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White Paper

DiMeo Schneider & Associates, L.L.C.
By: Matthew Rice, CFA, Chief Investment Officer
► JULY 2011

Hedge Funds

Opportunities, Challenges and Market Evolution

Introduction

University endowments have allocated significant assets to hedge funds over the past two decades. By 2010, the average endowments had 24 percent of its assets invested in hedge funds¹. In part due to the well publicized success of some large university endowments, smaller endowments, foundations, museums, libraries, healthcare organizations and pension funds “want to be like Yale.” While effective hedge fund investing can help investors meet difficult investment objectives, it also brings specialized risks and challenges that must be diligently managed.

Hedge funds have evolved since their introduction 60 years ago. They spread from the United States to Europe, Asia, and the emerging markets. While technical definitions vary across borders, in general, hedge funds are actively managed pools that follow less conventional investment strategies. They are usually unregistered investment vehicles intended for sophisticated institutional investors and wealthy individuals. In the strictest sense, hedge funds are not an asset class, but rather an amalgam of strategies that invest across asset classes. The term “hedge fund” itself functions as a catchall phrase for private investment partnerships, regardless of whether hedging techniques are actually employed. Like traditional investment managers, hedge funds manage portfolios of securities, have predetermined investment objectives and styles and employ strategies ranging from conservative to the extremely aggressive. Hedge funds can engage in a variety of investment strategies that include leverage, derivatives trading and short selling. Unlike traditional active managers, who seek to outperform benchmarks on a relative basis, hedge funds often target positive absolute returns regardless of market direction.

¹ Source: 2010 NACUBO-Commonfund Study of Endowments. The dollar-weighted average allocation to alternative investments was 52 percent for the 850 institutions surveyed. On average, about 46 percent of the alternative investment allocation was invested in hedge funds, which implies a 24 percent average hedge fund allocation. Hedge funds include marketable alternative strategies (i.e., hedge funds, absolute return, market neutral, long/short, 130/30, event-driven and derivatives) and distressed debt. The percentage of the alternative investments allocation was positively correlated to endowment size.

The Evolution of Hedge Funds

Alfred Winslow Jones created the first hedge fund in the late 1940s and is widely regarded as the father of the modern hedge fund industry. Jones' inspiration was to combine speculative tools to create what he considered a more conservative or "hedged" investment strategy. He used leverage to buy more shares, but also employed short selling to reduce exposure to market risk. He bought as many stocks as he sold short, so overall market moves up or down offset each other. His objective was to render the overall market's direction irrelevant and generate positive returns by buying and shorting the right stocks.

Jones' pioneering fund avoided the requirements of The Investment Company Act of 1940 by restricting itself to 99 investors in a limited partnership structure and charged a 20 percent incentive fee on gains. However, unlike most modern hedge funds, fees were not levied unless the fund actually profited. The private partnership structure, the incentive fee, and the blending of long and short positions remain core elements of the hedge fund industry today.

Hedge funds spent the thirty years between 1950 and 1980 in relative obscurity. However, by the mid 1980s, *long-short equity* and *global macro* managers dominated the landscape as hedge fund legends Julian Robertson, George Soros and others grabbed headlines in the financial press. Media attention deified such managers and drove many wealthy investors to seek out hedge funds for the first time. Hedge fund investing became the topic of boastful high society cocktail party chatter.

The industry's growth accelerated considerably in the 1990s. In 1992 George Soros made a famous (and massively profitable short bet) on the British pound that "broke the Bank of England." Long Term Capital Management's infamous and systemically hazardous implosion in 1998 grabbed the spotlight. According to Hedge Fund Research, hedge fund assets grew from \$39 billion in 1990 to \$539 billion by 2001. Over the same period, the total number of hedge funds increased more than seven fold from 610 to 4,454.

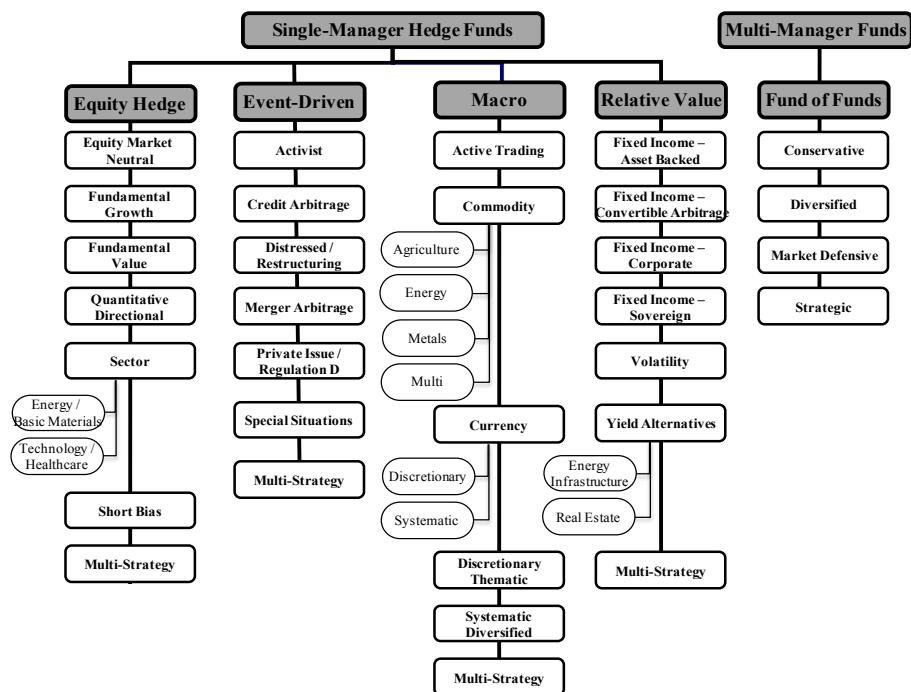
Modern Hedge Fund Strategies

The first decade of the 21st century was eventful for hedge funds. By the end of 2010, Hedge Fund Research counts 9,200 total hedge funds with nearly \$2 trillion in assets. Today's hedge fund landscape is crowded with new specialized strategies sprouting up seemingly overnight.

Exhibit I shows Hedge Fund Research's classification system at the end of 2010. There are five broad categories: **Equity Hedge**, **Event Driven**, **Macro**, **Relative Value** and **Multi-Manager**. Each category is composed of several underlying strategies with varying sub-styles. Many of these strategies, styles and nuanced sub-styles overlap.

Exhibit I

Hedge Fund Strategy Classification²



Equity Hedge

Equity hedge managers maintain long and short positions primarily in equity and derivative securities. Portfolio selection can be driven by either quantitative or fundamental strategies. Strategies can be broad (global) or narrow (sector specific) and have ranges of net exposures, leverage, holding periods and concentrations to various market capitalizations.

The equity hedge category has several sub-strategies:

- *Market neutral* managers often use quantitative techniques to build long-short portfolios, but maintain little directional exposure to the market.
- *Quantitative directional* managers are similar to market neutral managers, but they have greater leeway to maintain directional market exposure.
- *Fundamental growth and value* managers follow stock selection processes similar to traditional growth and value managers, but can also employ leverage and short-selling.
- *Sector specialists* concentrate on specific sectors (e.g., healthcare, technology, energy, etc.), but usually maintain net positive market exposure to their sectors.
- *Short-biased* strategies are similar to traditional long-short, but typically maintain varying levels of net short exposure.
- *Multi-strategy equity hedged* managers employ multiple hedged equity strategies within a single portfolio.

² Source: HFR Global Industry Report – Year End 2010

Event Driven

Event driven managers take positions in companies involved in corporate transactions such as mergers, restructurings, financial distress, tender offers, shareholder buybacks, debt exchanges, security issuance or other capital structure events. Security types can range from senior to junior in the capital structure. Such managers frequently use derivatives. Their investment theses are typically fundamentally-driven.

The event driven category has several sub-strategies:

- *Activist* managers seek to gain control to change management or the strategic direction of a company ostensibly to maximize shareholder value.
- *Credit arbitrage* managers seek to exploit mispricing among debt securities of an issuer.
- *Distressed* managers seek to profit from purchasing deeply discounted credit securities or instruments as a result of a company's actual or impending bankruptcy.
- *Merger arbitrage* managers seek opportunities in equity and equity related instruments of companies engaged in ownership transactions.
- *Private issue* strategies buy equity and equity related instruments that are primarily private or illiquid securities of companies.
- *Special situation* managers focus on opportunities in equity and equity related instruments of companies which are engaged in a corporate transaction, security issuance/repurchase, asset sales, division spin-off or other catalyst.
- *Multi-strategy event-driven managers* employ multiple event-driven strategies within a single portfolio.

Macro

Macro managers take an over-arching economic world view. They engage in strategies where economic change impacts equity, fixed income, currency and commodities markets.

The macro category has several sub-strategies:

- *Active trading* strategies employ either discretionary or rules-based high-frequency trading in multiple asset classes.
- *Single commodity* managers trade a single commodity type (e.g. metals, energy, agriculture) using a fundamental, systematic or technical process.
- *Multi-commodity* managers include both discretionary and systematic commodity strategies. Systematic means that mathematical, algorithmic and technical models drive portfolio positioning. The systematic commodity trading strategies are often used by Commodity Trading Advisors (CTAs). Discretionary commodity strategies rely on fundamental evaluation of markets, relationships and influences as they relate to commodity markets.
- *Currency discretionary* strategies rely on fundamental evaluation of market data to trade currency markets. They generally use top-down macroeconomic analysis of variables.
- *Currency systematic* strategies are driven by mathematical, algorithmic and technical models.
- *Discretionary thematic* strategies trade in equity, interest rates, fixed income, currency and commodity markets. They rely on the evaluation of market relationships and influences and a top down analysis of macroeconomic variables.
- *Systematic diversified* strategies trade multiple asset classes and are driven by mathematical, algorithmic and technical models.
- *Multi-strategy macro* managers employ a variety of macro strategies within a single portfolio.

Relative Value

Relative Value managers seek to exploit value discrepancies between securities. They employ a variety of fundamental and quantitative techniques to develop investment theses. They trade equities, fixed income, convertible bonds, and derivatives.

The relative value category has several sub-strategies:

- *Fixed income-asset backed* strategies seek to exploit mispriced spread relationships between related fixed income instruments backed by physical collateral or other financial obligations (i.e., loans, mortgages, credit cards, etc).
- *Fixed income-convertible arbitrage* strategies seek to exploit mispricing between a convertible bond and the stock of the issuer. They also may arbitrage spreads between other related instruments.
- *Fixed income-corporate* strategies seek to exploit the spread between multiple related corporate fixed income instruments. *Fixed income-corporate strategies* differ from *event-driven credit arbitrage* in that the former uses general market hedges. Event driven credit arbitrage typically has little or no net credit market exposure.
- *Fixed income - sovereign* strategies seek to exploit spreads between a sovereign fixed income instrument (foreign government bond) and some related instrument (a corporate bond or a derivative contract).
- *Volatility* strategies trade *implied volatility* as an asset class. They use derivative instruments such as options, and swaps on the volatility index (VIX) or some other measure of volatility. Volatility exposures can be long, short, neutral or variable to the direction of implied volatility.
- *Yield alternatives – energy infrastructure* strategies seek to exploit valuation discrepancies between master limited partnerships (MLPs), utilities or power generators. They typically use fundamental analysis.
- *Alternatives – Real Estate* strategies seek to exploit the valuation differences between related instruments with exposure to real estate. Strategies are typically fundamentally driven.
- *Multi-Strategy relative value* seeks to arbitrage spread relationships among any of the above.

Multi-Strategy

Multi-strategy funds allocate capital opportunistically among various hedge fund categories, strategies and styles. “Multi-strat” managers typically lever the whole portfolio. Total portfolio assets back the obligations of each specific underlying leveraged position. There is an important difference between single multi-strategy manager and multi-strategy fund of funds. Cross collateralization within a single multi-strat manager theoretically allows one errant highly levered strategy or trade to bring down the entire portfolio. A multi-strategy fund of hedge funds allocates capital to several hedge fund firms so this cross collateralization does not occur.

Multi-Manager Fund of Hedge Funds

Funds of hedge funds managers (FOHFs) invest in other hedge funds or managed account programs. A FOHF provides investors with “one-stop-shopping” to achieve strategy and manager diversification. A fund of hedge funds may also tactically weight the portfolio toward the strategies and managers they believe are best positioned for the future. The portfolio will typically diversify across a variety of

investment managers, investment strategies and subcategories. However, fund of hedge funds have a double layer of fees.

Why Invest in Hedge Funds?

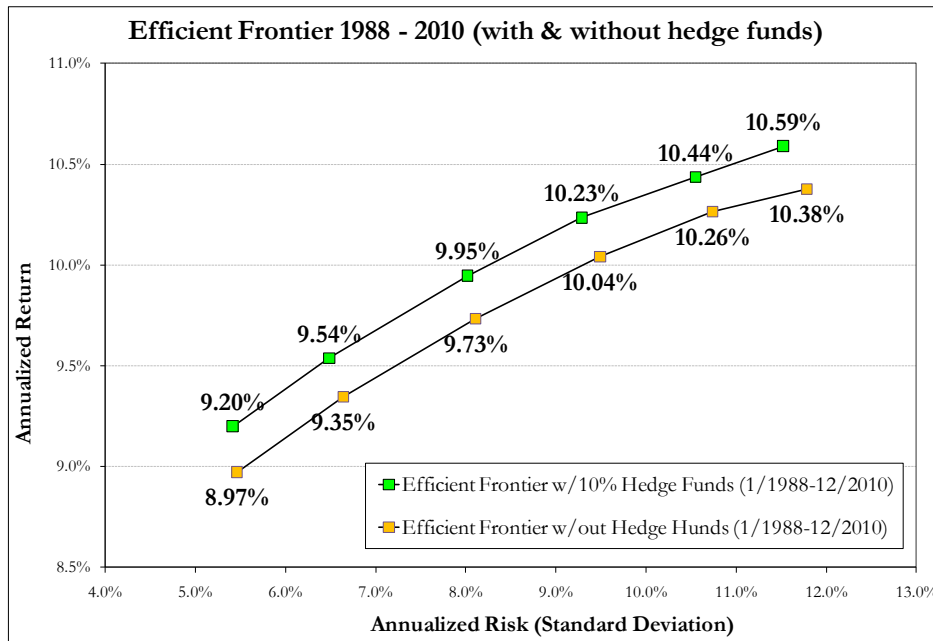
Why on earth would investors want to expose their portfolios to the baffling complexity of hedge funds? Unfortunately, there are more bad reasons to invest in hedge funds than good. A common (poor) rationale is “*Because Harvard and Yale do it.*” These high profile institutions have well-trained armies of employees and consultants to vet strategies and managers for the portfolio. Investing in hedge funds without the proper skill and resources is a recipe for disaster. The needed skills and resources are expensive and require significant scale to be cost-effective. A related poor rationale is that hedge funds provide a panacea for dealing with other investment risks. Hedge funds have their warts despite what you might hear from a highly skilled (and incented) hedge fund salesperson.

There are really only two rational reasons to invest in hedge funds. First, you think doing so will improve the risk-adjusted performance of your aggregate portfolio. Second, and significantly more importantly, you believe you can do it well. If you can’t clear these two hurdles, you would be wise to forgo hedge funds and focus your attention elsewhere.

An investor’s objective when allocating to hedge funds, or any other investment, should be to improve risk-adjusted performance. That can either mean increasing expected return without increasing expected risk or reducing expected risk without decreasing expected return. Exhibit II illustrates a theoretical 23-year performance history (January 1988 to December 2010) for six well-diversified portfolios along two frontiers; one includes and the other excludes hedge funds. The six portfolios on each frontier represents a range from 70 percent fixed income to 11 percent fixed income with the remainder allocated to equities or other non-hedge fund alternative investments. This range is meant to illustrate a spectrum of investment objectives and risk constraints applicable to different investors. Except for hedge funds, both frontiers include the same asset classes; *cash, TIPS, US investment grade bonds, foreign currency hedged and unhedged bonds, high yield bonds, US stocks, foreign developed stocks, emerging markets stocks, real estate, energy infrastructure MLPs and commodity futures*. Indices were used for asset class proxies and monthly rebalancing was used for illustrative purposes (see Exhibit III for details).

We must note that investing directly in indices is impossible, but for the purpose of this exercise is used to illustrate historical risk-adjusted performance with as few biases as possible. The ***HFN Fund of Funds - Multi-Strategy Index*** was used as the performance proxy for a diversified portfolio of hedge fund strategies. This index represents a peer group of multi-strategy fund of hedge funds. As we’ll discuss later, hedge fund indices have uniquely flawed construction methods that lead to performance biases. Therefore, review the performance history of any hedge fund index with some skepticism.

Exhibit II



As Exhibit II shows, a 10 percent hedge fund index allocation increased the historical returns along the entire frontier by approximately 0.20 percent annually, without increasing volatility. Over a 23-year period, the difference between compounding at a 10.23 % and 10.04% annual return for a \$100 million portfolio is about \$37 million. We again stress that it was impossible to have invested directly in indices over the past 23 years, and this analysis is for illustrative purposes only.

During this 23-year period, The **HFN Fund of Funds Multi-Strategy Index** had an annualized return of 10.3 percent with a standard deviation of 5.5 percent. Over the same period, the S&P 500 Index returned 9.8 percent with a 14.9 percent standard deviation, and the Barclays Aggregate Bond Index returned 7.3 percent with 4.0 percent standard deviation. Hedge funds had an R^2 of 0.18 to S&P 500 Index, meaning approximately 18 percent of hedge funds' return variance could be explained by large cap US stocks. Hedge funds had an R^2 of 0.01 to Barclays Aggregate US Bond Index, meaning approximately 1 percent of hedge funds' variance could be explained by US investment grade bonds. Exhibit III shows the index proxies used to represent each asset class and their historical performance from 1988 – 2010. Allocating to hedge funds over this period improved the risk-adjusted performance of a portfolio, regardless of where that portfolio falls on the risk-reward spectrum. The historical outperformance was driven by the hedge fund index's relatively high Sharpe Ratio (return per unit of risk) as well as its relatively low correlation to other asset classes in the portfolio.

Exhibit III

January 1, 1988 - December 31, 2010 Performance Metrics

	Cash	TIPS	US Bonds	Int'l Bond (50-50 H & UH)	HY Bond	Large Cap US	Small Cap US	REITs	Int'l Equity	Em. Mkts. Equity	Commodity Futures	Hedge Funds Portfolio	MLPs
Geometric Annualized Returns	4.1%	7.6%	7.3%	6.8%	9.0%	9.8%	10.1%	8.6%	5.8%	14.1%	12.3%	10.3%	16.7%
Annualized Standard Deviation	0.6%	5.4%	4.0%	5.4%	8.3%	14.9%	19.2%	19.9%	17.6%	24.2%	17.4%	5.5%	15.0%
Growth of \$1 million	\$2.5	\$5.4	\$5.1	\$4.6	\$7.3	\$8.6	\$9.1	\$6.7	\$3.7	\$20.6	\$14.5	\$9.4	\$35.1
Maximum Calendar Year Return	9%	18%	18%	19%	56%	38%	47%	37%	39%	79%	46%	26%	76%
Minimum Calendar Year Return	0.1%	-2.9%	-2.9%	-2.0%	-26.2%	-37.0%	-33.8%	-39.8%	-43.1%	-53.2%	-39.5%	-20.5%	-36.9%
<i>Maximum Drawdown (1988-present)</i>	N.A.	-12.1%	-5.2%	-5.4%	-33.1%	-50.9%	-52.9%	-70.9%	-56.4%	-61.4%	-59.0%	-21.1%	-41.1%
<i>Date Drawdown Began</i>	N.A.	Feb-08	Jan-94	Nov-88	May-07	Oct-07	May-07	Jan-07	Oct-07	Oct-07	Jan-08	Oct-07	Jun-07
<i>Date Drawdown Ended</i>	N.A.	Oct-08	Jun-94	May-89	Nov-08	Feb-09	Feb-09	Feb-09	Feb-09	Feb-09	Feb-09	Dec-08	Dec-08
<i>Duration of Drawdown (Years)</i>	N.A.	0.7	0.4	0.5	1.5	1.3	1.8	2.1	1.3	1.3	0.7	1.2	1.5
2000-2002 Bear: 8/31/00 - 9/30/02	7.6%	30.4%	23.4%	16.1%	-6.0%	-44.7%	-30.6%	21.0%	-42.2%	-34.0%	27.5%	9.7%	54.0%
2007-2009 Bear: 10/31/07 - 2/28/09	2.5%	1.0%	6.1%	6.0%	-26.2%	-50.9%	-52.0%	-67.1%	-56.4%	-61.4%	-43.6%	-21.0%	-32.7%
Return from 10/31/07 - 12/31/10	2.7%	20.2%	21.3%	19.4%	30.6%	-12.8%	-0.9%	-14.3%	-22.8%	-6.8%	2.4%	-9.4%	46.1%

Historical performance statistics were generated from the following indexes:

Asset Class	Dates Used	Most Recent Index Proxy	Prior Index Proxy	Dates Used
Cash	1/1979-12/2010	Citigroup 3-month T-Bill	N.A.	N.A.
TIPS	3/1997-12/2010	Citigroup Inflation-Linked Securities	Barclays US Aggregate Bond Index	1/1979-4/1997
U.S. Bonds	1/1979-12/2010	Barclays US Aggregate Bond Index	N.A.	N.A.
Int'l Bond (H)	1/1985-12/2010	Citigroup Foreign Bond (H)	Barclays US Aggregate Bond Index	1/1979-12/1984
Int'l Bond (UH)	1/1985-12/2010	Citigroup Foreign Bond (UH)	Barclays US Aggregate Bond Index	1/1979-12/1984
HY Bond	12/1984-12/2010	Meall Lynch High Yield Master	Barclays US Aggregate Bond Index	1/1979-10/1984
Large Cap	1/1979-12/2010	S&P 500	N.A.	N.A.
Small Cap	1/1979-12/2010	Russell 2000	N.A.	N.A.
REIT	1/1979-12/2010	DJ Wilshire Real Estate Sec.	N.A.	N.A.
Int'l Equity	1/1979-12/2010	MSCI EAFE	N.A.	N.A.
Em. Mkt. Eq.	1/1988-12/2010	MSCI Emerging Markets Free	MSCI EAFE	1/1979-12/1987
TIPS/Commodities	1/1991-12/2010	SP500 Commodity Index + Cit Inflation Securities 07 present & Barclays Ag. - Citigroup 5 Month T-Bill 07-08	Goldman Sachs Commodity Index + Barclays Ag. - Citigroup 3-Month T-Bill	1/1979-12/1990
Hedge Funds Portfolio	1/1982-12/2010	HFN Fund of Funds - Multi-Strategy Index	HFN Hedge Fund Aggregate Average	1/1979-12/1981
MLPs	1/1991-12/2010	Russell MLP Index 06 - present, Atlantic MLP Index 01-05, Waterloo MLP Index 06-05	Goldman Sachs Commodity Index + Barclays Ag. - Citigroup 3-Month T-Bill	1/1979-12/1990

As a skeptic once quipped, “I’ve never seen a back-test that didn’t work!” So now that you see how hedge funds are supposed to add value within a diversified portfolio, what’s the best way to determine if they really can add value going forward? In order to answer that question, we put together a forward-looking asset allocation model. This model quantifies the expected ten-year forecasted return for various portfolio mixes by aggregating the risks, returns and correlation coefficients of all underlying assets. Exhibit VI summarizes the 2011-2020 forecast assumptions.

Exhibit IV

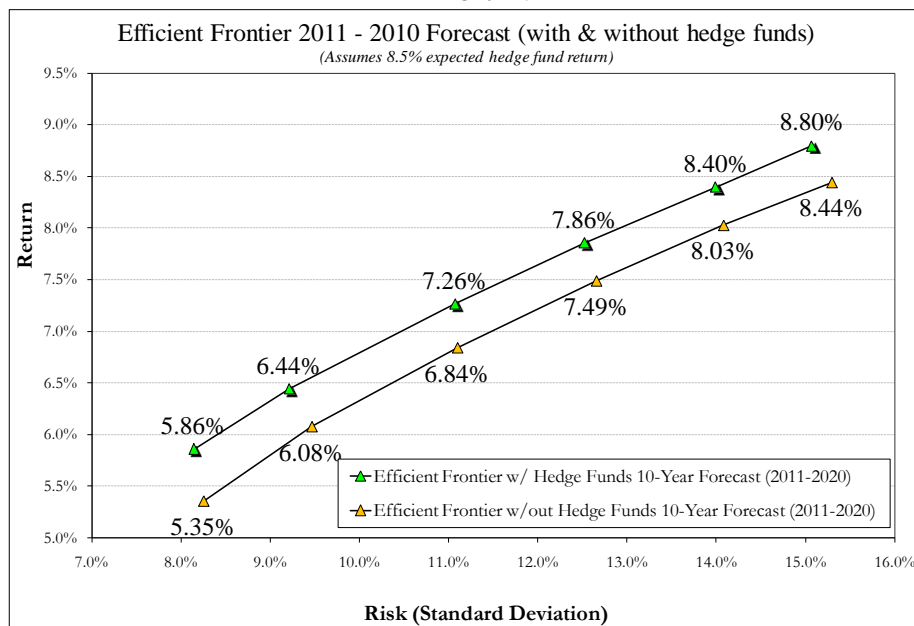
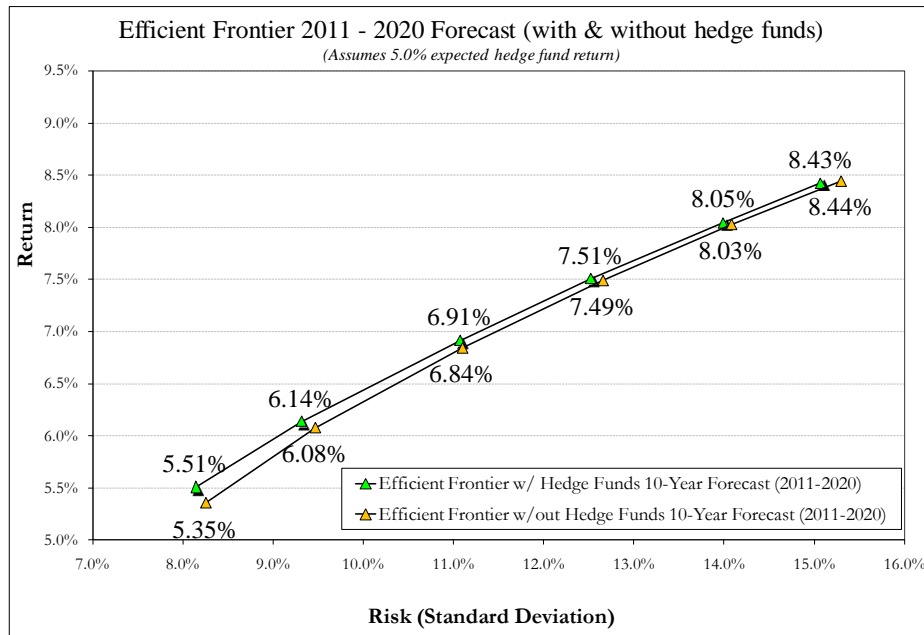


Exhibit IV illustrates a 10-year forecast for the same portfolio mixes illustrated in Exhibit II. In the forecast model, large cap stocks have an expected return of 8.1 percent. Investment grade U.S. bonds have an expected return of 2.9 percent, reflecting the average yield-to-maturity of the Barclays Aggregate US Bond index as of 12/31/2010. In Exhibit IV, the expected portfolio return for a diversified portfolio of hedge funds is 8.5 percent. If these forecasts are reasonable, hedge funds should improve the expected annualized return of portfolios along the frontier by 0.35 percent to 0.50 percent without increasing risk.

Exhibit V



If one believes an 8.5 percent return forecast (after expenses) for a diversified multi-strategy portfolio of “skilled” hedge funds is a reasonable assumption, a 10 percent hedge fund allocation can add significant risk-adjusted performance to a portfolio. On the other hand, if 8.5 percent seems too optimistic, Exhibit IV illustrates the same model, but with a 5.0 percent expected return, while holding all other variables constant (i.e., returns for non-hedge fund asset classes, volatility for all assets, and correlations for all assets). In this illustration, hedge funds, with a 5 percent expected return, neither add nor detract significantly from the portfolio in terms of risk or reward. Therefore, one threshold for investing in hedge funds may be whether you believe your diversified multi-strategy hedge fund portfolio will be able to generate at least a 5.0 percent return. The greater the hedge fund portfolio’s expected return above this threshold level, the stronger the rationale for allocating to hedge funds. This 5 percent return threshold may be applicable in a 2011 capital markets environment, but may not be applicable in the future. Therefore, a good rule of thumb for future market environments is to average the U.S. equity and U.S. investment grade bond forecasts (currently 5.5 percent). If the diversified hedge fund portfolio cannot meaningfully outperform that proxy (with average volatility) don’t invest.

Exhibit VI

FORECAST ASSUMPTIONS (2011-2020)

Returns & Volatility				Correlation Matrix													
ASSET CLASS	Expected Geometric Annual Return*	Expected Risk (σ)	Debt, Equity or Alternative		Cash	TIPS	US Bonds	Int'l Bond	HY Bond	Large Cap US	Small Cap US	REITs	Int'l Equity	Em. Mkts. Equity	Commodity Futures	Hedge Funds Portfolio	MLPs
Cash	0.1%	0.0%	D	Cash	1.0	0	0	0	0	0	0	0	0	0	0	0	0
TIPS	2.9%	10.5%	D	TIPS	0	1.0	0.75	0.56	0.28	0.03	0.00	0.19	0.09	0.10	0.56	0.10	0.10
US Bonds	2.9%	7.2%	D	US Bonds	0	0.75	1.0	0.51	0.28	0.22	0.13	0.20	0.17	0.01	0.32	0.08	0.13
Int'l Bond	2.1%	11.2%	D	Int'l Bond	0	0.56	0.51	1.0	0.09	0.04	-0.05	0.06	0.40	0.06	0.24	-0.02	0.03
HY Bond	6.0%	16.6%	D	HY Bond	0	0.28	0.28	0.09	1.0	0.57	0.59	0.60	0.51	0.55	0.26	0.46	0.53
Large Cap US	8.1%	18.2%	E	Large Cap US	0	0.03	0.22	0.04	0.57	1.0	0.83	0.61	0.65	0.66	0.24	0.52	0.34
Small Cap US	8.9%	21.9%	E	Small Cap US	0	0.00	0.13	-0.05	0.59	0.83	1.0	0.71	0.58	0.67	0.21	0.56	0.36
REITs	5.8%	23.1%	E	REITs	0	0.19	0.20	0.06	0.60	0.61	0.71	1.0	0.48	0.45	0.24	0.28	0.32
Int'l Equity	8.9%	23.9%	E	Int'l Equity	0	0.09	0.17	0.40	0.51	0.65	0.58	0.48	1.0	0.68	0.30	0.51	0.33
Em. Mkts. Equity	9.4%	31.4%	E	Em. Mkts. Equity	0	0.10	0.01	0.06	0.55	0.66	0.67	0.45	0.68	1.0	0.29	0.66	0.37
Commodity Futures	5.2%	19.6%	A	Commodity Futures	0	0.56	0.32	0.24	0.26	0.24	0.21	0.24	0.30	0.29	1.0	0.39	0.29
Hedge Funds Portfolio	Varied	9.3%	A	Hedge Funds Portfolio	0	0.10	0.08	-0.02	0.46	0.52	0.56	0.28	0.51	0.66	0.39	1.0	0.31
MLPs	9.8%	20.6%	A	MLPs	0	0.10	0.13	0.03	0.53	0.34	0.36	0.32	0.33	0.37	0.29	0.31	1.0

Please contact DiMeo Schneider & Associates, L.L.C. for the 2011-2020 capital market assumptions paper.

Alpha-Beta Framework, Hedge Funds and Fees

The alpha-beta divide is a confusing and often misconstrued concept. It seems simple; “beta is risk” and “alpha is skill”. The term “beta,” (derived from the Capital Asset Pricing Model, CAPM), describes the component of an investment’s total return that is explained by its exposure to a market (systematic) risk factor. For example, if a large cap stock portfolio has a beta of 1.0 to the S&P 500 index; it has the same market risk as the S&P 500 index. So if this stock portfolio generates a 10.75 percent return when the S&P 500 returns 10 percent, the beta component of total return was 10 and the alpha component was 0.75. Investors can capture Beta passively as it requires minimal skill. Beta is viewed as a commodity and should not command a pricing premium.

Hedge funds are at the opposite end of the pricing spectrum from beta-only index funds. Hedge funds also have significantly higher fees than traditional active long-only money managers. So, are high management fees in hedge funds justified? Exhibit VII provides a framework for comparing two managers; **Manager A** is a traditional long-only large cap mutual fund with a 0.75 percent management fee, and **Manager B** is a long-short equity hedge fund with a traditional 2 percent management fee, plus a 20 percent fee on profits.

Exhibit VII

Metrics	Manager A (Long-Only Mutual Fund)	Manager B (Long-Short Hedge Fund)
Manager Fee	0.75%	2% base + 20% on profits
Manager Beta to S&P 500 Index	1.00	0.40
Gross Manager Return (Before Fees)	9.00%	7.30%
Positive Alpha Hurdle (Adjusted For Beta)	8.00%	3.20%
Total Management Fee	0.75%	3.06%
Manager Return (Net of Fees)	8.25%	4.24%
Alpha (Net of Fees)	0.25%	1.04%
Alpha (Net of Fees) / Total Return	3.0%	24.5%
Total Fee / Alpha (Net of Fees)	3.00	2.94

<i>S&P 500 Index Return</i>	8.00%
<i>T-Bill Return</i>	0%

In this example, the S&P 500 Index returns 8 percent. **Manager A** returns 9.0 percent before and 8.25 percent after fees. **Manager A** has a 1.0 beta, which translates into an 8 percent alpha hurdle and +0.25 percent of net alpha. **Manager B** returns 7.3 percent before and 4.24 percent after fees. **Manager B** has a lower 0.40 beta, which lowers the alpha hurdle to 3.2 percent, and generates +1.04 percent of net alpha.

So which manager is more expensive? **Manager A** has the lower absolute fee (0.75 vs. 3.06). However, **Manager A** has a higher fee if measured in terms of fee per unit of alpha. **Manager A**'s fee is 3 times its net alpha, while **Manager B**'s fee is 2.94 times its net alpha. Only 3 percent of **Manager A**'s total return is alpha (or $.25 / 8.25 = 3$ percent), while 24.5 percent of **Manager B**'s total return is alpha (or $1.04 / 4.24 = 24.5$ percent). As we mentioned earlier, the beta component of total return is a commodity that can be generated passively and inexpensively. Alpha is the only component of return that warrants a pricing premium. So which manager is actually more expensive? The answer is in the eye of the beholder.

The vast majority of the total return generated by portfolios comes from the exposure to the risk premia of asset classes. These risk premia, or *betas*, are a valuable and an essential component of total return, but they are also fungible commodities that can be inexpensively replicated with passive management. While gaining exposure to betas may not require skill, effectively mixing those betas within a diversified portfolio does. Adding an asset class like commodity futures to a portfolio can improve a portfolio's risk-adjusted performance, but asset classes are sources of betas and not sources of alpha. Time and expense are scarce resource, and they should be deployed efficiently. The best place to deploy these scarce resources is to develop an optimal asset allocation strategy and to find alpha generating vehicles; beta generating investment vehicles do not demand a pricing premium or significant time allocation.

This alpha versus beta concept can be the most confusing when it comes to hedge funds because the investor may have a hard time understanding how a hedge fund generates its return. Given the opaque nature of hedge funds, this is a challenge for even the most sophisticated hedge fund allocators. For

example, perhaps a hedge fund bets on commodity price increases by loading up on commodities. The fund profits during a period when stock prices fell. When that hedge fund presents its return stream, compared to the S&P 500 Index, it might show a significantly positive alpha figure. Is this outperformance really alpha, or is it simply high beta relative to the commodity index (beta “dressed up as alpha”)? Without understanding the context, historical returns must be taken with a grain of salt.

If we look at the previous example (Exhibit VII), and don’t know if **Manager B**’s outperformance is “alpha” or “beta dressed up as alpha,” we have a hard time understanding whether the fee per unit of outperformance is a meaningful measure. **Manager A** is a large cap mutual fund, and we have access to all its underlying holdings so we know how it generated its alpha (either through sector and/or security selection). The problem with the opacity of hedge funds is that one often doesn’t have sufficient information to make an alpha vs. beta judgment. Investors in hedge funds require far more context about the managers’ strategies, styles and alpha theses to make objective assessments of manager skill.

While a skilled hedge fund manager may generate alpha, a significant portion of return usually still comes from beta. (If hedge funds were alpha-only vehicles, then the average multi-strategy fund of hedge funds would not have lost over 20% in 2008.) Quantifying that beta at the top-down hedge fund industry level is fairly easy. However, it’s challenging to quantify it at the individual manager level. Some managers are very skilled at dressing up beta to look like alpha.

Hedge Fund Indices and Benchmarks

A main purpose for any index is to serve as a useful benchmark, enabling investors to objectively evaluate manager performance. It is helpful to understand the minimum requirements for an index to be a ‘useful benchmark;’

- ✓ The index must be representative of the mandate.
- ✓ The index holdings and weights within the benchmark must be identifiable and unambiguous.
- ✓ An investor should be able to replicate the index benchmark passively.
- ✓ The index benchmark’s performance must be measurable on a regular basis.
- ✓ The index constituents classification (i.e., strategy) in the benchmark must be formulated from public information and be consistent with market opinions.
- ✓ The index benchmark must be constructed before the measurement period begins

Hedge fund indices seek to represent the performance of hedge fund peer groups. There are two types of hedge fund index categories and both struggle to meet the useful benchmark test. The first type is an *investable index*, which only includes funds that are accepting new capital and excludes funds that are closed. In addition to serving as hedge fund performance benchmarks, investable hedge fund indices are able to be passively replicated. Therefore, they meet at least one of the useful benchmark requirements. However, by excluding managers that are closed to new investment, investible indices do not fully represent the hedge fund peer group. The second type of hedge fund index is a *non-investable index*. Non-investable indices also fail to meet the definition of a useful benchmark. They include hedge funds that are closed to new capital and therefore cannot be passively replicated. While non-investible indices are perhaps more representative of hedge fund peer groups, they suffer from other sorts of biases.

Index providers screen the universe on broad metrics such as assets under management and track record length in order to establish minimum requirements. Once the index providers have applied the initial screens, they classify each fund based on stated investment style (i.e., equity long-short, global macro, etc.). Each index provider then applies its own definitions for style screens. Because index providers have differing definitions and methodologies for classifying strategies, the same fund may be placed into different categories. For example, a fund may be classified as “event-driven” by one provider and “merger arbitrage” by another. Further complicating matters, some index providers use equal-weights while others use asset-based weightings in their index construction methodologies. The index providers are also inconsistent on the timing of assumed rebalancing. Some use monthly and others use quarterly or other time intervals.

Due to the private, unregistered nature of hedge funds, databases and indices have several other imperfections. Calculating index returns based on the performance of funds still operating at the end of a reporting period leads to *survivorship bias*. This bias may positively skew index performance because funds no longer operating are often liquidated as a result of poor performance. Established indices typically have less survivorship bias once back-filled data is no longer being used. Once a fund reports to an index, historical returns remain in the index even if they fail.

Liquidation bias occurs when funds in the process of liquidating stop reporting before being fully liquidated; the index loses several months of performance as the hedge fund winds down operation. This bias tends to skew index performance upward as a poorly performing fund is removed from the index before it is done inflicting damage on investors. *Selection bias* occurs because selection criteria differ by index provider and construction methods vary, leading to discrepancy among returns for competing indices that track the same strategy. *Self-reporting bias* occurs because there is no official hedge fund database and participation is voluntary. Managers with poor track records often do not report performance, or only begin reporting once performance has improved. Larger, more successful funds may stop reporting results as capacity is reached. Funds that have performed well may have less incentive to report because they no longer need to attract new investors. *Backfilling bias* occurs when there is a lag between a fund’s inception and the date it begins reporting results to a database. This bias can lead to funds entering a database for the first time only after they have established a strong historical performance track record. Presumably, the poor performing funds may never start reporting, and simply disappear as if they never existed.

Two of the more widely recognized index providers are *Hedge Fund Research, Inc. (HFR)* and *Dow Jones*. HFR was established in 1992 and specializes in hedge fund indices, database management and analytics. HFR produces over 100 indices of hedge fund performance ranging from the industry aggregate level down to specific, niche sub-strategies and strategies with regional focus. With performance history dating back to 1990, the HFRI Fund Weighted Composite Index is a widely used benchmark. The HFR suite of products leverages the HFR database to provide detailed, current, comprehensive and relevant aggregate reference points for all facets of the hedge fund industry. The Dow Jones Credit Suisse Hedge Fund Indexes are a family of hedge fund indexes that include broad market and investable indexes. The indices are constructed from a database of more than 5,000 hedge funds. The database consists of 17 indexes, including a range of geographical and strategy-specific hedge fund indexes.

Hedge Fund Terms and Structures

The most common structures used for hedge funds are limited partnerships (LP) and limited liability companies (LLC). Both structures limit the liability of investors to the value of their investment. Within the LP structure, the general partner is typically the hedge fund manager while the investors are the limited partners. All owners of an LLC are referred to as members.

Due to tax considerations, hedge funds are structured either as *offshore* or *onshore* funds. Onshore funds may be more suitable for U.S. taxpayers as offshore funds raise complex tax issues. Investing in an offshore fund can be advantageous for tax-exempt U.S. investors because hedge funds can generate “unrelated business taxable income” or UBTI. UBTI is taxable even to tax-exempt investors.

Unlike ‘40 Act mutual funds, hedge funds have complicated expense structures. Fees are higher than typical mutual funds, and the general partner (or equivalent) normally shares in profits. However, there are also several less publicized and often meaningful expenses, including legal and administration fees. Management fees are meant to cover operating costs, typically range from 1-2 percent of the fund’s NAV, but can be (much) higher depending on the fund and strategy. Recently, some managers have reduced their fees, particularly if that manager has created a new fund or a share class with more restrictive liquidity terms. However, most pedigreed managers operating at or near capacity are unlikely to reduce fees, and some have actually increased them. Most hedge funds charge a performance fee. Performance fees are calculated as a percentage of the fund’s profits over a pre-determined period. Performance fees are customarily 20% of the profit, but can range from 0 to 50%. Some managers have been pressured into marginally lowering performance fees; that is less common than reductions in management fees.

Most hedge funds must beat a *high water mark* or a previously achieved threshold before they can collect a performance fee. This attribute prevents managers from collecting a performance fee until investors recoup previous losses. This is also sometimes referred to as a “loss carry-forward.” Depending on terms, some managers charge redemption fees if investors make withdrawals before a stated predetermined time period.

Hedge funds are typically open-ended vehicles, meaning investors contribute and redeem capital at net asset value on a periodic basis. Most funds allow for contributions at least as often as redemptions. Liquidity terms are usually at least annually, but quarterly and monthly redemptions are also common. In order to minimize strategy disruption, most managers require notification for contributions or redemptions anywhere from 30 to 100 days in advance of the next liquidity window.

Hedge fund managers often have initial lock-up periods. This lock-up can be specific to each individual contribution or just the initial investment. The lock-up periods vary by manager and strategy, but usually range from one to three years. Funds also can have redemption gates that limit the amount of capital that can be withdrawn on the fund’s scheduled redemption date. Gates can be used to delay or suspend withdrawals in order to prevent a run on the fund’s capital. During the 2008 financial crisis, many managers imposed gates to the great dismay of investors. However, managers are moving away from *portfolio-level* gates and towards *investor-level* gates, which allow investors to get at portions of their assets out under the worst case scenarios.

Fund of Hedge Funds versus Direct Investment

Once one has made the decision to invest in hedge funds, there are a number of ways to access them. Key criteria are the investor’s size and manager evaluation acumen. One option is to invest directly and build a diversified portfolio of hedge funds. Direct investment can make sense when the investor allocates greater than \$25 million to hedge funds and has the ability to effectively evaluate and monitor hedge fund managers. It can be challenging to build a diversified portfolio of direct hedge funds with less than \$10 million regardless of the investor’s manager evaluation and due diligence capabilities. For smaller hedge fund investors, it is preferable to invest through a fund of funds (HFOF) vehicle, where an outside manager selects and diversifies among multiple hedge fund managers and strategies.

For investors allocating between \$10 and \$25 million to hedge funds, a hybrid “core-satellite” model may be appropriate. This core-satellite approach has a core investment in a HFOF, but also satellite investments in direct hedge funds. This enables the core to be diversified among multiple managers and strategies, while allowing concentration in higher conviction strategies and managers.

Even if the investor has sufficient size, the decision to invest directly or through a fund of hedge funds is not clear cut. If an investor elects to invest directly, he only pays one layer fees. If an investor elects to allocate to a HFOF, he must also pay a second layer of fees. Exhibit VIII compares direct and FOHF investing.

Exhibit VIII

Direct Hedge Funds vs. Fund of Hedge Funds

Characteristic	Direct Hedge Funds	Fund of Hedge Funds (FOHF)
Fees & Expenses	Single layer	Double layer
Manager Evaluation and Due Diligence	Evaluation and due diligence required for all underlying direct managers	Evaluation and due diligence required on (single) fund of hedge funds manager who performs underlying manager due diligence
Diversification	Requires investor to diversify among many managers and strategies	Single fund of hedge funds manager can diversify among many underlying managers and strategies
Liquidity Management	Must be managed by investor	Must be managed by fund of funds
Hedge Fund Portfolio Investment Process	Investor builds and controls hedge fund portfolio's aggregate investment strategy	Fund of hedge funds manager controls overall investment strategy. Investor has no control other than to replace fund of hedge funds manager.
Investment Minimums	Requires significantly <u>higher asset levels</u> to build diversified portfolio	Can diversify with significantly <u>lower asset levels</u>

Hedge Fund Investment Due Diligence

Hedge fund investors must either have a comprehensive due diligence program to evaluate candidates, or they should forgo investing in the space. The process starts with evaluating the qualifications and track record of the manager. An investor should review the educational and professional history of the portfolio managers and their investment management history. A manager with a background that is incompatible with the current strategy should be eliminated. Also review the education and work experience of all other key analysts and risk management personnel. Crucial parts of the personnel review process are reference and background checks. Also review the fund’s ownership structure to ensure that interests are properly aligned. Finally, the investor should review how much of the manager’s own capital is invested in the fund; one wants managers who “eat their own cooking”.

The next step of the due diligence process is to understand the strategy of the fund. Investors must understand what *instruments* the fund trades and how its strategy is designed to generate alpha. As a part of the strategy review, the investor should seek to understand the types of market environments that will favor or dis-favor the strategy.

Once the investor is comfortable with the strategy, one needs to understand the research process, including how investment ideas are generated. The fund's analysts should walk the investor through the investment process from *idea generation* to *implementation* in the portfolio.

The final investment due diligence step is to understand portfolio construction including *concentration*, *leverage*, *liquidity constraints*, *factor exposures*, and *other constraints* such as maximum sector and position exposures. While it is helpful to have the manager describe the portfolio construction process, due diligence requires a thorough review of historical portfolio construction at various points in time (usually monthly). Historical portfolio construction that doesn't match the portfolio construction story is a major red flag.

Financial leverage inherently increases risk. By definition, leverage amplifies gains, but it also magnifies losses. The appropriate level of leverage varies by hedge fund strategy. *Explicit* leverage requires borrowing, but hedge funds can also *implicitly* lever assets by buying or selling futures, selling options, entering into swaps or trading other derivatives. The investor must be comfortable with the level of leverage and understand whether it is appropriate given the strategy.

Because hedge funds often employ leverage, trade derivatives, and invest in less liquid areas of the market, they can be prone to "*fat left tail*" events – unlikely but disastrous situations. Certain strategies exhibit return profiles similar to poorly underwritten flood insurance. They collect a steady stream of "insurance premiums", until the flood hits and they collapse. An example of this type of asymmetric risk-reward profile is selling *out-of-the-money* options. Most options expire worthless. As long as the options finish out the money, they expire unexercised and the seller pockets the premium received. Low month-to-month volatility gives the false impression of low risk...until the blow up. Similarly, the non-normality of hedge fund return distributions and unstable correlation coefficients make a single hedge fund or hedge fund portfolios hard to model. The best one can do is to thoroughly understand the strategy and risk management processes before deciding to invest.

Most successful hedge funds have a robust risk management process. The ideal is for the fund to have an independent risk management group that reviews the risks and stress tests the portfolio under a variety of scenarios and market conditions. The risk management team should provide copies of completed risk reports and be able to demonstrate their process. If a manager exhibits a defect or hole in the risk management process eliminate it.

While a strong performance history is a good starting point, a full quantitative review must be done to ensure an investor fully understands the context of a manager's return stream. Blindly chasing hot performance is a classic rookie mistake. *Return attribution* is important to understand a manager's return profile. The most basic attribution is *long/short attribution* which shows how a manager has performed on both their long and short portfolio each measurement period. The long/short attribution is vital to see if a manager has been successful on the short side, a requirement for any successful

hedge fund manager. Obtain and study return attribution by *security type*, *market capitalization*, *geography*, and *sector* to determine other sources of return.

There are many steps in the process to determine if a hedge fund manager is worthy of consideration. The analysts performing the work should document all investment due diligence steps.

Hedge Fund Operational Due Diligence

Hedge funds lack holdings transparency. Rightfully, many investors aren't comfortable allocating money to vehicles for which they don't control custody and can't look at positions. As fallout from the 2008 financial crisis, many hedge funds have improved transparency, but still lag their registered competitors. Investors other than multi-billion dollar institutions often cannot access key individuals at the hedge fund. This situation exacerbates concerns. The vast majority of hedge funds don't provide position level transparency.

However, *operational failure* is also a major risk with hedge funds. Just because a hedge fund manager may be a talented investor does not mean he is necessarily adept or capable of running a business enterprise. Many impatient or preoccupied hedge fund managers lack the expertise and commitment to run a business with proper systems and controls. Outright *fraud* is also a serious risk, given the opaque and loosely regulated nature of the hedge fund industry.

On December 11, 2008, Bernard L. Madoff was arrested and later pled guilty to 11 felonies for running the largest Ponzi scheme in history. Estimates of the fraud have been as high as \$65 billion! Madoff asserts his Ponzi scheme began in the early 1990's, but federal investigators suspect the fraud began much earlier, perhaps in the 1970's. As the Madoff disaster demonstrates, longevity and reputation are no substitute for the requisite independent operational due diligence.

As with all successful frauds, Madoff seemed reputable. He was well known in the industry and had even served as the head of NASDAQ. He was well connected, with a reputation for brilliance. He was also affable. However, even a modest operational due diligence effort should have raised numerous red flags. All of the following pieces of information could be found in the marketing materials of a least one of Madoff's feeder fund:

- Madoff's administration, brokerage and custody were done internally.
- Madoff's firm charged no investment management (or incentive) fee, so it presumably only made money on brokerage commissions charged for trading client accounts.
- Lastly, the auditor was a small and unknown accounting firm.

Without digging any deeper, this short list of operational red flags was more than enough to warrant elimination, but investors relied on word of mouth references. While spectacular failures and frauds like the Madoff debacle make the front page, most hedge fund failures are not spectacular. They result from simple operational failures. Hedge fund managers that are very good at executing their investment strategy may not have the time or expertise to establish and run a well controlled business. Investors need to perform strong operational due diligence that focuses on the non-investment aspects and the associated risks of running a hedge fund.

An investor must be comfortable with the controls around the process of trading, reconciling, and valuing holdings. Operational due diligence should examine controls across the entire trading process; from the time the portfolio manager initiates the trade with their trading desk, through the settlement and reconciliation process, and ultimately through valuation and the striking of a net asset value.

Outside service providers perform many of the key operational processes. Services providers for hedge funds include the following:

- *Prime Brokers* provide leverage to hedge funds, execute and clear trades, and lend securities (for shorting).
- *Administrators* provide critical middle and back office services, as well as key client servicing functions.
- *Auditors* examine holdings and provide an opinion as to whether the fund's financial statements meet Generally Accepted Accounting Principles (or GAAP).

Due to the importance of these functions, hedge fund investors must determine if the service provider is reputable and has the resources to service the hedge fund's strategy. The investor must then learn the role each plays and understand the reliability and independence of their work. This requires the hedge fund investor to interact with all service providers.

In addition, operational due diligence should also include the other risk mitigation activities performed by non-investment personnel. As the Securities and Exchange Commission polices insider trading, it has become paramount for hedge fund investors to vet compliance functions. The compliance function must be robust enough to ensure that firm personnel adhere to all regulatory provisions. Also, interview information technology personnel to review the firm's disaster recovery plan. Has it been successfully tested? Also evaluate the operations staff who manages counter-party risk. Determine what plans are in place if a counterparty's financial strength begins to deteriorate. Perform operational due diligence before an investment is made and continue it throughout the tenure of the investment. Eliminate or terminate any hedge fund with material gaps

Hedge Funds in the Post-2008 World

While market factors since 2008 may have pressured some hedge funds to adapt to new standards of transparency, some top tier funds have not succumbed to pressure. Still, much has changed. Regulation is the new norm for hedge funds. All funds with greater than \$150 million are required to register with the SEC by July 21, 2011, creating additional regulatory burden. These additional burdens may be too much for smaller and emerging hedge fund managers.

Tighter regulation and investor demand will hopefully drive more transparency, including position-level transparency. For HFOF investors, this means a greater look-through to underlying managers and exposures. Many hedge funds that refuse to provide such transparency are losing out in the race for assets with institutional investors.

Since 2008, most hedge funds have increased operations staff to provide more timely response to client demands. Hedge funds also provide greater investment process clarity and more access to senior-level staff. More hedge funds have begun to use third party risk aggregation platforms such as *Measurerisk*

or *RiskMetrics* to provide clients with useful information. Hedge funds have also increasingly turned to third party administrators to provide independent monitoring and reconciliation of hedge fund books with prime brokers and custodians.

Gates (exit restrictions) thrown up by hedge funds during the credit crisis have brought liquidity terms to the forefront. Post-2008, many hedge funds provide liquidity terms that better align with the liquidity of their strategies. For example, a U.S. equity long-short manager who trades in highly liquid securities may provide greater liquidity terms. A distressed debt fund that allocates to illiquid credit instruments warrants less liquidity. Hedge fund managers have also begun to offer multiple liquidity options. The share class with the longest lock-up may entice investors with a lower fee structure. Another share class may have a “soft” lock-up that permits earlier redemptions for a fee. There has also been a move towards shorter notice periods for redemptions (*i.e.*, from 90-180 days to 90 days or less).

The “Volcker Rule” embedded in the Dodd – Franks bill prohibits banks from engaging in proprietary trading. Although the rule has yet to be implemented as of early 2011, reducing the role of Wall Street trading desks within banks should ultimately reduce hedge funds’ competition for alpha.

Since 2008, there has been a shift towards lower fees. A 1.5% management fee level has becoming more common for new hedge funds versus the historical 2% management fee. However, a 20% performance fee remains the norm.

Conclusion

Investing in hedge funds presents unique challenges and risks, but there are compelling arguments for their inclusion in a broadly diversified portfolio. However, investors should approach hedge funds with sufficient diligence and with healthy skepticism. If your organization does not have the time or expertise to perform the required due diligence, you should either hire someone who does or avoid the strategies.

About DiMeo Schneider & Associates L.L.C.'s Hedge Fund Research Team:

Matthew R. Rice, CFA, CAIA®

Principal, Chief Investment Officer

As the firm's Chief Investment Officer, Matt directs the firm's capital markets research effort and asset allocation strategy. Matt also manages the firm's alternative investments research effort and leads the hedge fund research team. He also advises a number of the firm's corporate and nonprofit clients. In 2005, he co-authored "*The Practical Guide to Managing Nonprofit Assets*" (John Wiley & Sons). Matt received a BA in Economics from Northwestern University, is a CFA Charterholder, a CAIA (Chartered Alternative Investment Analyst), and is a member of the CFA Society of Chicago. Matt joined the firm in 2001.

Craig V. Adkins, CFA, CPA, MBA

Senior Alternative Investment Research Analyst

Craig's role is to source and research direct hedge fund managers. He also leads the firm's comprehensive direct hedge fund operational due diligence efforts. Most recently, Craig was a Senior Alternative Investment Analyst on Segall Bryant & Hamill's fund of hedge funds research team, where he spearheaded operational due diligence and was a key member of the investment research staff. He has also worked in finance and audit roles at Citadel Investment Group, Credit Agricole Alternative Investment Services and Northern Trust. He began his career as an auditor with Andersen. Craig holds an MBA from the University of Illinois and received his B.S. in Finance from Illinois State University. Craig is a Certified Public Accountant and is a CFA Charterholder.

Todd D. Leedy, CAIA®

Senior Alternative Investment Research Analyst

Todd's responsibilities include researching and performing operational due diligence on fund of hedge funds, direct hedge funds, private equity and real assets managers. He also leads the firm's extensive fund of hedge funds operational due diligence efforts. As the only firm analyst to serve on all three alternative investment research teams (Hedge Funds, Private Equity and Real Assets), Todd also serves as the liaison between teams. Todd received his BS from the University of Richmond, VA in Business Administration and Finance. He earned the CAIA (Chartered Alternative Investment Analyst) designation sponsored by the Chartered Alternative Investment Analyst Association, a not-for-profit global organization committed to education and professionalism in the field of alternative investments. Todd joined the firm in 2002.

Bryce Anderson

Alternative Investment Research Analyst

Bryce's primary responsibility is to source and research direct hedge fund managers and to perform operational due diligence. In addition, Bryce serves on the capital markets team, which is responsible for developing the firm's capital market assumptions and investment strategy. A graduate of The Ohio State University with a BA in Finance, Bryce has passed Level III of the CFA exam. Bryce joined the firm in 2007.

Adam P. Newell, CFA, CFP®

Senior Investment Research Consultant

Adam is on the Hedge Fund Research Team, assisting in research and serving in an advisory capacity. He is also member of the firm's Investment Committee. Adam advises a number of private foundations, nonprofits and high net worth clients. Prior to joining the firm, Adam was a Senior Financial Planner with The Ayco Company L.P, a subsidiary of Goldman Sachs, Inc., where he worked with high net worth corporate executives on their personal finances. He is a graduate of Purdue University where he earned a Bachelors of Science degree with high honors in Finance with a minor in Financial Planning. Adam is a Certified Financial Planner, a member of the Financial Planning Association, a CFA Charterholder and member of the CFA Society of Chicago. Adam joined the firm in 2004.

Alexander Hock, JD, MBA

Investment Research Consultant

Alex is on the Hedge Fund and Private Equity Research Teams where he brings valuable legal perspectives to the teams' investment manager research efforts. Alex also advises a number of private foundations, nonprofits and high net worth clients. Alexander previously worked at Franklin Templeton and as an attorney. Alexander earned his BA degree in International Business from Eckerd College and his MBA and JD from the University of Notre Dame. Alexander is admitted to the Bar in Illinois and is currently a candidate for level II of the Chartered Financial Analyst (CFA) examination.