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ASSET MANAGEMENT

Mitigating Downside Risks from Market Shocks

By

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MELLON CAPITAL® MANAGEMENT

Introduction

In the postmortem after the Lehman Brothers' collapse, the investment community collectively looked back on one of the most frightening episodes in market history. Risky assets sank in lockstep as volatility and illiquidity soared, resulting in devastating losses, and raising questions about the value of diversification as a risk reduction tool. The perils of systemic risk had moved from academic papers to newspaper headlines in dramatic fashion.

Classic market theory originally held that while diversification can reduce stock-and bond-specific risk, it could not protect against systemic risk, or the beta exposure of the portfolio. However, the growth of index investing over the past several decades sparked the rise of diversified beta portfolios, which offered attractive returns relative to a traditional 60% equity and 40% fixed income portfolio, as well as a way to potentially diversify the risk of such a 60/40 portfolio. At the same time, hedge funds offered "absolute return" and "market neutral" approaches that were supposed to be relatively uncorrelated with the market — yet another tool, in theory, for bracing portfolios against systemic shocks.

These promising developments need to be reassessed in the wake of the post-Lehman meltdown. Investors who reeled from the futility of diversified beta exposures also noticed that most hedge funds did not do much better. Was this a failure of alpha or beta, or both, and how does it matter? The answers are vitally important to defining the work that needs to be done in crafting portfolios that can withstand a "perfect storm" of volatility and illiquidity like the one we experienced.

This paper represents our thoughts on building just such a portfolio. In our view, there are benefits to three general approaches:

1. Passively invest in assets that have historically performed well during market stress events, such as Treasuries and other sovereign bonds.
2. Use strategies that have historically increased in value as volatility has increased. This includes market-neutral arbitrage in sovereign bonds and corporate credit, as well as commodity trading advisors (CTAs) and some short-term trading strategies.
3. Actively shift beta exposures based on the manager's analysis of economic trends.

In a Crisis, Correlations Go to One

It has been said that in a crisis, correlations go to one. This severely curtails the usual benefits of diversification. It was indeed the case that after the Lehman failure in September 2008, as nearly all risky assets, with the exception of sovereign debt, declined in value. The rise in correlations took place whether you looked across economic sectors and countries (Exhibit 1) or asset sectors (Exhibit 2). Remarkably, even asset classes such as commodities that were historically reliable hedges against equity bear markets suffered. The diversification typical of most portfolios — even those with a variety of beta exposures — simply did not prevent substantial losses. Only low-yielding assets such as Treasury bonds were a reliable shelter.

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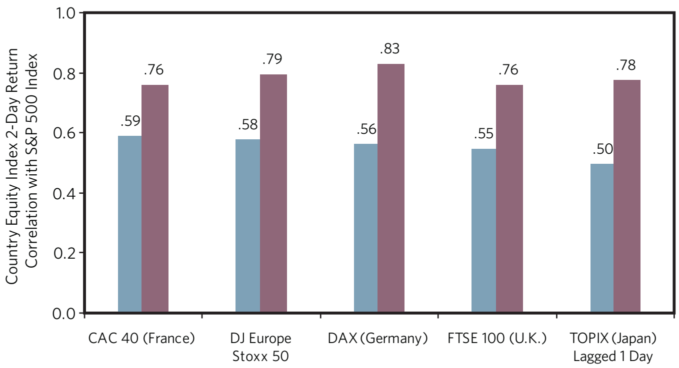
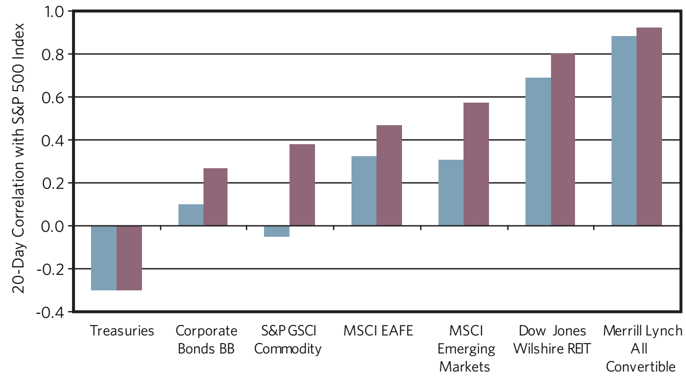
Exhibit 1: Equity Correlations across Countries Jumped Up after Lehman Failed



Source: Bloomberg and Mellon Capital Management. See index disclosure on page 12.

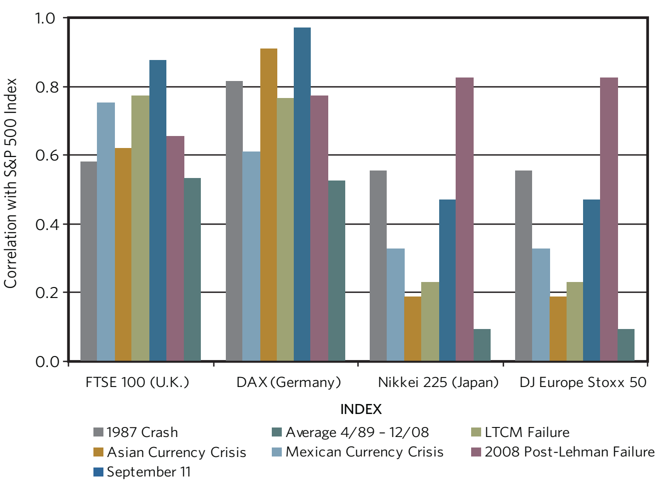
Exhibit 2: Most Asset Class Correlations Increased after Lehman Failed



Source: Thomson Reuters Datastream and Mellon Capital Management

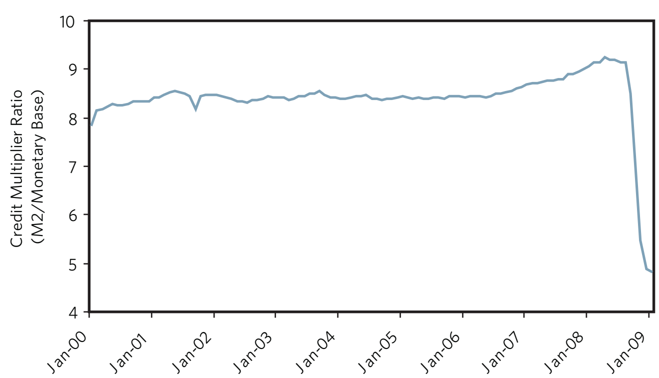
In fact, our research indicates that the increase in correlations[1] during the post-Lehman episode was not unique or notable, when considered in the context of other crises such as the 1987 stock market crash, the 1994 Mexican currency crisis, the Asian currency crisis, the Long-Term Capital Management (LTCM) failure in 1997 and 1998, and September 11 (Exhibit 3). On the other hand, what was remarkable after Lehman failed was a breakdown in credit creation and financial intermediation that caused the massive decline in liquidity. The sharp decline in the ratio of M2 (the broad money supply) to M0 (the base money supply) quantifies the collapse in credit creation (Exhibit 4). Another way to gauge the illiquidity is by comparing instruments that require investment capital, such as corporate bonds, with their capital-efficient equivalents, such as a package of credit default swaps (CDS) and interest-rate swaps (Exhibit 5). CDS-equivalent yields typically are lower because they do not require the same capital commitment and typically have much better liquidity. Also unique to this market crisis, bid-offer spreads for many exchange-based and over-the-counter transactions widened to as much as 4.4 times their normal standard deviations (Exhibit 6).

Exhibit 3: Correlations after Lehman Failed Were Not Out of Line with Prior Crises



Source: Bloomberg and Mellon Capital Management

Exhibit 4: There Was a Sharp Decline in Credit Creation after Lehman Failed

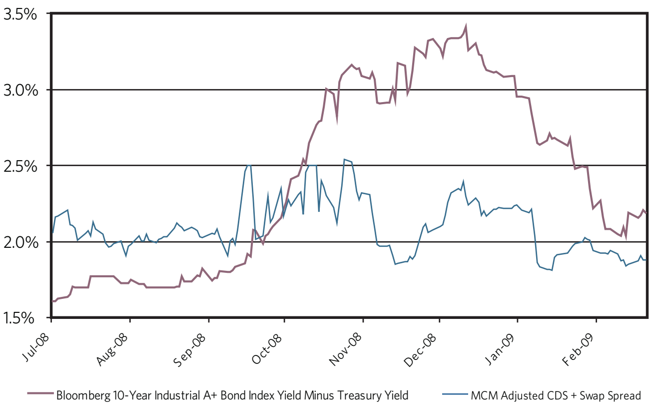


Source: U.S. Federal Reserve

1 **Correlation** measures the degree to which the performance of a given asset class moves in relation to another, on a scale of –1 to 1. Negative 1 indicates a perfectly inverse relationship, 0 indicates no relationship and 1 indicates a perfectly positive relationship.

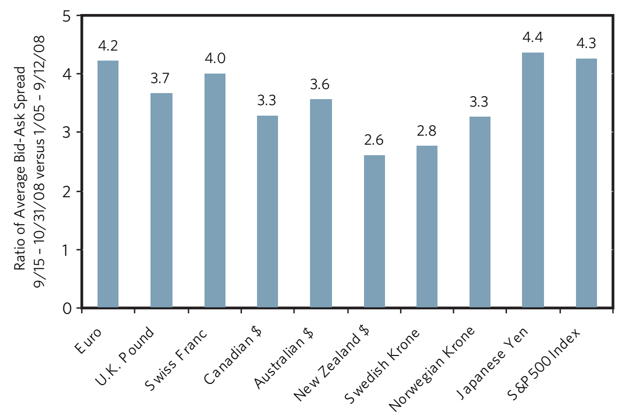
One may conclude that rising correlations are symptomatic of most financial panics. What distinguished the recent market instability was the system-wide illiquidity and volatility, which was a blow to beta strategies of every stripe.

Exhibit 5: Physical Bonds Became More Illiquid as Their Yields Rose More than CDS Equivalents



Source: Barclays Capital, Bloomberg and Mellon Capital Management
Past performance is no guarantee of future results.

Exhibit 6: Bid-Offer Spreads Widened after Liquidity Deteriorated



Source: Bloomberg, Various Broker Quotes and Mellon Capital Management. See index disclosure on page 12.
Past performance is no guarantee of future results.

One may conclude that rising correlations are symptomatic of most financial panics. What distinguished the recent market instability was the system-wide illiquidity and volatility, which was a blow to beta strategies of every stripe. But the episode also has important lessons for the role hedge funds can play as diversifiers, especially given the prominence alternative strategies have assumed in institutional portfolios. While hedge funds, as measured by the Hedge Fund Research Indices (HFRI) Weighted Composite Index, did not fall as far as the S&P 500 during the last four months of 2008, many investors were disappointed that they did not perform better as diversifiers.

Hedge Funds Had a Beta Problem

The concept of hedge fund or "exotic" betas has gained increasing acceptance by financial and academic analysts in recent years. For example, theorists such as David Hsieh, William Fung, and Lars Jaeger describe alternative beta factors for a number of common hedge fund strategies, and suggest techniques for passive strategies that could largely replicate hedge fund results.

These developments have a bearing not just on diversification, but also have an obvious connection to fee structure; some have even accused hedge funds of "selling beta as alpha."[2]

The post-Lehman meltdown provided the biggest test case to date for alternative beta theories. Our research indicates that alternative betas, defined by a number of style factors (based on the HFRI Fund Weighted Composite Index), that have been derived for various hedge fund strategies, explain performance to a greater degree than alpha exposures (Exhibits 7 and 8).

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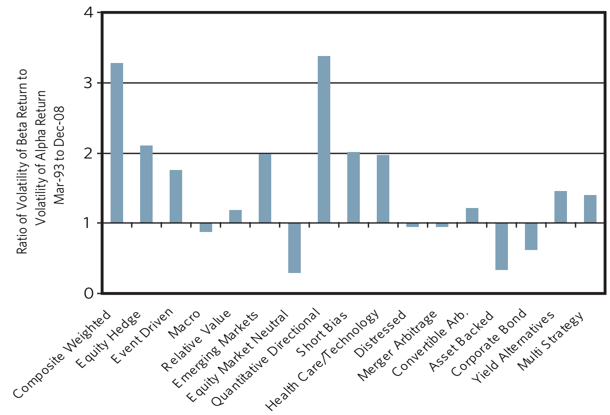
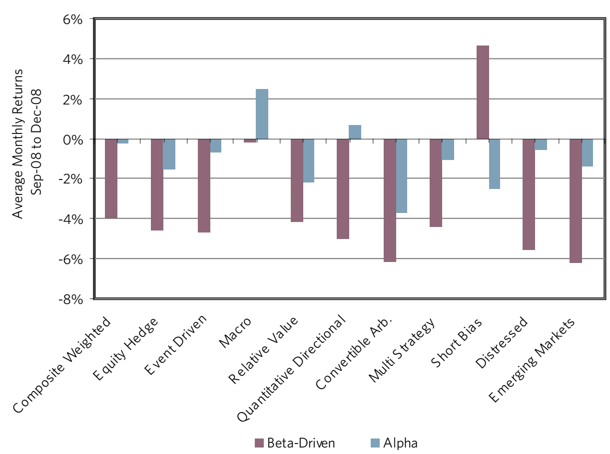
Exhibit 7: Our Analysis Shows a High Dependence on Beta Returns among Hedge Funds



Source: Thomson Reuters Datastream and Mellon Capital Management

Exhibit 8: Beta was the Primary Driver of Negative Returns after Lehman Failed



Source: Thomson Reuters Datastream and Mellon Capital Management

2 G. Jensen and J. Rotenberg, "Hedge Funds Selling Beta as Alpha" (2003).

Of the eleven hedge fund styles examined, nine had negative performance. In that group, beta was the primary driver of the losses in each instance.

We performed a Bayesian style analysis on both traditional asset class returns and alternative beta returns.[3] From this analysis, we decomposed hedge fund performance between 1993 and 2008 into alpha and beta and compared the ratio of the return volatility from the two sources (Exhibit 7). This ratio is greater than one for not only the HFRI Fund Weighted Composite Index but also in 11 of the 17 hedge fund style indices. Thus, the volatility of hedge fund returns coming from systemic risk premiums appears as high as, if not higher than, the volatility coming from alpha. This suggests that hedge funds have been highly dependent on beta for returns.

This general observation was borne out in hedge fund performance in the post-Lehman period between September 2008 and December 2008 (Exhibit 8). Of the eleven hedge fund styles examined, nine had negative performance. In that group, beta was the primary driver of the losses in each instance. Of the three styles with positive performance — macro, quant directional and short bias — alpha was the primary driver of results only for macro.

A similar analysis was done by Amir E. Khandani and Andrew W. Lo[4] at MIT. It covered an earlier stage of the financial crisis — August 6 through August 10, 2007 — when the markets were roiled by waves of deleveraging trades from hedge funds. Khandani and Lo observed that "there is more commonality among long/short equity strategies than we anticipated.... The fact that the entire class...moved together so tightly during August 2007 implies the existence of certain common factors within that class,...the notion of a 'hedge-fund beta' is now a reality."

Interestingly, the August 2007 turmoil did not broadly result in large losses for the affected hedge funds. The markets recovered to a significant degree on August 10, and Khandani and Lo observed that for the entire month, returns for a number of those managers were "unremarkable." On the other hand, for Khandani and Lo, the importance of the episode lies in what it showed about the evolution of our financial system: that problems in one corner — subprime mortgages — can spill over directly into an unrelated corner like long/short equity.

Controlling Systemic Risks

Given what we have learned about systemic shocks, we have identified three general categories that look promising as portfolio hedges in such difficult environments.

1. Passively invest in assets that have historically performed well during market stress events.

Diversification can be said to have failed during the Lehman meltdown if we only consider *risky* assets. Risk-free assets, such as U.S. Treasury bonds have historically performed especially well during flights to safety associated with spikes in equity volatility. The 2008 episode was no exception (Exhibit 9). We see that during periods of less extreme volatility other traditional diversifiers such as commodities, REITs and international stocks have done well. But only U.S. Treasury bonds have done well when the Chicago Board Options Exchange Volatility Index (VIX Index), an indicator of implied equity volatility, exceeded 25, as it did after Lehman failed. (A threshold reached only 17% of the time before the recent crisis.)

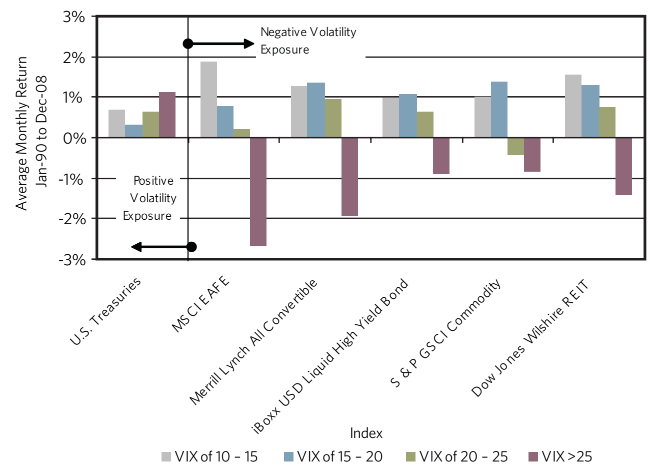
3 We use Kalman Filtering and factor selection to estimate time-varying exposure in both traditional asset classes and alternative beta returns. For further information, please inquire about details of our work in this area.

4 Khandani, Amir E. and Lo, Andrew W., What Happened to the Quants in August 2007? (November 4, 2007). Available at SSRN: http://ssrn.com/abstract=1015987

While U.S. Treasury bonds certainly have a role as a diversifier, they have one significant drawback: their correlation with equities has tended to increase as inflation grows (Exhibit 10). Thus, we do not believe that U.S. Treasury bonds will be a good equity hedge indefinitely, especially if the concerns over massive stimulus and deficit spending prove to be valid. Now let us look at a few strategies that structurally are designed to perform well during volatility and illiquidity spikes.

While U.S. Treasury bonds certainly have a role as a diversifier, they have one significant drawback: their correlation with equities has tended to increase as inflation grows.

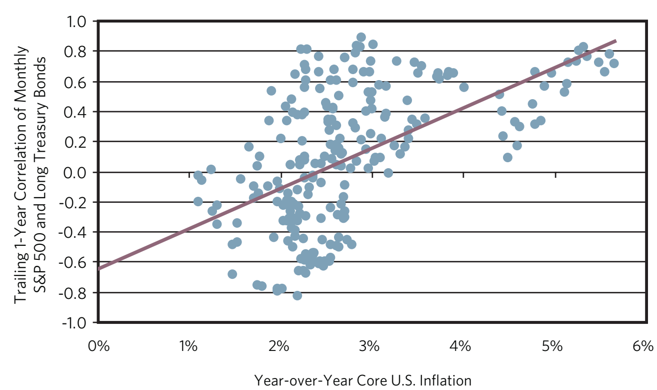
Exhibit 9: U.S. Treasuries Have Performed Well During Volatility Spikes



Source: Thomson Reuters Datastream and Mellon Capital Management. See index disclosure on page 12.
Past performance is no guarantee of future results.

Exhibit 10: U.S. Treasury Bonds' Correlation with Equities Rises with Inflation

January 1989 – January 2009



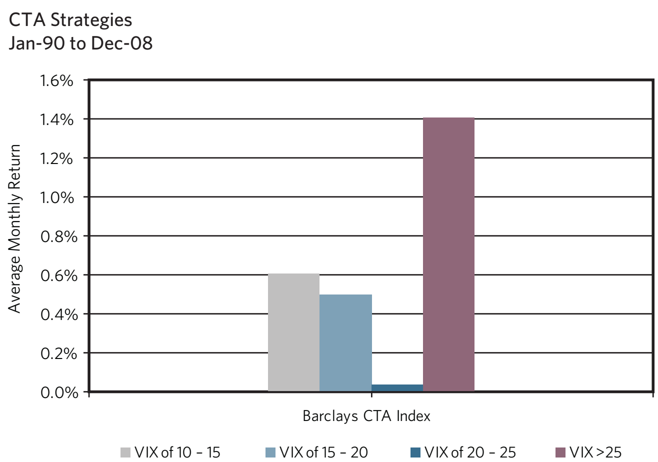
Source: Thomson Reuters Datastream, Barclays Capital and Mellon Capital Management
Past performance is no guarantee of future results.

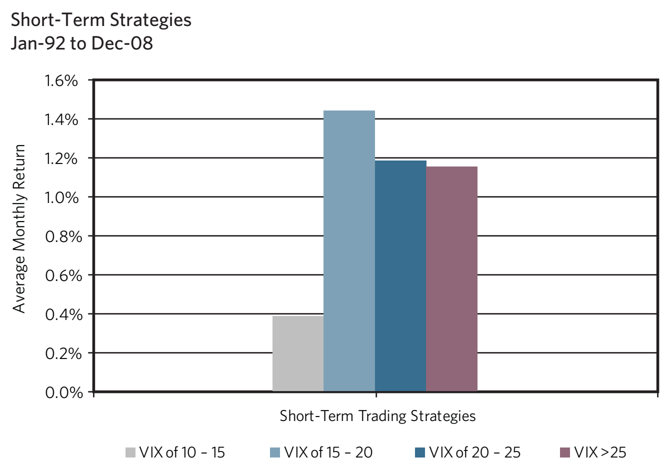
2. Invest in alpha strategies that have historically increased in value as volatility has increased. This includes Commodity Trading Advisors, short-term trading, as well as market-neutral arbitrage in sovereign bonds and corporate credit.

Commodity Trading Advisors (CTAs) are a good example of strategies that have historically done well when volatility is very high (Exhibit 11a). As pointed out by David Hsieh and William Fung, many CTAs act as trend followers — seeking to capture the majority of the upside gains of an asset's momentum, while avoiding the downside.[5] When executed correctly, such strategies have performed similarly to options, which gain value as volatility increases.[6]

Another approach during periods of volatility and illiquidity involves short-term trading strategies, such as statistical arbitrage (Exhibit 11b). These are trading systems that are typically based on daily or intraday mean reversion of stock prices. In implementation it is comparable to the role of exchange market makers, like specialists on the NYSE, who provide short-term liquidity. The specialists are, in effect, buyers and sellers of last resort, and can command a small premium relative to the current market price from those who need instant transactions. As a result, when markets are extremely illiquid, this group of strategies may earn higher compensation for taking short-term liquidity risk, and recent history appears to bear that out.

Exhibits 11a & 11b: CTAs and Short-Term Trading Strategies Often Benefit from Volatility





Source: Bloomberg, Thomson Reuters Datastream and Mellon Capital Management. Barclays Capital POINT/Global Family of Indices. ©2009 Barclays Capital Inc. Used with permission.

See index disclosure on page 12.

5 David Hsieh and William Fung, "The Risk in Hedge Fund Strategies: Theory and Evidence from Trend Followers," *Review of Financial Studies*, Summer 2001, Vol. 14 No. 2, pp 313-341.

6 Technically, it is comparable to a "lookback straddle," comprising a call that lets the owner buy a stock at the lowest price during the option's life, upon expiration of the option, and a put that lets the owner sell a stock at the highest price during the option's life, upon expiration of the option.

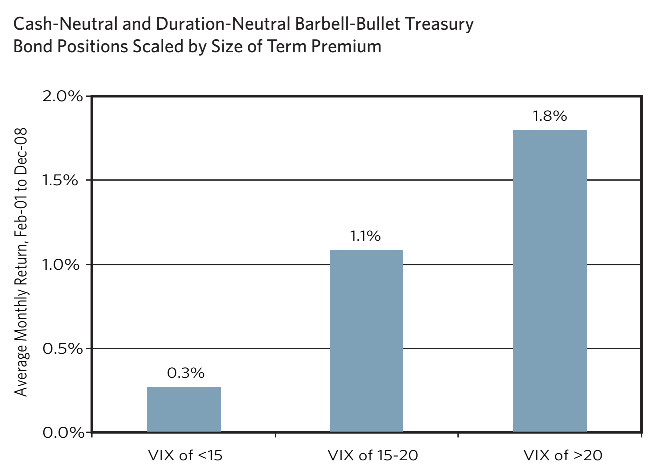
Market neutral strategies also have the potential to thrive in volatile environments. These strategies seek to exploit short-term dislocations in the market.

Market neutral strategies also have the potential to thrive in volatile environments. These strategies seek to exploit short-term dislocations in the market by establishing long and short positions in assets belonging to the same sector, based on their value relative to each other. One promising application we have observed is in sovereign bond arbitrage. In this approach, the manager looks for relative value along the yield curve — say of 2-year, 5-year and 10-year maturities. The manager establishes short positions in maturities deemed to be overvalued, and long positions in undervalued ones, weighting them to be duration neutral i.e., unaffected by interest rate moves. The strategy is designed to profit if and when the relative valuations of long and short positions tighten. In a volatile environment, intra-sector dislocations among asset classes tend to get larger, as market participants flock to one favored part of the sector, such as the flight to short-term U.S. Treasury bonds during the panic. We believe such an environment would present greater opportunities for this strategy.

Our analysis of sovereign bond arbitrage from February 2001 to December 2008 shows that monthly returns were not only positive on average but also improved as volatility rose, contrary to the behavior of most risky assets (Exhibit 12). When volatility was low (i.e., the VIX Index was less than 15) returns were modest but positive. As the VIX rose, returns became significantly and progressively more positive.

We examined a similar market neutral approach with corporate bonds, using CDS as proxies for them, and found interesting results. We evaluated the attractiveness of the bonds in terms of fair value and ranked them in quintiles. We used the highest-ranked quintile to select groups of CDS to buy, and the lowest ranked group for CDS to sell, in order to assess the performance of this methodology. Our analysis showed results very similar to sovereign bond arbitrage. The back-tested monthly returns were not only positive on average but also improved as volatility rose (Exhibit 13).

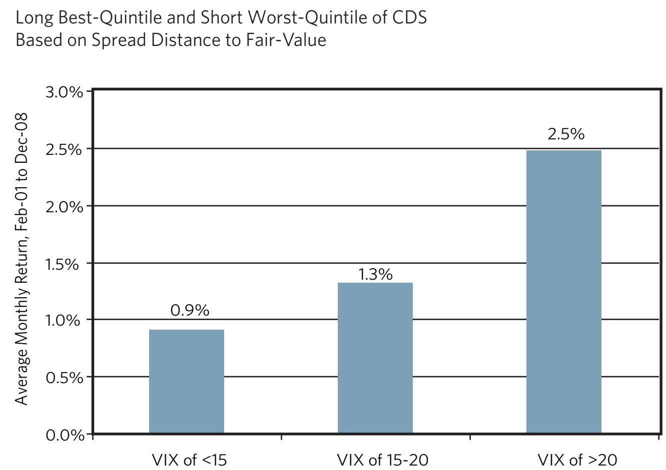
Exhibit 12: Returns Actually Rose with Volatility in a Sovereign Bond Arbitrage Approach



Source: Bloomberg and Mellon Capital Management. See index disclosure on page 12.
Past performance is no guarantee of future results. Actual results will vary.

Alpha strategies become beta because they are successful and are copied, as was notably the case with equity market neutral in August 2007. True alpha represents skill that is unique, proprietary and always evolving.

Exhibit 13: Returns also Rose with Volatility in a Corporate Bond Credit Spread Arbitrage Approach



Source: Bloomberg, Markit Group and Mellon Capital Management. See index disclosure on page 12.

We wish to acknowledge that readers may be skeptical of alpha strategies. Such skepticism is indeed warranted, considering that we have just described how many alleged alpha-producing hedge funds were instead relying on beta strategies, which largely failed as diversifiers. We offer four related points to address these issues.

- **Alpha is difficult to produce.** Our analysis of hedge fund alpha and beta uses a very broad brush, drawing inferences through attribution analysis at the macro level. Our analysis in no way proves or suggests that some managers are not generating returns through alpha (via hedge funds or other vehicles), just that a relatively small number actually do so.

- **Alpha is difficult to maintain.** Alpha strategies become beta because they are more successful and are copied, as was notably the case with equity market neutral in August 2007. True alpha represents skill that is unique, proprietary, and always evolving. For example, profitable sovereign bond market neutral strategies will likely look different two years from now, requiring managers to adapt and innovate.

- **Alpha needs to be diversified.** A strategy that performed as hoped in earlier crises may not do so in the future. After the post-Lehman meltdown, we now know how rapidly financial system "brushfires" can spread in any given direction. (Most hedge fund alpha returns were indeed negative in the post-Lehman meltdown, albeit by much smaller amounts than the beta returns — Exhibit 8.) Thus, several unique alpha sources are required — a point closely related to the one above.

- **Investors must adapt and understand.** Only ongoing due diligence can assess a manager's capability to produce alpha — not the label "hedge fund" or any other classification.

3. Invest in active strategies that exploit beta returns and seek to limit downside by cutting beta exposure at the right time.

A third way to potentially manage event risk is to reduce exposure appropriately after entering a prolonged high-volatility environment. Of course, a key challenge to this approach is determining if the volatility will be prolonged, which is very difficult judging by the level of volatility alone. As a result, managers such as ourselves are continually researching ways to interpret stress events. For example, generally, it paid to invest into the market dislocation caused by September 11 (based on current market conditions). The market decline after the subprime mortgage failure was more pronounced and prolonged than that of September 11, but the bounceback of the markets in 2009 illustrates the dangers of trimming risk exposure too sharply for too long.

The alpha strategies we have discussed represent promising hedges, but they should be viewed as complementary to a manager's overall ability to manage risk.

The alpha strategies we have discussed represent promising hedges, but they should be viewed as complementary to a manager's overall ability to manage risk. Entering economic downturns, equity prices tend to fall ahead of earnings estimates as market sentiment weakens. Similarly, prices tend to increase in advance of actual earnings improvements, as we appear to be witnessing in this year's rally. A typical valuation-driven TAA strategy is usually not able to anticipate such changes and adjust risk weightings accordingly. As with any major market episode — on the upside or downside — the post-Lehman meltdown has provided a wealth of new data, and new perspectives on the evolution of the global markets. Managers are now using the lessons from the financial crisis to refine TAA models, including signals that seek to anticipate expectations of future economic growth.

Conclusion

The post-Lehman meltdown exposed flaws in traditional diversification techniques to the extent they failed to protect against systemic risk. Our research indicates that the primary cause of the devastating losses in 2008 was heavy reliance on traditional and alternative betas to generate returns. This was true of many hedge funds, based on our analysis of the HFRI Fund Weighted Composite Index, which seemed to have relied largely on static beta factors.

We offer three potential approaches to portfolio construction in order to achieve true diversification: passive investments in relatively safe haven assets like sovereign bonds; alpha strategies that have historically done well in extremely volatile markets; and management that tailors risk exposure in tune with the financial and economic environment.

Above all, investors should understand that alpha is scarce and sometimes subject to market and economic dislocations. We must exercise ongoing due diligence to ensure that it is robust and durable. And of course, there can be no guarantee how any strategy or investment will perform in the future.

Michael Ho

As Chief Investment Officer of Mellon Capital, Michael Ho provides management oversight and strategic leadership for all of the firm's portfolio management, trading and research groups. With 19 years of investment experience, Michael's responsibilities encompass all domestic and international equity, fixed income, asset allocation, and derivative strategies.

Michael began his career at Mellon Capital in 1996 as a leader in the research team. Prior to his current tenure at Mellon Capital, he served as Chief Investment Officer of Marcuard Family Office AG in Zurich and founder and Chief Investment Officer of Kevian Capital Management. Michael has a B.S. from UCLA and an M.S. and Ph.D. from Stanford.

Successful use of hedging strategies is subject, e.g., to the ability of the investment manager to ascertain the appropriate correlation between the securities being hedged and their related price movements. In short sale transactions, a Fund sells a security it does not own in anticipation of a decline in the market value of the security. Short sales may be made to hedge positions or to enhance returns and can result in losses when the short seller becomes obligated to “cover” and purchase the security at a lower price.

The Markit iBoxx USD Liquid High Yield Index consists of 50 liquid USD high yield bonds, selected to represent the broader U.S. dollar high yield corporate universe, including bonds with a minimum of $200 million outstanding and a maximum age of five years. The S&P GSCI® is a composite index of commodity sector returns representing an unleveraged, long-only investment in commodity futures that is broadly diversified across the spectrum of commodities. The returns are calculated on a fully collateralized basis with full reinvestment. The Dow Jones REIT Composite Index is a total return index containing all the publicly traded U.S. REITs in the Dow Jones U.S. stock universe. The MSCI Europe, Australasia, Far East (EAFE) Index is an unmanaged market-value-weighted index of more than 1,000 securities issued by foreign companies.

The Merrill Lynch All-Convertibles Index is an unmanaged index of approximately 700 U.S. convertible securities, including bonds of all qualities. The CAC 40 is a capitalization-weighted index of the 40 most significant values among the 100 highest market caps on the Euronext Paris exchange, and considered broadly representative of French equities. The Dow Jones EURO Stoxx 50 Index, is a representation of stocks from 12 Eurzone countries:, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain. The DAX is a blue chip stock market index consisting of the 30 major German companies trading on the Frankfurt Stock Exchange, with prices are taken from the electronic Xetra trading system. The Topix 100 Index and Nikkei 225 Index track major issues on the Tokyo Stock Exhange, and are a widely used proxies for performance of Japanese equities. The FTSE 100 Index, tracks major issues on the London Stock Exchange, and is a widely used proxy for performance of U.K. equities. The VIX is the ticker symbol for the Chicago Board Options Exchange (CBOE) Volatility Index, which is constructed using the implied volatilities of a wide range of S&P 500 index options, and shows the market’s expectation of 30-day volatility. The HFRI Fund Weighted Composite Index is an equally weighted composite consisting of more than 2000 funds with either $50 million under management or a track record of greater than 12 months, designed to be broadly representative of the hedge fund universe. The Barclays CTA Index represents unweighted performance of 488 commodity trading advisors (in 2009), including CTAs with at least four years of performance history.

The S&P GSCI® is a composite index of commodity sector returns representing an unleveraged, long-only investment in commodity futures that is broadly diversified across the spectrum of commodities. The returns are calculated on a fully collateralized basis with full reinvestment. The S&P GSCI® Energy Index is a component of the full S&P GSCI® Index, representing about 71% of its value as of November 2009. The S&P GSCI® Non-Energy Index is a component of the full S&P GSCI® Index, representing about 29% of its value as of November 2009. The Dow Jones-UBS Commodity Index (DJ-UBSCI) is designed to be broadly representative of the commodities market, comprising 19 commodities that qualify according to liquidity and production criteria. The equal weighted long-only index is a monthly-rebalanced, equal-weighted index consisting of up to 24 exchange-trade commodity futures, compiled by Mellon Capital Management.

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Indices are unmanaged, are not available for direct investment, and are provided for illustrative purposes only. Comparisons to these indices have limitations because they have volatility and other material characteristics that may differ from the managed portfolios. Also, performance results for some of the indices do not reflect payment of investment management/ incentive fees and other expenses you may incur in managed portfolios. Because of these differences, investors should carefully consider these limitations when evaluating the performance data provided herein.

Past performance is no guarantee of future results.

Asset allocation and diversification do not ensure a profit or protect against loss.

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Hamon Investment Group
Insight Investment
Mellon Capital Management Corporation
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Pareto Investment Management Limited
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