Gregory Connor and Mason Woo

An Introduction to Hedge Funds

Introductory Guide

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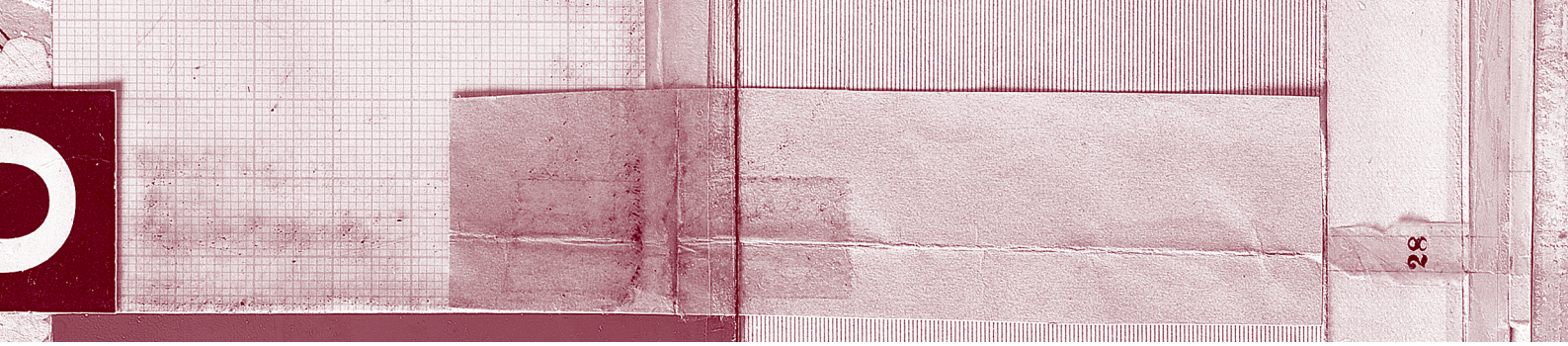

Introduction

International Asset Management ('IAM') is the proud sponsor of the IAM Hedge Fund Research Programme of the Financial Markets Group. Within this programme the LSE team undertakes independent research into aspects of the hedge fund industry. It is hoped that the results of this research will give greater understanding about this growing area of financial innovation.

This research paper gives a broad introduction to the hedge fund industry, the historical background to the evolution of hedge funds, the fund of funds industry and provides an explanation of some of the terminology used within this area.

As an overview of the industry the document does not attempt to address the use of hedge funds within the broader context of portfolio management such as organisational risk or other areas of concern for the investor. This is a non-technical paper and as such is intended for students or practitioners seeking a general introduction and reference tool. It is not a survey of the research literature and citations are kept to a minimum.

If you wish to keep updated on the IAM Hedge Fund Research Programme please let us know. If you have any questions please contact IAM at our London office or visit our website:

34 Sackville Street
London W1S 3EF
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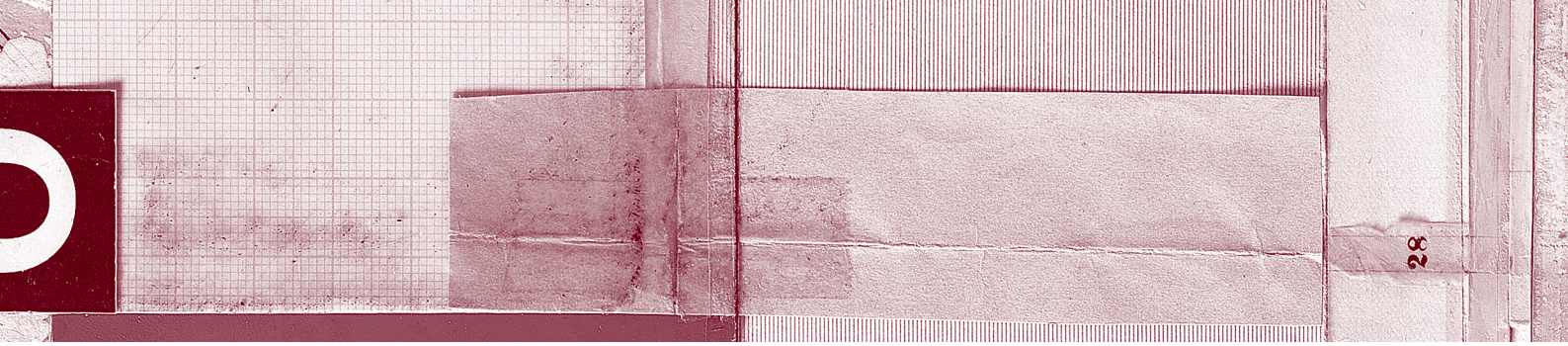


London School of Economics - Financial Markets Group

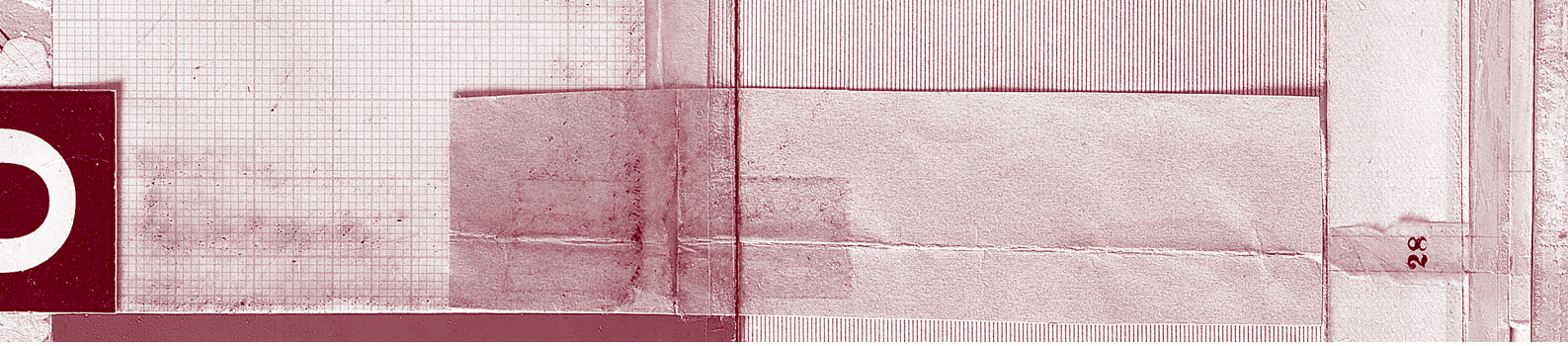
The Financial Markets Group ('FMG') research centre was established in 1987 at the LSE. FMG is now one of the leading centres in Europe for academic research into financial markets.

The FMG has developed strong links with the financial community, in particular investment banks, commercial banks and regulatory bodies and attracts support from a large number of City institutions, both private and public.

The FMG is led by Professor David Webb and Professor Charles Goodhart and brings together a core team of senior academics and young researchers to undertake cutting edge theoretical and empirical research in the areas of financial markets, financial decision-making and financial regulation. Through its Visitors' Programme the FMG attracts each year some of the world's renowned finance academics and outstanding researchers who participate fully in the FMG's research activities.

Research at the FMG is conducted through a number of thematic research programmes. Each thematic programme hosts a number of associated projects on key research areas and the Centre's dissemination activities such as seminars, conferences, public lectures and publications are organized around the FMG's research programme structure.

Gregory Connor is a professor of finance and director of the IAM/FMG Hedge Fund Research Programme, and Mason Woo is a graduate student in the risk and regulation programme at London School of Economics.



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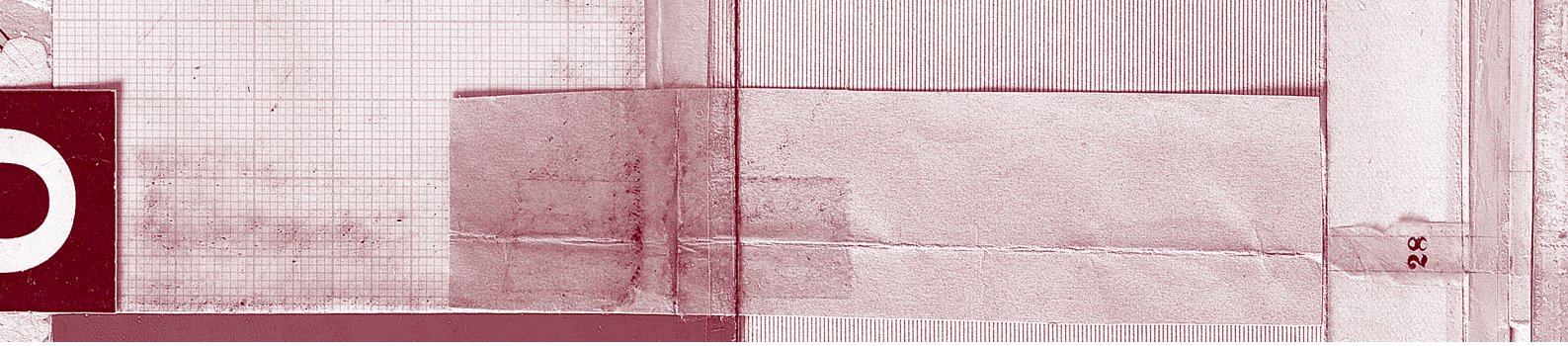


1 What is a Hedge Fund?

1.1 *Standard Definitions of a Hedge Fund*

A hedge fund can be defined as an actively managed, pooled investment vehicle that is open to only a limited group of investors and whose performance is measured in absolute return units. However, this simple definition excludes some hedge funds and includes some funds that are clearly not hedge funds. There is no simple and all-encompassing definition.

The nomenclature "hedge fund" provides insight into its original definition. To "hedge" is to lower overall risk by taking on an asset position that offsets an existing source of risk. For example, an investor holding a large position in foreign equities can hedge the portfolio's currency risk by going short currency futures. A trader with a large inventory position in an individual stock can hedge the market component of the stock's risk by going short equity index futures. One might define a hedge fund as an information-motivated fund that hedges away all or most sources of risk not related to the price-relevant information available for speculation[1].

[1]In our technical context, speculation is defined as any action, with some non-zero risk, made in order to make a profit. This classic definition of speculation also includes the careful research of undervalued securities for long-term gain – what is informally termed "investing". In informal contexts, the word speculation has acquired the implicit meaning of actions based on inconclusive evidence and the desire for short-term, high-risk profit. For an excellent description of how the word speculation has evolved, see Longstreth, Bevis, *Modern Investment Management and the Prudent Man Rule*, Oxford University Press, 1986, p. 86-89.

Note that short positions are intrinsic to hedging and are critical in the original definition of hedge funds.

Alternatively, a hedge fund can be defined theoretically as the "purely active" component of a traditional actively-managed portfolio whose performance is measured against a market benchmark. Let w denote the portfolio weights of the traditional actively-managed equity portfolio. Let b denote the market benchmark weights for the passive index used to gauge the performance of this fund. Consider the active weights, h, defined as the differences between the portfolio weights and the benchmark weights:

$$h = w - b$$

A traditional fund has no short positions, so w has all nonnegative weights; most market benchmarks also have all nonnegative weights. So w and b are nonnegative in all components but the "active weights portfolio", h, has an equal percentage of short positions as long positions. Theoretically, one can think of the portfolio h as the hedge fund implied by the traditional active portfolio w.

The following two strategies are equivalent:

1. Hold the traditional actively-managed portfolio w
2. Hold the passive index b plus invest in the hedge fund h.

Defined in this way, hedge funds are a device to separate the "purely active" investment portfolio h from the "purely passive" portfolio b. The traditional active portfolio w combines the two components.

This "theoretical" hedge fund is not implementable in practice since short positions require margin cash. Note that the "theoretical hedge fund" described above has zero net investment and so no cash available for margin

accounts. If the benchmark includes a positive cash weight, this can be re-allocated to the hedge fund. Then the hedge fund will have a positive overall weight, consisting of a net-zero investment (long and short) in equities, plus a positive position in cash to cover margin.

Why might strategy 2 above (holding a passive index plus a hedge fund) be more attractive than strategy 1 (holding a traditional actively-managed portfolio)? It could be due to specialisation. The passive fund involves pure capital investment with no information-based trading. The hedge fund involves pure information-based trading with no capital investment. The traditional active manager has to undertake both functions simultaneously and so cannot specialise in either.

This theoretical definition of a hedge fund also explains the "hedge" terminology. Suppose that the traditional actively-managed fund has been constructed so that its exposures to market-wide risks are kept the same as in the benchmark. Then the implied hedge fund has zero exposures to market-wide risks, since the benchmark and active portfolio exposures cancel each other out, ie, hedging.

What we have just described is a "classic" hedge fund, but the operational composition of hedge funds has steadily evolved until it is now difficult to define a hedge fund based upon investment strategies alone. Hedge funds now vary widely in investing strategies, size, and other characteristics.

Hedge fund managers are usually motivated to maximise absolute returns under any market condition. Most hedge fund managers receive asymmetric incentive fees based on positive absolute returns and are not measured against the performance of passive benchmarks that represent the overall market. Hedge fund management is fundamentally skill-based, relying on the talents of active investment management to exceed the returns of passive indexing.

Hedge fund managers have flexibility to choose from a wide range of investment techniques and assets, including long and short positions in stocks, bonds, and commodities. Leverage is commonly used (83% of funds) to magnify the effect of investment decisions [Liang, 1999]. Fund managers may trade in foreign currencies and derivatives (options or futures), and they may concentrate, rather then diversify, their investments in chosen countries or industry sectors. Hedge fund managers commonly invest their own money in the fund, which further aligns their personal motivation with that of outside investors.

Some hedge funds do not hedge at all; they simply take advantage of the legal and compensatory structures of hedge funds to pursue desired trading strategies. In practice, a legal structure that avoids certain regulatory constraints remains a common thread that unites all hedge funds. Hence it is possible to use their legal status as an alternative means of defining a hedge fund.

1.2 *The Legal Structures of Hedge Funds*

Hedge funds are clearly recognisable by their legal structures. Many people think that hedge funds are completely unregulated, but it is more accurate to say that hedge funds are structured to take advantage of exemptions in regulations. Fung and Hsieh (1999) explain the justification for these exemptions is that the regulations are meant for the general public and that hedge funds are intended for well-informed, well-financed, private investors. The legal structure of hedge funds is intrinsic to their nature. Flexibility, opaqueness, and aggressive incentive compensation are fundamental to the highly speculative, information-motivated trading strategies of hedge funds. These features are in conflict with a highly regulated legal environment.

Hedge funds are almost always organised as limited partnerships or limited liability companies to provide pass-through tax treatment. The fund itself

does not pay taxes on investment returns, but returns are passed through so that individual investors pay the taxes on their personal tax bills. (If the hedge fund were set up as a corporation, profits would be taxed twice.)

In the USA, hedge funds usually seek exemptions from a number of SEC regulations. The Investment Company Act of 1940 contains disclosure and registration requirements and imposes limits on the use of investment techniques, such as leverage and diversification [Lhabitant, 2002]. The Investment Company Act was designed for mutual funds, and it exempted funds with fewer than 100 investors. In 1996, it was amended so that more investors could participate, so long as each "qualified purchaser" was either an individual with at least $5 million in assets or an institutional investor with at least $25 million [President's Working Group, 1999].

Hedge funds usually seek exemption from the registration and disclosure requirements in the Securities Act of 1933, partly to prevent revealing proprietary trading strategies to competitors and partly to reduce the costs and effort of reporting. To obtain the exemption, hedge funds must agree to private placement, which restricts a fund from public solicitation (such as advertising) and limits the offer to 35 investors who do not meet minimum wealth requirements (such as a net worth of over $1 million, an annual income of over $200,000). The easiest way for hedge funds to meet this requirement is to restrict the offering to wealthy investors.

Some hedge fund managers also seek an exemption from the Investment Advisers Act of 1940, which requires hedge fund managers to register as investment advisers. For registered managers, a fund may only charge a performance-based incentive fee (which is typically the manager's main remuneration) if the fund is limited to high net-worth individuals. Some managers elect to register as investment advisers, because some investors may feel greater reassurance, and the additional restrictions are not especially onerous [Lhabitant, 2002].

Hedge funds are usually more secretive than other pooled investment vehicles, such as mutual funds. A hedge fund manager may want to acquire her positions quietly, so as not to tip off other investors of her intentions. Or a fund manager may use proprietary trading models without wanting to reveal clues to her systematic approach. With so much flexibility and privacy conferred to managers, investors must heavily rely upon managers' judgement in investment selection, asset allocation, and risk management.

There is a fundamental conflict between the needs of hedge funds and the needs of regulators overseeing consumer investment products. Hedge funds need flexibility, secrecy, and strong performance incentives. Regulators of consumer financial products need to ensure reliability, full disclosure, and managerial conservatism. Removing hedge funds from the set of regulated consumer investment products, and then barring or restricting general consumer access to them, reconciles these conflicting objectives.

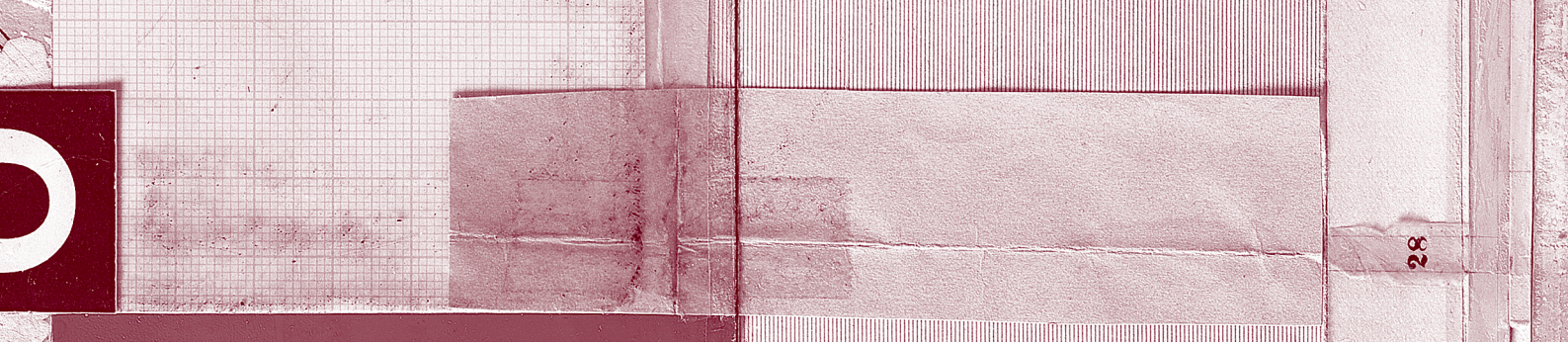
1.3 *Legal Structures for Non-US Hedge Funds*

The United States has been the centre of hedge fund activity, but about two-thirds of all hedge funds are domiciled outside the USA [Tremont, 2002]. Often these "offshore" hedge funds are established in tax-sheltering locales, such as the Cayman Islands, the British Virgin Islands, Bermuda, the Bahamas, Luxembourg, and Ireland, specifically to minimise taxes for non-US investors. US hedge funds often set up a complementary offshore fund to attract additional capital without exceeding SEC limits on US investors [Brown, Goetzmann, and Ibbotson, 1999].

In the UK, the Financial Services and Markets Act 2000 (FSMA) and the Public Offers of Securities Regulations 1995 (POS Regulations) are statutes that influence the creation of UK-domiciled hedge funds. The FSMA specifies restrictions for the marketing of hedge funds ("collective investment scheme") that are similar to the US, such as number of shareholders and limits

on advertising. The POS Regulations makes restrictions on how a hedge fund is structured to be a private placement.

Outside the US, UK, and tax-haven countries, the situation for hedge funds is wide-ranging. In Switzerland, hedge funds need to be authorised by the Federal Banking Commission, but once authorised, hedge funds have few restrictions. Swiss hedge funds may be advertised and sold to investors without minimum wealth thresholds. In Ireland and Luxembourg, hedge funds and offshore investment funds are even allowed listings on the stock exchange. On the other extreme, France has greatly restricted the establishment of French hedge funds, and French tax authorities frown upon offshore investing.



2 The History of Hedge Funds

2.1 *The First Hedge Fund*

In 1949, Alfred Winslow Jones started an investment partnership that is regarded as the first hedge fund. Remarkably many of the ideas that he introduced over fifty years ago remain fundamental to today's hedge fund industry.

Jones structured his fund to be exempt from the SEC regulations described in the Investment Company Act of 1940. This enabled Jones' fund to use a wider variety of investment techniques, including short selling, leverage, and concentration (rather than diversification) of his portfolio.

Jones committed his own money in the partnership and based his remuneration as a performance incentive fee, 20% of profits. Both practices encourage interest alignment between manager and outside investor and continue to be used today by most hedge funds.

Jones pioneered combining shorting and leverage, techniques that generally increase risk, and used them to hedge against market movements and reduce his risk exposure. He considered himself to be an excellent stock picker, but a poor market timer, so he used a market-neutral strategy of having equal long and short positions. Jones' long-short strategy rewarded exceptional stock selection and created a portfolio that reacted less to the vagaries of the overall market. He also used the capital made available from short selling as leverage to make additional investments.

Jones also hired other managers, delegated authority for portions of the fund, and thus initiated the multi-manager hedge fund. The multi-manager approach later evolved into the first fund of hedge funds [Tremont, 2002].

2.2 *Hedge Funds from the 1960s to the 1990s*

By the mid-1960s, Jones' fund was still active and began to inspire imitations, some from investment managers who once worked for Jones. An SEC report documented 140 live hedge funds in 1968 [President's Working Group, 1999]. A stock market boom began in the late 60's, led by a group of stocks dubbed the Nifty Fifty, and hedge funds that followed the Jones' long-short style appeared to underperform the overall market. To capture the rising market, hedge fund managers altered their investing strategy. Their funds became directional, abandoned the risk reduction afforded by long-short hedging, and opted for portfolios favouring leveraged long-bias exposure. During the subsequent bear market of 1972-1974, the S&P 500 declined by a third (adjusted for dividends and splits). Funds with leveraged long-bias strategies were battered—because of insufficient risk reduction techniques; they were effectively "unhedged." As a result, many hedge funds went out of business, and hedge funds decreased in popularity for the next 10 years. A 1984 survey by Tremont Partners identified only 68 live hedge funds, fewer than half the number of live funds in 1968 [Lhabitant, 2002].

A mid-80s revival of hedge funds is generally ascribed to the publicity surrounding Julian Robertson's Tiger Fund (and its offshore sibling, the Jaguar Fund). The Tiger Fund was one of several so-called global macro funds that made leveraged investments in securities and currencies, based upon assessments of global macroeconomic and political conditions. In 1985, Robertson correctly anticipated the end of the 4-year trend of the appreciation of the US dollar against European and Japanese currencies and speculated in non-US currency call options. A May 1986 article in Institutional Investor noted that since its inception in 1980, Tiger Fund had a 43% average annual return, spawning a slew of imitators [Eichengreen, 1999].

Hedge funds became admired for their profitability, and reviled for their seeming destabilising influence on world financial markets. In 1992 during

the European ERM (Exchange Rate Mechanism) crisis, George Soros' Quantum Fund, another global macro hedge fund, made over a billion dollars from shorting the British pound. During the "Asian Contagion" currency crisis, the Thai Baht fell 23% in July 1997. Quantum Fund had shorted the Baht and gained 11.4% that month [Fung and Hsieh, 2000]. Spectacular success stories like these increased the allure and glamour associated with hedge funds, but also established a reputation for benefiting from and contributing to financial market chaos.

In the late 90s, hedge funds made the headlines once more, but for staggeringly large losses. In 1998, Soros' Quantum Fund lost $2 billion during the Russian debt crisis. Robertson's Tiger Fund incorrectly bet upon the depreciation of the yen versus the dollar and lost more than $2 billion. During the dot-com boom, Quantum lost almost $3 billion more from first shorting high-tech stocks and then reversing its strategy and purchasing stocks near the market top [Deutschman, 2001]. Robertson kept his Tiger Fund long on "Old Economy" and short on "New Economy" shares. Robertson would eventually be proved to be right, but not soon enough. Tiger Fund sustained losses from trading as well as mass investor redemptions and was closed down in March 2000, ironically, just before the dot-com bust which could have validated the fund's strategy.

2.3 *Long Term Capital Management*

During the late 90s, the largest tremor through the hedge fund industry was the collapse of the hedge fund Long-Term Capital Management (LTCM). LTCM was the premier quantitative-strategy hedge fund, and its managing partners came from the very top tier of Wall Street and academia. From 1995-1997, LTCM had an annual average return of 33.7% after fees. At the start of 1998, LTCM had $4.8 billion in capital and positions totalling $120 billion on its balance sheet [Eichengreen, 1999].

LTCM largely (although not exclusively) used relative value strategies, involving global fixed income arbitrage and equity index futures arbitrage. For example, LTCM exploited small interest rates spreads, some less than a dozen basis points, between debt securities across countries within the European Monetary System. Since European exchange rates were tied together, LTCM counted on the reconvergence of the associated interest rates. Its techniques were designed to pay off in small amounts, with extremely low volatility. To achieve a higher return from these small price discrepancies, LTCM employed very high leverage. Before its collapse LTCM controlled $120 billion in positions with $4.8 billion in capital. In retrospect, this represented an extremely high leverage ratio (120/4.8 = 25). Banks were willing to extend almost limitless credit to LTCM at very low no cost, because the banks thought that LTCM had latched onto a certain way to make money.

LTCM was not an isolated example of sizeable leverage. At that time, more than 10 hedge funds with assets under management of over $100 million were using leverage at least ten times over [President's Working Group, 1999]. Since the collapse of LTCM, hedge fund leverage ratios have fallen substantially.

In the summer of 1998, the Russian debt crisis caused global interest rate anomalies. All over the world, fixed income investors sought the safe haven of high-quality debt. Spreads between government debt and risky debt unexpectedly widened in almost all the LTCM trades. LTCM lost 90% of its value and experienced a severe liquidity crisis. It could not sell billions in illiquid assets at fair prices, nor could it find more capital to maintain its positions until volatility decreased and interest rate credit spreads returned to normal.

Emergency credit had to be arranged to avoid bankruptcy, the default of billions of dollars of loans, and the possible destabilisation of global financial markets. Over the weekend of September 19-20, 1998, the Federal Reserve Bank of New York brought together 14 banks and investment houses with

LTCM and carefully bailed out LTCM by extending additional credit in exchange for the orderly liquidation of LTCM's holdings.

The aftermath of the Russian debt crisis and LTCM debacle temporarily stalled the growth of the hedge fund industry. In 1998, more hedge funds died and fewer were created than in any other year in the 1990s [Liang, 2001]. The number of hedge funds as well as assets under management (AUM) declined slightly in 1998 and the first half of 1999. Hearings were held on LTCM, resulting in recommendations for increased risk management at hedge funds, but without new legal restrictions on their practice [Lhabitant, 2002; Financial Stability Forum, 2000].

LTCM proved to be a bump, rather than a derailing of the hedge fund industry. The appeal of hedge fund investing remained, and the industry rebounded. Less than a year after the Federal Reserve Bank of New York unravelled LTCM, Calpers (California Public Employees' Retirement System), the largest American public pension fund, announced they would invest up to US$11 billion in hedge funds [Oppel, 1999].

2.4 *Development of Funds of Funds*

The explosive growth in hedge funds led to a market for professionally managed portfolios of hedge funds, commonly called "funds of funds." Funds of funds provide benefits that are similar to hedge funds, but with lower minimum investment levels, greater diversification, and an additional layer of professional management. Some funds of funds are publicly listed on the stock exchanges in London, Dublin, and Luxembourg. The oldest listed fund of funds on the London Stock Exchange, Alternative Investment Strategies Ltd., dates back to 1996.

In the context of funds of funds, diversification usually means investing across hedge funds using several different strategies, but may also mean

investing across several funds using the same basic strategy. Funds of funds may offer access to hedge funds that are closed to new investors. Given the secrecy in hedge funds, a professional funds of funds manager may have greater expertise to conduct the necessary due diligence. Of course, professional management of a fund of hedge funds entails an additional layer of fees.

2.5 *Size and Growth of the Hedge Fund Industry*

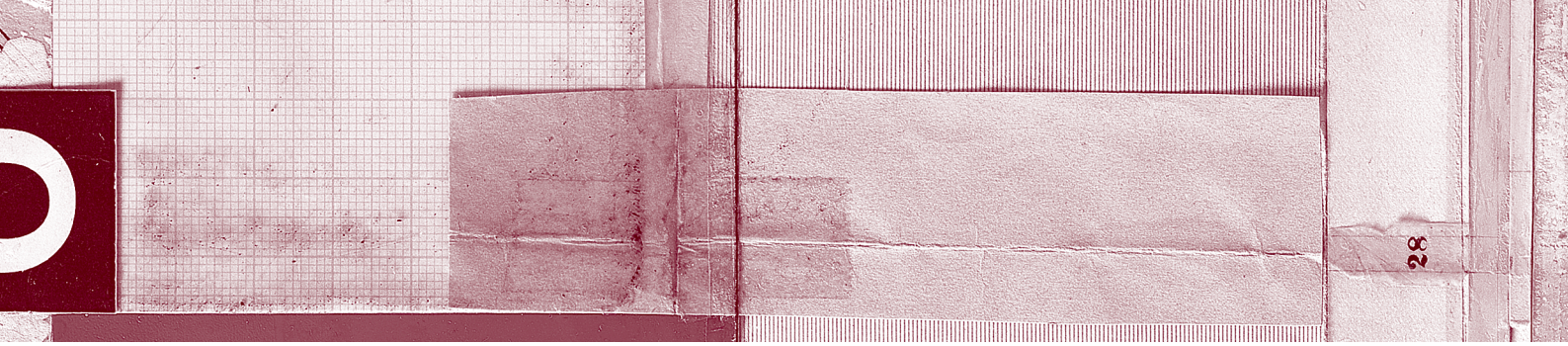
Since hedge funds are structured to avoid regulation, even disclosure of the existence of a hedge fund is not mandatory. There is no regulatory agency that maintains official hedge fund data. There are private firms that gather data that are voluntarily reported by the hedge funds themselves. This gives an obvious source of self-selection bias, since only successful funds may choose to report. Some databases combine hedge funds with commodity trading advisers (CTAs) and some separate them into two categories. Also, different hedge funds define leverage inconsistently, which affects the determination of assets under management (AUM), so aggregate hedge fund data are best viewed as estimates [de Brouwer, 2001].

Our theoretical derivation of a hedge fund from a traditional active fund can be used to illustrate the problem with AUM as a measure of hedge fund size. Consider a traditional active fund with AUM of $1 Billion invested in equities. Suppose that the traditional active fund decides to re-organise itself into a passive index fund and an equity long-short hedge fund. Obviously the equity long-short hedge fund will need some capital to cover margin. The traditional fund could be re-organised as a $900 million passive index fund plus a $100 million hedge fund. If this makes the hedge fund seem too risky, it could be re-organised instead into an $800 million passive index fund plus a $200 million hedge fund. Note that the hedge fund AUM differs by a factor of two in these two cases, but the overall investment strategy is the same.

The only difference is in the degree of leverage of the hedge fund. Clearly, AUM is not the whole story in understanding the "size" of a hedge fund, or of the hedge fund industry.

Even with the caveat about data reliability and the usefulness of AUM, the growth of the hedge fund industry is apparent. In 1990, Lhabitant (2002) estimates there were about 600 hedge funds with aggregate AUM less than $20 billion; Agarwal and Naik (2000) cite aggregate AUM of $39 billion. By 2000, Lhabitant reports between 4000 and 6000 hedge funds in existence, with aggregate AUM between $400-600 billion. Agarwal and Naik quote aggregate AUM of $487 billion. de Brouwer (2002) summarises a wide range of end of the 1990s estimates: between 1082 to 5830 hedge funds and $139-400 billion in aggregate AUM. Lhabitant's figures imply averaging at least 20% annualised growth in number of hedge funds and 35% in AUM. However, this was also a period of tremendous growth in the overall equities market. Over the decade, the number of mutual funds grew at 23% annualised and the capitalisation of the New York Stock Exchange grew at 17.5% annualised [Financial Stability Forum, 2000].

Most hedge funds are small (as measured by AUM), but the uncharacteristically large hedge funds are the most well known and manage most of the money in the hedge fund industry. The Financial Stability Forum (2000) reports 1999 estimates that 69% of hedge funds have AUM under $50 million, and only 4% have AUM over $500 million. Despite the number of smaller funds, larger hedge funds dominate the industry. Global macro strategy funds, such as Caxton, Moore, Quantum (Soros), and Tiger (Robertson), manage billions of dollars, attract most of the attention, and establish much of the reputation of the hedge fund industry. For example, a hedge fund index (HFR) used in research by Agarwal and Naik (2000) incorporates hedge funds with average assets of $270 million (non-directional strategies) and $480 million (directional strategies). In their selection process, hedge fund index providers have considerable leeway and may be likely to favour funds that they judge to be more reliable.



3 Hedge Fund Fee Structures

3.1 *Performance-based Fees*

Hedge fund managers are compensated by two types of fees: a management fee, usually a percentage of the size of the fund (measured by AUM), and a performance-based incentive fee, similar to the 20% of profit that Alfred Winslow Jones collected on the very first hedge fund. Fung and Hsieh (1999) determine that the median management fee is between 1-2% of AUM and the median incentive fee is 15-20% of profits. Ackermann et al. (1999) cite similar median figures: a management fee of 1% of assets and an incentive fee of 20% (a so-called “1 and 20 fund”).

The incentive fee is a crucial feature for the success of hedge funds. A pay-for-profits compensation causes the manager’s aim to be absolute returns, not merely beating a benchmark. To achieve absolute returns regularly, the hedge fund manager must pursue investment strategies that generate returns regardless of market conditions; that is, strategies with low correlation to the market. However, a hedge fund incentive fee is asymmetric; it rewards positive absolute returns without a corresponding penalty for negative returns.

Empirical studies provide evidence for the effectiveness of incentive fees. Liang (1999) reports that a 1% increase in incentive fee is coupled with an average 1.3% increase in monthly return. Ackermann et al. (1999) determine that the presence of a 20% incentive fee results in an average 66% increase in the Sharpe ratio, as opposed to having no incentive fee. The performance fee enables a hedge fund manager to earn the same money as running a mutual fund 10 times larger [Tremont, 2002]. There is the possibility that managers will be tempted to take excessive risk, in pursuit of (asymmetric) incentive fees. This is one reason why, in many jurisdictions, asymmetric incentive fees are not permitted for consumer-regulated investment products.

3.2 *Determining Incentive Fees: High Water Marks and Hurdle Rates*

To ensure profits are determined fairly, high water marks and hurdle rates are sometimes included in the calculation of incentive fees. A high water mark is an absolute minimum level of performance over the life of an investment that must be reached before incentive fees are paid. A high water mark ensures that a fund manager does not receive incentive fees for gains that merely recover losses in previous time periods. A hurdle rate is another minimum level of performance (typically the return of a risk-free investment, such as a short-term government bond) that must be achieved before profits are determined. Unlike a high water mark, a hurdle rate is only for a single time period. Liang (1999) determined that funds with high water marks have significantly better performance (0.2% monthly) and are widespread (79% of funds). Hurdle rates are only used by 16% of funds and have a statistically insignificant effect on performance.

3.3 *Equalisation*

The presence of incentive fees and high water marks may complicate the calculations of the value of investors' shares. If investors purchase shares at different times with different net asset values (NAV), naïve calculations of incentive fees may treat the investors differently. For example, presume shares in a hypothetical hedge fund are originally worth £100 when investor A purchases them. Subsequently the shares fall to £90, which is when investor B invests, and then shares return to £100. If there is a high water mark at £100, then investor B theoretically can liquidate her shares without incurring a performance fee, because the high water mark has not been passed. Since B has made a gross profit of £10 per share, this is obviously unfair, so an adjustment is required.

To treat both earlier and new investors fairly, the adjustment of profit calculations is an accounting process called equalisation. Since new investments are usually limited to certain periods (sometimes monthly or quarterly), a very simple form of equalisation is to issue a different series of shares for each subscription period, each with a different high water mark and different accruals of incentive fees. However, this form of equalisation leads to an unwieldy number of series of shares, so it is rarely used.

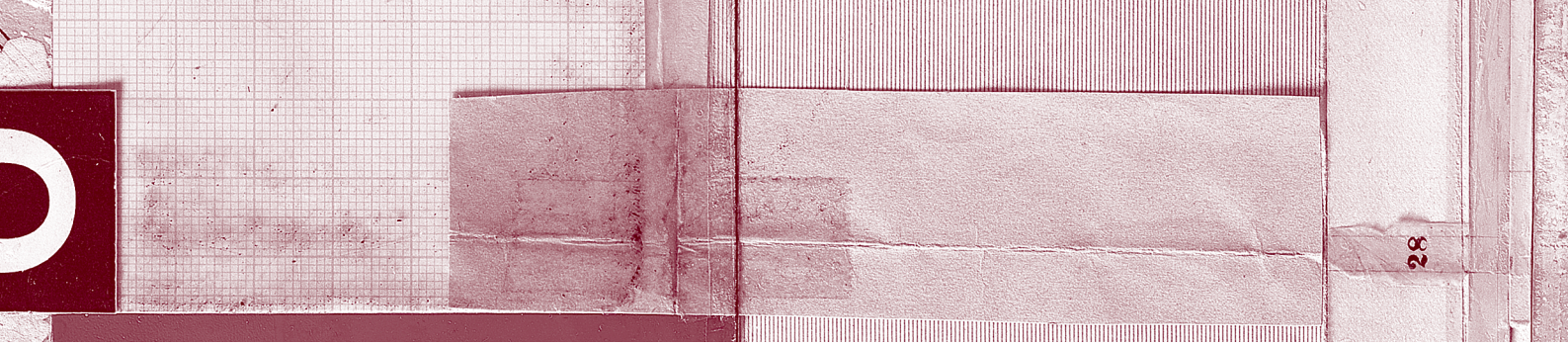
A more common equalisation method involves splitting new purchases into an investment amount and an equalisation amount that matches the incentive fee of earlier investors. The equalisation amount is used to put earlier investors and the new investor in the same position. If the hedge fund shares go up in value, the equalisation amount is refunded. If the hedge fund shares lose value, the equalisation amount is reduced or eliminated [Lhabitant, 2002]. Many US hedge funds do not require equalisation, because they are either closed, so they do not allow new investments, or they are structured as partnerships that use capital accounting methods.

3.4 *Minimum Investment Levels*

Minimum investment levels for hedge funds are usually high, implicitly dictated by legal limits on the number of investors who are not high net worth individuals ("qualified purchasers" or "accredited investors"), and restrictions on promotion and advertising. The SEC & FSA requirement of private placement for hedge funds means that hedge funds tend to be exclusive clubs with a comparatively small number of well-heeled investors. $250,000 is a common minimum initial investment, and $100,000 is common for subsequent investments [Ackermann et al., 1999; Liang, 1999]. From the perspective of the fund manager, having a small number of clients with relatively large investments keeps client servicing costs low. This allows the hedge fund manager to concentrate more on trading and less on client servicing and fund promotion.

3.5 *Fees for Funds of Funds*

Funds of funds (portfolios of hedge funds) are an increasingly popular way to invest in hedge funds with a much lower minimum investment. Funds of hedge funds usually impose a 1-2% management fee and 10-20% performance fee, in addition to existing hedge fund fees. However funds of funds often negotiate with hedge funds for lower fees than individual clients and this lowers their pass-through costs.



4 Hedge Fund Investment Strategies

4.1 *Strategy Categories for Hedge Funds*

In order to compare performance, risk, and other characteristics, it is helpful to categorise hedge funds by their investment strategies). Strategies may be designed to be market-neutral (very low correlation to the overall market) or directional (a “bet” anticipating a specific market movement). Selection decisions may be purely systematic (based upon computer models) or discretionary (ultimately based on a person). A hedge fund may pursue several strategies at the same time, internally allocating its assets proportionately across different strategies.

As Schneeweis (1998) notes, some hedge fund strategies (for example, fixed income arbitrage) were previously the proprietary domain of investment banks and their trading desks. One driver for the growth of hedge funds is the application of investment bank trading desk strategies to private investment vehicles.

4.2 *Long-Short*

Long-short hedge funds focus on security selection to achieve absolute returns, while decreasing market risk exposure by offsetting short and long positions. Compared to a long-only portfolio, short selling reduces correlation with the market, provides additional leverage, and allows the manager to take advantage of overvalued as well as undervalued securities. Derivatives may also be used for either hedging or leverage. Security selection decisions may incorporate industry long-short (such as buy technology and short natural resources) or regional long-short (such as buy Latin America and short Eastern Europe).

The classic long-short position is to choose two closely related securities, short the perceived overvalued one and long the undervalued one. For example, go long General Motors and short Ford Motors. This classic example has the greatest risk reduction since the two stocks are likely to have very similar market risk exposures. The pair-trade removes most of the market risk. Idiosyncratic risk remains, but it can be reduced with a portfolio of similar trades.

Long-short portfolios are rarely completely market-neutral. They typically exhibit either a long bias or short bias, and so have a corresponding market exposure (positive or negative). They are also likely to be exposed to other market-wide sources of risk, such as style or industry risk factors.

4.3 *Relative Value*

Relative value funds use market-neutral strategies that take advantage of perceived mispricing between related financial instruments. Fixed-income arbitrage may exploit short-term anomalies in bond attributes, such as the yield curve or the spread between Treasury and corporate bonds. Convertible arbitrage profits from situations where convertible bonds are undervalued compared to the theoretical value of the underlying equity and pure bond. In these cases, the hedge fund manager takes long positions on the convertible bond and shorts the underlying stock. Statistical arbitrage involves exploiting price differences between stocks, bonds, and derivatives (options or futures) while diversifying away all or most market-wide risks.

Situations for relative-value arbitrage often occur with illiquid assets, so there may be added liquidity risk. Gains on individual trades made be small, so leverage is often used with relative-value strategies to increase total returns.

4.4 *Event Driven*

Event-driven strategies exploit perceived mispricing of securities by anticipating events such as corporate mergers or bankruptcies, and their effects.

Merger (or risk) arbitrage is the investment in both companies (the acquirer and takeover candidate) after a merger has been announced. Until the merger is completed, there is usually a difference between the takeover bid price and the current price of the takeover candidate, which reflects uncertainty about whether the merger will actually happen. For instance, a fund manager may buy the takeover candidate, short stock of the acquirer, and expect the prices of the two companies to converge. In this case, there may be substantial risk that the merger will fail to occur.

Bankruptcy and financial distress are also hedge fund trading opportunities, because managers in traditional pooled vehicles (such as mutual funds and pension funds) may be forced to avoid distressed securities, which drive their values below their true worth. Certain hedge fund managers may also invest in Regulation D securities, which are privately placed by small companies seeking capital, and not accessible to traditionally managed funds. Investing in distressed securities typically increases liquidity risks.

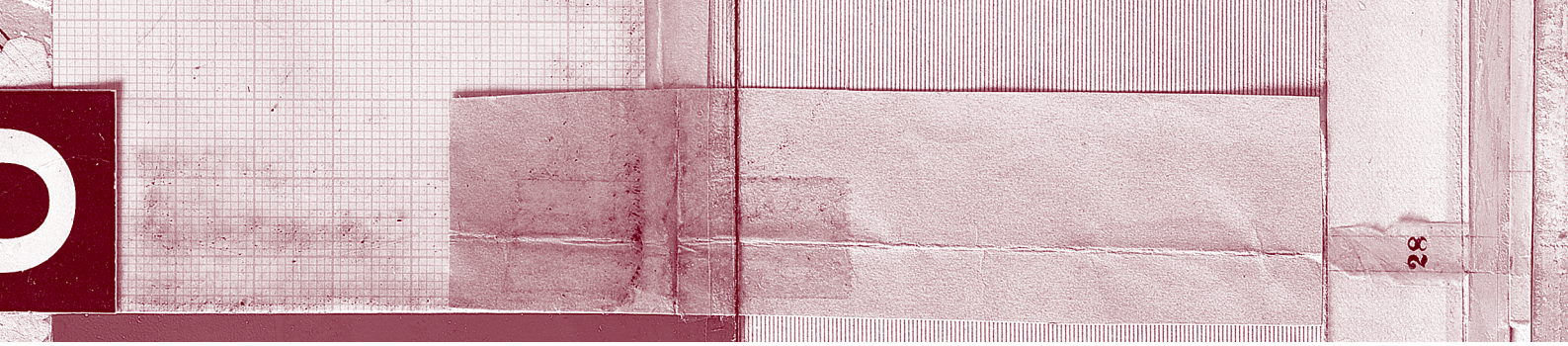
4.5 *Tactical Trading*

The tactical trading classification includes a large variety of directional strategies, including the subcategories of global macro and commodity trading advisers (CTAs). Global macro funds make investments based upon appraisals of international conditions, such as interest rates, currency exchange rates, inflation, unemployment, industrial production, foreign trade, and political stability. The global macro subcategory tends to contain

the largest hedge funds – earlier hedge funds, such as Robertson's Tiger Fund and Soros' Quantum Fund, and current funds, such as Brevan Howard and Moore. Global Macro funds receive the most scrutiny when hedge funds are accused of undermining global stability.

Global macro traders may use leverage, short sales, or derivatives to maximise returns. Some funds specialise in illiquid assets in emerging markets, which sometimes have financial markets that do not allow short sales or do not offer derivatives on their securities.

Commodities trading advisers (CTAs) specialise in speculative trading in futures markets. Trades may involve futures on precious metals, currencies, financial instruments, or more typical commodities in futures exchanges throughout the world. CTAs often use computer models to profit from differences in contract selection, weighting, and expiration. Fung and Hsieh (2001) explain "trend-following," the strategy of a majority of CTAs, and how the strategy can show positive returns, especially in extreme markets. In the US, the Commodity Futures Trading Commission (CFTC), not the SEC, regulates the actions of CTAs.



5 Risk Management

5.1 *Sources of Risk*

The name “hedge funds” seems to imply risk reduction (since “hedging” is a risk reduction technique), but this need not be the case. It is better to think of a hedge fund as a fund that hedges away any risk not related to its speculative strategy. The riskiness of a hedge fund therefore depends intimately upon its strategy. This contrasts with a traditional active fund where most of the risk comes from the benchmark, and a minority from the active portfolio strategy.

For traditional active funds, risk is measured in units of total return or in units of active return. Active return equals total return minus benchmark return. The performance of traditional fund managers is measured in terms of their active return against the benchmark, so active risk is the primary concern of the portfolio manager. The fund’s investors care both about total return (in order to measure the overall risk of their investment) and about active return (to ensure that the portfolio manager is properly positioned in terms of the investor’s allocation of funds across benchmark types). For hedge funds, active risk management and total risk measurement are equivalent since the benchmark is risk-free cash.

Using our theoretical definition of a hedge fund as the “purely active” component of a traditional fund, total risk measurement of a hedge fund is theoretically equivalent to active risk measurement of a traditional active fund. To summarise, for a hedge fund, total risk measurement and active risk measurement are the same, and they are theoretically equivalent to active risk measurement of a traditional active fund.

As mentioned above, hedge fund risk exposure is strongly dependent on the investment strategy chosen. In a well-run hedge fund, the only risks remaining in the portfolio are those that are intimately connected to the fund’s speculative strategy, or those that it is impossible or too costly to hedge away.

The market risk of a global macro fund includes the movements of currency exchange rates, interest rates, commodity prices, and equity prices. Tactical trading and long-short equity funds are affected by specific equity price risk. Hedging generally reduces correlation with a broad market index, but the equity trading strategy may increase correlation with changes in particular industry sectors or global regions. Fixed-income arbitrage is directly affected by market risk (the yield and duration of debt securities) and often by credit risk, materialised in the creditworthiness of the debtor companies. Of course, CTAs are affected by commodity risk.

Some hedge funds incur liquidity risk, such as those specialising in emerging market equities or distressed assets, which target illiquid securities that may be overlooked and mispriced by other analysts. Often, the profitable trading strategies of arbitrage-based hedge fund strategies include active positions in securities with limited or uncertain liquidity. Hence liquidity risk is of particular importance in risk measurement for hedge funds.

Hedge funds have two sources for credit risk. A hedge fund that specialises in distressed securities or fixed-income arbitrage is exposed to the default risk of debt securities that it owns. More significantly, most hedge funds use leverage, which subjects them to the other type of credit risk, the need to repay the financial institutions that extend hedge funds their credit.

Under extremely adverse market conditions, a hedge fund may face both credit and liquidity crises simultaneously. In an emergency (such as margin calls), the hedge fund may not be able to obtain additional credit and may be forced to obtain cash quickly. Other hedge funds, and similarly positioned traders, may be facing similar circumstances. A large imbalance between willing buyers and desperate sellers needing cash may compel a hedge fund to sell its portfolio below “fair value”.

If many aggressive high-margin speculators have similar positions in a credit crisis, this can induce a liquidity crisis, or vice-versa. This type of interaction seems to have contributed to the collapse of LTCM.

5.2 *Measuring Hedge Fund Risk*

There are two standard approaches to measuring portfolio risk: the variance-based approach and the value-at-risk approach. These two approaches are not incompatible, and many portfolio managers use both.

The variance of a portfolio return is the expected squared deviation of the return from its mean. If the portfolio return has a normal distribution, the variance of the return completely describes the riskiness of the return. Although normality is not necessary for application of the variance-based approach, the approach becomes less useful if returns differ very sharply from a normal distribution. Derivative securities and portfolios that include derivatives are notable for their lack of normality.

The variance-based approach is most powerful if returns have a linear factor structure, so that the random return of each asset can be decomposed into linear responses to a small number of market-wide factors plus an asset-specific risk. A linear factor model is a useful model for simple stock and bond portfolios, but not for portfolios that include derivatives. Derivatives have a non-linear relationship to their underlying security, and so a portfolio including derivatives (except plain-vanilla futures contracts) cannot be modelled with a linear factor model.

Because of the lack of normality and the inadequacy of factor models, variance-based approaches do not work well for portfolios that include derivatives. Most (but not all) hedge funds include derivatives. Some types of hedge fund strategies, for example, betting on currency or interest rate re-alignments, lead to highly non-normal portfolio returns and poor factor model fit even without any derivatives exposure. It is clear that some other approach instead of (or in addition to) the variance-based approach is needed to measure the risk of hedge funds.

In the aftermath of the LTCM collapse, the President's Working Group on Financial Markets (1999) recommended use of the value-at-risk (VaR) approach to monitor hedge fund risk and guard against extreme events. VaR is defined as the maximum loss to be sustained within a given time period for a given level of probability. So for example a hedge fund might have a 5-day, 1% VaR of $100,000, meaning that only in one trading week out of 100 the fund will have a loss of $100,000 or more. VaR describes one feature of the return distribution – the length of the lower tail to reach a chosen cumulative probability value. Knowing VaR is equivalent to knowing variance only in the special case of a normal distribution.

VaR is more difficult to estimate than variance, and there are no simple rules for determining the contribution to VaR of individual asset positions, as there are for variance. Linear factor models cannot be used to decompose VaR into a set of risk exposures and an asset-specific risk, as can be done for variance. The strength of VaR lies in its generality. It works for a portfolio including derivatives and other non-linear return patterns, and does not rely on variance serving as a useful measure of dispersion. A fundamental problem with VaR is that it is extremely difficult to estimate the true probability of low probability events. Hedge funds require additional risk assessment techniques, such as stress testing, to monitor the source and severity of low probability events. Stress tests are computer-based "what-if" simulations of a portfolio's reaction to extreme adverse conditions. Stress tests examine the effects of simultaneous adverse changes in market prices, bond yields, exchange rates, volatility, and correlations on portfolio value.

6 Hedge Fund Performance Measurement

6.1 *Hedge Fund Indices*

As the hedge fund industry matures, the demand arises for benchmarks to compare the performance of hedge funds to one another and to compare hedge fund performance with other asset classes. Several third parties (such as CSFB-Tremont, Hedge Fund Research (HFR), Van Hedge, and Zurich Capital Markets/MAR) have filled the demand for hedge fund benchmarks by providing hedge fund indices.

Hedge fund index providers generally do not provide a single monolithic index, but instead provide separate indices for different hedge fund strategies. This approach groups hedge funds of similar size and correlation to the market. In addition, new categories may arise as hedge fund managers devise innovative trading strategies. However, the categorisation approach suffers because there is no industry-wide consensus on the definition of categories, so indices from different providers are not always comparable with one another.

6.2 *Data Biases: Selection, Survivorship, and Closed Funds*

Due to lack of reporting requirements, there is no single, central database for aggregate performance analysis of hedge funds. Hedge funds that do report results and are included in a database may use the added recognition and legitimacy to attract new investors. This gives rise to a "self-selection bias," since choosing to report results to a database might be related to the fund's performance.

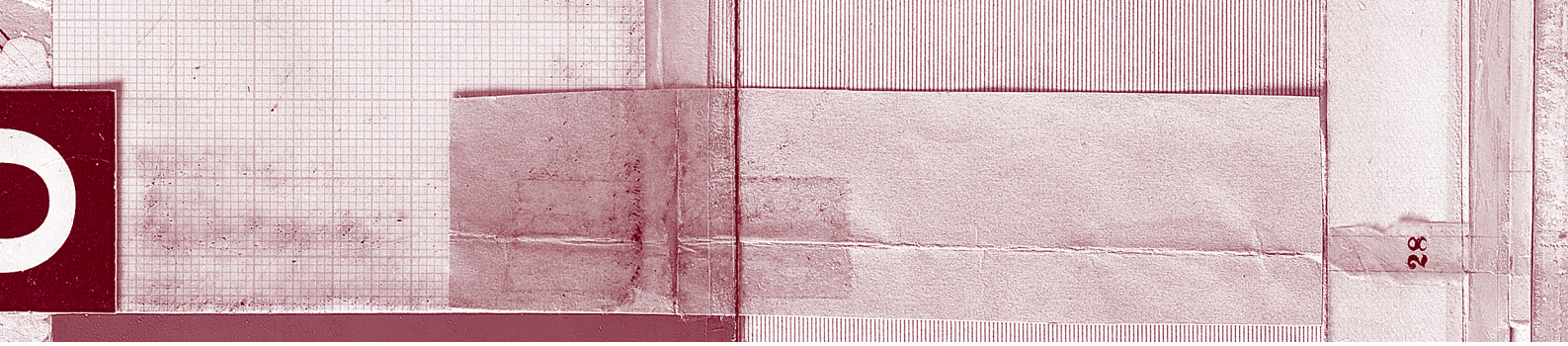
Hedge fund databases also exhibit "survivorship bias" from several causes. When a database is created, it cannot reflect funds that are already defunct. Funds that die or otherwise stop reporting are usually removed from an index

and its associated database, and returns from their final period (or even their entire history) may be unreported. Some index providers practice additional selection bias and will not include a small or young hedge fund. These influences generally create an upward performance bias on an index.

Ackermann et al. (1999) investigates survivorship bias and compares the performance of funds that leave databases against funds that remain. They conclude that survivorship effects on data are small, as low as 0.013% monthly. Brown, Goetzmann, and Ibbotson (1999) claim that survivorship bias has a much stronger influence. Using only non-US hedge funds, they determine bias of almost 3% per year, up to 20 times Ackermann et al.

There is a performance shortfall (not really a bias) associated with hedge funds that are included in aggregate performance data but that are closed to new investors. Hedge fund managers sometimes have an incentive to close funds since a larger-size fund incurs higher market impact costs in implementing trades, and this detracts from net return. Hedge fund managers have personal wealth invested in the fund, as well as strong return-related compensation from the fund. Traditional active funds, where management fees tend to be proportional to assets under management, are less often closed to new investors.

If closed hedge funds tend to outperform other hedge funds, then the average measured return across funds will be higher than the average return available to new investors not already enrolled in the closed funds. This creates a difference between the average return to hedge funds versus the average return available to new hedge fund investors.



7 Conclusion

Hedge funds are an exciting innovation to the range of professionally managed investment vehicles. Hedge funds concentrate almost exclusively on the speculative role of investment management, that is, the attempt to outperform the market average by superior security valuation and successful trading strategies. Hedge funds are in a sense the opposite of index tracking funds, which simply try to earn the market average return with minimal management cost. Theoretically, one can view a traditionally managed active fund as a combination of a hedge fund and an index tracking fund. The index tracking fund is the "purely passive" component and the hedge fund is the "purely active" component of the traditional active fund.

Hedge funds offer very strong incentives for the portfolio manager by linking the manager's compensation tightly to the realised return of the fund. Hedge funds minimise information leakage and maximise flexibility by avoiding full disclosure and granting the manager very wide latitude in strategy and trading decisions. These policies differ from those of the traditional fund, which must meet regulatory guidelines intended for protection of the investment public. Hedge funds restrict access to exempt investors only, in order to avoid these regulatory constraints.

Hedge funds confront the traditional fund sector with a strong challenge. They have attracted more attention and media interest than the traditional sector, they have drawn heavily on the pool of talented fund managers due to their lucrative compensation packages, and they have attracted a very strong (but still proportionately small) flow of capital. There is also some evidence that hedge funds have outperformed on average in terms of their risk-reward profile, although this evidence is not yet conclusive. At a minimum, hedge funds have brought innovative investment strategies and a new sense of excitement to the investment community.

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Glossary

Absolute Return - Portfolio return without subtracting any benchmark return.

Active Management - Conducting valuation research and then choosing a portfolio in an attempt to outperform the average investor by overweighting undervalued securities and underweighting (or short-selling) overvalued ones. See Passive Management.

Active Return - Portfolio return minus the benchmark return.

Active Risk - Standard deviation of active return. The term is also sometimes used to refer to the difference between the risk exposures of the portfolio and the benchmark.

Alpha (or Jensen's Alpha) - The average or expected out-performance of an asset or portfolio, adjusted for market risk. Historical alpha (average out performance over an earlier sample period) is called ex-post alpha, whereas forecast alpha (expected out performance in the future) is called ex-ante alpha.

Alternative Investments - Broad category of investments, other than stocks and bonds, including venture capital, private equity, precious metals, collectibles, and hedge funds.

Arbitrage - In theory, profiting by exploitation of mispriced securities while hedging away all risk. In practice, arbitrage strategies do not eliminate all risk.

Commodity Trading Advisor (CTA) - Asset manager who specialises in portfolios consisting of futures and options on commodities or on any other type of underlying security. Some CTA's deal only in futures and options on stocks and bonds and do not trade in any traditional commodity market futures.

Convertible Arbitrage - Hedge fund strategy of taking advantage when a convertible bond is mispriced compared to the theoretical value of its underlying security.

Derivative - Financial instrument whose value depends upon the value of an underlying security. Options, forwards, and futures are examples of derivatives.

Directional - Describing an investment strategy that relies upon the direction of an overall market movement, rather than the mis-pricing of individual securities. Global macro is an example of a directional strategy, as opposed to for example convertible arbitrage.

Discretionary Trading - Security selection that uses the intuition of portfolio managers as well as computer models.

Distressed Securities - The equity and debt of companies that are in or near bankruptcy or in a similar chaotic situation. Distressed securities may be purchased in an event-driven hedge fund.

Drawdown - The amount lost during a particular measurement period such as a month or year. Maximum drawdown, a common measurement, is the maximum loss during a measurement period, had an investor bought at the highest valuation during the period and sold at the lowest valuation.

Event Driven Strategies - Hedge fund strategies that exploit anomalous pricing of securities due to corporate events such as mergers, financial distress, or debt refinancing.

Fixed Income Arbitrage - Exploitation of anomalies in debt securities, such as unusual risk premiums, yield curve shapes, or prepayment patterns.

LSE

Fund of Funds - Managed portfolio of other hedge funds. Also known as a "fund of hedge funds."

Global Macro - Hedge fund strategy where large directional bets are made, often on the direction of currency exchange rates or interest rates

High Water Mark - Incentive (performance) fee is based upon surpassing an absolute level of success. With a high water mark, a hedge fund that loses in its first year and then merely regains that loss in the second year will not result in the manager receiving an incentive payment for the second year gain.

Long-Short Equity - Hedge fund strategy that is based on skill in security selection, taking both long and short positions. The resulting portfolio is not necessarily market-neutral, because it may exhibit a long-bias or short-bias.

Market Neutral - Investment strategy that does not count on a specific market movement (also known as non-directional)

Merger Arbitrage - Investment in both companies (the acquirer and takeover candidate) involved in a merger or acquisition, anticipating either the success or failure of the event. Also known as Risk Arbitrage.

Passive Management - Buying and holding a representative portfolio in an attempt to earn the market-wide average return without having to research security valuations. See Active Management.

Passive Returns - Returns from holding a benchmark, such as the S&P 500 or MSCI EAFE.

Relative Value Strategies - Broad category of market-neutral hedge fund strategies that take advantage of anomalies among related financial instruments.

Risk Arbitrage - see Merger Arbitrage.

Sharpe Ratio - Average return to a portfolio in excess of the risk-free return divided by the standard deviation of the portfolio return. A higher value indicates a better "reward-to-risk" tradeoff. Also called the reward-to-variability ratio.

Special Situations - Events such as announced mergers and restructurings, spin-offs, hostile takeovers, and bankruptcy situations.

Survivorship Bias - The statistical bias in performance aggregates due to including data only from live funds, while failing to include dead (liquidated or no longer operating) funds.

Systematic Trading - Security selection that relies upon the decisions of computer models.

Tracking Error - How closely a portfolio return follows a benchmark return. See Active Risk.

VaR (Value at Risk) -
The maximum loss to a portfolio over a given time period with a given level of confidence. For example, if a 10 day VaR at 99% confidence level is $100,000, then we conclude that 99% of the time the portfolio will not decline more than $100,000 in value within 10 days.

Water Marks-see High Water Mark.

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One Rockefeller Plaza, Suite 1010
New York NY 10020 USA
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