe Ratio and the Modified Sharpe Ratio

The Sharpe Ratio $S$, invented by Sharpe [Sha66], is based on MPT’s risk measure (variance):

$$S = \frac{R_p - R_f}{\sigma_p},$$

where $\sigma_p$ is the portfolio return’s standard deviation.

The Sharpe ratio can be interpreted as "(Return - Risk-free rate)/risk" since Sharpe considers standard deviation to be a risk measure. The Sharpe ratio provides a portfolio risk measure in terms of the quality of the portfolio’s return at its given level of risk. A discussion on the Sharpe ratio can be found at Sharpe’s website (www.stanford.edu/~wf-sharpe/).

Fung and Hsieh in [FH00b] and [FH99b] use a modified version of the Sharpe ratio to rank Hedge Fund performance so to specifically cater for Hedge Fund return distributions. This is simply the Sharpe ratio without subtracting the risk free rate from the numerator:

Modified Sharpe Ratio=$\frac{R_p}{\sigma_p}.$

4.4. Jensen’s Alpha and Treynor ratio

Based on CAPM, Jensen formulated a portfolio risk measure to quantify portfolio returns above that predicted by CAPM called $\alpha$:

$$\alpha = R_p - [R_f + \beta_p(R_m - R_f)].$$

One can interpret $\alpha$ as a measure of "excess returns" or portfolio manager’s investment ability or i.e. "beating the market".

The Treynor ratio is a lesser well known portfolio ratio measure, similar to the Sharpe ratio, but assesses portfolio performance on a CAPM model basis:

$$\text{Treynor Ratio}=\frac{R_p - R_f}{\beta_p}.$$

Like the Sharpe ratio, the Treynor ratio can be interpreted as the "quality" of portfolio return for the given level of risk but risk measured on a CAPM theory basis.
4.5. Three Factor Model of Fama and French

The CAPM model is a single factor model that compares a portfolio with the market as a whole. Fama and French modified this model in [FF93] to take into account 2 empirical observations about asset classes that tend to have higher returns:

- small sized companies;
- value stocks (companies with high book to market value).

Having a higher return implies a higher risk premium associated with them. The 3 factor model accounts for these higher premiums with the following equation:

$$R_a = R_f + \beta_{p1}(R_m - R_f) + \beta_{p2}SMB + \beta_{p3}HML + \varepsilon,$$

where

- SMB is the difference in return for small and large sized companies;
- HML is the difference in return for high book to market value and low book to market value companies;
- $\beta_{p1}, \beta_{p2}, \beta_{p3}$ are regression gradients (slopes).

Essentially the 3 factor model is a multiple linear regression equation. Jagadeesh and Titman in [JT93] modify the CAPM model by adding a momentum to account for return. Fung and Hsieh in [FH04] apply both these models to long/short equity Hedge Funds, giving regression results.

4.6. Sharpe’s Asset Class Factor Model

Sharpe in [Sha92] invented an asset factor model for risk measurement of Mutual Funds but Fung and Hsieh in [FH97] have applied it to Hedge Funds. This model essentially suggests that most Mutual Fund performances can be replicated by a small number of major asset classes e.g. large capitalisation growth stocks, large capitalisation value stocks, small capitalisation stocks etc... . Using Fung and Hsieh [FH97] notation Sharpe’s model is:

$$R_p = \sum_k w_k F_k + \varepsilon,$$

subject to:

- $w_k = \sum_j x_j \lambda_j$;
\[ \epsilon = \sum_j x_j \epsilon_j, \]

where

- \( j \) is the asset class;
- \( k \) is the total number of asset classes;
- \( x_j \) is the weighting of asset class \( j \);
- \( \lambda_j \) is the factor loading for asset \( j \) (change in fund return/change in asset \( j \) return);
- \( \epsilon_j \) is the error term for asset \( j \).

Thus Hedge Fund return is a weighted average of a small number of asset classes, rather than a weighted average of a large number of individual asset returns as in MPT.

4.7. VaR (Value at Risk)

VaR (value at risk) was invented by JP Morgan in 1994 as a general risk management tool and has now become the industry standard for risk. It has become a popular and important risk measure primarily because of the Basel Committee, who standardise international banking regulations and practises. Gupta and Liang in [GL05] applied VaR to Hedge Funds, specifically for assessing a Hedge Fund’s sufficient capital adequacy.

VaR tells us in monetary terms how much one’s portfolio can expect to lose, for a given cumulative probability and for a given time horizon. For example, for a cumulative probability of 99% over a period of 1 day, the VaR amount would tell us the amount by which one would expect the portfolio to lose e.g. $100.

VaR can be calculated by simulation using historical data or some mathematical formula. VaR can also be calculated by the “variance-covariance method” (also known as the delta-normal method) but makes unrealistic assumptions about portfolio returns e.g. returns are normally distributed.

5. Problems with Hedge Fund Risk Modelling

Most portfolio risk measures make unrealistic modelling assumptions, particularly with respect to the assumed return probability distributions for mutual funds. Risk measurement assumptions become even more unrealistic for Hedge Funds. We now explain the difficulties in Hedge Fund risk measurement.
5.1. Non-Normal Return Distribution

As stated by Do et al. [DFW05], Hedge Fund returns do not approximate to normal distributions, thus popular portfolio risk measures (which assume a normal distribution) are inappropriate e.g. Sharpe ratio. Furthermore Fung in [FH99a] shows that the empirical probability distribution of monthly returns for Hedge and Mutual Funds differ significantly.

Fung [FH99a] proposes the reason for a non-normal return distribution is a result of the diverse trading strategies employed by Hedge Funds. Fung firstly suggests that Mutuals engage in buy-and-hold strategies whereas Hedge Funds engage in much more shorter term trading strategies. Secondly, Hedge Funds apply substantial leveraging, whereas Mutuals have limited or strict regulation on leveraging. Additionally, the relatively regulation-free investment environment of Hedge Funds leads to complex management strategies and high performance incentives -these all affect Hedge Fund returns.

5.2. Investment Strategy and Return Distribution

It has been empirically observed that different investment strategies significantly alter the return distribution, particularly the mean and standard deviation. For example standard deviation, a common risk metric, varies from a low 2.1% in market neutral funds to 16.3% in Global/Macro funds [FH99a]. Consequently, it has been argued it would be better to apply separate risk measures for each Hedge Fund type (according to its strategy), rather than treating all Hedge Funds as part of 1 homogenous class.

5.3. Hedge Fund Failure Rate

Hedge fund survival rates are significantly lower than other funds [Gar05] and substantially vary; cumulative failure rates after 7 years range from 32-66% depending on the Hedge Fund’s size. The table below from the European Central Bank [Gar05] describes this:
Thus the inclusion of non-existent Hedge Funds poses a problem when assessing the overall performance of Hedge Funds (similar to the survivorship bias issue with Mutual Fund performance).

6. Hedge Funds Available On The Market

6.1. Close Man Hedge Fund

Close Man Hedge Fund is an absolute return Hedge Fund. This fund applies the market neutral investment strategy (specifically fixed income arbitrage) by investing solely in Capital Guaranteed Bonds issued by The Royal Bank of Scotland. Thus the fund is theoretically insulated from market risks but can still benefit from price movements using a variety of techniques. For this particular fund, Close Man will engage in leveraging and using swaps (a type of derivative) to boost returns.

See Close Man’s website [http://www.closefm.com/](http://www.closefm.com/) for more detail.

6.2. RAB Capital

RAB Capital is a unique Hedge Fund in that it is one of the few UK Hedge Funds (or more specifically FOHF) that is listed on the London Stock Exchange (ticker symbol RAB.L). Their funds are accessible to the general public rather than high net worth individuals, although RAB warns “These funds are not appropriate for a novice investor”. They specialise in a variety of absolute return funds, some of which employ the long-only investment strategy, where assets are bought on the basis that they are
considered undervalued.

See RAB Capital’s website [http://www.rabcap.com/](http://www.rabcap.com/) for more detail.

6.3. Thames River Capital

Thames River Capital is an absolute return based Hedge Fund, offering a range of regulated and unregulated funds. Each fund uses various investment strategies, ranging from Global strategies (see Global Emerging Market Fund) to market neutral strategies using high leverage.

See Thames River Capital’s website [http://www.thamesriver.co.uk/](http://www.thamesriver.co.uk/) for more detail.

6.4. Ikos Hedge Fund

The founder and co-owner of her own hedge fund has made Elena Ambrosiadou one of the richest women in Britain according to the 2006 Sunday Times Rich List. This hedge fund engages in “program trading” whereby trades are executed according to a computer program. This method of trading has the advantage removing any subjective decision making from speculation but can also result in investments that one would strongly and intuitively disapprove. Ikos focus on exchange rate investing but also speculate in equities.

For more information on Ikos see [http://www.ikosam.com/](http://www.ikosam.com/).

7. Famous Hedge Funds Withdrawn From The Market

All major funds are susceptible to collapsing, however, in the case of Hedge Funds this is more frequent and the losses tend to be substantially higher. It is therefore quite informative to understand some of the spectacular Hedge Fund losses. We now describe some Hedge Funds that were previously available on the market but have now ceased trading.

7.1. George Soros’s Quantum Fund

Perhaps the most famous Hedge Fund investor is Soros, who in 1 day made US$1 billion on September 6, 1992, by short selling the British pound. In 1992, Britain was part of the ERM (European Exchange Rate Mechanism) and Soros was able to anticipate the currency devaluation of the British Pound. Consequently by employing the Global/Macro investment strategy, Soros managed to net a profit of US$1 billion in 1 day. However years later, his fund suffered massive losses; in 1998 Russia’s defaulting crisis created a loss of US $2 billion.
7.2. Long Term Capital Management (LTCM)

Perhaps the most notorious Hedge Fund collapse was in September 1998; LTCM announced it had lost 44% of its investors’ capital in August alone (US$2.1 Billion)\footnote{Sto99b}. For a detailed case study of LTCM see Stonham in \cite{Sto99b, Sto99a}.

LTCM began trading with over $1 billion of investor capital. LTCM applied the Hedge Fund strategy of market neutral investment; LTCM used the method of fixed income arbitrage, taking advantage of temporary changes in prices. The market neutral strategy was successful from 1994-98 but in 1998 Russian financial markets fell into crisis. However, LTCM speculated that the situation would quickly return back to normal again, so LTCM took large, unhedged positions. Unfortunately, Russia began defaulting on its debts in August 1998, causing LTCM to experience losses approaching $4 billion as it was significantly exposed to Russian government bonds. The US Federal Government then devised a rescue plan for LTCM to avert a major US financial crisis and panic.

7.3. Robertson’s Tiger Management Fund

Robertson’s Hedge Fund invested by going long on undervalued stocks whilst simultaneously short selling what he considered overvalued stocks. For years this strategy was extremely successful, giving annual returns of 43% from 1980-86, so he continued applying this strategy during the technology boom. During the tech boom, Robertson rightly considered many stocks to be overvalued and so began short selling such stocks with the expectation overvalued stocks would eventually fall. Yet during the tech boom a speculation bubble formed, causing the overvalued stocks to continue to rise beyond expectation. Consequently Robertson’s fund collapsed in 2000 after heavy losses, just before the speculative bubble itself collapsed.

8. The Case For and Against Hedge Funds

Despite the potential to provide substantial returns, it would appear conclusive that Hedge Funds ought to be abolished or at least highly regulated. However the issue is far more complex than one assumes. We now elaborate on the benefits and disadvantages of Hedge Funds.

8.1. The Case for Preserving Hedge Funds

It can be argued Hedge Funds provide an economic benefit to markets, in particular they aid price discovery. It has been suggested that Hedge Funds take contrarian positions; they do not engage in “herd-mentality” trading, unlike Mutual Funds. Therefore
Hedge Funds buy or sell assets according to the perceived fair value.

A second economic benefit of Hedge Funds is that they aid competition and the economic concept of the "invisible hand" \cite{DTZ05} and thrive on market inefficiencies. As traders do not have instantaneous and costless access to market information, asset mispricing or an arbitrage opportunities must occur e.g. an asset trading in 2 different markets may have different prices. Hedge Funds take advantage of such arbitrage opportunities and so push prices to their no-arbitrage price.

Another important economic benefit of Hedge Funds is liquidity provision. Hedge Funds typically invest in riskier assets that many investors would not consider. Hedge Funds therefore provide much needed capital for investments.

Hedge Funds can actually reduce overall risk rather than increase it. Firstly, Hedge Funds take on riskier investments, thereby “absorbing” some of the risk that would be concentrated in a smaller number of funds. Additionally Hedge Funds are more willing to invest in volatile markets, thereby “absorbing” the effects of market shocks.

Hedge Funds are important as an investment product in itself. They provide sophisticated investors with another vehicle for high returns that would not be available in traditional Mutual Funds \cite{DTZ05}. They also provide diversification (a method of reducing risk without reducing return by investing in more than 1 asset) as they represent a different investment class.

A second benefit from a investor’s perspective is that Hedge Funds can provide "absolute" returns. Hedge Funds can achieve this because they pursue a variety of sophisticated investment strategies. Traditional Mutual Funds are limited in trading strategies due to heavy regulation.

\subsection*{8.2. The Case Against Hedge Funds}

Rather than aid market functioning, Hedge Funds have been criticized for doing more harm than good. Firstly, rather than contrarian investing, Hedge Funds engage in "herding" \cite{DTZ05}. Notable examples include the 1992 ERM crisis and the 1997 Asian Currency Crisis.

Secondly, it was suggested Hedge Funds provide much needed capital by investing in risky assets, yet Hedge Funds have been blamed for exhausting liquidity in the market
Due to Hedge Funds typically taking large positions and the trading strategies they pursue, they are unable to make trades without causing a massive price moves due to illiquidity (Fung supports this idea in [FH00a]). Additionally, Hedge Funds are usually heavily leveraged, increasing the likelihood of illiquidity e.g.LTCM. However, Gupta in [GL05] investigates capital adequacy using VaR (value at risk) measures and concludes that most Hedge Funds are adequately funded.

Thirdly, Hedge Funds can prevent efficient market functioning by causing market price distortions, rather than aiding price discovery. Large volume trades can cause significant price movements, rather than price movements occurring due to company/economic fundamentals. Fung in [FH00a] cites such examples as the 1992 ERM Crisis but concludes that Hedge Funds overall do not distort prices beyond their company/economic fundamentals.

The Hedge Fund as a viable alternative investment product has also been heavily disapproved. For instance some quotes from leading academics on Hedge Funds:

- “If you want to invest in something where they steal your money and don’t tell you what they’re doing, be my guest., Eugene Fama.

- “If there’s a license to steal, it’s in the hedge fund arena”, Burton Malkiel.

In an article in Forbes (May 14, 2004) Bernard Condon claims that “You would do better giving your money to a monkey” than investing in Hedge Funds. As a managed investment product Hedge Funds command the highest management fees, typically around 20%, compared to mutual funds that normally charge around 1%. Additionally Hedge Fund investors have tougher withdrawal constraints.

Secondly as Fama mentions, Hedge Funds have poor transparency. Regulatory bodies such as the SEC do not dictate the same strict rules for Hedge Funds that it does for Mutual Funds: there are no rules on publishing records on asset holdings and financial performance, lack of transparency increases the chances of investors being unable to effectively assess risk.

Finally, Hedge Funds have a higher failure rate than Mutual Funds and thus a higher credit risk. Hedge Fund face less regulation on leveraging and investment strategies, thus are susceptible to a higher probability of default e.g. LTCM. Consequently there
is less likelihood of capital recovery.

9. Conclusion

Hedge Funds are clearly a complex and unique investment product that can produce extraordinary gains as well as losses. They have and continue to thrive on the unregulated aspects of the business, spawning a variety of innovative investment techniques. It has only been in the past 10 years that regulatory bodies have focussed on Hedge Fund regulation to avert previous Hedge Fund disasters e.g. LTCM.

Despite the clear necessity to understand such a powerful investment, knowledge and understanding of the Hedge Fund industry remains relatively poor. There is no consensus on the specific definition of a Hedge Fund, very little literature is devoted to Hedge Fund risk modelling and their various investment techniques. Consequently there is a large scope for future research into Hedge Fund risk management.
References

[Bro01] SJ Brown. Hedge funds: Omniscient or just plain wrong. *Pacific-Basin Finance Journal*, 9(4):301–311, 2001.

[CH04] D. Capocci and G. Hübner. Analysis of hedge fund performance. *Journal of Empirical Finance*, 11(1):55–89, 2004.

[DFW05] V. Do, R. Faff, and J. Wickramanayake. An empirical analysis of hedge fund performance: The case of Australian hedge funds industry. *Journal of Multinational Financial Management*, 15(4-5):377–93, 2005.

[DTZ05] J. Danielsson, A. Taylor, and J.P. Zigrand. Highwaymen or heroes: Should hedge funds be regulated?: A survey. *Journal of Financial Stability*, 1(4):522–543, 2005.

[ES98] Mathieson D. Chadha B. Jansen A. Kodres L. Eichengreen, B. and S. Sharma. Hedge Fund and Financial Market Dynamics. *International Monetary Fund*, 1998.

[FF93] E.F. Fama and K.R. French. Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33(1):3–56, 1993.

[FH97] W. Fung and D.A. Hsieh. Empirical characteristics of dynamic trading strategies: the case of hedge funds. *Review of Financial Studies*, 1997.

[FH99a] W. Fung and D.A. Hsieh. A Primer on Hedge Funds. *Journal of Empirical Finance*, 6(3):309–331, 1999.

[FH99b] W. Fung and D.A. Hsieh. Is Mean-Variance Analysis Applicable to Hedge Funds? *Economic Letters*, 62(1):53–58, 1999.

[FH00a] W. Fung and D.A. Hsieh. Measuring the market impact of hedge funds q. *Journal of Empirical Finance*, 7:1–36, 2000.

[FH00b] W. Fung and D.A. Hsieh. Performance Characteristics of Hedge Funds and Commodity Funds: Natural vs. Spurious Biases. *The Journal of Financial and Quantitative Analysis*, 35(3):291–307, 2000.

[FH04] W. Fung and D.A. Hsieh. Extracting portable alphas from equity long-short hedge funds. *Journal of Investment Management*, 2(4):1–19, 2004.
[Gar05] D. Garbaravicius. F., Hedge Funds and Their Implications for Financial Stability, ECB. *Occasional Paper Series*, 34, 2005.

[GL05] A. Gupta and B. Liang. Do hedge funds have enough capital? A value-at-risk approach star, open. *Journal of Financial Economics*, 77(1):219–253, 2005.

[GLM04] M. Getmansky, A.W. Lo, and I. Makarov. An Econometric Model of Serial Correlation and Illiquidity in Hedge Fund Returns. *Journal of Financial Economics*, 74(3):529–610, 2004.

[JT93] N. Jegadeesh and S. Titman. Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency. *The Journal of Finance*, 48(1):65–91, 1993.

[Sha64] W.F. Sharpe. Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. *The Journal of Finance*, 19(3):425–442, 1964.

[Sha66] W.F. Sharpe. Mutual Fund Performance. *The Journal of Business*, 39(1):119–138, 1966.

[Sha92] W.F. Sharpe. Asset Allocation: Management Style and Performance Measurement. *Journal of Portfolio Management*, 18(2):7–19, 1992.

[Sto99a] Paul Stonham. Too Close To The Hedge: The Case Of Long Term Capital Management. Part Two: Near-Collapse And Rescue. *European Management Journal, Volume 17, Issue 4, Pages 382-390*, 1999.

[Sto99b] Paul Stonham. Too Close To The Hedge:the Case of Long Term Capital Management LP Part One:Hedge Fund Analytics. *European Management Journal, Vol. 17,p282-289*, 1999.