The Education Committee of

The Greenwich Roundtable

KNOWLEDGE, VERACITY, FELLOWSHIP

THE GREENWICH ROUNDTABLE
PRESENTS

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IN THIS ISSUE

BEST PRACTICES IN HEDGE FUND INVESTING: DUE DILIGENCE FOR FIXED INCOME AND CREDIT STRATEGIES

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About the Greenwich Roundtable

The Greenwich Roundtable, Inc. is a not-for-profit research and educational organization located in Greenwich, Connecticut, for investors who allocate capital to alternative investments. It is operated in the spirit of an intellectual cooperative for the alternative investment community. Mostly, its 200 members are institutional and private investors.

The purpose of the Greenwich Roundtable is to discuss and provide current, cutting-edge information on alternative investing. Our mission is to reveal the essence of both trusted and new investing styles and to create a code of best practices for the alternative investment industry.

The Greenwich Roundtable hosts monthly, mediated symposiums at the Bruce Museum in Greenwich, Connecticut. Attendance in these forums is limited to members and their invited guests. Selected invited speakers define complex issues, analyze risks, reveal opportunities, and share their outlook on the future. For the past 11 years, the Greenwich Roundtable has hosted some of the leading managers, scientists, and policy makers of our day.

The Board of Trustees, whose membership reflects a cross section of the alternative investment community, sets the direction of the Greenwich Roundtable.

RESEARCH COUNCIL OF 2007

Four years ago we began to tap into the knowledge of our members under the auspices of the Education Committee. Investing in alternatives is not well documented. We wanted to conduct original research apart from our symposiums and so we began the task of assembling best practices from the investors' point of view. However this assignment would require additional funding and our ability to raise funds was limited. Our regular membership is closed. Associate memberships do not generate much revenue. Still we got phone calls from hedge funds, from private equity funds and from industry vendors asking how they can help. Some of these general partners began making contributions. They simply wished to support us with no strings attached and, in some cases, anonymously.

In this spirit, the Research Council was born. Our Education Committee has been working as a group of altruistic investors (curiously some investors declined to assist us because they did not wish to reveal their due diligence techniques in credit and fixed income strategies) who contributed their time and worked to raise professional standards. Then the Research Council emerged as a group of altruistic sell-siders who wish to help investors document the allocation process. The final result is intended to demystify alternative investing and to bring about greater understanding.

In 2005, our Board of Trustees named a small group of high integrity institutions for Research Council appointments. These wonderful managers launched us into a new orbit. *Best Practices in Due Diligence for Equity Strategies* was released in that summer to the approval of investors and the industry at large.

In January 2007, our Board again nominated candidates to the Research Council. We kept the group small to limit our funding from the sell-side and thus maintain our independence. The trustees also restricted the number of hedge fund managers, and opened nominations to a few high integrity industry suppliers. Nominees were selected because their business activities serve as an example to all of their sincere desire to educate investors and of their belief in our mission. Once again the response was gratifying. And so we are pleased to announce the members of the Research Council of the Greenwich Roundtable for 2007.

Greenwich, Connecticut has a long tradition of community involvement and philanthropy. We began with the hope that the same spirit would extend into the alternative investment community. We were not disappointed. Today the Research Council serves as a small group of sustaining sponsors of our research at the Greenwich Roundtable. Our purpose is to foster research and publishing in the field of non-traditional investing to educate sophisticated investors. Dedicated to the development of best practices, members of the Research Council not only provide no-strings funding but they have also assisted the members of our Education Committee by rolling up their sleeves in the discovery and editing phases. The Research Council enables the Greenwich Roundtable to pursue the broadest range of investigation that serves the interests of investors. They also share our belief that education is one of the greatest needs in the marketplace. The Research Council has generously underwritten the entire *Best Practices in Hedge Fund Investing* series. They are providing it to you with their compliments. For that, we are all sincerely grateful.

Stephen McMenamin
Chair and Executive Director, The Greenwich Roundtable

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"The Research Council enables the Greenwich Roundtable to host the broadest range of investigation that serves the interests of the limited partners and investors."

Introduction:
Letter from the Chair

Best Practices in Hedge Fund Investing: Due Diligence for Fixed Income and Credit Strategies represents the third installment in a series and completes our survey of hedge fund due diligence. The Education Committee of the Greenwich Roundtable began our investigation of due diligence almost four years ago and was motivated by an elegantly simple thesis: the topic had not been explored in a comprehensive, informed way from the perspective of the hedge fund investor as opposed to the hedge fund manager. We believed the topic of due diligence deserved a more searching and substantive written review and set out to rectify this.

We had several goals. In broad terms, we hoped to educate investors, policymakers, journalists and students of investing about the qualitative art of hedge fund due diligence. By doing so, we hoped, as we underscored in our last edition of *Best Practices,* to demystify a process that had been given an almost unrecognizably ominous portrayal in the mainstream press. We also hoped to promote an elevated standard of conduct for the community of dedicated hedge fund investors and the alternative investment industry as a whole. Our work commanded formal notice in respected publications, such as the *Financial Times* and *Barron's,* and we continue to be humbled by formal inquiries from institutional investors as far away as Japan, the Gulf and Scandinavia.

That said, what we could not have anticipated was the level of interest generated by our publication in the policymaking and regulatory communities in Washington and beyond. It is here that the relationship between the GR's Education Committee (research and writing of publications) and the External Affairs Committee (articulating this educational message) warrants further explanation. The extraordinary members of the External Affairs Committee have played a vital role in sustaining proper attention to *Best Practices* by explaining it to policymakers, journalists and a disparate range of constituencies in the investment community at large. The members of the External Affairs Committee are the GR's unabashed "grey-hairs" who explain our work to investor groups, policy-makers, legislators and, occasionally, the media. They have been commendably dedicated to this work, having traveled to Washington D.C., Hartford, Albany,

Introduction:
Letter from the Chair (cont.)

Colorado, West Virginia, London, Geneva and Singapore in the past year to spread this message. The message was certainly heard and the External Affairs Committee deserves high praise for its work. With a view toward this point, Bob Steele, the Undersecretary for Domestic Affairs, U.S. Treasury, complimented the Greenwich Roundtable when he remarked that we are widely trusted because we don't promote any agenda, have no axe to grind and are not paid to speak. We owe special thanks to David Storrs, the Chairman of the External Affairs Committee, David McCarthy, Paul Roth, Steve McMenamin, John Griswold, and Michael Castine for their extraordinary work in educating the right people.

To tackle *Best Practices in Hedge Fund Investing: Due Diligence for Fixed Income and Credit Strategies,* we asked a broad cross-section of the fixed income and credit market participants for their input. Seasoned allocators were intimately involved in the painstaking work of research, writing and editorial review for each overview and chapter. Specifically, we would like to thank Ben Alimansky, Christine Jurinich, David McCarthy, Brunello Nucci, Jeff Paulker, Rob Sachs, Evan Seiler, Nancy Solnik and Tom Williams for their authorship of the various chapters and insights throughout the process. Our Chairman of the Due Diligence Working Group, Aleks Weiler, contributed a mammoth amount of writing, editing and research to the completed work and deserves enormous credit for the intellectual clarity and substantive understanding that is reflected in this publication. Others provided critical input at different stages of the writing and editing process. We interviewed managers trading these strategies, in addition to investment bankers, credit officers, and analysts. In particular, we would like to highlight the contributions of Rod Berens, Jean-Louis Lelogeais, Bill McCauley, Brian Redmond, Sudhir Rani, and David Viney. Collectively, they were a fount of wisdom and gave our Committee a nuanced and intelligent sounding board for their work. They provided the technical understanding necessary to engage intelligently with this complex investment universe. Without meticulous editing and skilled effort to distill disparate viewpoints and styles, this publication would not have made its way to publication. For invaluable editorial assistance and judgment, Susan Benjamin and Walter Stratton deserve our praise and sincere thanks. Finally, for providing guidance, counsel and support throughout this long process we would like to thank the Research Council of the Greenwich Roundtable and the organization's Executive Director, Steve McMenamin. Steve's passion and abiding commitment to the mission of the Greenwich Roundtable has been an inspiration for everyone who has come into contact with the GR, its publications and its programs.

In the final analysis, we hope you will find value in this latest edition of *Best Practices*. In future publications, we expect to take on the subjects of portfolio construction and monitoring. However, if we have erred in any way (with this publication or any prior one), we hope you will take care to engage us directly. We remain committed to improving our work and understanding how we can continue to fulfill our mission to educate.

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"There is an enormous diversity of fixed and credit income strategies. In essence, managers trade the entire length of the government yield curve from Fed Funds to Long Bonds, the wide and ever-expanding array of fixed income spread product, and all of the derivative instruments relating to these securities."

Introduction: Overview of Fixed Income and Credit Hedge Funds

Fixed income is thought by many to be complicated, both in terms of the instruments traded and the strategies pursued. While this is partly true, especially in terms of some of the mathematics involved, a small degree of effort, applied to understanding the instruments, underlying markets and trading strategies, can yield substantial dividends. This overview attempts to provide hedge fund allocators with a sketch of the different fixed income markets, a summary of recent market trends and a description of major hedge fund strategies employed by fixed income and credit managers. A Glossary at the back of this paper covers some concepts needed to understand the instruments and strategies as well as to navigate through the industry's jargon.

I. Overview of Fixed Income and Credit

In our interviews in preparation of this paper, even seasoned hedge fund investors admitted to us some level of discomfort with fixed income and credit strategies due to (a) the complexity of the instruments and trading approaches, (b) the leverage levels habitually employed, (c) the rapid changes in the marketplace, (d) a seemingly low return-to-effort ratio, and, quite frankly, (d) a lingering suspicion from the 1998 implosion of fixed income trader Long-Term Capital Management. However, opportunities for the strategies have never been better. First, the complexity and relative unpopularity of debt investing create a barrier to entry for these strategies. Second, the revolution in debt trading engendered by innovations in structuring and the explosion in the notional value outstanding of credit derivatives is hard to overstate. Once a sleepy corner of financial markets, credit investing is now its most dynamic area. Often missed in the discussions of this phenomenon is the resulting improved ability to short and to target risks in the credit universe. A hedged approach can now be more easily pursued. Third, there exists the secular trend of financing activity moving out of banks and into hedge funds due to these latter's advantages in capital structure, risk-taking incentives and, ultimately, staffing.

Despite trading one of the largest asset classes and one of the broadest arrays of instruments, hedge fund managers focused on fixed income and/or credit oversee a relatively small amount of the industry's total capital. At the time of writing, the Lipper-Tass database contained 185 fixed income funds out of a total of 2,891 hedge funds; of the $1.5 trillion of hedge fund assets under managment in the HFR database, only 10% are credit managers and 6% are fixed income managers. Contrast this allocation with

Table 1 – Classifications of Debt Markets

Fixed Income	Corporate Credit	Securitized Instruments
Developed Markets – Supra-nationals – Sovereign Debt – Inflation-Protected – Agency – Municipals Emerging Markets	Bank Debt/Loans Investment Grade Crossover High Yield Distressed/Defaulted Hybrids and Convertibles Private Debt	Mortgage-Backed Securities (MBS) Asset-Backed Securities (ABS) Commercial Mortgage-Backed Securities (CMBS) Collateralized Debt Obligations (CDOs, CBOs, CLOs, etc.)

the Federal Reserve Flow of Funds Accounts that, for the end of 2006, listed $44.5 trillion of U.S. credit market debt outstanding as compared to $20.6 trillion of U.S. corporate equities.[1] However, the fundamentals that underlie these strategies are important to the balance of the hedge fund universe. Interest rates are not only the building blocks for debt trading, but are also one of the main ingredients in asset valuations of all kinds. Indeed, fixed income traders originally honed many of the common arbitrage, structuring, financial analysis, portfolio construction and financing techniques used by all hedge fund managers.

Though large, the world's debt markets are generally divided into three groups: Fixed Income, Corporate Credit and Securitized Instruments. Each of these groupings is composed of different markets outlined in Table 1; hedge fund strategy classification follows a similar arrangement. Other important dimensions further distinguish securities within these sub-groups: remaining time to maturity; issuing entity; geography; and cash versus derivative instrument.

Fixed Income instruments include debt issued by governments and their agencies, which set most markets' 'risk-free' rate, and their related derivatives. Corporate Credit (and its derivatives) represents the primary claims on companies' earnings and cashflows (with equities being the residual claims) and, since the creditworthiness of corporations is generally less than that of sovereigns', these securities trade at a spread to the risk-free curve. Securitized Instruments are debt securities whose underlying collateral is some income-producing asset, or a pool of such; the securities are usually 'pass-through' or 'flow-through' structures for the cashflow from the underlying assets.

Debt securities from the same issuer can be highly standardized from issue to issue, such as Treasury debt or papers issued by a corporate Medium-Term Note (MTN) program, or they can be highly differentiated, such as those spanning the entirety of a given company's capital structure (given the multiple entities issuing paper, each with their own jurisdiction, and business and tax objectives). While the latter may appear daunting to the non-specialist, it is this heterogeneity that allows managers to extract alpha from debt trading.

In actuality, these diverse instruments tend to coalesce into discrete markets, each with its

[1] Federal Reserve Board of Governors, Flow of Funds Accounts of the United States, Fourth Quarter 2006, Table L.4 Credit Market Debt, All Sectors, by Instrument.

own participants, market conventions and liquidity. Different actors, valuation metrics and tools dominate a given market. Hedge fund managers who look across the many markets are able to detect mispricings overlooked by single market investors. So, when looking at a manager it is important to understand in which particular sandbox he is playing.

There are some important notes of caution in approaching this space. First, markets are fragmented and mostly over-the-counter (OTC) in nature. Unsurprisingly, each market has its idiosyncrasies. And second, operations are involved, and can be heavily manual, especially in comparison to equity-based and global macro approaches. To successfully trade in these markets, managers require sophisticated systems and robust back offices. Investors should understand the important roles these play in order to properly evaluate allocation decisions.

II. Recent Market Trends

The revolution engendered by the development of the credit derivatives market is hard to overstate. Originally issued on emerging market sovereign debt in the mid-1990s, enabled by standardized definitions and documents courtesy of ISDA in 1999, the credit default swap (CDS) has broadened to become the *de facto* credit trading instrument. These swaps cover the entire Investment Grade universe and, lately, larger and larger portions of the High Yield universe. The more recent introduction of CDS indices (such as iTraxx in 2004) and the widespread creation of collateralized structures have led to an explosion in the notional value of the instruments issued and a revolution in how credit is traded.

In practice, this has dramatically expanded the debt-trading manager's ability to short. Now it is just a matter of buying protection on a name or an index, as opposed to borrowing the cash bonds – which may be difficult to obtain and subject to 'squeezes' in repo – and arranging the attendant financing and hedging trades. In fact, broker dealers have been paying millions of dollars in fees to insurance companies and the like to be able to borrow corporate debt securities (and, increasingly, high yield issues) in order to facilitate the underwriting and trading of credit derivatives. Since shorting is now so much easier, hedged strategies in credit are now more practicable, allowing for long/short approaches to exploit inefficiencies in the credit world.

In a parallel development, bank debt has emerged as an important asset class for credit managers, especially for High Yield traders. This is partly as a result of the increasing international focus of hedge funds, with foreign high yield markets being mostly composed of bank debt. In the United States, the market is roughly evenly split between leveraged loans and junk bonds, whereas in Europe the split is closer to 80/20 and in Japan and Emerging Markets it is more like 95/5. It is also partly due to the generous premium paid, even after adjusting for default losses, for investing in what was an illiquid instrument.

And finally, all of this activity can be thought of as being part of the larger disintermediation of banks in the lending world, with hedge funds moving in to take their place. Direct lending, participation in loan markets, and credit derivatives trading all allow hedge funds to provide cheaper financing to companies – since funds have no BIS/regulatory capital requirements – while still earning attractive returns for their limited partners.

It is for these reasons that fixed income and credit hedge funds are attracting increasing amounts of capital.

III. Hedge Fund Strategies

There is an enormous diversity of fixed and credit income strategies. In essence, managers

> "Traditional lenders are shedding risks to more efficient holders. They are motivated by pressures from Basel II standards, return on capital, regulatory capital and equity holders. Opportunity comes to lenders who are willing to own the residual risks."
>
> Michael Rosenberg,
> June 15, 2006

trade the entire length of the government yield curve from Fed Funds to Long Bonds, the wide and ever-expanding array of fixed income spread product, and all of the derivative instruments relating to these securities. Furthermore, managers are increasingly trading this entire spectrum of products globally, both within and between markets. Ranging from the largest and most liquid (the short end of the government curve and associated futures and swaps) to some of the most illiquid (distressed debt, mortgage derivatives, private loans and bespoke credit derivatives), the markets traded also run from the most mature and efficient ones (again the short end of the government curve and associated futures) to some of the youngest and most dynamic ones (credit derivatives). As with hedge funds trading other asset classes, fixed income and credit funds range from those with a conservative, low volatility focus to those seeking higher returns with commensurately higher volatility.

A. Fixed Income Strategies

- Fixed Income Arbitrage
- Mortgage Arbitrage
- Municipal Bond Arbitrage

Hedge funds trading fixed income typically focus on more relative value trades using sovereign and quasi-sovereign debt. With a multitude of securities making up the yield curve and numerous derivatives based on the curve, the matrix of possible relationships within this asset class is large. Given the efficiency of the markets traded, most strategies involve applying large amounts of leverage to small inefficiencies, yielding steady returns that can be sensitive to liquidity crises.

Traditionally, as the name implies, ***Fixed Income Arbitrage*** managers have traded various 'arbitrages': true arbitrages such as basis trades; carry trades (such as swap spread arbitrage); or by employing convergence trades (such as yield curve arbitrage). Given their nature, the strategies can be highly technical and statistically based. However, successful managers blend strong quantitative skills with fundamental analysis to understand the reasons behind the dislocations, and the timing of when they will narrow. With the proliferation of derivative instruments and increasing liquidity of other global sovereign debt markets, even simple approaches have become highly complex. In fact, a solid understanding of fixed income mathematics, of derivative securities (options, swaps, futures, swaptions, etc.) and of the operational issues is required to develop an edge in this space.

It is close to scripture among allocators that the returns Fixed Income Arbitrage managers generate are normally steady but have considerable downside during a crisis. This is not borne out by research. The leverage applied to trades is large, and so large negative returns can and do occur, but most managers attempt to run hedged books and actively focus on mitigating short volatility exposure. In a recent paper, academics concluded that "the strategies requiring more 'intellectual capital' to implement tend to produce significant alphas after controlling for bond and equity market risk factors. … In contrast with other hedge fund strategies, many of the fixed income arbitrage strategies produce positively skewed returns. These results suggest that there may be more economic substance to fixed income arbitrage than simply 'picking up nickels in front of a steamroller.'"[2]

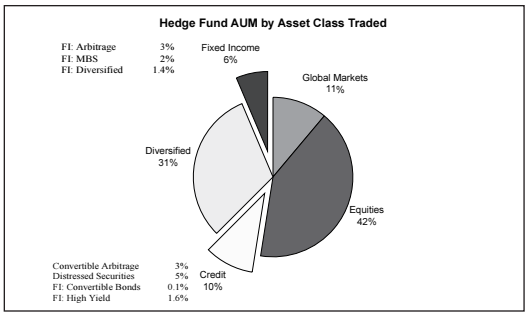
Mortgage Arbitrage traders focus on the complex world of mortgage pass-through securities and their various derivatives. The importance of this market derives from its size: as of the end of April, Mortgage-Backed Securities (MBS)

"These results suggest that there may be more economic substance to fixed income arbitrage than simply 'picking up nickels in front of a steamroller.'"

2 Duarte, Jefferson, Longstaff, Francis A. and Yu, Fan, "Risk and Return in Fixed Income Arbitrage: Nickels in Front of a Steamroller?" (March 2006). Available at SSRN: http://ssrn.com/abstract=872004

comprised 38% of the U.S. Lehman Aggregate Index, a portion greater than that of U.S. Treasuries (23%) and Government-Related entities (14%) combined and over double that of Corporates (19%). The possibilities for generating alpha in mortgages would seem to be large for a number of reasons. Each mortgage pool is unique. There is considerable disagreement on how to price MBS and what prepayment assumptions should be used. The pass-throughs are variously 'guaranteed' by entities such as Freddie Mac or Fannie Mae, whose hedging activities and accounting scandals have invited considerable scrutiny of late. The securities can be 'stripped' into Principal-Only (PO) and Interest-Only (IO) pieces or packaged up into Collateralized Mortgage Obligations (CMOs). The innovation in lending to households (whose borrowings form the raw material of this market after all) has been great, with new and difficult-to-price instruments created (such as option ARMs). However, these same characteristics, coupled with the illiquidity of some parts of the markets, and the embedded leverage and negative convexity of many of these instruments, also mean that, even at the best of times, pricing a portfolio can be difficult notwithstanding any misrepresentation such as with Beacon Hill in 2002. When the mortgage market faces tougher times and trades go wrong, they tend to go seriously wrong, as investors in Askin Capital Management and the Treasurer and taxpayers of Orange County found out in 1994. Managers skilled in general fixed income arbitrage techniques, possessing knowledge of mortgage instruments' particularities and capable of better dissecting the underlying pools, will come out ahead.

Managers invested in ***Municipal Bonds Arbitrage*** (or Muni Arb) follow similar



Source: HFR

long/short strategies applied to the world of municipal bonds. These securities are issued by states, cities, local governments and their agencies and have tax advantages that engender a high participation rate by non-fundamentals-driven investors. This arbitrage strategy generally consists of building a leveraged portfolio of high-quality, tax-exempt municipal bonds and simultaneously hedging the duration risk in that municipal bond portfolio by shorting the equivalent taxable corporate bonds. These corporate equivalents are typically interest rate swaps referencing Libor. Muni arb is a relative value strategy that seizes upon an inefficiency that is related to government tax policy; interest on municipal bonds is exempt from federal income tax. Because the source of this arbitrage is artificially imposed by government regulation, it has persisted (i.e., it has not been 'arbed away') for decades. Given this and the very different tax and credit characteristics of each class and each individual security,[3] managers who perform detailed fundamental analysis can often have an edge in this arena. The assets in this trade are small, with most Fixed Income Arbitrage managers allocating a small portion of their book to it when spreads are wide, and a few dedicated managers consistently plying the trade. Returns tend to be steady, as they are mostly carry-based, but losses occur when spreads widen.

[3] Examples would be General Obligation (GO) bonds that are based on the taxation power of the issuer as opposed to Revenue Bonds whose payment depends on a specific project or revenue stream (such as from an utility or a regional airport or road authority). There can be additional event risks and rewards from municipals such as the large re-rating from the tobacco settlement bonds issued by states over the past half decade.

B. Credit Strategies:

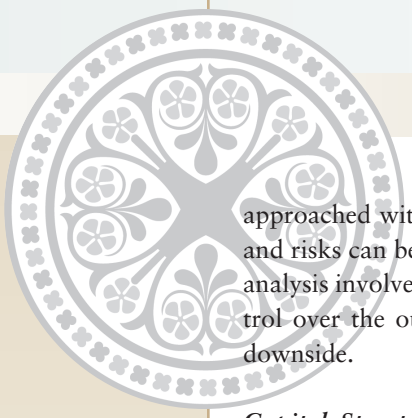
- Investment Grade
- Credit (High Yield) Long/Short
- Distressed Securities
- Capital Structure Arbitrage
- Structured Credit
- Asset-Based Lenders (or Direct Lenders)

Five years ago, the credit universe was an often-overlooked area of hedge fund investing. While Fixed Income Arbitrage managers traditionally dabbled in credit instruments at the margin and Distressed Securities traders represented core allocations for many limited partners, the capital devoted to credit-specific trading was a fraction of that devoted to equity- and global market-specific approaches. Today, Credit managers are increasingly seen as core allocations in their own right, with the dynamism and relative adolescence of the market providing ample opportunity for hedge fund managers to ply their trade. As with Fixed Income managers, the breadth of instruments and approaches is wide. In some senses it is greater, as the universe of company earnings and events is opened up to investment. Hedge funds trading in Credit, while borrowing some of the technical and relative value techniques used by Fixed Income managers, tend to have a more fundamental basis to their investment strategies. Credit managers, after all, are trying to assess the health of the underlying enterprise, and the changes in expectations surrounding it, in order to determine value.

The simplest style to understand is that of ***Credit (High Yield) Long/Short,*** which, as the name implies, involves managers constructing portfolios of bonds and/or bank debt based on assessments of security over- and under-valuation. Like their Equity Long/Short cousins, these managers use fundamental analysis to construct long/short portfolios of high yield bonds and/or loans. In credit investing, though, an understanding of the specific covenants of each debt security is as important to the analysis as is the understanding of the reference entity's fundamentals. Most Credit strategies tend to demonstrate a heavy net long bias to portfolios, as carry constitutes a substantial portion of returns. While some managers are quantitatively focused, qualitative and fundamental research methods seem to predominate. This is true both of ***Investment Grade*** and High Yield managers, with the composition of each universe determining the opportunity set and the leverage used (High Yield tends to be less leveraged than Investment Grade as the carry is higher). In either case, returns produced tend to be steady until one of the credits owned is downgraded or defaults, though the ability to easily short credit indices has allowed managers to hedge systemic spread widening. The periods following credit market retrenchments tend to be best for these managers.

The largest style within Credit (in terms of dollar allocations) is ***Distressed Securities,*** the act of buying the debt securities (usually bank debt or bonds) of companies in 'distress' (often bankruptcy or heading in that direction), either as an active investor shepherding the company through the bankruptcy and restructuring process or as a passive investor looking for value. By buying the debt at fractions of face value and having the enterprise's capital structure and/or business reorganized, Distressed Debt managers can often sell their holdings for multiples of what they bought them for; they can also be left holding worthless and illiquid paper should restructuring fail. The skills required for success include detailed financial analysis, an understanding of covenants, industry expertise, an investment banker's ability to manipulate capital structures, creditor committee management talent, and deal sourcing abilities. In contrast to most other Fixed Income and Credit styles, this approach is very directional (long-only), is categorized as Event-Driven (as opposed to Relative Value) and is

> "We believe playing between the cash and derivative markets offers opportunity. Cash players talk about defaults, severity of loss and collateral quality. Derivative players talk about correlations, risk neutral pricing and attachment-detachment points. Yet their markets share the same risk."
>
> Christian Zugel,
> June 16, 2005



approached with little or no leverage. Returns and risks can be quite high, but the painstaking analysis involved, coupled with a degree of control over the outcome, somewhat mitigate the downside.

Capital Structure Arbitrage is the process of being long or short the different securities issued by the same company with the idea of taking advantage of the mispricing of securities within a capital structure. The opportunity arises because there is a delineation of buyers and valuation methodologies between the buyers of bank debt, bonds and equities. Because companies construct their capital structures to optimize a combination of funding costs, accounting treatment and tax burden, this can lead to multiple entities and Special Purpose Vehicles (SPVs) with varying degrees of recourse back to a given company or set of assets. This factor can create bountiful opportunities for the trader willing to understand the idiosyncrasies of each security within a given enterprise (especially to what assets and with what degree of seniority). However, as some capital structure traders have found, failing to understand these particularities can lead to enormous losses. Returns tend to be better when there are more defaults or corporate events.

It can be argued that ***Convertible Arbitrage*** is a sub-set of Capital Structure Arbitrage; after all you are long a bond and short the stock of a given company, but most allocators and managers consider it a separate strategy. In this investment style, managers buy various securities convertible into others (convertible bonds or preferred stock, warrants and the like) and, against those, short the underlying equity. To be successful, managers need to be able to properly determine the hedge ratio in order to monetize the embedded option. Once among the most touted hedge fund strategies overall and the highest returning in the 2000-02 bear market, in recent years managers attracted considerable assets which, given the declining supply of convertible bonds, led to the bonds trading at a premium to the embedded option. The 2004 GM and Ford downgrades engendered widespread losses among convertible arbitrageurs and capital exiting the strategy. Of late, managers have become much more credit-focused and event-driven in their approach, leading to more credit spread sensitivity in their returns.

Given the gallons of ink and acres of forest devoted to the credit derivatives market, it is not surprising that this area has produced its own sub-strategy within Credit. Loosely grouped under the heading of ***Structured Credit,*** managers in this style generally use a fundamental research-based approach to create long/short portfolios of credits expressed using credit default swaps (CDS) and other credit derivatives. With the "tranching" of credit resulting from the proliferation of structures such as Collateralized Debt Obligations (CDOs) and its offshoots (loans, asset-backed securities, etc.) as well as the establishment of CDS indices, additional more technical strategies such as correlation trading have been added to managers' toolboxes. Managers require credit analysis skills, derivative security understanding coupled with the quantitative and technical skills needed to model complex instruments and trades in order to be successful. Returns from this strategy tend to be lower volatility if the manager pursues long/short strategies and considerably more volatile if they focus on correlation trading.

Asset-Based Lenders managers are a fast-growing group whose fundamental credit analysis and world-class deal sourcing and servicing infrastructure allows them to construct portfolios of asset-backed loans, direct financing deals and other high carry paper, in addition to collecting origination (arrangement) fees. These managers (also called ***Direct Lenders***) closely resemble commercial lenders (such as Goldman

Sachs, Cargill or GE Capital) and the old British merchant banks, in that they provide private funding to any entity in need of liquidity. Their portfolios are just as likely to contain corporate loans as they are to have pools of parking ticket receivable, airplane EETCs, real estate or non-performing loans. The skills required would thus be excellent credit analysis (especially an understanding of collateral values), a strong 'servicing' (read collection) ability and a proprietary deal sourcing infrastructure. The returns can be high and uncorrelated, but a manager must have a strong and stable capital base in order to be successful.

I. Strategy, Investment Process, and Market Opportunity

"Try to assess how genuine a manager's edge is. Is the edge intangible as in a sixth sense, or derived from a tangible mix of experiences, or a certain quality of experience? How is the edge different from that of other major competitors? How sustainable is this edge?"

Fixed Income and Credit Strategies hold an almost unique position in hedge fund investing. The variety of financial market instruments, their complexity, and the substantial opportunity to employ both directional and relative value strategies, offers an extremely wide opportunity set. But, this opportunity set bears a special burden as well.

The material in the section emphasizes the importance of understanding each of the underlying strategies used in an individual hedge fund. And, it focuses on the need to relate each specific strategy to both the performance opportunity in the style as a whole and to the relative performance among managers engaged in this style of investing. In some cases, directional sovereign debt trading for instance, managers will need to demonstrate significant ability in macroeconomic analysis. In other cases, distressed security investing for instance, managers will need to demonstrate superior skills in understanding all aspects of the legal documents and environment surrounding an individual debt issue. The complexity of many of these fixed income and credit instruments and strategies are an important source of performance opportunity for skilled managers. Directional trading opportunities arising from economic imbalances within or across countries, between securities of an individual company, or securities across companies provide an enormous source of return potential for the successful hedge fund.

The material below is designed to aid investors in identifying the particular opportunities that hedge funds focus on in Fixed Income and Credit investing, what some of the factors of successful investing are, and assessing whether an individual manager involved in these strategies has the specific skills to generate attractive returns.

A. Overview

- How is the strategy best categorized? Is the strategy primarily focused on sovereign debt and its derivatives or is it mostly dealing in corporate credit? Does the strategy focus on a particular region? Within fixed income strategies, does the fund profit from Yield Curve Arbitrage, Basis Trading, macro trading, Mortgage Arbitrage or some other approach? Within credit, does the manager select securities that are current pay/current coupon or securities that are defaulted, but where capital appreciation is expected from positive events?

Strategies within fixed income include Fixed Income Arbitrage, Mortgage Arbitrage and Municipal Bond Arbitrage. For credit managers, the strategies include Investment Grade, Credit (High Yield) Long/Short, Distressed Securities, Capital Structure Arbitrage, Structured Credit, Asset-Based Lending (see the Introduction for more complete description.)

Strict classification is easier said then done for many managers, and looking at a portfolio alone may be misleading, as many of the standard funding and hedging instruments are common to all approaches. Further compounding this problem is the tendency for many managers to migrate to where the opportunities are and to become more multi-strategy in their approach. Asking the manager who he considers to be his closest competitors can be helpful in both classifying his approach and establishing an appropriate peer group to compare him to.

- What specific securities and markets does the fund trade (e.g., OECD sovereign or

I. Strategy, Investment Process, and Market Opportunity (cont.)

agency debt, mortgage-backed securities, emerging markets sovereign debt, investment grade credit, high yield, distressed securities, structured credit/CDOs/CLOs, asset-backed securities, bank debt, loans, futures, options, swaps, swaptions, forwards, convertible securities)? Do the key investment professionals possess the specialized knowledge and experience to invest successfully in the identified securities?

Does their experience permit them to operate successfully in the range of markets required by the strategy?

This question is of particular importance given the apparent complexity of many debt and derivative instruments. Not understanding the dynamic of even simple instruments (for example the convexity of a bond or its cheapest-to-deliver status) let alone the intricacies of corporate debt covenants and indentures is a recipe, at best, for disappointing results or, at worst, for serious losses. The innovation, rapid securitization and structuring currently characterizing the credit universe means that even plain vanilla debt instruments can now be subject to more complicated technical forces arising from collateralized structures or index trading.

Since the skills and knowledge needed differ widely from strategy to strategy, it is important to familiarize one's self with how each market trades and what skills are important. Asking a manager what he would look for in a candidate to fill his role may help you understand this better.

- In which countries or regions does the manager invest?

While the general advice advanced in previous *Best Practices* publications – "beware of the reduced liquidity and latitude for hedging in certain markets, especially emerging markets" – still holds in the case of both fixed income and credit investing, in contrast to equity investors in emerging markets, sovereign debt investors are generally able to short both in the derivative and in the cash markets. The genesis of the credit derivatives market was credit default swaps on emerging market sovereign debt. It has expanded to include most developed market Investment Grade paper, regardless of type, and, additionally, an increasing amount of High Yield securities worldwide. Fixed income and credit hedge funds thus ought to be able to run hedged books in most markets.

- What is the manager's investment philosophy and what are the core principles that inform this strategy? Were there any professional experiences that were instrumental for the manager in developing his investment philosophy or approach?

The core philosophy may require some elaboration but the manager should be intellectually disciplined enough to articulate this in a clear, concise and easily understandable way.

While the market crises of 1994 and 1998 should have been particularly instructive to fixed income traders and the summer of 2002 would have been similarly so for credit managers, what the manager learned from other periods and/or trades is likely to be more of a differentiating factor.

- How has the current strategy evolved over time? What factors might cause the strategy to be altered – however subtle these changes might be?

I. Strategy, Investment Process, and Market Opportunity (cont.)

"What conditions would create the perfect storm, where portfolio leverage would pose problems for the strategy or the portfolio manager?"

How does the manager plan to introduce new strategies to the portfolio? What is the process for allocating capital to new strategies or systems?

When analyzing changes to strategies, it is important to assess the scope of the change. Is it a refinement to an existing strategy or an expansion into new areas? If it is an expansion, how has the expertise for this extension been developed? Will the manager be making new hires? Does the firm have the appropriate operations and infrastructure to handle the expansion? Is the firm missing certain systems or operations that may be important or crucial to its success?

Try to assess if the manager has fundamentally changed his strategy to accommodate an undue increase in assets or to capitalize on opportunities in which he has little expertise. Or, is the manager making logical adjustments to profit in a changed environment that is still fundamentally consistent with his/her investment philosophy? The pace of innovation in the credit derivatives arena has changed the nature of credit investing and opened up a new realm of opportunity for managers. You have to ask yourself if they have the expertise to fully participate in what is a relatively adolescent and sometimes illiquid market.

One way to measure style drift is to watch the degree of realized volatility for the strategy. Is the manager taking more or less risk over time? Why? Does the current investment profile of the fund seem justified given the manager's expressed views of the market?

- How unique is the strategy? Does it attempt to exploit persistent market inefficiencies or is it a less viable longer-term strategy? What is the hedge fund manager's 'edge?'

Try to assess how genuine a manager's edge is. Is the edge intangible as in a sixth sense, or is it derived from a tangible mix of experiences or a certain quality of experience? How is the edge different from that of competitors? How sustainable is this edge? In both fixed income and credit investing, edge can just as readily derive from trade structuring, greater understanding of indentures/covenants and operations as from insights about markets and/or companies.

- What are the best environments for the strategy? What are the worst environments for the strategy? Examine examples of each. To what macroeconomic factors is the strategy most/least sensitive?

Fixed income may appear 'unvolatile' relative to equities and commodities, but it too has cycles. There are both bull and bear markets in credit products and particular segments of markets. Distressed securities are more abundant and better priced during a recession than during mid-cycle. Interest rates both rise and fall. The Fed is more active during certain segments of an economic cycle. And finally, investment strategies wax and wane in popularity with commensurate asset flows, with a resultant impact on returns. While coupon payments mitigate return volatility, they do not eliminate it. Understanding when a manager's particular style is in the sun and when it is not goes a long way in completing fruitful due diligence on and making a successful investment in a given hedge fund.

- Which indices or investment manager peer group would be most appropriate to understand the market dynamics relevant to the

I. Strategy, Investment Process, and Market Opportunity (cont.)

strategy? Are there certain indexes or strategies that might be ideal for "benchmarking" purposes?

Most arbitrage-focused managers will tell you that their approach targets absolute returns and so has no index proxy. However, the level of rates matters significantly in determining the basic carry they can earn. Higher volatility (in the level and shape of the curve) and lower correlation between securities increase returns to relative value trading in general.

For credit-focused approaches, the performance of corporate credit, particularly sub-investment grade debt, often goes some way in explaining the performance of these managers. For Distressed Securities traders, the quantity of defaults relative to the capital investing in them is important to understand though the last few years' industry-specific "rolling bankruptcies" has meant opportunity despite low default rates.

In short, peer groups may be of greater use in understanding what to expect from a manager than particular market indices are. Asking a manager who he thinks his competition is usually provides some good insight into his strategy as well as providing good fodder for further inquiry.

- Is the strategy long or short volatility? Is the strategy long or short tail risk?

As part of understanding a manager's fundamental strategy as well as his ability to manage risk, it is often helpful to think of a strategy in the concept of optionality. In other words, is the strategy similar to owning (being long) an option or selling (being short) an option? Long volatility strategies may cost something to hold (the option premium) but will pay nicely as either volatility increases or the option becomes "in the money," and is often compared to buying an insurance policy. Short option strategies will pay the option seller, but will be costly if the inverse occurs much like an insurer who writes only one policy that is triggered. Optionality can arise implicitly from the trading strategy employed or explicitly from being long or short options overall.

Tail risk is what happens when market crises occur and liquidity disappears. It has a coincident relationship with volatility and a direct relationship with correlations, which underlie all relative value trading. Arbitrage strategies may or may not be short volatility, but they tend to be short tail risk.

B. Investment Process: Idea/Trade Generation

- What is the process for generating investment ideas or the selection and implementation of trades?

It should be noted that the structuring of trades constitutes an investment edge for both fixed income and credit managers.

In the case of fixed income, the large array of seemingly fungible instruments is actually composed of differentiated securities with a wide opportunity for creative structuring and a number of pitfalls for the less initiated arising from market idiosyncrasies such as the dynamics surrounding cheapest-to-deliver note, the role of on-the-run versus off-the-run paper, how a particular bond trades in repo, and the large difference between mortgage pools.

I. Strategy, Investment Process, and Market Opportunity (cont.)

In the case of credit-focused approaches, understanding the instrument's indenture and its covenants – the seniority of the paper, the assets it has recourse to, its payment and redemption schedule (including put and call provisions) – form the basis of a hedge fund's value added. As can be seen from even this short list, how a trade is structured and the investment idea itself are often inseparable in both fixed income and credit strategies.

- Research: How does the manager approach investment research? Does the manager employ a bottom-up or top-down security selection or asset allocation approach? How are potential positions identified or screened? Are quantitative models or software used? To what degree does the manager use primary research (and/or consultants) and how rigorous does this effort appear to be? What is unique about this approach to research? What capacity does the manager have to generate, consistently, a truly original investment thesis?

Fixed Income: Many of the strategies employed by hedge funds, while dubbed 'arbitrage,' have historically been better described as 'mean reversion' approaches. Given the wide range of instruments traded, most managers employ some form of quantitative screening tools in the initial research efforts. While whole textbooks have been written on the mathematics behind these calculations (dealing with the tricky issues of rolldown, carry and the like), for an allocator it is simply a matter of establishing a manager's ability to build appropriate systems and, just as important, to understand how he sources and cleanses the data used as inputs.

Credit: Corporate debt-focused hedge funds, while employing many of the tools of their fixed income cousins (technical screening, etc.), tend to focus more on the fundamentals of the enterprises and industries targeted as well as the specific covenants and indentures of the paper being investigated. Consistently understanding any of these items better or sooner than the competition can be a huge edge. For managers more focused on the private transactions, the additional skills of deal structuring and collateral collection are required. For distressed security hedge funds, the manager's ability and desire to shepherd a creditor committee and the restructuring process to a successful conclusion must also be investigated on the part of an allocator.

- Modeling and Valuation: What are the security valuation methodologies that are important to a manager? Do the analysts create their own financial models? How do managers develop research ideas in concert with less experienced analysts? Or, more broadly, how does the manager leverage the capabilities of all investment professionals involved in the research process?

- Carefully review current and historical investment examples. Ensure that these examples represent a broad mix of investment outcomes (i.e., both good and bad).

Try to make sure that you are being presented with more than just a select number of highly polished and carefully vetted "examples." Those included in the marketplace document are likely of this type. The best approach is to randomly choose current and historical portfolios, select positions either that you know had very good or adverse outcomes in the marketplace and are

I. Strategy, Investment Process, and Market Opportunity (cont.)

meaningfully-sized and then engage the manager in a dialogue on his rationale for both adding the position and sizing it as he did.

This should also include an examination of historical portfolios, using dates chosen by the potential investor, and risk reports associated with them. Many managers are especially sensitive about this request and refuse to provide them. This should be a red flag for allocators, who have a fiduciary obligation to their clients to understand what they are buying when they hire a manager.

Do the examples tie in with your understanding of the manager's philosophy and perception of an investment edge?

C. Portfolio Construction

- What is the overall approach to portfolio construction? How does it enable the fund to reach investment targets?

Next to idea generation, this is the most important area to focus on. Understand how a manager allocates capital to individual trades and themes. Portfolio construction expresses the balance between a manager's conviction in his ideas, the capacity available in it and the risk of it to the investor (both at a position level and in terms of the portfolio as a whole). Managers can be entirely bottom-up in assigning capital, or they can employ a more top-down approach, or even a blend of both. Some managers use heavily quantitative approaches while others rely on manager discretion and judgment. Improperly-sized positions will mean that good ideas contribute too little to profits and bad ideas generate too great a loss. A collection of great individual ideas does not automatically create a great portfolio. In contrast, great portfolio construction can make up for a multitude of idea generation errors (i.e., the mistakes are sized small). Understanding the particular dynamic at the manager being examined is crucial to understanding what the return stream will look like.

- What are the targeted position sizes and exposure ranges for the fund? What is the typical, minimum, and maximum sizing for positions within the portfolio? What have the historical sizes and exposures been? What is the leverage target and how is it measured? Consider stress tests, DV01, country and region, asset class and credit rating limits for each. Are the limitations noted in the offering memorandum (rarely) or are they set by the investment team (and if so, by whom)?

Develop a solid understanding of the way in which the manager approaches position concentration in the portfolio. Historically, how large has the manager let positions grow and in what context? Was this discipline always applied or was it adjusted in practice? This applies also to the number of positions, as fixed income traders tend to be heavy users of swaps in their various forms. Because most positions are closed out with offsetting swaps rather than unwinding the original trade with the original dealer, a fund with a long history may have a substantial book of swaps whose DV01 risk is technically zero but whose counterparty risk and operational complexity can be substantial.

Try and understand the degrees of risk created by position concentration especially in less liquid markets; alternatively, try to understand the analytically dilutive effects of an over-diversified portfolio – the risk of not

> "Above all, understand the effect of leverage on a manager's ability to hold onto a good position that may have a temporary mark-to-market loss. Leverage cuts both ways and more good traders have been undone by applying increasing leverage to a diminishing return opportunity than have been lucky enough to have survived the inevitable denouement."

knowing the portfolio as well. Do you sense that the number of positions in the portfolio is a function of the fund's (possibly too large) asset size and less driven by a "risk management" discipline? Tie your understanding of concentration to the fund's performance characteristics to aid in your understanding of how the manager will perform going forward.

- What is the typical number of positions in the portfolio?

How many of the positions are really material to the portfolio? Is the number of positions realistically manageable? In other words, can the manager (and his team) really know the positions well? Does the infrastructure of the business support the number of positions, in terms of asset and liability tracking and stress tests? Both the number and the complexity of the instruments in the portfolio impact operations.

- Does the portfolio manager have experience managing liabilities (i.e., funding, repos, term financing, structuring CDOs/CLOs if applicable) as opposed to simply managing assets (i.e., picking securities or analyzing credits)?

Given that funding is such an important part of some fixed income strategies, the importance of this question cannot be overstated. For leveraged books typical of 'arbitrage' styles, this is particularly true; for unleveraged styles, such as Distressed Securities, this is less of a concern. Mismatches between investor liquidity, underlying security liquidity and financing terms have undone some of the best and brightest in the business. All other things being equal, longer-term financing in the form of long notice periods for haircut changes by prime brokers, or some of the 'permanent capital' vehicles being currently issued, are preferred.

This skill should be evident in both the front- and back-offices of leveraged managers as technical issues surrounding both investment concerns, such as a security's inclusion in CDOs, and operational concerns, such as trade failures, can both be costly. Good communication between the two areas is key.

- For credit managers, does the fund have a bias toward specific sectors of the market (e.g., merchant energy or air transportation)? Does the manager have specific sector concentration limits? Look at how the manager's sector or industry concentration has changed over time.

Similar questions should be posed about issuers, credit ratings and instrument types.

To what degree does the manager seem to appreciate the risks posed by excessive concentration? Does the manager demonstrate an appreciation for the risk posed by rating, market, issuer, industry or duration mismatches potentially embedded in a given investment portfolio?

- What is the size of issuers and issues which managers are generally targeting for their investments? Do they invest in private securities (sometimes termed 144As), structured products (CDO equity for example) or other asset-backed strategies? Compare AUM to market size, issue size or sector size for any fund you are evaluating, and try to aggregate hedge fund activity to judge market efficiency.

I. Strategy, Investment Process, and Market Opportunity (cont.)

Be careful to scrutinize the liquidity risk implicit in smaller asset classes within fixed income and credit markets. Try to assess the additional impact of other variables on liquidity such as position concentration, issue size, market size, asset growth, investor concentration and redemption terms.

Credit managers may refer to the middle market: this is normally companies with enterprise value between $100MM and $2BN. This may be related to the types of risks the manager is willing to take and the size of their funds.

- Does the manager target a general allocation of capital to various sub-strategies, such as yield curve arbitrage, mortgage-backed or asset-backed trading in the case of fixed income?

Understand how this is set, by whom and how often.

- What kind of geographic exposure does the fund's strategy have?

Credit managers will generally have greater concentrations in the U.S. and Europe than other markets such as Asia or traditional emerging markets. Due to the less developed nature of credit markets outside the U.S., it is important to understand how much capital is allocated to these markets and how it is managed.

Fixed Income managers may focus on similar strategies both in the U.S. and abroad. Be sure to ask how much is allocated and to what markets, as well as how the opportunity may be different there than in the U.S.

- How is leverage used in the portfolio?

To what degree will leverage be employed in the portfolio and in what context? What particular environments or circumstances would prompt a reduction in the use of leverage? An increase? Fixed income managers will use varying degrees of leverage, also tied to the underlying types of strategies they implement. Credit managers may leverage securities where they believe downside risk is both well understood and limited. Ask the manager to detail his use of leverage by trading strategy.

As has been noted before, fixed income strategies, specifically in the world of yield curve arbitrage, tend to be much more highly leveraged by the standards of equity strategies.

There are many technical reasons for this, which is why managers tend to see dollar leverage as less important than risk-based measures such as 10-year equivalents, DV01 and stress levels. For investors, it is crucial to understand a manager's leverage in all of its dimensions: on an absolute basis (both gross and net notionals), relative to peers, how it responds to market conditions (does the manager maintain leverage in periods of rising volatility or reduce it) and, most important, how the liabilities are dealt with operationally (especially the terms of the financing – the longer-term the better). Above all, understand the effect of leverage on a manager's ability to hold onto a good position that may have a temporary mark-to-market loss. Leverage cuts both ways and more good traders have been undone by applying increasing leverage to a diminishing return opportunity than have been lucky enough to have survived the inevitable denouement.

I. Strategy, Investment Process, and Market Opportunity (cont.)

D. Trading

- Who makes trading/execution decisions? Who is the backup?

Is there separation between PM and trader? Who reviews and oversees trades? Does the trader only execute trades, or does he have some portfolio management authority over a prescribed carve out of capital? How does the fund avoid the problems that can arise from having multiple traders?

- Are there systematic or quantitative elements to the strategy? If so, what are they, how were they developed? When is the manager's judgment sufficient to "override" such a systematic or quantitatively driven investment discipline?

This is particularly relevant for fixed income strategies. Certain strategies lend themselves to systematic identification of the opportunity. However, it is important to understand the interaction of the manager and systems he relies on. Does the system simply output potential trades which are then up to the manager's discretion?

- How are positions exited? Does the manager set a target, rely on a set of rules, or base the sell decision on a catalyst or event?

Fixed income managers may set price, yield, spread or volatility targets – depending on the nature of the underlying strategy or trade.

Credit managers will typically see the exit as 'event driven,' meaning that a realization of value arises from some catalyst or event. For example, the value of a class of debt in a corporations' capital structure undergoing bankruptcy reorganization might depend on the priority designation of the courts.

- Are there different types of positions such as "core" and "trading" positions?

- What is the average holding period? What is the annual average turnover of the fund?

Some credit strategies may try to be tax-efficient on the long-side, holding credits for more than a year to capture capital gains. Fixed income managers may have varying holding periods depending on the nature of underlying trades.

- Is there a "stop-loss" policy? How is it executed?

Strict stop loss procedures are more important for some strategies than for others. For example, in more trading and arbitrage oriented strategies within Fixed Income arbitrage, strict stop loss procedures are vital due to the amount of leverage and position concentration that is sometimes employed. With many distressed managers, stop loss disciplines are explained with a greater degree of ambiguity. The sell-discipline is understood to be more "art" than science.

Understand the portfolio manager's tolerance for losses. What is the manager willing to lose in a position before cutting it back, or in the portfolio before reducing total leverage? "Getting married" to a position(s) or a story is one of the most common reasons for incurring a substantial portfolio loss.

Understanding the risks a manager is willing to take if he is meaningfully profitable or unprofitable for the year is extremely useful.

"The liquidity on the way out is not the liquidity on the way in."

Gregory Jacobs,
May 17, 2007

I. Strategy, Investment Process, and Market Opportunity (cont.)

Some more trading-oriented managers (and strategies) will tend to press their bets when they are up and invest more conservatively when they are down.

- Shorting: What specific shorting experiences do the manager and trader have? If shorting is meant to generate alpha, then has it actually done so in practice? Will the manager employ any other shorting/hedging strategies? What range of instruments will be used to short or hedge (e.g., credit derivatives or bonds)? How costly has the use of hedging instruments been YTD and, on average, annually?

Fixed Income: Unlike in most equity strategies, fixed income and credit managers routinely short instruments to create hedges and so shorting most frequently acts to reduce risk, not increase it.

Credit: Are short positions created using physical bonds or via derivative instruments? If physical bonds are used, how do they locate the bonds and borrow them, prior to shorting them? If Credit Default Swaps are used, then evaluate the notional size of the positions and overall hedges, and the cost of CDS. Since CDS are priced at a spread to LIBOR, ask what the spread is, how frequently the contracts reset, and who the counterparties are.

E. Market Opportunity

- What is the breadth of the investment universe that the manager's strategy will target? How diverse or liquid are the companies, sectors or regions that are targeted for the strategy?
- What conditions are favorable to the strategy? What are the current conditions for the strategy? How much capital is being deployed against the opportunity in aggregate?

How much money is currently flowing into the strategy? Is the strategy congested? How are the conditions for issuance, gross and net, versus historical levels? Is there any reason to suspect that it is poised to suffer from diminished returns going forward? Does the manager's size mean that they are less or more affected by capital flows? As a benchmark for the appropriate size of the fund, consider the asset size of other successful funds that employ the same strategy. Then aggregate the AUM of similar hedge funds and compare it to the market size. Can the particular market or set of securities absorb that much leveraged capital?

- To what degree can the strategy be understood to have "cycles?"

Where is the cycle today? Beware of conspicuous outperformance when the strategy is concluding the most attractive segment of an investment cycle. How does the strategy change at different parts of the cycle?

- What kind of external shocks is the strategy most vulnerable to?

Ask the portfolio manager to decompose the strategy into the risk factors for which it is most sensitive. As part of the basic strategy discussion, how is the manager's investment approach designed to hedge against significant external shocks? Note that shocks may or may not be directly related to the market - they could be political or legislative in their origin.

"Once a strategy is broadly defined, when an index is formed, capital will flow in, the trade gets crowded and it's time to move on. It's important to understand the cycle. My first bank debt trade took longer to settle than the entire distressed cycle lasted. When correlations blew up in May 2005, we had 3-5 days to act."

Eric Mindich,
November 17, 2005

I. Strategy, Investment Process, and Market Opportunity (cont.)

- How tax-efficient is the strategy?

Credit managers will employ a mix of carry and capital appreciation strategies. Capital gains and income are taxed at very different rates for U.S. onshore investors. Fixed Income managers may not capture income but may rather be short-term traders of securities - which has its own tax implications.

II. Market Risk Management

Fixed Income and Credit strategies use a broad array of financial instruments, more so than many other hedge fund styles. Some of these instruments are reasonably straightforward to analyze (e.g., G7 sovereign debt). Others are quite complex. Even at the simpler end of the spectrum, non-sovereign fixed income investing requires consideration of risks such as rating changes, calls, prepayments (in the case of mortgage obligations), and varying levels of instrument liquidity. There has been significant volume growth in fixed income markets over the past ten years. But, perhaps more important, the complexity of the financial instruments currently in use, and the even greater complexity of their related derivatives, has expanded even more dramatically.

The following section draws the reader's attention to risks to consider when allocating to hedge funds employing fixed income and credit strategies. As noted below, leverage will usually be an insufficient indicator of market risk in fixed income investing. Other risk measures beyond leverage, and even VaR, are usually employed in this hedge fund style (e.g., measuring DV01 risk). The common use of relative value strategies in this hedge fund style increases the importance of "tail" risk analysis. Some of these relative value strategies may have a significant short volatility aspect to them. Finally, the use of more exotic, often less liquid, instruments in these strategies raises an important due diligence focus on the independence of instrument pricing. The section below attempts to highlight some of these very important issues.

A. Portfolio Risks

- Invite the manager to articulate his risk management philosophy.

  Is the process systematized or does it seem more intuitive? Risk management can vary considerably between the more quantitative Fixed Income shops and the discretionary and private-focused Distressed Securities players. No one philosophy covers all markets and all situations but the beliefs expressed should be appropriate for the markets being traded and reasonable in light of the risks being taken.

  Why do they believe what they do? Often the experiences of losses are felt more acutely than those of gains. A string of losses may engender tighter controls while a series of gains can lead to increased laxity. Understanding the balance between caution and abandon possessed by a particular manager, goes a long way to understanding what the return stream will look like.

  Does this philosophy take into account both "normal" market conditions, and the inevitable "tail" event?

- Does the manager have written policies and procedures that communicate an approach to risk management?

  Obtain a copy of any relevant documentation or procedures. Make a detailed review that includes operational, liquidity, and counterparty risk.

- How does the manager gauge risk? What risk measures does the hedge fund use internally? Which measures are most important? How often are these risk measures calculated? Are they calculated internally or by an external vendor?

  Does the manager measure risk in terms of stress levels, volatility, leverage, or in some other fashion?

"Greater separation of duties can enhance the long-term vitality of a hedge fund. It can also help reassure investors that multiple sets of unrelated eyes are watching over the business and the portfolio."

II. Risk Management (cont.)

Does the manager conduct statistical calculations, such as DV01 or Value at Risk (VaR)?

It is important to remember that various risk measures, like VaR, might understate risk during periods of low market volatility. Stress testing and scenario analysis help gauge portfolio risk during periods of high market volatility and high correlations. They provide a more accurate picture of potential losses in difficult environments. In essence, they help gauge "tail risk."

Fixed Income strategies tend to be highly leveraged by the standards of other hedge fund strategies. This is both because they are relative value-focused in highly efficient markets and because of technical and operational factors peculiar to these markets (e.g., swaps are rarely unwound with the original counterparties but rather an offsetting swap is put in place to exit the trade; thus counterparty exposure is high but economic exposure is not).

- Which portfolio, market, factor, or security-specific risks are most relevant to consider? Are these particular risks in specific types of investments or trades? The list is not meant to be comprehensive but it may serve as a rudimentary point of reference:

  – Interest Rate Risk
  – Foreign Exchange Risk
  – Credit Risk
  – Equity Market Risk
  – Basis Risk
  – Liquidity Risk
  – Position Concentration Risk
  – Correlation Risk
  – Volatility Risk
  – Counterparty Risk
  – Leverage

Again, it is worth highlighting that Fixed Income strategies tend to have risks that differ materially from those of Credit strategies. Since the former are based on intra- and inter-country yield curve arbitrage, factors related to sovereign debt and foreign exchange markets dominate investment risk. In the case of Credit managers, credit spreads and company-specific events will tend to dominate investment risk. Both of these areas will be subject to counterparty, leverage and volatility risks. It should be noted that there is volatility in many different markets, even seemingly 'docile' ones like fixed income.

- To what extent does the manager trade derivatives? What instruments are used? How are these instruments modeled and valued? If options are used, does the manager have a bias to buy or sell options?

Derivatives can give rise to non-linear portfolio risks so focus on understanding the tail risk that may be inherent in some of these strategies. They also can hedge these risks. Focus also on the trading and liquidity characteristics of these instruments. As a rule of thumb, the more 'exotic' and structured a derivative is, the more likely there is only one source of liquidity: the originating dealer.

Fixed Income managers will likely be heavy users of derivatives as they are both important tools (for instance using swaptions in 'conditional' trades) as well as a strategy in its own right (volatility arbitrage). It goes without saying that the revolution in credit derivatives has meant that Credit managers have become heavier users of derivatives as opposed to their historical focus on cash instruments. As an allocator, you would be wise to familiarize yourself with the various

II. Risk Management (cont.)

instruments, their investment profiles and their operational issues.

The distinction of being, in aggregate, short or long options is not a trivial one. Many 'arbitrage' strategies may be short volatility given the 'normal' conditions necessary for 'mean reversion'-type trades. Short option strategies have attractive statistical properties – consistent monthly income in times when markets are generally directionless – until they do not. Because of this, increasing leverage tends to be applied to the shrinking returns it produces resulting in a blow-up. Portfolio insurance in 1987 and Yield Curve Arbitrage in 1998 are examples of where short optionality produced enormous losses.

Many new derivative structures are being invented daily, though they are generally built from basic instruments (futures, options, swaps). Hedge funds may be early adopters of these structures, in some cases driving their creation. Credit default swap indices are proliferating across all debt instrument markets, most recently across the various asset-backed and mortgage-backed markets. You should evaluate how skilled the manager is at using the new instruments, especially if he is using them extensively. New markets tend to be somewhat adolescent initially, with unpredictable moods and liquidity availability.

In all of these discussions, understand the distinction between being short volatility and short tail risk. Being long or short volatility tends to be an idiosyncractic trading choice made by a manager. Begin short tail (or liquidity) risk tends to be inherent to a strategy.

- Does the manager monitor position, sector, credit rating, and geographic or thematic concentrations? Does the manager monitor correlations among trades?

A manager may appear to have a diversified book but in actuality have a book full of trades implicitly expressing the same view. Understand if the book expresses a unitary view structured differently or a true collection of uncorrelated idiosyncratic ideas.

- Is the portfolio stress tested? What methodology and assumptions are used?

How often are they performed? Who reviews the stress tests? Have they ever been acted upon? Ask for examples. Well-constructed stress tests go a long way to addressing short optionality and tail event risk, and revealing inappropriate correlation assumptions.

- Does the fund have an individual who is responsible for risk management? Who does the individual report to and how is he or she compensated?

- What training has this individual had? What other responsibilities in the firm does this individual have? What is the scope of his/her authority? Does the risk manager have the independent authority to liquidate positions if risk guidelines are violated?

Of all of these items, the combination of authority, reporting lines and compensation incentives for the risk manager bear the closest scrutiny. Having a Risk Manager who cannot effectively 'police' risk limits is often worse than not having one at all as a false sense of comfort may be created.

"In all of these discussions, understand the distinction between being short volatility and short tail risk. Being long or short volatility tends to be an idiosyncractic trading choice made by a manager. Begin short tail (or liquidity) risk tends to be inherent to a strategy."

- Has the manager ever had a significant drawdown? If so, what were the circumstances?

What is the value of the manager's largest peak to trough drawdown? How long did it take the manager to recover? Was this drawdown within expectations? How did the timing of the drawdown compare to their peers'? Has the manager made any changes to his investment approach or risk management policies as a result of this drawdown?

What are the manager's largest daily and monthly losses? Describe the reasons for these losses and any changes in investment approach or risk management policies that came about in response to these losses.

B. Liquidity Risks

- What is the hedge fund manager's definition of liquidity? How many days would it take to liquidate the portfolio in an orderly fashion? What is the definition of an orderly liquidation? What is the bid-ask spread on the securities in the portfolio?

It is also important to determine the liquidation price under various market scenarios. If a manager can liquidate 100% of his portfolio in one to two days, but only with a substantial loss, the portfolio is not really liquid. Similarly if it takes two or three days to liquidate 75% of the portfolio with little impact, and three months to liquidate the remainder, it is important to understand what constitutes the less liquid 25% of the portfolio.

Be careful to scrutinize the liquidity risk implicit in particular regions or derivative structures that managers may employ.

Try to assess the additional impact of other variables on liquidity such as position concentration, asset growth, investor concentration and redemption terms. These last three items are critical as a sudden, large redemption may push a manager to fund it with the most liquid items on the book, leaving a substantially less liquid book for the remaining investors.

- How do reduced trading volumes affect the liquidity of the relevant markets or instruments? Is the manager nimble enough to handle varying liquidity environments? What is the market impact of a typical trade for this strategy?

Who is on the other side of the trades that the strategy typically executes? Is there a dominant dealer? Is the dominant dealer monopolizing the liquidity in that instrument? Who are the pricing sources?

Familiarize yourself with the dynamics of the markets in which your manager trades. Get a sense of how large a manager's positions are with respect to the markets in which he trades. This is particularly important for less liquid markets.

Will a significant redemption alter the portfolio by leaving the most illiquid instruments with remaining investors? Be wary of this possibility, particularly if there are side letters and preferred redemption terms for some investors.

- Do the liquidation terms of the fund make sense or match the liquidity of the fund's instruments or marketplace?

Be very wary of funds that provide generous liquidity terms relative to the liquidity of the

II. Risk Management (cont.)

instruments and securities trafficked in by that given strategy. Make sure that the fund's cash is actually unencumbered and that it is truly cash, not invested in some other term instrument.

- Has the manager installed appropriate terms to prevent a run on the bank? Are there 'gate' provisions installed to protect remaining investors? How do any gate provisions impact your specific interests as an investor?

The liquidity offered by hedge funds to their clients, like that of a bank, generally exceeds their ability to deliver on it should a substantial portion of investors demand it at the same time. Most offering memorandums contain language allowing for a manager to suspend redemptions to protect the remaining investors in a fund. Be aware that these trump all other liquidity provisions should they be triggered.

- What is the maximum position size long and short with respect to average daily trading volume or issue size? Has the manager ever exceeded this parameter? Given the manager's AUM, how do these maximums compare to the outstanding issue and market size?

This is going to be somewhat harder to objectively measure than in equity- or futures-based strategies (where publicly-available information such as 13D filings and open interest can help you) as most fixed income and credit markets are OTC. You will have to get this information from the manager and/or counterparties.

Even in seemingly large markets like the U.S. Treasury market, there are multiple securities, some with less liquidity than others. It only takes a cursory look at the tussle over cheapest-to-deliver Treasury Notes and the Note Future in 2006 to see how this can be a problem or be manipulated. This is likely doubly true in the burgeoning credit default swap market where the notional positions are now multiples of the underlying instruments, though most of these instruments are now cash settled. Understand the liquidity of the markets the manager trades and how this relates to the size of the manager's positions.

One final caveat, for some approaches, such as Distressed Securities, control positions of the senior-most or the pivotal securities may represent an important ingredient in the successful application of the strategy.

- Does a manager intend to hold any private issues? Will private issues be side-pocketed? How are they marked and what is the procedure for marking them?

C. Leverage

- Is leverage used in the portfolio?

How does the manager define leverage, especially in the context of options, futures and swaps (i.e., market value or face value)?

To what degree is leverage employed in the portfolio and in what context? What is the maximum leverage that could be employed at any time? What is the historical average, maximum, and minimum leverage used by the manager? What particular environments or circumstances would prompt a reduction in the use of leverage? An increase?

Familiarize yourself with the nomenclature of leverage and leveraging practices in different markets. Options require payment or receipt of a premium up-front in exchange

"Derivatives are, either by their nature or by their margining, leveraging instruments. Leverage is a double-edged sword: in good times you can never be too leveraged whereas in bad periods never too little."

for economic control over larger notional amounts. Futures require a small amount of margin funding. Swaps require some cash that can be posted in the form of bonds as a 'haircut.'

Derivatives are, either by their nature or by their margining, leveraging instruments. Leverage is a double-edged sword: in good times you can never be too leveraged whereas in bad periods never too little. Be aware that the extensive securitization and structuring of credit that has occurred in the past few years tends to involve elements of leveraging as well (somebody is holding the equity piece after all). It is important to understand both how much leverage a manager has as well as how he generates it.

- What conditions would create the "perfect storm" where portfolio leverage would pose problems for the strategy and/or the portfolio manager?

- How many brokers and/or banks extend leverage to the fund? Who is the manager's prime broker(s)?

  Understand the hedge fund manager's own process in analyzing and diversifying his counterparty risk?

Given the events at Refco two years ago, counterparty risk is no small affair. An insolvent counterparty cannot pay a fund its gains on a transaction. The practice of closing swap positions using offsetting swaps with a different counterparty may eliminate economic risk but it has just doubled counterparty risk.

Review any arrangements the manager maintains with counterparties. What are the terms of the manager's ISDA agreements?

- What is the tenor of the manager's borrowing terms?

Are the liability resets synchronized with the asset resets, or is there curve risk embedded in the financing structure? How much is less than 90 days? How much is greater than 90 days? How has that changed over the past 12 months? Do the terms of their assets match their liabilities? Can counterparties change the "[financing] haircut" with less than 90 days notice? It goes without saying that longer-term financing is preferred to shorter-term liabilities. Many managers have worked assiduously to ensure that their borrowings are termed out and many are looking to capital markets to avail themselves of more stable sources of financing than prime brokers (who may also double as their trading counterparties).

III. Team and Organization

A competent hedge fund organization is a critical variable in its potential long term success. This is no less true in Fixed Income and Credit hedge fund investing than in other hedge fund styles. Indeed, a strong case can be made that it is even more important in Fixed Income and Credit strategies, both for front and back office operations. For instance, many strategies and instruments found in this style are relatively new and have only recently gained widespread use. Analyzing the investment team's research capabilities and adaptability is important in long-term investment success. Similarly, assessing the operational ability to track, price, and settle a large number of often-complex financial instruments is no less important.

The following section highlights issues to review when considering an allocation to Fixed Income and Credit hedge funds. The heterogeneity and complexity of strategies and instruments places a special burden on investors to understand and be able to assess the strengths and weaknesses of the firms engaged in this investing

A. Key Investment Professionals

- Review the academic training and professional background of the key investment professionals. Carefully assess the quality of work experience of those individuals. Is the length of work experience appropriate? Do the principals have any hedge fund experience?

  Does the experience of the principals suggest they will be successful in the execution of their current strategy? Be careful with managers who recast or re-invent their skill set based on market demand.

  Does the manager have any prior performance record that can be shared? Is the performance/track record relevant for the strategy you are trying to evaluate?

  It is difficult to make any blanket statements of what constitutes the 'right' background for fixed income and credit generally as the investment disciplines are so broad. Suffice it to say that focusing only on the names of firms worked at would be overlooking equally important specific skills acquired, as well as personal characteristics demonstrated over time: desire to succeed, integrity, ability to lead and motivate, inquisitiveness and flexibility.

- How do the firm's principals make investment and business decisions? What is the structure for investment decision-making versus operational decision making and business management? What kind of input do other investment professionals and senior back-office professionals have in their respective areas of responsibility?

  How the front- and back-offices relate is particularly important in fixed income and credit strategies as these markets are particularly operationally intensive. While equity and futures markets tend to be relatively standardized with the potential for operations to be highly automated, the converse is true for debt markets. For example, the terms and conditions of a typical debt security may number in the dozens as compared to a much lower number for equities. In another example, trade settlement can be tricky when non-standard instruments are traded.

  If the front office trades actively and is constantly adding new securities and security types to the portfolio without adequate infrastructure in the back-office, the result could be disastrous. Having the proper level of dialogue and respect between the two areas is key in fixed income and credit strategies.

> "How the front- and back-offices relate is particularly important in fixed income and credit strategies as these markets are particularly operationally intensive."

III. Team and Organization (cont.)

- What were the circumstances that caused them to leave their previous positions? Are there any non-compete or legal issues from previous positions?

  If relevant, is their former employer investing in their current fund? If not, why? Keep in mind there are circumstances where an investment by a previous employer may not be appropriate or even desirable. Is the previous employer a reference?

- How are investment professionals compensated? To the degree possible, review compensation for all investment professionals.

  Try to understand whether the proper incentive structure exists both for principals and employees to pursue investment success in a productive way.

  The taxation environment for deferred compensation plans – whereby portions of peoples' bonuses are invested in the fund – is both dependent on jurisdiction and currently subject to considerable political scrutiny. As such, understand how much, absent the tax advantages, would be deferred in the fund.

- Does one of the key principal(s) have managerial, operational or marketing experience?

  There can be advantages in having at least one partner experienced in and focused on running the business to allow a fund manager's undivided attention on making shareholders money. This is especially true in fixed income and credit investing where the needed business and operational infrastructure can be considerable.

- Has the team worked together in the past? Do the skills of the investing team appear to complement one another? Is there a skill set or role that is missing?

  Every team takes some time to gel. These issues are more or less important depending on the size of the shop and the structures/culture in place.

  One way to address this topic is to imagine what an 'ideal' shop plying that strategy would look like in terms of people, then ask yourself how the one you are examining compares. While no shop is perfect, obvious deficiencies should at least be recognized and a plan to address them in place.

- Assess the personality and character of the team members with respect to their integrity, attitude, work habits, reputations and expectations for success.

  Ceteris paribus, an honest, honorable, 'hungry,' harmonious and hard-working team will tend to outperform one lacking any one of those traits.

- What is the policy for personal trading accounts? What is the process for reviewing personal account activity? Who reviews it and how often?

  Assure that if personal trading is monitored, the compliance person receives statements directly from the employee's broker rather than from the employees themselves.

  If trading is permitted, are there any limits placed on the amount of time spent and the kinds of instruments traded? What instruments are traded separate from fund activities? Is there a potential for any individual to "front-run" the fund's trading or investment activity?

"*Ceteris paribus,* an honest, honorable, 'hungry,' harmonious and hard-working team will tend to outperform one lacking any one of those traits."

III. Team and Organization (cont.)

Pay particular attention to this in a private lending or control-based credit strategy (especially Distressed Securities and those involved in PIPEs) as the examination of companies may lead to the possession of Material Non-Public Information ("inside information"), whose use in buying or selling publicly-traded equities is illegal.

- Have any of the fund principals ever been involved in a lawsuit? Do any of the fund principals possess an official disciplinary record (pending or past)? Have there ever been any regulatory infractions, fines or suspensions from any regulatory agency or professional organization? What are the details? Do any of the fund principals have a criminal history?

It is crucial to perform thorough examinations of an individual's entire background: education, employers, civil courts, tax liens, criminal convictions, bankruptcies, regulatory agencies and general news services. The web has made a number of these checks much easier and a simple search using the principals' names will often yield surprising results. Needless to say, discrepancies or omissions should be a major red flag for an investor.

- Are key investment professionals' incentives aligned with the overall fund? What are their personal capital commitments? Of the entire staff, what percentage of their net worth resides in the management company and in the funds? Will the portfolio manager communicate a reduction in the level of personal investment held in the fund?

Alternatively, for more long-standing fund managers with very substantial sums invested in the fund, does the current fee structure create potential disincentives for appropriate risk-taking? Have former "alpha-generators" turned into mere "asset gatherers?"

- What are the provisions for the absence of the "key man?" Who has the ability to fill in on a short-term or longer-term basis? What arrangements are in place for this eventuality? If the fund would be liquidated, how long would this take, who would do it and what are the estimates of the cost of doing so?

B. Founders and Principals

- Are the founders/principals the key investment professionals? What is their level of involvement in the firm/fund?

With some hedge funds having become multi-billion dollar investment organizations, the original founders may no longer directly be making investment decisions, focusing instead on running a medium-sized enterprise. Understand how this could impact returns going forward.

- Have there been gaps in their professional history? Have there been failed funds or other ventures?

Be wary of unexplained gaps in resumes in general. In addition, be wary when failed predecessor funds are involved. Discover specifically what happened and understand what the manager may have taken from the experience. Although failure can be instructive, multiple failures or a string of brief professional stints can be a red flag.

- Has the business been floated publicly or are any plans for such a float underway?

"Look for general partners with strong infrastructure and operations. This a business rather than a fund."

Dan Zwirn,
June 15, 2006

The history of an investment management firm's results following public floatation or acquisition is both short and, to date, not promising.

C. Staff

- How many staff members are there? What is the ratio of back office to investment professionals? Review (or sketch out) an organizational chart.

There are no hard-and-fast rules in regards to the proper level or ratio of staffing. Rather ask yourself if it seems adequate for the strategy being pursued and any growth being contemplated.

- How many investment professionals are on staff? Review their biographies. How long have they been employed by the firm and in the industry? Has there been a pattern of organizational turnover?

A significant number of new staff can require time to work effectively together and such a phenomenon can influence the effectiveness of an investment organization.

Beware of heavy turnover at either senior or junior staff levels. Portfolio managers who seem unable to preside over a stable organization should be evaluated with greater scrutiny. The ability and commitment to keep talented professionals and employees who have been encouraged to develop their skills should be evident for any firm that plans to grow. An inability to do so may in fact be a sign of a congenitally poor business and/or personnel manager. It also may reflect an unhealthy ego on the part of the principal. Broadly constructed, these circumstances can breed employee disloyalty, turnover, and possibly elevate key man risk.

- Is the depth of the organization sufficient for the assets under management? What are the growth plans for the fund and the organization as a whole?

It is better to grow assets into infrastructure than vice versa.

- Are there any branch offices? What activities are done there and by whom?

While branch offices for a large research team may be beneficial, long distance "portfolio management" has shown a less compelling track record of success. Portfolio management by principals in disparate branch offices often suffers from poor communication and isolated decision-making and can even create conditions for rogue trading.

- Regardless of the size of an organization, who is responsible for the following function?

  – C.I.O. (Chief Investment Officer)
  – C.O.O. (Chief Operating Officer)
  – C.F.O. (Chief Financial Officer)
  – Research
  – Trading/Risk Management
  – IT/Systems/Programming
  – Operations/Back Office/Audit
  – Compliance/Legal
  – Marketing/Investor Relations – are these separated?

- Are there backup provisions in place for key functions/people in case of the unexpected departure of a key employee?

To the degree possible, separation among key professional functions (i.e., COO, CIO,

III. Team and Organization (cont.)

CFO, Marketing, and Compliance) is better. Greater separation of duties can enhance the long-term vitality of a hedge fund. It can also help reassure investors that multiple sets of unrelated eyes are watching over the business and the portfolio. In the case of trading versus broker/position reconciliation, separation of duties is vital. However, be realistic given the asset size of the hedge fund. Greater specialization of duties is more realistic for a billion dollar plus fund. And some strategies are more operationally expensive, such as Fixed Income Arbitrage, Structured Credit, Leveraged Loans and Direct Lending.

Try to understand where the range of professional responsibilities naturally lies in whatever size organization you are attempting to assess. Specifically, try to understand how smaller organizations concentrate the number of professional responsibilities managed by key individuals. This can represent a potential "hidden level" of investment risk.

Under-qualified employees in key roles and/or nepotism in the hiring of personnel for key organizational roles should be viewed with caution.

IV. Management Company, Fund Structure, and Asset Base

Some common themes run across all hedge fund due diligence analysis. This is especially true in examining the legal and operational framework of the investment management company, the structure of the underlying hedge fund, and the impact of asset growth on a specific strategy.

The section below draws the reader's attention to some of the issues common to all hedge funds. Further, it attempts to highlight issues particular to Fixed Income and Credit strategies. For example, many investment management companies in this space manage multiple investment products. Some offer long only products. Some, in the distressed investment area for instance, sit on bankruptcy committees. Investors need to understand the full investment implications of the choices that investment management companies make. For example, how trades are allocated across products, whether there are restrictions on specific types of trades as a result of other investment activity, or whether trading in any individual instrument is restricted because of other activities of the investment management company are critical points to understand. Further, implications of hedge fund asset growth on the complex and often less liquid instruments in this space also need to be fully understood.

A. Management Company

- What is the legal entity? What are the details of its state or country of formation? Where is it domiciled?

Is the country of domicile a well known or an unknown jurisdiction? Is it a well-respected jurisdiction? For example, reputable jurisdictions have been known to be Dublin and Bermuda, followed by Luxembourg and Cayman. For onshore entities, Delaware is the usual domicile.

- What is the history of the hedge fund management company and what is the company's development plan?

Aggressive asset gathering in one or many funds may reveal business priorities that are not aligned with the interests of most investors. Is the management company more focused on gathering assets than on generating performance? Again, explore the details of the principal's and the institution's level of co-investment and business ownership. Are the incentives greater for earning management fees rather than for generating incentive fees?

- Are they registered as an Investment Advisor, Commodity Trading Advisor (CTA) or Bank Holding Company? Are they regulated under the U.S. Securities and Exchange Commission (SEC), National Association of Securities Dealers (NASD), the National Futures Association (NFA), the Financial Services Authority (FSA), Bank of England or the Federal Reserve Bank?

Do you understand fully the kind of information implied by the various mix of registrations that may apply to a portfolio manager or investment advisor? Use an in-depth review of these information sources to deepen your understanding of the investment professionals and the organization as a whole. Anticipate your plan for consistently reviewing these affiliations and registrations for your eventual monitoring regimen as you consider a prospective investment.

- What is the ownership structure?

IV. Management Company, Fund Structure, and Asset Base (cont.)

Simple is better. Ask who are the ultimate owners? Is it certain employee(s), an institution(s) or public shareholders? Bear in mind that a cultural difference may be reflected in the ownership structure. For example, U.K.-based funds will often be owned by institutions, whereas U.S. funds tend to be employee-owned.

Watch out for funds where principals have recently sold a significant equity stake and evaluate them closely to avoid an investment with a manager suffering from the "wealth effect."

- Does the manager own a significant percent of the fund or management company? What percentage of his net worth is invested in the fund or the management company? Does the manager have an upfront policy for highlighting any material changes in his personal investment in the fund?
- Are there any joint ventures or partnerships through which business is conducted that may cause a conflict?
- In what other partnerships and businesses do the principals operate or maintain a significant interest?

Does the Management Company own a broker dealer? Is it disclosed? Are trades recaptured by the hedge fund? Does that present any conflicts or does it add value? Why or why not?

Do the principals sit on any boards or have time consuming obligations such as private equity investments?

- Are there any direct relationships with other hedge funds? For example, does another hedge fund provide seed capital? Is that seed money from the hedge fund manager's personal capital or is it provided by his/her investors?

Seed capital from a larger hedge fund can mitigate start-up risk when it acts as a mentor to the new fund. This stands in contrast to broker-sponsored funds whose mentoring ability is limited.

Are there any special arrangements with the sponsor that can create a burden on the new manager? Is there a "sunset" provision for this relationship? In other words, is the economic relationship designed to diminish over time? Does the portfolio manager retain the right to buy back the sponsor's interest?

- If the hedge fund has a sponsor relationship, seek to understand the agreement. Does the sponsor have capacity or other special arrangements?

Does a sponsor dominate a new fund's capacity?

- Does the sponsor share its infrastructure with the hedge fund? If so, can the sponsor see the trades?

Can the sponsor "piggyback" on these trades? Do they share ideas which can negatively impact capacity and/or trading nimbleness?

Has the management company recently reorganized itself out of a mutual fund structure? Why? If yes, how is its investment strategy different?

- Who is on the Board of Directors? What authority does the Board have, if any? If the fund has an advisory board, what

"Undue administrative and business complication is always the enemy. Less complicated business and decision-making structures generally allow for better professional focus and tighter alignment of incentives between the manager and the investors' interests."

specifically has been the value-added and how is it expected to add value in the future?

Do not overestimate the influence of a Board of Directors or an Advisory Board. Currently they are hired by the Hedge Fund Manager and have little independence. Many boards are rather transparently established for marketing and public relations during an initial capital-raising phase.

B. Fund Structure and Asset Base

- What funds do the management company offer? How are they structured? For example, is it a master-feeder structure?

Does the offshore fund run *pari-passu?* If not, why? Compare the performance of the two funds over time to see if this is really the case.

Understand the allocation process between funds if they are not organized as a master-feeder structure.

This is especially true for private placements and Direct Lending. Onshore and offshore funds' regulatory regimes may prevent them from participating in certain classes of trades. Understand which types you are getting.

- Is there more than one strategy? If so, is there synergy in the application of the various strategies?

Ideally, you should want the key professionals' investment and business success to be focused on the fund in which you are invested. You want them to have a substantial personal investment in the same fund in which your capital is invested.

- What are the total assets under management of each fund and of the management company? What is the historical growth in assets under management for each vehicle and in the aggregate?
- Are the assets under management appropriate for the strategy? What is the anticipated growth in assets and does this appear to be measured/disciplined? Are the strategy and investment process scalable as assets under management grow?

Is the manager realistic in determining the capacity? Is the manager creating a false sense of urgency? Is the manager manufacturing hype to raise money by setting a soft close?

Will growing the assets beyond a certain point result in "style drift?"

This may be a good time for you to understand the composition (and stability) of the manager's investor base. It may also be an opportune time to discuss your potential future capacity needs to determine if the manager will be able to meet them.

- Have there been periods of substantial redemptions? If so, is there a reasonable explanation? Were redemptions met without delay, a 'gate,' or interruptions? Was performance negatively affected by the redemptions?
- What has been the rate of asset inflows?

Does the fund have a disciplined policy for taking money in? Have the principals established any limits on inflows? Does the portfolio manager have control over inflows?

IV. Management Company, Fund Structure, and Asset Base (cont.)

- Are there separately managed accounts? Are these accounts subject to special arrangements like structured notes? What percentage of assets is managed separately from the fund? How are the separate accounts structured? Are the liquidity terms of the fund different from the separate accounts?

  Undue administrative and business complication is always the enemy. Less complicated business and decision-making structures generally allow for better professional focus and tighter alignment of incentives between the manager and the investors' interests.

- What is the composition of the investor base?

  Is it diversified or is there concentration among a few outsized investors? Is it concentrated in one category of investor? For example, how big is each one of the three largest investors?

  Try to understand the relative stability and sophistication of the marginal fund investor. Also, pay attention to the mix of offshore and onshore investors and the manager's (or organization's) level of direct familiarity with those investors.

- Is there a "Most Favored Nations" clause? If so, get an explanation of any different terms offered to other investors such as better liquidity, fees, transparency, etc.

V. Operations and Technology

Operational robustness is often a good indicator of a manager's overall strength and stability, and a necessary precondition to any investment. A stable operating platform enables portfolio managers to focus on alpha generation, while an unstable platform could impede or eliminate their best efforts.

When it comes to Fixed Income and Credit instruments, operational due diligence is particularly important owing to the preponderance of complex OTC instruments in these two sectors. Many of these instruments are naturally opaque as only the two counterparties of the contract know them, and they are full of many unique attributes. Accordingly, a rigorous process of contract comparison, review and execution is critical.

The challenge for investors new to this sector is to know where potential problems could arise. Besides contract confirmation processes, another good place to explore for operational risk is the link between hedge fund managers, their prime brokers, pricing services, third party risk systems and the various clearing agencies, such as DTCC. Even if managers have a solid confirmation process, that doesn't assure that they have timely and accurate reporting of their positions, their valuation and their risk metrics from their service providers.

An earlier section of this report emphasizes the importance of understanding the operational sources of hedge fund "investment" risk. This section's goal is to ensure that the business operations fully support all investment activities, as well as an unforeseen market or shock event. A hedge fund is, in the end, a small asset management firm and all areas need to be addressed: accounting, IT, operations/disaster recovery, cash management, legal/compliance, human resources, and investment. Ultimately, the key issue is the degree of trust and comfort you have in your relationship with the portfolio manager and whether you believe you have the latitude to stay on top of the risks that matter. The best insurance policy for this is an investor's conviction about the integrity of the person with whom they are investing and the depth of the organization.

> "An alarmingly high proportion of hedge fund failures can be attributed to operational issues."
>
> Understanding and Mitigating Operational Risk in Hedge Fund Investments: A Capco White Paper. March, 2003

A. Trade Capture and Settlement

- How are the distinct responsibilities for the fund's front and back office arranged and, ideally, separated?

Lack of separation of front and back offices has historically been an ingredient in many of the operational and investment blow-ups across all types of financial institutions. Hedge funds are not exempt from this fact.

- Are the operational, back-office, and administrative professionals seasoned? What challenges have these professionals encountered since the fund's inception (or at a prior firm)? In general, how do they appear to have adapted to these challenges? With what frequency have issues or problems been surfacing? Are there any current "operational issues" the firm is dealing with? To what degree do you sense that problems are being anticipated?

Fixed Income and Credit strategies are the most operationally intensive trading approaches employed by hedge funds. This is due to the large array of instruments (cash and derivatives), the complexity of the instruments themselves, the need for extensive documentation in many trades (e.g., credit default swaps), the variegated settlement practices and venues used, and the usu-

ally private or OTC nature of the transaction. Not having both an operational and IT infrastructure and an operations team capable of handling these complexities could easily spell disaster for managers in these spaces.

- Follow the trade. After an investment decision is made, how is the idea executed? By whom and how is the trade executed? How are the trades captured? Is there an order management system (OMS), a portfolio management system (PMS) and a back office system? How are they all related and reconciled? Who reads the indentures and inputs the terms and conditions? What is the settlement process and what is the role of the various parties (the fund, its administrator, its prime broker and its custodian)? What is the frequency of broken trades and the reasons for them?

An allocator must understand and be comfortable with the trading and settlement process, along with the cash controls and cash management processes, of any Fixed Income or Credit manager they intend to invest in.

Capturing and confirming the terms and conditions of the securities is a vital and difficult part of the operations job. Allocators should understand how and by whom this is done, whether they are independent of the front office, whether they have the necessary expertise to do so, how quickly this is done and how much of a backlog exists. These have to be right to both properly value a position and to allow back-office staff to process any payments due or owed on the trade.

Settlement procedures vary considerably across the instruments and markets traded. At one end of the spectrum, U.S. Treasury securities as well as the related futures are traded electronically and settle quickly and in straight-forward fashion (either via Fedwire for Treasuries or the relevant exchange's clearing house for futures). At the other end of the spectrum, bank debt involves an entirely manual settlement taking as long as six months while lawyers review the sales-and-purchase agreement (whose form is governed by the Loan Sales & Trading Association (LSTA) in the U.S. or the Loan Management Association (LMA) in Europe). Generally-speaking, the more liquid instruments are more easily settled while less liquid instruments and markets (especially bespoke derivatives) require manual confirmation and settlement. For any non-current pay (distressed) securities this is especially true. In a cautionary example, in 2005 the Federal Reserve chastised credit derivative dealers for having a massive backlog of unsettled trades.

Equity-, foreign exchange- and futures-based strategies are much simpler operationally than fixed income and credit-based ones. Familiarize yourself with the settlement process for the securities being traded. "Broken trades" – those that fail to settle properly – cost money, often lots of it in the case of debt securities.

- What is the process for OTC contract comparison? Are all contracts compared by T+1? Is the manager working on any T+0 initiatives? What is the manager's contract backlog? Is the comparison process independent of trading? Does the manager use straight-through processing?

- How does the manager assure that all variation margin is collected by the funds or their prime brokers every day so that he is not

over-collateralized with any counterparties? Does the manager have global netting agreements with any counterparties? Do any of his counterparties use a VaR-based margin system? If so, can the funds revert to straight variation margin following a volatility spike?

- How does money flow into and out of the fund? Where is it kept? Who signs checks for the company and for the fund in which you are investing? Is there a co-signer? Is one of these individuals a third party? Do you fully understand the path that the money takes? What is the role of independent third parties?

  What is the fund's cash management policy?

  There are two risks expressed here: that of misappropriation of funds from the portfolio and that of proper cash management. In the case of the former, understanding the controls in place or lack thereof should be high on an allocator's to do list. Two or more signatures should be required for large transfers out of the fund with one of them preferably from a senior back-office person.

  In the case of the latter, fixed income and credit instruments are by their nature cash flow-focused and so income will form an important part of returns. Cash management will be much more active for managers in these strategies and may actually be a source of returns as well. Given the substantial leverage levels applied to small mispricings that is characteristic of managers in fixed income (and some credit strategies), access to the cheapest funding at the longest tenor is often necessary for success in this space. Citadel's recent debt issue is an example of managers getting creative in both diversifying funding sources and lowering borrowing costs.

- Is all of the fund's cash unencumbered, or is some of it invested in short term instruments?

- How often has the fund experienced operational or back-office errors? Who pays for those errors? Is the manager content with the service provided by the prime broker(s) and other key back-office service providers?

  How fluent (and comfortable) does the manager seem in discussing the character of the fund's back-office processes and operational discipline(s)? Does the manager seem distracted or preoccupied with trade reconciliation or broken trades?

  Because of the importance of funding in Fixed Income and Credit strategies, make sure you have a sufficient understanding of some of the following risks:

  – Counterparty Risk
    Ratings of Counterparties
    Degree of equity concentrations by counterparty
  – Financing Liquidity Risks
    Tenor of financing terms (maturity or term of financing or period during which haircut cannot be reset)
    Sensitivity of income to change in financing rates

- Has the manager ever done a SAS 70 review? Has he considered using one of the operations rating services? Has the firm ever had an external operations audit or consultant review their processes?

V. Operations and Technology (cont.)

B. Pricing

- What is the fund's portfolio pricing policy? Is it marked to the mid or the unwind side of the trade? Is there a liquidity adjustment for less liquid or large positions (relative to market size or trading volume)? Who prices the portfolio? How often is the portfolio priced? Is the fund self-administered? What data sources are used for pricing purposes? Are there differences in the way daily or weekly estimates are calculated versus the official monthly NAV? Has the manager ever restated an NAV? If so, find out why.

It is crucial for allocators to understand how a fixed income or credit manager prices the fund.

First and foremost, pricing should be done independent of the front office. It should be a red flag if it is not.

Second, most instruments traded are OTC and many are illiquid, so determining an appropriate value for them is neither simple nor uncontroversial. Government securities, interest rate swaps and futures, and some of the larger corporate issues all trade regularly and can be independently marked-to-market. Less liquid securities and derivatives generally require dealer marks or model-generated pricing to be valued. For many derivatives, the only price (and liquidity) source is the originating dealer. Private securities (such as direct loans) are often treated like private equity: values are maintained at cost unless there is an impairment or position sale. Distressed securities are usually treated in a similar fashion.

In the past few years, a number of third-party pricing sources (e.g., Markit Group, Lone X, IDC) have arisen and the NASD rolled out TRACE in 2002 for corporate bond transactions in the U.S., making the task of obtaining independent marks on credit derivatives and corporate debt possible. Despite this, understand that, for some portion of a manager's book, pricing is largely based on assumptions and models and may (or may not) reflect the true economic value of the positions.

Ask the manager how much of the book can be priced by independent sources as opposed to dealer marks, marks-to-model or private equity techniques.

- Has the hedge fund manager ever delayed his/her estimates of the fund's net asset value? Why? Is the delay out of the manager's control?

- How frequently are performance estimates available to investors? Are mid-month or weekly estimates available?

- Would the manager allow the prime broker to provide a monthly or quarterly portfolio for the investor's review?

  This procedure can significantly reduce the potential for manager fraud, as well as give the investor insight as to how the manager invests.

- What information is available to investors on a monthly, quarterly, and annual basis? The following list represents ongoing information which should be considered fundamental for educated investors:
  - Size of fund and growth of assets under management?

  - Net and gross performance by share class?
  - Top 10 holdings? Position weightings? Industry concentrations? Many funds will not reveal current short positions, but should agree to characterize the positions.
  - Participation by sector, market cap, geographic region or asset class?
  - Net and gross exposure information?
  - Duration and Credit exposure information?
  - Information regarding any changes in the firm, fund strategy and personnel?

- How does the manager communicate to investors? How often? Are intra-month estimates of performance provided?

Does the manager's letter to investors reveal what is really going on in the portfolio? Is there a commitment to maintaining a dialogue of substance and quality?

- Are manager meetings with investors discouraged? If so, why?

- Are those responsible for investor relations sufficiently experienced and informed enough to provide a useful and in-depth dialogue?

- Is there appropriate disclosure of the character of the fund's overall balance sheet and/or the degree to which certain asset/liability "gaps" may be present? Is the notional value of derivatives disclosed?

C. Business Continuity

- What are the backup procedures for the hedge fund's operations? Is offsite trading readily available? Are there frequent back-ups of trade, client accounts, and research data?

  Is there a disaster recovery plan? What precautions has the portfolio manager taken in light of a possible catastrophic failure prompted by a computer, systems, software, telecommunications, fire, or terrorist attack?

- Is the manager's data backed-up offsite on a real-time basis? Is his Business Continuity Plan tested? Can all key individuals access the firm's systems via a secure connection from outside the office?

- Are all trading lines recorded? Emails? IMs?

- Are there provisions for the loss of the portfolio manager or other key investment professionals?

VI. Third Parties

Third party service providers support the operations of hedge funds in a variety of ways. Administrators, custodians, prime brokers, auditors, and law firms each may have an important role to play in a successful hedge fund investment. Independent pricing sources, the degree of dependence on a single prime broker, and the degree of segregation of the fund's cash assets are all substantive issues faced by hedge funds. There are a variety of ways that individual hedge funds address their needs in this area. Investors should understand these and become comfortable with the approach of any individual hedge fund. But, as importantly, the choices made by any individual hedge fund may be an indication of the degree of importance they attach to this issue themselves. Investors will be interested in this as well.

The following section focuses on the principal third party relationships found in most hedge funds. A few of these (e.g., administrators) may be more common in offshore hedge funds. But, all have an important role in assuring the integrity of the underlying assets in the fund.

A. Auditor

- Contact the Auditor. Cultivate a relationship and speak with the account leader.

  Auditors – like almost all service providers – are becoming reluctant to even acknowledge they service a fund because this may establish that they owe a direct duty of care to the investor. Thus, investors may be forced to get audit information from public filings, if available, or from the manager.

- When was the last audit? Was the audit opinion "clean" or was there a "qualification?" If there was a qualification, what was the reason?

- Has the auditor ever been changed? Why? Carefully scrutinize turnover in key vendor relationships but especially with the prime broker and the auditor. If fraud is occurring, these vendors will likely know before you do, and many firms have shown a willingness to shun business they think will eventually bring them trouble.

- Where did the audits take place? How was information collected? How often are the books audited?

- Is there also an outside accountant?

- Have there ever been any valuation issues that have arisen during an audit? Any other issues?

  Ever since the episode of fraud at Manhattan Capital where the auditor failed to identify the fraud, auditors are reluctant to release any details to investors. They usually refer the investor to the annual audited financial statements. This is why it is essential that an investor read through the audited financial statements as far back as they are available.

- Ask for the financial statements to come directly from the auditor. Review them in detail, paying particular attention to the Auditors Notes to the Financial Statement and the Auditors Report or Statement. Go back to the auditor directly to clarify anything in these sections or for the statements in general. What is the auditor's reputation?

  Compare year-end assets, subscriptions and redemptions (cash flows) and NAV to your notes with the manager.

  Review expenses. Do they seem in line with those of the fund's peers and, in percentage

"Intelligence collection consists of three basic elements: finding people who have insights that are important to your making an informed decision, getting them to speak to you candidly, and using the resulting information to draw accurate conclusions."

Jim Roth,
March 9, 2006

terms, have the expenses changed materially from year to year?

Often "hidden" expenses are disclosed in the footnotes.

Look for any additional information in an audit such as a condensed schedule of investments. This schedule will force the manager to provide a reasonably detailed breakdown of the portfolio.

Are there any other share classes disclosed with better terms or superior performance that might imply a lower fee class not shown?

Major changes to the Management Company or fund are often disclosed in the footnotes, including changes to the administrator, prime broker, directors, and to changes of ownership.

Is there any litigation noted? Have any provisions for possible liability been made?

- Does the auditor provide any other services to the fund or the management company?

The past five years have seen auditors exposed as having, at times, been less than thorough when auditing tax and other consulting clients. The margin on auditing business is much lower than on these other services. That being said, most of the large accounting firms have recently moved to sever their links with their consulting brethren and return to their roots as unbiased auditors.

B. Prime Broker/Futures Clearing Merchant (FCM)

- Contact the prime broker/FCM. Cultivate a relationship with the prime broker/FCM and speak with the account representative.

  Does the fund use multiple prime brokers/FCMs? Who are they?

  Has the fund manager ever changed prime broker/FCMs? Why?

Understand that the prime broker, as a lender, stands ahead of the investor in the fund's capital structure in the event of a liquidation. Understand that the prime broker can and will liquidate the fund to take its capital first, leaving what is left for the investor. However, they also have an incentive to shun relationships that might create liability and many firms have demonstrated a record of doing so. The recent $160 million ruling against Bear Stearns in the case of Manhattan Investors Fund will likely increase prime brokers' scrutiny and oversight of their hedge fund clients.

- Who are the counterparties? Who is the custodian?

For many strategies, it is very important that there be a prudently diversified group of counterparties to the fund. This helps to insulate the fund's operations from market dislocations that could affect a counterparty's ability to meet its contractual responsibilities.

- What are the credit ratings of any counterparties to the fund?

"Let's not forget, in the end, the funding counterparty says: 'I'm the house. I make the rules. The game is over when I say it is.'"

Gregory Jacobs,
May 17, 2007

VI. Third Parties (cont.)

Ideally, the disposition of the fund's assets should reflect proportionally the different ratings of its counterparties.

- Has the fund been assessed fees by their prime brokers for operational errors?

Operational errors in fixed income and credit will be particularly expensive given accrued income and financing penalties assessed. Consider this a good check of the soundness of the back office.

- Obtain permission from the portfolio manager so that you are able to contact the prime broker directly to confirm the fund's assets under management before formally investing in the fund.

As mentioned before, any discrepancies should be reconciled as this is one of the crucial checks an allocator makes. That said, there may be good reasons for the differences: multiple prime brokers, separate accounts and capital market-based financing. However, these should all be able to be ascertained.

C. Administrator

- Contact the administrator. Establish a relationship and speak with the account leader.

  Is it a respected, well-known administrator?

In many of the cases of investment fraud, a little known or fabricated administrator was used. Since you, the shareholder or limited partner, would be paying for this service, you should question why an unknown name is being used since generally minimal cost is involved.

- Do they have a full service agreement or just a record keeping agreement?

- How often is NAV calculated? When can investors expect to receive estimates and final NAVs?

- By what means and how often does the administrator receive the trades? Do they get trades from the manager or from a direct feed provided by the prime broker?

Position and trading information must come from an independent source, and not the manager.

- How do they receive pricing? Do they receive it directly from a market data vendor, from the prime broker(s), from a third party pricing agency, or from the manager?

The administrator should price a portfolio independently from the manager.

Understand the administrator's capabilities for pricing complex securities. For complex models that might be required, from what source does the administrator get his input for the models?

Some illiquid or privately traded securities may be difficult to price. In those situations, the administrator should have written policies on valuation.

If the manager prices some of the portfolio, what percent of the portfolio does he price? Be very diligent in understanding a manager's influence on the portfolio valuation.

- In the case of less liquid securities, do they determine prices with quotes from more than one source?

VI. Third Parties (cont.)

It should be noted that even esoteric securities are beginning to have independent pricing services available for them (e.g., Markit Group for credit default swaps) so this problem is less pronounced that it used to be. For private securities and control positions, it is still an issue though and a thorough understanding of how they are priced is essential.

- Has there been any restatement of month-end NAV? When? How often has this occurred?
- Through the administrator, develop an understanding of the pattern of recent redemptions and subscriptions. Compare this information to what has been discussed with the hedge fund manager.
- Ask the administrator for NAVs since inception. Compare this to performance numbers given by the hedge fund manager.

D. Marketing Relationships

- Is there an external or outsourced marketing relationship?

What kind of an agreement exists between the fund and the marketing agent? Is it an exclusive agreement? Are there multiple marketing agents?

- From where do the fees payable to the marketer come?

Investors who come into a fund through a marketer or placement agent should not be disadvantaged in any way, and shouldn't pay higher fees or expenses.

- Does the agent add value or communicate with the investor after the initial introduction? Is there a sunset provision for their involvement?
- What is the reputation of the marketing agent?

Good agents are concerned with fund due diligence, determining investor suitability and managing appropriate expectations. Some agents are more focused on rapid asset gathering rather than creating a stable base of long-term investors. Agents can often have a crude incentive to encourage a manager to raise more capital and raise it more abruptly than might be prudent.

Does the agent clear trades for the fund? This may create a conflict of interest.

Remember that introductions by reputable brokers do not constitute an endorsement. Moreover, prospective investors must understand that prime broker-sponsored marketing introductions do not include due diligence.

- Is the Agent registered with the National Association of Securities Dealers (NASD) in the U.S., the Financial Services Authority (FSA) in London, or any of the relevant authorities in other jurisdictions?

E. Other

- Try to understand the marginal benefit of additional third party providers versus the added complication of additional vendor relationships. Also, attempt to understand what services may be better handled in-house.

VI. Third Parties (cont.)

- What other functions are outsourced by the management company?

– Trading
– Front/Back Office
– Accounting
– Research Consultants
– Risk Management
– Operational Consultants
– Compliance
– Political Consultants

VII. Documents

A full review of all documents associated with a hedge fund investment is a necessary step in the due diligence process. There are a variety of documents to consider. In many cases, the review should cover the consistency of key terms across these documents, if only to verify that the investment manager has shown proper care in their preparation. For instance, investors in an offshore fund normally review the fund's Offering Memorandum. However, the fund's Memorandum and Articles of Association may ultimately be a more important document. Surprisingly, there may be inconsistencies in these documents. While the investment manager may quickly fix these, the issue may offer insight into the overall quality of the hedge fund's management.

The following section highlights some of the documents investors need to review before making an investment. Assuring consistency, completeness, and accuracy of these documents are all necessary conditions prior to a hedge fund investment.

- Offering Memorandum and Subscription Agreement.

Take note of the quality of the prospectus. Does it include the appropriate biographies of the management team? Is it written in clear, understandable language? Is there a clear statement of the fund strategy and investment process? Are the risks disclosed? Are the risks clearly explained?

- Audited Financial Statements

It is essential that an investor read through the audited financial statements as far back as they are available. Audited financial statements should be closely investigated in the context of manager interviews regarding expenses, transparency and legitimate administrative expenses.

Pay particularly close attention to a change in auditor because here such changes may very well entail a vendor seeking to avoid liability associated with fraudulent practices.

- Marketing Materials

Qualitative review of the marketing material and the manager's own correspondence should help delineate particular nuances of the strategy that is being executed as much as the philosophy that animates the approach.

– Marketing Materials

– Monthly/Quarterly/Annual Reports to investors (2-3 years' worth)

- Due Diligence Questionnaire

RFP's might be seen as akin to Wall Street research. A due diligence questionnaire can be a nice way to fill in any gaps in the story but it is not a substitute for doing your own homework on the fund, strategy, principals, and the organization as a whole.

- Investment and key personnel biographies, and an organization chart of the hedge fund's management company and for the hedge fund's investment team.

Review the biographies of each of the key investment and back office professionals to understand the strengths and weaknesses of the organization. Try to conceptually link the precise skill sets the key professionals possess and the ideal requirements for an organization trying to execute that strategy.

> "It is essential that an investor read through the audited financial statements as far back as they are available."

VII. Documents (cont.)

- List of references that should be contacted by the evaluator:

To the degree possible, the evaluator should seek to complement formally offered references with supplemental industry references generated through your own network of investment industry contacts.

Careful interviewing of current and, especially, past vendors and third-party service providers should also help.

Do a background check on the manager, key employees, and the firm. This can be outsourced to an investigative firm.

The added expense of a full background check can help add a level of fiduciary comfort but is unlikely to convey much color on key intangible areas such as motivation, work habits, and managerial or operational expertise.

- Several historical portfolios – dates chosen by you (the evaluator) rather than the hedge fund.

Try to understand if past portfolio holdings mesh with your understanding of the investment strategy and risk management disciplines you have read about in the prospectus and have come to understand in the interview process.

As outlined earlier in the document, historical risk reports for these same dates may aid in understanding the risks in the portfolio as a whole, as well as how the manager looks at risk and what he feels is important.

- Prime brokerage agreements and other financing agreements.

Independent confirmation of the fund/firm's assets via the prime broker(s) is often considered an important final step before a formal investment is made.

VIII. Fee Structure and Terms

Fees and terms go to the heart of the investor-manager relationship as they represent payment made for investment services rendered. While Fixed Income and Credit hedge funds usually demand no overly unique fees or terms from investors, the specific details of each hedge fund offering are necessary to understand to the fullest extent. In fact, it may be argued that investors need to take some special care when investing in this style. For example, they need to assure themselves that the redemption terms of an individual fund are appropriately matched to the underlying market liquidity.

The material below draws attention to variability in hedge fund terms. It highlights the importance of understanding all aspects of liquidity and fee terms. And, it looks to heighten an investor's ability to seek clarification of the basis for non-standard fund terms. Further, it focuses on potential issues an investor faces in individual fund structures, such as the possible cross-collateralization implications of multiple share classes. As investors know, investing in hedge funds involves much more than simply understanding management and incentive fees, and redemption terms. This section is designed to help guide investors to seek out more nuanced fund information.

A. Fee Structure

- What are the management and incentive fees for the fund that is being evaluated? How are these fees calculated and accrued?

  Are the fees for this fund appropriate given what other similar funds charge?

  How often does the fund pay itself fees? Does the fund use a "rolling clawback" for its fees or similar device to encourage longer-term performance?

  How does the portfolio manager make use of his management and performance fees? Is the management fee invested in the business?

  Who participates in the 'carry' (performance fees), and to what degree are less senior professionals given incentives to contribute to the investment success of the fund? Is this expected to change over time?

- Is there a high-water mark or hurdle rate for the performance fees? How are they calculated? Is the high-water mark reset?

  Ask what percentage of assets is 'underwater' and for what period of time they have been so. If the fund has experienced a drawdown, how much performance does the fund have to accrue to earn performance fees? If this is an unreasonable amount, beware of the built-in temptation for a manager to 'swing for the fences' and risk even more substantial capital losses.

- What expenses are charged to the fund, in addition to management and performance fees?

  Standard fees usually include items such as administration, audit, and other professional expenses. However, a manager sometimes will expense the entire firm's overhead to the fund including travel and entertainment, rent, and salaries and bonuses. If this is the case, understand what the percentage charge to the fund has been in prior years. Is it in line with industry standards? Are you willing to accept this?

  Needless to say, check the audited financials, especially the footnotes, as well as the prospectus!

VIII. Fee Structure and Terms (cont.)

- Are soft dollars employed? What are they used for? What are they in relation to all operational costs?

- Do the management firm and/or principals receive revenues from sources other than the management and performance fees charged to fund investors? If so, what are they and who receives them?

As hedge funds, private equity and investment banking activities continue to overlap, investors should closely examine the issue of advisory fees (bankruptcy proceedings or restructurings), and loan origination and syndication fees. Other fees include the proceeds from lending securities owned by the portfolios. Suffice it to say that, in this as in all cases, managers are working on behalf of their investors and so the fees should go to the fund.

B. Terms and Conditions

- What is the liquidity/redemption policy? Lock-up? Notice period? Is the liquidity provision for investors consistent with the liquidity of the underlying securities of the fund? Does the Fund have a 'gate' or a limit on withdrawals? What are the terms of the gate?

Beware of funds that give unduly accommodating liquidity terms to investors when the underlying assets are themselves not highly liquid. Generous liquidity terms coupled with illiquid positions gone wrong has been a primary ingredient in many hedge fund catastrophes. Note that being a large percentage of the float or open interest of even a highly liquid security creates an illiquid position.

Ask if any investors have side-letters with more forgiving liquidity terms. If so, in a liquidity crunch these investors will have an unfair advantage. However, realize that this advantage may be ephemeral as managers can redeem (or not) investors as they see fit, side letter notwithstanding. The offering memorandum, which trumps all other arrangements, usually contains language permitting the Investment Manager to suspend redemptions should he deem it in the "best interest of all shareholders."

Understand how much of capital base is still subject to lock-up and when those lock-ups roll off. Once investors are free of lock-ups, the fund's redemption profile deteriorates markedly.

- If there is an early redemption fee, is it payable to the fund or the management company?

The fee should be payable to the fund, not to the management company.

- Have there been any prior liquidity suspensions? Are there pending changes to the redemption policy?

- How many share classes are there for each fund? If there is more than one class, what are the various fees and terms for each class? Are there different fees and terms for onshore and offshore investors? Are the employees of the fund subject to the same fees and terms as outside investors?

Does the class structure allow one class to inherit risk of the other? Do cross-liabilities exist between the classes or funds? For example, does the class with lower leverage assume the risk of the higher leverage class?

"Generous liquidity terms coupled with illiquid positions gone wrong has been a primary ingredient in many hedge fund catastrophes."

VIII. Fee Structure and Terms (cont.)

Try to appreciate the character of the strategy's liquidity relative to the liquidity of the different share classes and how much capital resides in each share class. Is the bulk of the capital principally invested in one share class? What are the implications for the stability of this fund's capital base? If there is a gate, does it apply to each share class, or to the overall Fund?

- Is the manager incubating new or separate strategies at the expense of current investors?

Sometimes a large fund will begin to incubate start-ups to access emerging talent (and to develop a promising sub-strategy that can help diversify firm capital) or have the proximity of a talented individual who could not be persuaded to become a regular employee. If this is the case, what is the fund's arrangement with the newly incubated manager strategy and has the larger fund informed Limited Partners as to how they are compensated?

IX. Quantitative Review

Investors will immediately know that a quantitative review of any hedge fund is important but also has significant limitations. In fact, similar to other areas of this document, it can reasonably be argued that quantitative analysis of Fixed Income and Credit strategies has more potential pitfalls than analysis of other hedge fund styles. For example, it is often more difficult to benchmark some of the relative value strategies in this style than more directional strategies in other styles. Further, the significant (and continuing) increase in fixed income and related instruments presents special challenges in evaluating historical track records. Finally, the short volatility risk of some of these strategies may not be fully reflected in a simple quantitative analysis of historical returns.

The following section looks to make investors more aware of the general difficulties in quantitative performance reviews. And, it tries to help guide investors to more explicitly consider issues necessary to interpret historical performance given its limitations.

- Review monthly performance of the Hedge Fund since its inception and confirm the ownership of the record. Consider prior track records for key principals if the degree of ownership is material and can be accounted for.

- Is the track record audited?

  Note any caveats offered by the auditors in their letter and beware any unaudited track records.

- Is the track record pro-forma?

  Be wary of pro-forma track records. Most investors do not consider the evaluation of pro-forma track records to carry much analytical value.

- What are the return and risk goals for the fund? Have the performance and risk objectives been consistently achieved?

- Is performance consistent with your – the prospective investor's – expectations?

  Compare monthly, quarterly and annual track records to those of appropriate peer groups and to market indices. How does performance compare with that of similar funds and strategies?

- What are the volatility parameters for the fund? Does the fund's recorded standard deviation fall in line with what the portfolio manager has suggested in interviews, in marketing documents or in the prospectus?

  Is the Fund's volatility outside of its expected parameters or the volatility you would reasonably expect of others trading similar strategies or assets? A volatile track record for a manager trading 'un-volatile' assets is a sure indication of a substantially leveraged book (either explicitly through borrowing or implicitly through concentrated positions or investments in leveraged entities).

  There is considerable debate surrounding the actual volatility of Fixed Income Arbitrage and other Relative Value approaches. Since it involves applying substantial amounts of leverage to small inefficiencies, the strategy tends to produce steady, low-to-average level returns in 'normal' market conditions. However, since many convergence trades involve buying the less liquid security, during times of market stress this can lead to losses as market participants look to buy safest

> "Suffice to say that allocators should be cognizant of the dual, state-dependent nature of returns, and not be fooled by low volatility returns in calm times."

and most liquid securities to hedge themselves and dispose of less liquid positions (so managers' shorts go up and longs go down). Hence the strategy being characterized as "picking up nickels in front of a steamroller," especially in light of the losses seen by traders of this style in 1998.

It is open to debate whether or not the strategy could be outright characterized as 'short volatility.' Certainly volatility tends to expand during market crises, when fixed income arbitrageurs tend to be losing money. But it may be more appropriate to describe the strategy as being short "tail risk" or "liquidity risk" rather than outright short volatility (which the arbitrageur could be long courtesy of option positions). Suffice to say that allocators should be cognizant of the dual, state-dependent nature of returns, and not be fooled by low volatility returns in calm times. Talking to the manager about his stress testing results and corroborating that with your understanding of a manager's overall leverage levels will help to overcome this.

In a different vein, Distressed Securities and Asset-Based Lenders tend to have books replete with illiquid and private securities whose valuation depends on private equity-like approaches (i.e., keep it at book value until an event realizes value or an impairment occurs). Allocators should be aware that this approach will understate the actual volatility of the return stream.

- Review all drawdowns from peak to trough. How quickly did the Fund recover? What is the longest monthly return streak both positive and negative?

What kinds of drawdowns are acceptable to the manager? Ask the manager, "what kind of drawdown should prompt a call from me?"

As an investor, what is the maximum drawdown you would expect from this manager?

Ask the manager to tell you the fund's largest intra-month drawdowns. This can be significantly different than what the monthly data discloses. Again, be cognizant of valuation methodologies as a large book of illiquid securities that are infrequently priced can understate drawdowns.

Finally, review the timing of drawdowns compared to the drawdowns suffered by peer funds and relevant indices. This is often a more fruitful exercise than simple correlation analysis as it measures a manager's 'edge' in the terms that matter most: gains and losses.

- What are the biggest positive and negative months?

Do these outlier months make sense in the context of your expectations for the fund's performance and its supposed risk management disciplines? A large positive outlier, however pleasant, should be reviewed with the same care as a similarly-sized negative month. This is because large returns, of either type, indicate the presence of leverage, investment in volatile securities, or both.

- Understand drawdowns and large upswings in the context of the market environment in which the fund has operated. Is the fund's performance too dependent on a lucky call or two? Is good performance the result of a single outsized bet that worked out and is unlikely to be repeatable? Has the basic

"A large positive outlier, however pleasant, should be reviewed with the same care as a similarly sized negative month. This is because large returns, of either type, indicate the presence of leverage, investment in volatile securities, or both."

IX. Quantitative Review (cont.)

portfolio posture (and the returns the strategy has generated) simply been the beneficiary of a market environment that is perfectly suited for it?

- Consider how assets under management may have changed over the life of the track record. Gather data on the assets by fund, by strategy, and for the firm in aggregate.

Did rapidly increasing assets diminish the performance? Fund size has consistently been the enemy of performance.

Was the track record achieved with a tiny amount of assets? If so, was the manager able to use smaller capitalization instruments that the fund may be too large to take advantage of now? In general, is the process that generated the present track record repeatable?

Are separate accounts included in the track record? If not, are they attempting to disguise the true amount of assets under management in the strategy? Be aware that separate accounts can hide a fund's true measure of capacity and continued growth.

- What percent of the track record is attributable to the current team managing the hedge fund? Are the individuals who created the track record still there and are they still as actively involved in the investment process?

Seek to understand the ownership of a track record. Understand who was responsible in precise terms. Understand who had authority for investment decision-making.

- Have there been any changes to the strategy over the life of the track record that should cause the record to be reviewed in segments? Examples of this may include a new hedging discipline or a marked increase and/or decrease in gross exposure.

New funds often require time to "ramp up" exposure.

If some key investment disciplines are being applied differently due to adjustments or "lessons learned," be certain to segment the performance history accordingly.

- Review the correlation of the hedge fund's track record to relevant market indexes and, to the degree it's appropriate, the portfolio for which inclusion is being considered. Review correlations over different and possibly revealing intervals of time such as periods of market dislocation. Understand the fund's correlations in the context of its strategy, its chosen exposures and its performance during notably difficult market environments.

Use correlation analysis as a tool to enhance your understanding of the fund strategy but beware of its obvious limitations. In particular, correlations can be relatively unstable and may change dramatically in different market environments. Quantitative analysis can help shed new light on the character of a strategy but should be evaluated in the context of all other research, including qualitatively drawn judgments. Correlation analysis is considered most helpful as a complement to rigorous qualitative assessments.

- Gather detailed return attribution data on longs and shorts, sectors, different instruments, sub-strategy, and/or credit rating. Review your understanding of the fund's return drivers and contrast it with your study of the fund's actual sources of return in practice.

"Quantitative analysis can help shed new light on the character of a strategy but should be evaluated in the context of all other research, including qualitatively drawn judgments."

IX. Quantitative Review (cont.)

Does the attribution analysis confirm your understanding of where the fund made money? Is there surprisingly strong or weak performance in certain segments of the portfolio?

What does the attribution analysis suggest about the manager's true level of trade construction or portfolio management skill?

Is the manager a proven talent as a hedge fund manager or in deploying portfolio hedging strategies and how can you tell?

- Obtain, if it is permitted, a few historical portfolios using dates chosen by the evaluator for review prior to an investment.

These portfolios should be obtained directly from the prime broker rather than the hedge fund manager to ensure data integrity and independence. This test should demonstrate the manager's consistency in the application of the strategy over time as well as the portfolio manager's adherence to stated risk disciplines.

Note that for many fixed income strategies and technical credit strategies as well as large multi-strategy shops, the fund's portfolio may contain hundreds or even thousands of positions, which may significantly degrade the usefulness of this exercise in helping an investor understand the risk of the portfolio. .In these cases, risk reports for the same days may be required as well.

- Is the fund managed with a degree of tax sensitivity in mind? What percentage of returns is realized versus unrealized and how much is ordinary income?

Bearing in mind that the offshore investor is indifferent to tax consequences, are the onshore and offshore funds being managed in a substantially different way? Are differences in the application of the onshore and offshore strategies a source of distraction? Compare the performance of the onshore and offshore funds. If there are differences, ask the manager why.

X. Intuition, Judgement and Experience

Excellence in due diligence requires thorough and thoughtful quantitative and qualitative analyses. This section focuses on the "softer" side of the due diligence process by exploring the qualitative tools of Experience, Intuition and Judgment.

Experience derives from procedural knowledge. One generally gains experience over a period of time from exposure to different situations. In an evaluation of potential investments, it is useful to include at least one person at the on-site due diligence visit who has extensive experience in the industry, and ideally the specific sector such as Credit. In evaluating potential investment opportunities, it is essential to determine the depth and diversity of experience among the key players at the firm. In most cases, experience builds over an extended period of time. However, a single event can provide valuable experience as well. Thus, it is useful to question management and investment staff about their experiences, both good and bad.

Intuition is really a form of common sense. A good practice in the due diligence process is to hold a brainstorming session after a due diligence meeting. In this way, an investment group can harness the intuitive insights of the team and identify the various opinions regarding the investment opportunity. It is important to recognize intuitive reactions, but we must use our experience and knowledge to find out what is causing them.

But, we need more than experience and intuition to follow best practices in due diligence. We also need good judgment. Good judgment integrates facts, assumptions, knowledge, and personal experience into an informed opinion. In following best practices and using good judgment, it is critical to consider multiple opinions in forming a judgment. Follow a process that includes channel checking, Internet searches, outside investigative reports, etc. and the ability to develop good judgment will be enhanced. Recognize that nearly all of the decisions made about investment opportunities are judgment calls. Develop a process that provides the discipline to constantly examine your assumptions and conclusions.

- Do you feel comfortable with your level of understanding of the strategy and risks that attend to it? Can you explain it well to others? Investors and allocators should stick to the rule that they only invest in what they understand and where they can properly assess the risks.
- Can you trust this manager? Does he have any personal or emotional issues? Are there hints of issues with integrity, ego, arrogance, pride, affluenza, complacency, carelessness, excessive optimism or any personal difficulties?
- Do you feel pressured to make an investment? Is this a "hot" manager? Have you been given enough time to properly perform your due diligence? Does the manager appreciate your fiduciary obligation to do complete and proper due diligence? Were you expecting to "fill in the blanks" later?
- Do you believe the manager is truly committed to the fund and the interests of the LPs and Shareholders?
- Fundamentally is the manager staying true to his core investment philosophy and doing what he said he always would be doing?
- Finally, and most importantly, would you invest your own money or your family's money with this manager? If you cannot confidently answer yes, you should not invest with this manager personally or on behalf of your client.

> "Finally, and most importantly, would you invest your own money or your family's money with this manager?"

Glossary

This Glossary is intended to highlight the concepts allocators investing in Fixed Income and Credit should be familiar with in order to comprehend the space. It is not meant to be comprehensive, and we offer the following references as good places to start in dealing with the minutiae and theory in fixed income and credit:

Further Reading

The web is a great source of information, definitions and articles on fixed income and credit. In particular we found Wikipedia's treatment of the various topics useful (http://en.wikipedia.org/wiki/Fixed_income). Other useful references we found were:

PIMCO, "Bond Basics: Everything You Need to Know About Bonds," PIMCO website

Freddie Mac, "Glossary of Fixed Income Market Terminology," Freddie Mac website

Fixed Income Glossary

- Basis Point (bp): A basis point is 1/100th of a percent or 0.01%. It is the basic unit used in fixed income and credit to describe yields and spreads.

- Measures of Interest Rate Sensitivity

  – Convexity: A measure of the non-linear relationship between price and yield for a debt security. Prices increase at an increasing rate as yields fall, and vice versa, for debt securities. A bond's convexity depends on its coupon and whether it is callable or not. Convexity is a measure of risk with higher readings being riskier (as it indicates greater changes in price for a given change in yields).

  – Duration: The weighted average maturity of a bond's cash flow(s). Duration is also the linear approximation of a bond's price change for a 100 bp yield change, and so can also be used as a risk measure. A higher duration bond/portfolio is 'riskier' than a lower duration one. Since it is a linear approximation, it will be less accurate for larger changes in yields and/or more convex securities.

  – DV01: The Dollar Value of a Basis Point (DVBP) measures the change in price of a bond (or portfolio of fixed income securities) for a one basis point decline in yields. Of the basic measures of interest rate sensitivity, it is the most widely used.

  – 10-year Equivalent: A measure of the interest rate sensitivity of a debt security in terms of 10-year Treasury Notes or swaps. Mathematically it is the ratio of the DVBP of the bond divided by the DVBP of a 10-year instrument. This can be used as a hedge ratio for parallel shifts in yields.

- Yield Curve: The imaginary line drawn through all of the yields to maturity of a given class/issuer's debt securities. It expresses the relationship between the yields and the maturity date and is also called the term structure of interest rates.

- Benchmark Securities: The basic security against which all others are compared. This is normally a U.S. Treasury security or local equivalent (the "risk-free" rate) or a LIBOR (London Interbank Offer Rate) loan. For Treasuries, there are scheduled auctions as part of the U.S. Government's regular borrowing program. Treasury market trading is most active around the newly-issued Bills (4, 13- and 26-weeks), Notes (2-, 3-, 5- and 10-

year) and Bonds (30-year), so these are considered the most accurate indications of market yields and are deemed the true "benchmark" Treasuries. These newer benchmark securities are termed "on-the-run" Treasuries, with the remaining, less liquid Treasuries (previous "benchmarks") called "off-the-run." Due to the high liquidity in the U.S. Dollar swap market, the swap curve offers an alternative to Treasuries for maturities exceeding one year.

- LIBOR: The London Interbank Offered Rate is the daily reference rate at which banks offer to lend unsecured funds to each other in the London wholesale money market. As such, it is not a "risk-free" rate as the credit risk of the counterparty bank – however low – is present. U.S. Dollar LIBOR is widely used as a reference rate for many financial instruments and transactions, notably the Chicago Mercantile Exchange's Eurodollar contracts (three-month LIBOR) and most interest rate swaps.

- Interest Rate Swap (IRS): An agreement in which two parties exchange periodic interest rate payments in the same currency (convention is quarterly) on a predetermined notional principal amount; payments are usually settled on a 'net' basis. The most common form is the 'fixed-for-floating' whereby one party 'pays' a fixed rate of interest while the other 'receives' a floating rate of interest; these are called "vanilla" swaps. Floating-floating interest rate swaps are known as basis swaps. The floating rate for all IRS is normally 3- or 6-month LIBOR (or Euribor for Euro-denominated swaps). Market convention is based on the fixed rate (versus a flat LIBOR) with *payors* of fixed quoted in terms of spread-over-Treasuries that the receiver gets (hence to pay or receive in swaps). IRS are the most commonly-used instrument for trading interest rate risk as well as the most common derivative instrument (the Bank for International Settlements estimates that, of the $370 trillion of outstanding OTC derivatives globally in June 2006, IRS represented $207 trillion) and are a highly liquid market with bid-ask spreads of around a basis point. Of note, margin requirements for IRS can be as low as 1% of notional so considerable leverage can be achieved in trading them. When closing a swap position, traders can either unwind it with the original counterparty or enter an offsetting swap with another one; while the result is economically the same in terms of interest rate exposure, the latter case involves greater counterparty risk and operational complexity.

- Interest Rate Derivatives: There are many other interest rate derivatives than IRS, with interest rate futures being quite commonly used and very liquid. Other derivatives of note are *swaptions* (an option to enter into an IRS and the most common method to trade interest rate volatility) and *caps* or *floors* (the buyer of a cap receives a payment at the end of each period that interest rates exceed the agreed strike price, whereas the buyer of a floor receives a payment if interest rates are below the strike price).

- Repo: A Repurchase Agreement ("repo") is the standard funding/leveraging vehicle in interest rate markets. In a repo (or Sale and Repurchase Agreement), the "buyer" loans the "seller" cash for a specific period (either "overnight" or "term") in exchange for receiving a security (usually a fixed income one) from the seller as collateral; at the end of the period, the seller 'repurchases' the original collateral in exchange for the cash loaned

plus interest (at the "repo rate"). The title of the collateral passes to the buyer during the repo while, by convention, the buyer passes any coupons paid during the repo to the seller. Buyers use repos to finance long positions, to obtain cheap financing (since it is "collateralized") and to cover short positions.

- Security Types

– Agency Debt: The debt issued by both federal agencies and government-sponsored enterprises (GSEs). Due to explicit or implicit Federal Government guarantees, they possess little credit risk. However, since they are not the direct obligation of the Federal Government they tend to offer a slightly higher yield than comparable Treasuries. The largest borrowers in this category are the housing GSEs: Fannie Mae (FNMA) and Freddie Mac (FHLMC).

– Mortgage-Backed Security (MBS): A security backed by an underlying pool of mortgages. The principal and interest payments actually made by the pool are "passed-through" to the security holder (usually monthly in the case of U.S. MBS) and since mortgage-holders can prepay the principal, the actual stream of payments is unknown in advance. This prepayment ability functionally renders the bondholder short a call option on interest rates and creates *negative convexity* in MBS. There are a number of types and derivatives of MBS. In addition to the most common Residential MBS, there are are Commercial MBS and Stripped MBS (where MBS are divided into Interest-Only (IO) and Principal-Only (PO) portions). Collateralized Mortgage Obligations (CMOs) represent a 'tranching' of the mortgage pool into securities of differing credit quality; the junior securities absorb the first default losses in exchange for a higher coupon whereas the senior tranches pay lower coupons but are over-collateralized. At the time of writing, the MBS market in the U.S. was larger than the Treasury market.

– Municipal Debt: A bond issued by a state, city, local government or their agencies. Bonds can either be General Obligation (repayment is based on the credit of the issuer) or revenue bonds (repayment is based on the income of a specific asset or project). The income from municipal debt is tax-exempt in specific cases.

- Yield Curve Arbitrage (Curve Trades)

– Basis Trades: A trade involving long (or short) position in a Note future and a short (or long) position in the corresponding Note deliverable into the future. This trade would be initiated when there is a mispricing between the two. Since the two securities (future and Note) are completely fungible, this trade would be a true arbitrage. Since delivering a range of securities to the futures holder can satisfy obligations from Note futures, the short futures trader tends to provide the Cheapest-to-Deliver security. Occasionally this security can be in short supply leading to being "special" in repo (short squeezed) such as occurred in 2006 with Citadel and PIMCO and the 10-year Note Future.

– Convergence Trade: Not a strict 'arbitrage', it is a trade between two related securities (either economically or statistically) whereby the arbitrageur would be long- and short- securities with an economic or statistical relationship but whose prices have diverged from historical norms. The trade is

generally constructed to be neutral to market factors (such as interest rates). The expectation would be that the price relationship would 'converge' to the historically normal one. An example is long off-the-run and short on-the-run Treasuries: since the current benchmark securities are more liquid, their yields are lower than the less liquid off-the-run securities; eventually, as new benchmarks are auctioned and the current ones lose their status, their liquidity premium disappears. The risk in this trade is a financial crisis as market participants bid up the most liquid security.

– Butterfly: A trade consisting of the purchase or sale of one note (usually 5-year) and the simultaneous sale or purchase of both a longer- and a shorter-duration note from the same issuer. The key is the weighting of the three legs, which is usually done to ensure interest rate neutrality. The trade will be profitable if the three legs converge to the expected (historical) relationship.

– Barbell: A trade consisting of the purchase (or sale) of a long-dated bond and the simultaneous sale (or purchase) of a shorter-duration one. This can be constructed in a duration-neutral fashion with the trade being profitable if the yield curve between those two points flattens (or steepens) more than is currently implied by forwards.

– Steepener/Flattener: Curve trades designed to profit from changes in the steepness of the yield curve. A steepener involves buying a shorter-dated security and selling a longer-dated one (or paying the fixed rate in the longer-term swap and receiving it in the shorter-term one) while a flattener is the opposite. Since longer-dated securities possess greater interest rate sensitivity, significantly more face value of the shorter-dated security is required for the trade to be duration-neutral; flatteners are thus negative carry trades.

– Conditional Trade: A steepener/flattener constructed with swaptions. Because it is being done with options, there is a capped downside in exchange for a premium payment. The trade allows greater flexibility in expressing a view as well as the advantage of premium take-in if it is a contrarian view.

- ISDA Agreements: For Fixed Income, Credit or FX trading, managers set-up counterparty trading agreements which are governed by standards established by the International Swaps and Derivatives Association (ISDA). Individual terms are negotiated by the counterparties themselves (notably the trading limits, margin requirements, and borrowing terms).

Credit Glossary

- Credit Rating: The quality of a credit security as deemed by a recognized credit rating agency. The largest three are Moody's, Standard & Poor's and Fitch. Ratings express an estimation of the default probability of a security over its lifetime. Overall, securities are classified as Investment Grade, Non-Investment Grade (or High Yield or "junk bond") or Defaulted. Ratings are important since many entities are limited to investing only in securities with a certain rating (either for regulatory capital treatment in the case of broker-dealers, banks and insurers or by investment mandate in the case of mutual funds). Because of this restriction, holders may be forced to make non-economic sales if a security is downgraded below Investment Grade status.

Glossary (cont.)

- Credit Spread: The extra yield (above the benchmark rate) that a corporate security offers to compensate for assuming credit risk.

- Default: A default occurs when a company or government does not meet its obligations as set forth in its debt covenants. The type of default (a missed coupon versus renegotiating terms) can be important as the default provisions in the swap agreements trigger payments by credit default swap sellers. This can be costly for either party (buyer/seller of protection) as was seen in the litigation surrounding the Argentina debt restructuring in 2002.

- Covenant: The covenant outlines the terms of the debt offering and generally contains indentures that specify obligations that the issuing entity must abide by. Important items in a covenant are the security's collateral and seniority within the capital structure.

- Capital Structure: A corporation or entity finances itself by issuing a variety of securities. Debt securities confer no ownership but tend to be the senior-most instruments in the capital structure (with bank debt the senior-most of all). Since corporations may create multiple entities to optimize their operational, legal and tax situations, the entire capital structure may include the various debt and equity instruments of the main corporation as well as those of the affiliates and Special Purpose Vehicles (SPV).

- Convertible Security: A security that can be converted into another. Usually it is a bond that can be exchanged for a certain number or quantity of the firm's common equity. This conversion may be optional or mandatory, and either at the option of the holder or the issuing company. Convertible bonds are considered a hybrid security that are akin to owning a corporate bond and a call option on the common equity of the company.

- Asset-Backed Security (ABS): Any security whose collateral and payments are backed by a specific asset and/or revenue stream. The most-common type are Mortgage-Backed Securities but any asset can underlie an ABS. An example would be the Enhanced Equipment Trust Certificates (EETCs) that airlines issue on specific aircraft or pools of aircraft. The airline pays a lease fee to the EETC entity that is passed-through to the note holders.

- Asset Swap: The combination of a debt security and an interest rate swap. It allows the fixed rate investor (holding the corporate bond) to turn a credit spread in the bond into a spread over a floating reference rate. As such, it allows investors to manage duration and to trade credit risk opportunities.

- Credit Derivatives:

  – Credit Default Swap (CDS): A contract between two parties that requires the buyer of protection to pay the seller a periodic amount (the credit spread) in exchange for the seller agreeing to pay a pre-determined amount should a credit event occur over the life of the swap. An event is typically default, bankruptcy or the violation of a covenant. Originally the buyer would deliver the reference bond and be paid par value but most contracts have moved to cash settlement. The terms of a CDS have become increasingly standardized by ISDA over the years. Since the CDS involves payment for insurance against corporate defaults, it is a

pure expression of corporate risk and has become the *de facto* credit-trading instrument.

– Collateralized Debt Obligation (CDO): A series of securities collateralized by an underlying pool of debt instruments, either cash bonds ("Cash CDOs") or credit default swaps ("synthetic CDOs"). This pool may or may not be actively managed. The important characteristic of a CDO is the 'tranching' of risk, with Senior, Mezzanine and Equity tranches issued. The Equity tranches suffer principal impairment for the initial defaults (typically the first 0-3% of defaults), the Mezzanie tranches are impaired next (typically the next 4-7%) and the Senior tranches are impaired last. For bearing this default risk, Equity tranches are paid the highest coupon and represent a leveraged play on credit spreads.

– "Waterfall": The order in which tranches and/or securities are paid out of the underlying collateral and cashflows. These are specified in the indenture. Normally payments are made to the senior-most tranches first, while defaults are applied first to the junior-most ones.

– Bespoke derivatives: Customized credit derivatives, typically single equity or mezzanine tranche structures. Since they are customized to the buyer, they tend to be highly illiquid with only the issuing dealer willing to trade it.

– Correlation Trading: There are a number of ingredients involved in pricing individual CDO tranches: default probability, default severity (or recovery) and default correlation. Correlation measures the distribution of defaults throughout a portfolio and the likelihood of a single default causing a succession of defaults. The value of the lowest parts of a CDO (equity or mezzanine tranche) increases as the correlation between defaults rises and decreases as default correlation falls. The more the defaults within a basket become correlated, the more the portfolio behaves like a single credit, and so the probability of the equity tranche being wiped out becomes more similar to the probability of the most senior tranches being wiped out. Hence a long correlation trade would involve buying subordinate tranches and selling senior tranches of a given CDO.

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