



C A M B R I D G E A S S O C I A T E S L L C

SURVIVING THE BEAR MARKET: AN INVESTOR'S GUIDE

2008

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ABSTRACT

During prolonged bear markets, investors naturally focus on how best to allocate portfolio assets to ensure they are not wholly exposed to the full brunt of declining equity prices. However, as the economy deteriorates and the financial sector in particular suffers declining revenue and job losses, investors should also consider whether they have increased exposure to operational and financial risks. What follows, while by no means exhaustive, is a guide to six strategies for survival, targeting the main trouble spots investors should evaluate in case the market environment continues to deteriorate.

Six Strategies for Surviving the Bear Market

Strategy #1: Rebalance. Rebalancing is essential in the current environment, as it reduces risk by preserving diversification. In volatile markets, rebalancing policies provide a disciplined way to buy low and sell high, which can be difficult to do, as it requires selling stars and loading up on slackers. You should rebalance with an eye to maintaining desired *exposures*. Maintaining weights to individual asset classes is not as important as maintaining weights to the core exposures that have fundamentally different roles in portfolios, such as hedges against the macroeconomic risks of deflation or unexpected inflation.

Strategy #2: Manage and monitor portfolio liquidity. A relatively high degree of portfolio illiquidity, combined with the potential for rough seas ahead, suggests that investors should make sure that they have adequate liquid assets to navigate through periods of high market stress. If you have a low allocation to liquid investments that typically perform relatively well during such downturns you may find you need to sell equities at depressed prices to support liquidity needs. You can tolerate a higher degree of illiquidity if you pay close attention to cash flow management, by knowing and proactively managing the sources of portfolio liquidity and the demands on that liquidity, and if you develop a plan for addressing asset allocation when that liquidity is taxed.

Strategy #3: Evaluate hedge fund managers' procedures for managing (a) liquidity funding risk (i.e., risk of needing to sell assets to meet liquidity needs such as margin calls or client redemptions), (b) prime broker exposure, and (c) counterparty risk. The best managers with conservative leverage practices and strong risk management and operational skills should be able to survive, while the challenges of the current environment will certainly take their toll on less skillful managers and those that rely primarily on leverage to produce competitive returns.

Strategy #4: Invest cash conservatively. Rather than take risk in cash investments, where the opportunity for gain is relatively limited and the risk assumed is often at odds with cash portfolio objectives, we recommend that you size cash allocations appropriately and take more risk in other parts of the portfolio where the risk/reward ratio may be more appealing.

Strategy #5: Ensure that fixed income portfolios are implemented as appropriate to meet your objectives. For example, a bond portfolio designed to hedge against the risk of a malign economic

contraction must be invested in high-quality bonds free of call, credit, and counterparty risk. Only portfolios designed to meet diversification or return enhancement objectives should incur these risks. However, it is particularly important to evaluate how well managers investing in credits and credit derivatives have been able to navigate the environment. Adequate due diligence and monitoring should be maintained to understand managers' skills and risk controls, particularly as they relate to evaluating credit and counterparty risk. Experienced managers will be best able to take advantage of opportunities and avoid such "value" traps.

Strategy #6: Participate in securities lending programs only if the collateral is managed conservatively with an eye to principal protection. Participants in securities lending programs generally regard them as a low-risk means to earn a small return that can cover or defray custody costs without altering the investment characteristics of their portfolio. While this may be true, custodians have an incentive to maximize the return of the cash collateral pool, while the lender (i.e., the investor participating in the securities lending pool) bears the full risk of principal loss. Therefore, you should only participate in such securities lending arrangements if your due diligence provides adequate comfort that collateral will be managed conservatively with an eye to principal protection.

SUMMARY

Introduction

During prolonged bear markets, investors naturally focus on how best to allocate portfolio assets to ensure they are not wholly exposed to the full brunt of declining equity prices. However, as the economy deteriorates and the financial sector in particular suffers declining revenue and job losses, investors should also consider whether they have increased exposure to operational and financial risks. What follows, while by no means exhaustive, is a guide to six strategies for surviving the bear market, targeting the main trouble spots you should evaluate in case the market environment continues to deteriorate.¹

1. Rebalance with an eye to maintaining desired *exposures*, in contrast to asset values.
2. Develop a proactive game plan for managing and monitoring portfolio liquidity and cash flow needs.
3. Evaluate hedge fund managers' procedures for managing liquidity funding risk (i.e., risk of needing to sell assets to meet liquidity needs such as margin calls or client redemptions), prime broker exposure, and counterparty risk.
4. Invest cash conservatively and size cash allocations appropriately.
5. Ensure that fixed income portfolios are implemented as appropriate to meet your objectives. For example, a bond portfolio designed to hedge against the risk of a malign economic contraction must be invested in high-quality bonds free of call, credit, and counterparty risk. Only portfolios designed to meet diversification or return enhancement objectives should incur these risks.
6. Participate in securities lending programs only if the collateral is managed conservatively with an eye to principal protection.

#1: Rebalance—Maintain Desired Exposures

Rebalancing is essential in the current environment, as it reduces risk by preserving diversification. In volatile markets, rebalancing policies provide a disciplined way to buy low and sell high, which can be difficult to do, as it requires selling stars and loading up on slackers. Since rebalancing can trigger regret if the assets sold continue to appreciate while those bought underperform, investors must commit to a disciplined regime. Rebalancing can also be challenging when portfolios contain relatively illiquid assets that cannot be easily acquired or sold.

What to rebalance? While it is always important to rebalance assets across the portfolio, the most important goal of rebalancing should be to maintain desired *exposures*. We use the word *exposures*, rather than asset classes, to emphasize that, to a large extent, maintaining weights to individual asset classes is not as important as maintaining weights to the core exposures that have fundamentally different roles in portfolios. For example, although it is certainly worthwhile to rebalance to maintain target allocations to U.S. equities and global ex U.S. equities, it is more important from a risk management perspective to maintain exposures to inflation-hedging and deflation-hedging assets, or even more specifically to maintain desired deflation and inflation “betas.” If a portfolio includes a range of inflation-hedging assets, and the value of

¹ Portfolio risk management is another significant area that is important in surviving the bear market. This topic is beyond the scope of this paper and will be covered in a research report scheduled for publication at the end of this year.

upstream oil & gas partnerships fell, that would have a greater impact on the inflation-hedging capabilities of the portfolio than if, say, the REIT portfolio decreased by an equal amount, since REITs have a very low (if any) inflation beta, while oil & gas partnerships have relatively high inflation betas.

Similarly, you should also rebalance among high-quality and low-quality assets² to ensure you do not become prematurely overweight the latter. Indeed, we have advocated overweighting high-quality assets such as mega-cap stocks, large-cap growth stocks, and high-quality bonds, and underweighting small-cap equities, emerging markets, and strategies incorporating a high degree of leverage. As the credit cycle advances and low-quality assets of all sorts become cheap, you should gradually take advantage of these opportunities, but for now we would recommend only limited exposure to such “value” plays.³

Finally, as illiquid or semi-liquid assets cannot be easily rebalanced, you may need to rebalance illiquid assets by altering allocations to the closest marketable substitute. For example, in late 1999 through early 2000, many investors were overweight venture capital in their portfolios. As they could not sell these illiquid positions, many chose to rebalance by reducing allocations to small-cap growth managers. Similarly, today you could rebalance any excess exposure to buyouts by reducing your allocations to value, or your exposure to private real estate by selling REITs, and so on.

Rebalancing exposures is not an exact science, as exposures are unstable, difficult to measure, and often cut across multiple asset classes (e.g., natural resources exposures can be found in equities, commodities, and diversified real asset allocations). Consequently, any attempt to quantify exposures incorporates a sizeable degree of estimation error. Nonetheless, thinking in these terms is constructive since the primary purpose of any rebalancing regime is risk management and precision is less important than persistence in sticking to whatever rule one has chosen (Exhibit 1).

It should be noted, however, that rebalancing does not come without a cost, and that all rules entail some trade-off between accepting tracking error relative to target exposures and higher transaction costs (Exhibit 2). For example, an investor with a relatively diversified portfolio that earns market returns, spending 5% of a 12-quarter moving value of beginning period assets, and rebalancing only through spending cash flows, would have experienced a relatively high degree of tracking error over the roughly 17-year period shown in Exhibit 2. However, using spending cash flows to rebalance *and* rebalancing when market values fell outside of the prescribed ranges nearly cut the tracking error in half while producing a relatively modest amount of turnover.⁴ Cash flows should be used to move investors toward desired exposures, while further rebalancing should be considered relative to the cost of moving to targets.⁵ As a

² For more information on quality equity investing, please see our respective May 2008, June 2007, and August 2006 Market Commentaries: *Quality: A Closer Look*, *U.S. Value Stocks Moving Out of the Markdown Aisle*, and *The Unloved Mega-Caps*.

³ For a more in-depth discussion of our market outlook and asset allocation advice, see our April 2008 Market Commentary *The Eye of the Storm*.

⁴ Turnover excludes that incurred to support spending, focusing solely on the impact of rebalancing. Turnover is a useful proxy for the cost of rebalancing, as commissions for the purchase and sale of assets are asset-based fees. In general, the greater the turnover, the higher the rebalancing cost.

⁵ For a more complete discussion of rebalancing, please see our 2004 report *Rebalancing*.

final note, we would point out that rebalancing in volatile markets requires close oversight, as markets can move sharply, rapidly changing rebalancing needs.

#2: Portfolio Liquidity—Measure, Monitor and Proactively Manage

Long-term investors have always recognized that markets will generally (but not always) pay them a premium for locking up assets. Moreover, some attractive investment opportunities are available only in structures that require long-term lock-ups due to the illiquidity of the underlying investments. However, managing and monitoring your liquidity needs becomes increasingly important in periods when market volatility is high, since market sectors that are highly liquid under normal conditions can become illiquid overnight.

Consequently, if you have significant allocations to illiquid investments, we would recommend that you stress test your impending cash flow requirements to ensure that you will have adequate liquidity to navigate any rough seas ahead. If you have low allocations to liquid investments that typically perform relatively well during such downturns (e.g., intermediate to long-duration Treasuries, which historically have tended to benefit most from a flight to quality, and liquid or income-producing inflation-hedging assets that tend to do well in periods of unexpected inflation) you may find you need to sell equities at depressed prices to generate cash. You can tolerate a higher degree of illiquidity if you pay close attention to cash flow management, by knowing and proactively managing the sources of portfolio liquidity and the demands on that liquidity, and if you develop a plan for addressing asset allocation when that liquidity is taxed.

Know the Layers of Liquidity in the Portfolio

To gain a clear understanding of portfolio liquidity, you should monitor the liquidity of portfolio assets on an ongoing basis, keeping track of assets that are liquid (i.e., daily/weekly liquidity), semi-liquid (i.e., available quarterly or annually, often after an initial lock-up period), and illiquid (i.e., only accessible through distributions over time as the partnership matures or through sales in the secondary market). While difficult to estimate, such analysis should also include expectations for distributions from non-marketable alternative managers. You should maintain a liquidity schedule so you know when you can access your funds from which managers, if and by when advance notice must be given, and when cash from redemptions will become available. With regard to hedge funds, additional considerations include how much of the portfolio's hedge fund assets are inaccessible because they are subject to lock-up provisions or are invested in illiquid side pockets and how much will be held back in a redemption until after the final audit (usually 10%). Manager liquidity availability should be aggregated to allow an understanding of total portfolio liquidity over time (Exhibits 3 and 4).

Further, you should review how these sources of liquidity might change in a difficult market environment, as lower-quality liquid assets or assets with an inherent funding mismatch (e.g., asset-backed commercial paper, auction-rate securities) may become relatively illiquid, or may be liquid only at depressed prices. At the same time hedge funds that offer periodic exits typically have gating provisions that limit

redemptions if too many investors request assets be redeemed at the same time. Consequently, you should consider not just liquidity under normal market conditions, but how it might diminish in a severe market environment. You should also consider the degree to which use of assets may be constrained in difficult environments. For example, endowment investment pools are actually an aggregation of many endowments, some of which may be restricted. For institutions with relatively low levels of unrestricted assets, attention should be paid to the various sub-pools as part of a liquidity analysis.⁶

Estimate Liquidity Needs

Cash flow management should also incorporate a thoughtful estimation of liquidity needs going forward. For most investors, liquidity needs relate primarily to meeting spending requirements and capital commitments for non-marketable alternative investments. However, liquidity may also be desirable to serve as dry powder to take advantage of investment opportunities that may arise as deep-value opportunities gradually become available throughout a difficult market environment.

In evaluating liquidity needs, you should assess how spending might be curtailed, if at all, during a prolonged downturn. Would you need to keep spending at the current nominal level or would you have flexibility to cut back spending until the environment improved? Most institutions find spending cuts excruciating at any time, and many find it virtually impossible to cut nominal dollar spending, seeking instead to maintain at least the nominal level of distributions, even at the expense of their funds' purchasing power. When spending is sustained in a bear market, impairment of purchasing power can be significant, as shown rather powerfully in the 1970s.⁷ As such, a contingency plan should be laid out in a relatively calm environment, well in advance of any crisis, in order to allow clear and reasoned debate of the options.

Further, in estimating cash flow requirements to support a non-marketable alternatives program, you should consider how expectations may change under adverse conditions. While a mature non-marketable program is typically cash flow positive, in a severe bear market distributions could shrink such that capital calls exceed distributions. It would not be unusual for distributions to dry up even as managers continue to call capital to invest in new opportunities (possibly after a brief hiatus).

⁶ U.S. nonprofit institutions should consider restrictions on payout of gifts related to the Uniform Management of Institutional Funds Act (UMIFA), which requires preservation of the historic dollar value of individual gifts (although some state Attorney Generals interpret the law to relate to the aggregate value of gifts), and the Uniform Prudent Management of Institutional Funds Act of 2006 (UPMIFA), which for states that have adopted the law replaces UMIFA. UPMIFA eliminates the concept of preserving the historic dollar value of individual gifts, and instead requires that investors maintain a holistic approach to prudent management at the portfolio level, requiring preservation of the purchasing power of additions to the fund in the aggregate. Institutions should consult counsel to determine specific state requirements.

⁷ This was conspicuously true in the last secular bear market, in the 1970s, when most institutions were unwilling to reduce the nominal value of their spending and overrode their own spending rules, severely impairing endowment market values that had already been hammered by the bear market. For a discussion of spending considerations in a bear market, please see our 2002 report *Endowment Spending in a Bear Market*.

Review Other Sources of Liquidity

You should also evaluate the degree to which you have access to other liquidity sources through fund raising and/or your debt capacity if appropriate, such as a committed line of credit.⁸ However, institutions should also recognize that gifts, government funding, and other revenue sources tend to be highly correlated with investment returns during times of stress and could significantly diminish, causing further liquidity strains during a difficult market environment.

The Impact of a Bear Market on Liquidity: A Hypothetical Example

In order to think through the potential impact of a bear market on portfolio liquidity, consider the following illustrative example of the effects of a three-year severe market downturn on an institution with an endowment of \$500 million. This institution has invested 15% (\$75 million) in non-marketable alternatives (broadly defined to include venture capital, buyouts, private real estate, oil & gas partnerships, timber, etc.), 20% (\$100 million) in marketable alternatives, and 65% (\$325 million) in a diversified assortment of liquid assets (e.g., traditional marketable stocks and bonds). This allocation is roughly the average of the 157 portfolios in our database with at least 5% of their assets in non-marketable alternatives as of December 31, 2007. To keep the analysis straightforward, we make the following simplifying assumptions that affect the specific results, but do not alter the conclusions:

- The institution maintains a nominal annual spending level equal to 5% of beginning of period assets, or \$25 million each year. Spending occurs at the end of each year.
- The portfolio experiences an average annual compound return (AACR) of -3.5% a year, or a cumulative return of just over -10%. We selected this return as it is sufficiently severe to provide a reasonable stress test, but not so extreme that it sheds doubt on the validity of the exercise.⁹ The experience is roughly a once in 40 years event (i.e., a 2 standard deviation event) for a portfolio with an expected nominal return of 8% to 9% and a standard deviation of 10 to 11—not uncommon for reasonably diversified portfolios using the risk, return, and correlation assumptions we have developed for long-term modeling purposes. In addition, since severe returns occur more often than a normal (or log-normal) distribution of returns would suggest, we look at the impact of performance twice as severe, -7% a year, or a cumulative three-year return of nearly -20%.
- Net capital requirements are reviewed under three scenarios. First we assume that the portfolio is self-funding and capital requirements are equal to distributions. Next we assume that distributions dry up, but capital calls continue. In this scenario, the portfolio has uncalled commitments equal to 50% of the beginning period net asset value of the non-marketable program, or \$37.5 million, and that capital is called over three years, requiring \$12.5 million a year. Finally, we assume that distributions at least partially fund capital requirements such that net capital requirements are between \$10 million and \$20 million (\$3.3 million and \$6.6 million annualized) over the three-year period.

⁸ U.S. nonprofit institutions should recognize that use of a line of credit may generate UBTI.

⁹ For example, a -10% return is comparable to the performance experienced by many diversified investors during the severe bear market of 2000–02.

- All cash flow needs are sourced, pro rata, from liquid and semi-liquid assets. No gifts are available to support spending.
- Cash flow coverage ratios reflect the liquid and semi-liquid assets available in year four to cover spending requirements of \$25 million.

In this scenario, the -3.5% AACR would result in the \$500 million portfolio shrinking to \$376 million at the end of three years after spending. The illiquid portion would have increased from 15% to 18% at the end of the period, leaving \$309 million to support \$25 million in spending the following year—a comfortable coverage ratio of 12.4 times cash needs, assuming that the portfolio is truly liquid. In practice, we would be able to look through a specific marketable alternative program to determine what proportion is actually illiquid and reflect this in the analysis accordingly.

If we also assume that the non-marketable alternatives program is no longer self-funding, but instead provides no distributions and requires \$12.5 million to meet capital calls in each of the three years, the illiquid assets would increase to 27.5% of assets, significantly higher than the original allocation of 15%, but still leaving \$273 million in liquid and semi-liquid assets to cover the \$25 million spending requirement in year four, a coverage ratio of 10.9. Should distributions offset a significant percentage of capital requirements such that \$10 million to \$20 million (\$3.3 million to \$6.6 million annualized) in net commitments is needed over the three-year period, the illiquid assets would only increase to between 20% and 23% of the portfolio at the end of the three years, leaving liquid and semi-liquid assets providing cash flow coverage of between 11.6 times and 12.0 times for the \$25 million spending in year four, still a very comfortable margin.

Even if the entire 20% allocation to marketable alternatives turned out to be relatively illiquid, the portfolio would have nearly 9 times coverage for the \$25 million in spending, leaving plenty of room to make any needed additional capital commitments. Exhibit 3 provides a sensitivity analysis of this scenario to show how cash flow coverage ratios change with cash flow needs and portfolio illiquidity assuming the portfolio experienced a three-year AACR of -3.5% and -7.0%. For both return scenarios, liquidity coverage ratios are driven primarily by the initial size of the allocation to illiquid assets and the cash flow needs. For example, a portfolio with 60% in illiquid assets that has annual cash flow needs of \$35 million would have cash flow coverage of just 2.2 times following a three-year bear market with an AACR of -3.5%, and 1.8 times following a three-year bear market with an AACR of -7.0%.

While Exhibit 3 does not show much diminution in liquidity availability in the more severe return scenario, the real impact of more severe returns would likely be seen in a reduction in the percentage of portfolio assets that are truly liquid, as we have seen time and time again that liquidity can dry up rapidly in a severe market decline. Cash flow management gets increasingly challenging as coverage ratios decline, particularly if the liquid portion of the portfolio includes relatively low-quality or leveraged investments that are subject to further decline and potential illiquidity in this sort of market environment. Such changes to the liquidity profile of a portfolio raise the risk that equities will need to be sold at depressed prices to support liquidity needs, which could cause the portfolio to have a higher allocation to illiquid assets for years after the bear market ends, as equities that would have appreciated sharply in a recovery have been sold to raise

cash. This hypothetical example demonstrates that it takes quite a bit of illiquidity, combined with high cash flow requirements, to cause significant cash flow constraints. However, well before liquidity becomes constrained, asset allocation can become distorted, as more and more assets are locked up in illiquid investments.

Sharp declines in the value of a portfolio will necessitate tough choices in regard to new commitments to non-marketable alternative assets. Investors wishing to keep a steady pace of vintage year diversification may find themselves with a higher than comfortable level of future commitments versus their new, lower, portfolio value. This would then require cutting back the size or pace of new commitments in a time when such commitments might be most attractive. Further, it could take several years for such cuts to result in lower non-marketable allocations.

In sum, you should be proactive in analyzing your cash flow needs and sources, consider how these might change in severe environments, and engage in advance planning to find the best means to meet upcoming cash requirements. For institutions that are able to reduce their liabilities (e.g., spending requirements), that would choose to (and could) reduce non-marketable alternative commitments, that have available debt capacity, and/or that have revenue sources outside of their portfolio to support cash flow needs that they expect to continue in a high-stress market environment, liquidity concerns would be lessened, allowing for a higher percentage invested in illiquid assets.

#3: Hedge Funds—Focus on Management of Liquidity, Prime Broker and Counterparty Risks

It is critical that hedge fund managers (and other leveraged investors) maintain rigorous and thoughtful operating and risk management procedures.¹⁰ While our process for evaluating managers is intended to be appropriate for all environments, the nature of our focus often shifts to address areas of particular concern as conditions change. Today we have been placing increased emphasis on the following three risks: liquidity funding risk (i.e., risk of needing to sell assets to meet liquidity needs such as margin calls or client redemptions), prime broker exposure, and counterparty risk.

Liquidity Funding Risk

The fundamental principles of our manager selection process have helped us limit our clients' exposure to hedge fund managers and strategies that have proved toxic in periods of financial distress. As we noted in our 2007 marketable alternatives report *Hedge Funds: A Framework for Making Strategy Allocation Decisions*:

¹⁰ For additional useful guidance on evaluating hedge funds, see *Principles and Best Practices for Hedge Fund Investors*, "Report of the Investors' Committee to the President's Working Group on Financial Markets," April 15, 2008. *Sound Practices for Hedge Fund Managers* by the Managed Funds Association also provides best-practice recommendations for hedge fund managers.

A core tenet of our approach to strategy allocation has always been to evaluate the ROA [return on assets] in various hedge fund strategies without any consideration for the “leverage-ability” of those strategies. For example, we have historically avoided strategies (such as global fixed income arbitrage) where managers are forced to gear a low ROA into a high ROE [return on equity] in order to satisfy investor expectations. Similarly, a core tenet of our approach to manager evaluation has always been to focus on the quality of earnings generated by managers, which includes a careful analysis of the leverage used to generate returns.

Furthermore, we generally favor hedge fund strategies that use proprietary, fundamental research, incorporating valuation-driven analysis. We must have adequate transparency to understand what inefficiencies managers are seeking to exploit in a given strategy, how they seek to benefit from those inefficiencies, and whether the process is sustainable. While liquidity considerations are important for all investors (particularly those who are leveraged), they can make or break hedge funds, as evidenced by the recent failures of several prominent managers. Liquidity is needed for a wide variety of reasons, including meeting margin calls, making payments to creditors, meeting investor redemption requests, making trades, and maintaining flexibility to add to positions when market stresses present trading opportunities.

When levered hedge funds are forced to raise cash by liquidating positions, the results can be disastrous, particularly when multiple funds with similar positions must unwind them at the same time. Sale of positions can further reduce market values of assets held, which could result in further cash requirements, both for margin calls and investor redemptions. However, leverage should be evaluated in relation to managers’ ability to handle losses. For example, a hedge fund with a relatively high degree of balance sheet leverage, but solid access to credit and a stable capital base, may have less risk of forced selling of assets to meet margin requirements than would a less levered hedge fund that has less access to credit and more liberal redemption procedures.

There are a variety of ways to manage liquidity needs, and no particular solution is a silver bullet for all hedge funds. Rather, there are many best practices that are appropriate for different funds facing varied circumstances. Most thoughtful hedge fund managers think very carefully about how well their assets and liabilities match. More specifically, they examine the duration of the leverage, the holding period of the assets, and the liquidity available to the limited partners in terms of redemptions, and then consider how these characteristics may change during high-stress conditions. They maintain stable access to credit, succeed in negotiating favorable terms with counterparties, and strategically manage the stability of their capital base.

Access to cash and other highly liquid assets is critical to avoid forced selling in severe markets. The best managers develop strong relationships with credit providers to help maximize the probability that credit lines will be available when needed. They are also careful to manage the terms of their debt. For example, managers with only short-term financing may be at a disadvantage relative to those with more stable financing, particularly in taking advantage of new investment opportunities that arise in periods of market volatility.

Relationships with counterparties should also be negotiated with a view to maintaining stability during market crises. For example, any ability to improve the terms of margin and haircut requirements or to receive advance notification of increases is valuable. Prime brokers' use of dynamic models, such as value at risk measurements, to set margin and haircut requirements can heighten unpredictability. Value at risk is based on many inputs, including volatility and correlations, both of which tend to increase in market downturns, leading to increases in margin requirements during periods in which liquidity may also evaporate.

Finally, managers should be attentive to the stability of their capital base such that the ability of investors to redeem investments best matches the liquidity of invested assets. Thoughtful managers set appropriate lock-up periods and gating provisions. They may stagger withdrawal dates (e.g., annual redemptions on the anniversary of the investment so they are not available for all clients at the same time) to prevent investors from requesting redemptions all at once. They think through the implications of using side letters for large investors that may materially change the asset/liability characteristics of the fund. They are also selective in building their limited partner base by seeking out stable, long-term investors that might be less likely to exit the fund after a brief period of market turbulence.

Prime Broker Risk

While the failure of a major prime broker would certainly have ripple effects of global proportions, we focus here on the direct effects on prime brokerage customers. In the event that a prime broker fails, there are some protections already woven into the global financial system intended to protect customers' assets (up to certain limits). An additional, and perhaps more worrisome, risk is that brokerage customers could lose discretion over their portfolios for weeks (or possibly longer) while the mess gets sorted out. Further, as we discuss later in the section on hedge fund counterparty risk, almost all contracts to which the failed brokerage is counterparty will be closed out, possibly leaving hedge funds with exposures that are significantly different from those intended.

Even before the rescue of Bear Stearns, most hedge funds sought to diversify their prime brokerage exposure, with very few of the managers we track using only one broker. According to a survey by the TABB Group, by early 2008, large hedge funds (more than \$3 billion in assets under management) used an average of 3.7 prime brokers; mid-sized funds (\$500 million to \$3 billion), 2.1; and small funds (under \$500 million), 1.7.¹¹ The Managed Funds Association has recommended such diversification for years, as reflected in their publication *Sound Practices for Hedge Fund Managers*.

The increase in prime broker relationships has been fueled by many factors, including the desire to access prime brokers that offer the best service (e.g., access to large securities lending pools, low execution cost) in multiple markets and/or securities, to maintain confidentiality about a hedge fund's entire book, and to negotiate better pricing. More recently, prime broker diversification has taken on renewed urgency as

¹¹ Matthew Simon and Monica Schulz, *Hedge Funds 2008: Perspectives on Prime Brokerage, Volatility and Expansion*, TABB Group, V06:009, May 8, 2008. The study is based on discussions with 61 U.S.-based hedge funds during first quarter 2008, with \$227 billion in assets under management. Roughly half of these funds had assets of at least \$1 billion under management.

stress on prime brokers related to the credit crisis, punctuated by the collapse of Bear Stearns, has served as a reminder to hedge fund managers of the risks of having only one relationship.

While there are many sound reasons for adding prime brokers, each situation should be evaluated in the context of the specific manager and strategy. For example, for some hedge fund managers moving from a single prime broker to a multi-prime-broker platform is easier said than done, as prime brokers have served important reporting, operations, and risk management functions that need to be revisited when this transition is made. However, hedge fund managers can use an additional prime broker in a limited way to establish a relationship for future flexibility.

While most hedge fund managers now use more than one, more often than not Goldman Sachs or Morgan Stanley serves as the primary prime broker. The industry dominance of two prime brokers creates a high degree of risk concentration. While it is reasonable to question whether policymakers would allow a major prime broker to fail, particularly after Bear Stearns' rescue, hedge fund managers (and investors in hedge funds) should not ignore this risk.

All major developed markets, as well as many emerging markets, have a network of laws designed to encourage investment in securities by providing some level of asset protection through a combination of safeguards and insurance. In the United States, the Securities Investor Protection Act of 1970 (SIPA) requires all U.S. regulated broker-dealers to be members of the Securities Investor Protection Corporation (SIPC), a nonprofit corporation established by SIPA to provide protections for customers in the event of insolvency of a U.S. broker-dealer.¹²

U.S. broker-dealers are required to maintain reserve bank accounts that are for the sole benefit of customers and are protected from losses due to a broker-dealer's proprietary trading activities. These accounts are subject to reserve requirements intended to make sure the broker-dealer maintains adequate assets to cover customers' net equity claims in aggregate in the event of failure. *Net equity claims of broker-dealer customers under SIPC are senior to the claims of all other general unsecured creditors.* Customers of a failed broker-dealer will receive all securities registered in their name or in the process of being registered in their name, and a pro rata share of net equity claims for customer assets registered in "street name" based on available customer property. SIPC will pay up to \$500,000 per customer to meet any net equity shortfall.¹³

In addition, many broker-dealers also obtain additional surety bond coverage from another insurance provider on a voluntary basis (e.g., the Customer Asset Protection Company [CAPCO]).¹⁴ For those broker-

¹² For more detail on SIPC and U.S. bankruptcy law protections, see, for example, *The Risks Associated with Financial Counterparties*, by Jessica L. Fainman and Lawrence V. Gelber, March 19, 2008, published on the website of Schulte Roth & Zabel LLP, or *Treatment of Customers and Financial Counterparties In Stockbroker Liquidations Under SIPA And The Bankruptcy Code*, by Henry Bregstein, et al, Katten Muchin Rosenman LLP, June 2008.

¹³ While most assets are covered by SIPC, there are important exceptions, including unregistered investment contracts, unregistered limited partnership interests, fixed annuity contracts, currency, and futures and options on commodities.

¹⁴ CAPCO Excess SIPC Surety Bonds have a one-year term, so confirmation that this protection is retained should be requested on an annual basis.

dealers without CAPCO or additional protections,¹⁵ any additional claims would be treated as general unsecured claims to be satisfied on a pro rata basis from the settlement of the broker's estate. Other countries have similar organizations with like goals, such as the Financial Services Compensation Scheme in the United Kingdom and the Canadian Investor Protection Fund.¹⁶

While protections exist, they are by no means exhaustive or fail proof, and they do nothing to address the potential for a temporary loss of control of assets. Hedge fund managers have therefore been concentrating on how to mitigate these risks in a variety of ways. Examples include thoughtful consideration of the number of prime brokers retained, continual monitoring of prime brokers' financial condition, and evaluation of whether prime brokers have retained supplemental surety bond protection in the event of insolvency. An emerging trend in the industry is for hedge fund managers to move funded long securities and excess cash from their prime brokers to custody accounts at a bank or trust company, as these accounts can be registered in the customer's name and these banks, unlike brokers, cannot rehypothecate customer securities (i.e., reuse posted collateral for purposes such as repurchase agreements, securities lending, or as collateral with a third party). Of course, before making such a decision, hedge fund managers should also factor in their ability to manage this more complex operational structure, as well as the relative ability of these financial institutions to service their accounts.

While SIPC and like organizations seek to protect the net equity of broker-dealers' customers, some securities often traded by hedge fund managers (e.g., commodities futures and options) are not covered. Consequently, thoughtful managers weigh the trade-offs of investing in such securities against the risks that protections are unavailable or relatively weak. Finally, some hedge fund managers evaluate their net exposures with each prime broker at the end of each day to examine the implications if the portfolio could no longer be traded for a period of time in the event of prime broker insolvency.

Counterparty Risk

A separate, but related, risk is counterparty risk, as prime brokers both serve as the middlemen between counterparties as well as a significant counterparty themselves. Counterparty risk is of particular concern given the explosive growth of the credit default swap (CDS) market. CDS notional value has skyrocketed to \$33.1 trillion from just under \$900 billion at the start of the decade, a substantial percentage of the \$516 trillion over-the-counter derivatives market. This rapid growth has created challenges to the infrastructure of the over-the-counter market, but significant developments have been made in recent years, as highlighted most recently by the announcement of the joint venture between the Clearing Corporation and the Depository Trust & Clearing Corporation to create a central clearinghouse for CDS.

While important infrastructure improvements have been made, the expansive CDS market may present challenges to an already weakened financial sector. As the primary sellers of CDS contracts, banks

¹⁵ As always, it is important to recognize that insurance is only as valuable as the company providing the insurance. CAPCO is collateralized by its 15 member firms. It also has a reinsurance program through two monoline insurance companies.

¹⁶ However, there are important distinctions. For example, the Financial Services Compensation Scheme covers losses due to fraud, while SIPC does not.

are on the hook to pay out on these insurance policies in the event that the underlying credits experience a specified credit event (typically bankruptcy, restructuring, or a failure to pay), yet there is no evidence these banks have set aside reserves or used loan loss provisions to cover potential losses. While banks claim to hedge their exposures, the degree to which they have done so effectively remains uncertain. Hedge funds are also major participants in the CDS market as both providers of insurance against credit events and as buyers of such protection. Sellers face the risk that they will need to make large payouts, while buyers face the risk that the protection they are counting on will not be delivered should a counterparty fail.

Hedge fund managers have a wide range of options for managing counterparty exposure. Some of the most prevalent practices include evaluating and monitoring the degree of counterparty risk in portfolios (i.e., concentration in over-the-counter, or customized, contracts, versus fully funded, or exchange-traded, securities), counterparties' creditworthiness and financial strength, and limits on the amount of allowable exposure to any one counterparty. The best hedge fund managers develop a prudent collateral management process. Some sophisticated managers use bilateral collateral arrangements instead of standard unilateral agreements. Bilateral agreements require both parties to put up collateral, providing counterparties with at least a minimum collateral value should a counterparty fail. While not every hedge fund has the negotiating power to secure bilateral counterparty agreements, they do help mitigate risk to some degree.

Further, more frequent marking-to-market of margin accounts, such as daily marking, limits the maximum exposure to one day of price movement. Of course, even maintaining one day of price exposure may result in significant loss, as it is likely that the price movement on the day of a counterparty failure would be significant. Thoughtful hedge fund managers also reflect on how their exposures would be modified should a brokerage firm serving as a counterparty fail, as derivatives contracts would be closed out. For example, some hedge fund managers try to match their long and short book with each prime broker to increase the likelihood that their net exposures would be maintained.

The Importance of Manager Selection

While hedge fund managers have been facing increasing management challenges as the investment landscape has become more hazardous, hedge funds continue to serve a useful role in investors' portfolios. Manager selection is always paramount in alternative strategies, as the dispersion of returns across managers is particularly high, but in the current environment it is critical. The best managers with conservative leverage practices and strong risk management and operational skills should be able to survive, while the challenges of the current environment will certainly take their toll on less skillful managers and those that rely primarily on leverage to produce competitive returns.

#4: Cash—Stay Conservative and Size Allocations Appropriately

Just as long periods of market calm can create a perception that risks are negligible, market disruptions serve as a reminder that they are ever present and should be carefully considered. Prior to last summer, many cash managers sought out higher yields in an environment in which yields were low across the board, as credit risks were perceived to be virtually nil. Asset-backed commercial paper proved particularly attractive to such cash managers because these securities provided slightly higher yields, with much of the paper securing AAA credit ratings. When it became clear that risks were higher than the pristine credit ratings suggested, and linkages to subprime mortgages, structured investment vehicles (SIVs), and collateralized debt obligations came under scrutiny, the markets froze and many market values became impaired. Some money market sponsors (including U.S. money market mutual funds registered under Rule 2a-7 of the Investment Company Act of 1940) have had to step in to support the value of their funds, lest they “break the buck,” and a number of enhanced cash managers have chosen to take write downs on asset values or close their products.

There have also been difficulties in the U.S. tax-exempt money market arena.¹⁷ Money market funds geared toward U.S. taxable investors typically include variable-rate demand notes (VRDNs) and tender option bond floating-rate securities (TOB floaters). VRDNs compose the majority of securities in a tax-free money market mutual fund. While VRDNs and TOB floaters have not suffered any significant disruption as of this writing, VRDNs often include an insurance wrapper written by now-troubled monoline insurers, while both VRDNs and TOB floaters have raised investor concerns because they share some characteristics with SIVs. While there are some parallels, municipal securities have greater transparency, and the underlying bond assets are generally of much higher quality. There is a remote possibility that if these securities were to suffer from capital flight, say if investors concerned about monoline downgrades sought redemptions from these money market funds en masse, the put options on these securities may be exercised in quantities too large for banks to handle.

Auction-rate securities have also raised significant concerns over the last several months. While these securities are generally excluded from money market mutual funds, individual investors and corporations had invested in these securities as high-yielding cash substitutes. New issuance of auction-rate securities has ceased, but investors that purchased them as a cash substitute now find that they are largely locked into the securities, with margin loans or discounted secondary-market sales the only option for accessing the cash.

The current market environment highlights the need to exercise sound judgment in cash implementation. Investment options range from low-risk, low-cost, and low-yielding short-term government paper funds to more aggressively invested, more expensive, and higher-yielding enhanced cash strategies that seek to preserve principal, but allow for some short-term volatility. Investors holding cash to meet day-to-day operating needs, imminent capital calls, or to serve as “dry powder” to move rapidly into assets that become inexpensive due to market turmoil (e.g., distressed and deep-value investments) require a high degree of

¹⁷ For a more in-depth discussion of the municipal securities markets, see our March 2008 Market Commentary *Municipal Bonds: Waters Are Roiling*.

predictability and stability in their cash allocations; cash investments that truly have a longer time horizon (e.g., cash that serves as a buffer should cash flow needs be greater than anticipated) could benefit from taking more risk, as long as the risk is priced appropriately and is consistent with the investor's objectives.

In addition to considering liquidity and capital preservation needs, investors should also evaluate the potential for cash collateral to alter the characteristics of an investment (collateral and derivative combined performance). For example, if cash in a fully collateralized diversified commodities allocation, such as one tied to the S&P GSCI™, is invested too aggressively, the commodities exposure, which typically is intended to serve as a portfolio diversifier and inflation hedge, could become more correlated to financial assets.

Conservatively managed cash portfolios typically invest in short-term government paper, high-quality commercial paper, bank certificates of deposits, bankers' acceptances, and repurchase agreements (repos). These cash investments include an element of interest rate risk and, with the exception of AAA-rated short-term government paper, credit risk, while repos also introduce counterparty risk. Given these risks, if you choose to implement cash allocations through managers participating in these markets you should only do so if you can gain comfort with a cash manager's ability to evaluate, measure, and monitor these allocations. For example, a manager that relies primarily on ratings agencies to assess credit quality does not inspire confidence, but a manager that can answer questions about the quality of its portfolio, such as the percentage of loans (collateral) in home equity (subprime) securities that are fixed versus floating, or first lien versus second lien, indicates that the firm is doing fundamental research itself. You can also gain confidence in the liquidity of such portfolios by asking the manager such questions as: What percentage of the portfolio would you have trouble selling within a couple of business days, and would you have to accept a discount to do so?

The importance of such due diligence is obviously greater for more aggressively managed enhanced cash portfolios. Such portfolios typically include at least some allocation to the types of securities in more conservative portfolios, but will also take more credit and interest rate risk, potentially investing in some securities with maturities that exceed one year, non-investment-grade credits, emerging markets debt, and other fixed income securities that fall outside formal definitions of cash. While objectives for enhanced cash portfolios vary, they typically seek to make a modest trade-off between capital preservation and liquidity for higher yield. In contrast to money market funds that focus on maintaining market value at all times, enhanced cash managers may allow for some wiggle room. For example, enhanced cash managers may expect market values to range from \$0.98 to \$1.02 for each \$1.00 invested, with some more aggressive managers operating within a wider range of expectations.

We would not advocate taking a particularly aggressive stance in cash investments—the opportunity for gain is relatively limited and the risk assumed is often at odds with cash portfolio objectives. Rather, we would recommend that you size cash allocations appropriately and take more risk in other parts of the portfolio where the risk/reward ratio may be more appealing than that of cash. In sizing cash allocations, you should review the income sources in your portfolio—including maturing bonds, investment income, private equity or venture capital distributions, and lines of credit—as well as other sources of cash flow outside the

investment portfolio that could be used to meet liquidity needs. While cash is the “risk-free” asset, holding more cash than needed often serves as a drag on portfolios.

In sum, there are a variety of ways to implement a cash investment. First and foremost, the investment of the assets should be consistent with investment goals. As noted above, cash required to meet short-term needs or intended to serve as dry powder to fund future investment opportunities should be invested in the safest, most liquid securities. While no option is perfect, we have been emphasizing the following possibilities, all of which have their merits and drawbacks:

1. *Invest in government paper or government/agency money market mutual funds.* This is the safest option, but at today’s yields, returns may be negative on an inflation-adjusted basis, particularly for taxable investors after taxes are taken into account. For example, as of June 30, 2008, three-month U.S. T-bill yields were 1.90%.
2. *Choose conservatively run money market funds.* Given that “prime” funds offer significantly higher yields than do T-bills as of this writing, we would also recommend investing in conservatively managed funds, offered by financially sound sponsors, provided that the yield spread is wide enough to compensate for the incremental additional risk taken on a net-of-fee basis. Funds with low management fees have generally been able to offer competitive yields without purchasing higher-risk assets such as asset-backed commercial paper. For eligible US\$-based investors (both taxable and tax exempt), money market mutual funds registered under Rule 2a-7 of the Investment Company Act of 1940 and offered by established money management firms provide the added security that the firm would step in to sustain the value of the funds should any difficulties arise in order to maintain their reputation in the industry. For non-U.S. investors that do not have access to 2a-7 funds, the most conservatively managed cash vehicles are generally short-term investment funds or liquidity funds seeking to maintain a rating of AAA from the credit agencies. While the AAA rating provides no guarantee that such funds will hold their value, such managers will usually follow more predictable and conservative strategies than will funds that have a lower or unrated status.
3. *Add yield through liquidity/interest rate risk as appropriate.* Investors may choose to take on some interest rate risk and invest further out on the yield curve for cash that truly has a longer-term horizon. For example, in the United States as of June 30, 2008, six-month U.S. T-bills yielded 27 basis points (bps) more than three-month T-bills, while two-year Treasuries add an additional 46 bps of yield.

While these strategies represent our best ideas for the current environment, we recognize that each situation is different. Some cash managers with more aggressive mandates have held up well, and we see no reason to terminate such managers as long as they meet your objectives in terms of capital preservation and liquidity. Otherwise, we would move to a more conservative, liquid strategy, such as those outlined above. However, should an existing cash manager have a material degree of written-down securities in its portfolio, timing of such a move should be considered.

In such cases, *if* you have an appropriately long time horizon to allow holdings with impaired values to mature *and* the manager claims that the affected securities are “money good,” we would advise you to

assess such a manager's credit analysis capabilities before terminating. We see no reason to realize losses if you have an appropriate time horizon to realize the full value of quality securities that have been beaten down by market turbulence. However, if a manager cannot convince you that portfolio holdings have been thoroughly vetted by its credit analysis team to be of solid quality, that the holdings are priced to compensate for potential risks, and that the manager will not take on new and potentially unquantifiable risk to boost performance, we would recommend taking the losses and moving on.

Finally, it is worth inquiring how cash managers with a high allocation to relatively low-quality assets would manage potential redemptions. In a severe environment, if many investors choose to terminate a manager significantly exposed to illiquid assets, redemptions would result in a lower-quality, relatively illiquid portfolio if all the high-quality liquid assets had to be sold off. Would such a portfolio meet your cash needs? This is another important consideration in determining if it is worth staying the course.

#5: Fixed Income—Implementation Should Match Objectives; Focus on Credit and Counterparty Risk Management

It has been our longstanding advice that investors hedging against the risk of a prolonged economic contraction should invest in high-quality, non-callable bonds, particularly intermediate- to long-duration sovereign bonds. While it is reasonable to invest in bonds or credit derivatives that take credit, counterparty, or call risk, such investments should only be made for the purpose of meeting diversification and return-enhancing objectives, not as part of a recession hedge, regardless of current prices, yields, or valuations.¹⁸ In the current environment, this is particularly important, as the risk of contraction cannot be dismissed given the excessive credit expansion that is now in the process of unwinding.

For those that choose to invest in bonds for return enhancement or diversification, we would recommend, as always, that adequate due diligence and monitoring be maintained to understand managers' skills and risk controls, particularly as they relate to evaluating credit and counterparty risk. While large bond managers have invested in credit derivatives for some time, this practice has become ubiquitous in the last few years. Given the counterparty risk associated with over-the-counter credit derivatives, it is important to be comfortable with the ability of managers to evaluate and manage such risks.

Further, given the land mines that have exploded in various sectors of the credit markets, it is particularly important to evaluate how well managers have been able to navigate the environment and what their exposures are to these segments of the market (e.g., subprime-related securities and asset-backed securities). Managers insufficiently experienced and knowledgeable could easily fall into the value trap of believing that hard-hit credits represent good value, only to see their investments sink lower. For example, the recent peak high-yield credit spread over ten-year Treasuries of more than 850 bps was above the average

¹⁸ There remains the risk that such a "disaster hedge" could fail should non-U.S. holders abandon US\$ assets en masse, or even aggressively scale down their future purchases. In such an environment, non-U.S. sovereign bonds would be expected to benefit from a re-allocation away from U.S. Treasuries. Gilt-based investors face a similar risk with regard to deflation-hedging portfolios composed of gilts. Therefore, it might be sensible for US\$- and sterling-based investors to incorporate a sort of "reinsurance" in the form of exposure to unhedged sovereign bonds.

historical spread, but did not represent good value compared to past credit cycles, when spreads widened to over 1,000 bps at their peak. Experienced managers will be best able to take advantage of opportunities and avoid such “value” traps.

#6: Securities Lending—Check the Collateral

Participants in securities lending programs generally regard them as a low-risk means to earn a small return that can cover or defray custody costs without altering the investment characteristics of their portfolio. However, since these programs involve some of the key risks we regard as important to manage today, most notably counterparty risk and collateral risk, we think such investors should be particularly attentive to their exposure.

The premise of any securities lending program is that the cash collateral posted by the borrower can be invested in such a way as to earn a higher return than that paid to the borrower in the form of a rebate.¹⁹ The demand to borrow securities routinely arises as short sellers need to demonstrate ownership of a security, which they cannot do directly without borrowing. The lending arrangement between the lender and borrower is typically brokered via a lending agent, which is most often a custodian bank.

Thus, investors participating in securities lending programs temporarily lend out securities to borrowers through lending agents. The lender retains all beneficial rights related to ownership, with the exception of proxy voting.²⁰ The agent provides the loaned securities to the borrower in exchange for cash collateral, which is typically equal to 102% of U.S. securities loans and 105% of non-U.S. securities loans (including accrued interest). Should the value of the collateral fall below 100% of the value of the assets, the lending agent requires the borrower to replenish the collateral to the original level (e.g., 102% of the current value for U.S. securities). The borrower receives some percentage of the interest earned by the cash collateral (the rebate), which can be negative for securities in high demand relative to supply. The custodian invests the collateral to earn a spread over the rebate, which is split between the custodian and the lender. Splits range from 50/50 to 90/10, though today 70/30 and 80/20 splits are typical.

The risks to securities lending fall into three areas: counterparty risk, operational risk, and collateral risk.

Counterparty risk is the risk that the borrower will default and not return the securities at the completion of the contract. However, this risk is mitigated through the lending agent’s borrower default indemnification. In the event the borrower does not return the borrowed securities, the lending agent will make the lender whole with securities purchased with the marked-to-market collateral. Furthermore, the

¹⁹ For example, a borrower providing T-bills as collateral would expect to receive slightly less than T-bill interest from the lending agent. The greater the demand for the securities the borrower needs, the smaller the rebate; indeed, in the case of borrowed securities for which there is particularly high demand, borrowers’ rebate is negative (i.e., the borrower must pay the lending agent some interest).

²⁰ Investors interested in voting proxies can find ways around this limitation, such as arranging a return of the security on the day of the proxy vote or having the borrower vote at the direction of the lender.

lending agent often marks to market the securities lent on a daily basis and adjusts the collateral value accordingly. Further lending agents will diversify loans across many borrowers, achieving counterparty risk diversification. Finally, lending agents should perform thorough due diligence and ongoing monitoring on borrowers. Most custodians have an approved list of borrowers, although the number and quality of names can vary.

Operational risks include the risk that interest or dividends are not posted, that security delivery fails, and that collateral is not adequately marked to market. The lending agent mitigates these risks through indemnification against negligence or willful misconduct. If any particular operational failure arises from within the lending organization, the lending agent should indemnify against such negligence and insure against a potential lender financial loss. Lending agents also settle transactions delivery versus payment in U.S. markets and demand pre-delivery of collateral in non-U.S. markets. They automate the processes for dividend payment, corporate action, pricing, and marking to market. Finally, most lending agents have extensive risk management and oversight processes.

Collateral risk relates to both the risk that the collateral fails to earn a return that exceeds the rebate rate paid to the borrower over the period of the loan contract and the risk that the collateral suffers a loss in principal value. Due to the symmetric design of the split, the lending agent shares the risk with the lender if the spread of the collateral return over the rebate paid to the lender is negative. However, there is not a similar alignment of incentives with regard to preservation of principal on the collateral. In this case, the lender is taking all the risk of principal loss at the same time that the custodian has incentive to maximize the spread by investing collateral aggressively. Therefore, it is particularly important that you only engage in securities lending if your due diligence provides adequate comfort that the collateral will be managed conservatively with an eye to principal protection. Should you determine you wish to move from an aggressive to a conservative collateral pool, you should be careful with regard to timing, as noted in our earlier discussion in relation to cash investments in general. Termination of a securities lending program with an impaired collateral pool would potentially result in your receiving a vertical slice of the portfolio, locking in the losses of the collateral, which may turn out to be “money good” if the custodian has a strong credit analysis team.

Today, operational and counterparty risks have been mitigated, primarily through indemnification, which is now standard in all securities lending contracts. However, investors with long-standing securities lending arrangements would be well served to make sure that they have amended their agreements to include indemnification of these risks. The main risk to securities lending today relates to collateral investment. Assuming you can gain comfort in the quality of the management of the collateral pool, then the question should turn to the degree to which the securities in any given portfolio are in demand for lending. Unfortunately, while a custodian can help investors assess this demand at any point in time (although it will vary across custodians based on their specific borrowing base), demand shifts with market conditions. For example, today demand for borrowing exchange-traded funds is particularly strong and is reasonably strong for equities, but for fixed income demand is lacking due to the ability to short credit through the CDS market.

From a pure risk/return standpoint, securities lending is worthwhile for investors with conviction that a collateral pool will be conservatively managed through thick and thin, and is particularly attractive today for investors with securities that are in such high demand that borrowers are willing to accept negative rebates. Still, the returns are likely to be slim over the long term, while the resources committed to due diligence and ongoing monitoring are not insignificant. You should therefore assess the degree to which it is worth using resources, which are usually limited, to earn what may be an attractive spread today, but could be a very narrow spread over the long term. Such resources may be put to better use elsewhere in the portfolio.

Conclusion—Make Sure You Have the Right Map and Navigation Tools, Then Stay on Course

Investors are faced with difficult decisions in bear markets. Maintaining purchasing power may require cutting staff or mission-related funding. Maintaining portfolio exposures may require selling down the only investments that have provided shelter to buy assets that have seemingly sunk into the abyss. To the extent possible, such decisions should not be made on a reactive basis in the throes of market turmoil. While many asset classes have suffered considerable pain in recent months, and equities are again in official “bear” territory, having breached the 20% decline mark, the diversification in most investors’ portfolios has dampened the blow to some degree.

If you have not done so recently, now is the time to review investment policies and procedures to make sure they are designed to meet long-term objectives and that they are implemented in a way that does not subvert that effort. This is also the time to develop a plan for dealing with difficult decisions that may arise should the decline prove steep and/or long. Bear markets also require a lot more attention to nitty-gritty details, such as those involved in liquidity management. While the six strategies for survival discussed in this report do not cover the full spectrum of financial and operating issues investors face, they address the major concerns we have today and are intended to give a flavor for the degree to which portfolio management and due diligence must be adapted in a bear market to increase the odds of survival.

EXHIBITS

REBALANCING MODEL ASSUMPTIONS

Overview

Our rebalancing model uses historical asset class returns to evaluate the effects of using different rebalancing rules on a given portfolio. These rules may utilize spending (and other cash flows) to rebalance. The model excludes non-marketable assets that cannot easily be rebalanced. We compare rebalancing quarterly to policy targets to the following other rebalancing rules:

- None: portfolio is allowed to drift for entire period evaluated
- Spending Only: spending is utilized to move portfolio allocations closer to policy targets
- Range Rebalancing: each asset class that violates its range is rebalanced to target
- Range, With Spending: same as Range Rebalancing, but incorporates spending
- Quarterly, with Spending: rebalance quarterly and incorporate spending

Spending Rule

5% of the trailing 12-quarters average market value with a floor of the prior year's spending

Asset Allocation Targets and Ranges

	Target <u>Allocation</u>	Range <u>Lower</u> <u>Upper</u>	
U.S. Equity	25.00%	20.00%	30.00%
Global ex U.S. Equity	20.00%	15.00%	25.00%
Emerging Markets Equity	5.00%	3.50%	6.50%
Absolute Return	15.00%	10.00%	20.00%
Equity Hedge Funds	10.00%	7.00%	13.00%
REITs	5.00%	3.50%	6.50%
Commodities	5.00%	3.50%	6.50%
U.S. Fixed Income	15.00%	10.00%	20.00%

Analysis and Conclusions

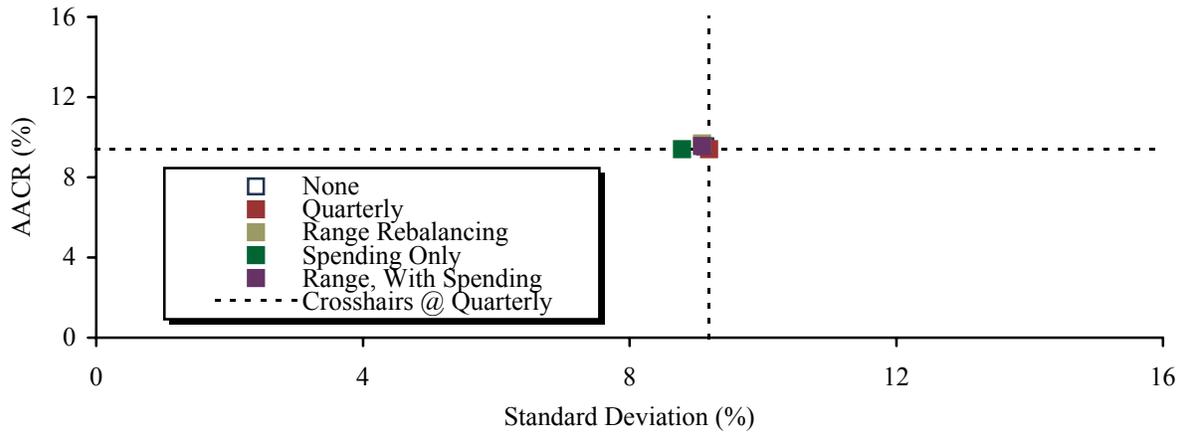
- We compare the return and standard deviation of the portfolio using the above rebalancing rules. We also show returns relative to a portfolio rebalanced each quarter. While the risk/return profile of the portfolio under the different rebalancing rules is similar over the roughly 17-year period evaluated, divergences over rolling five-year periods are material. As might be expected, a portfolio that is never rebalanced exhibits the most significant performance differentials relative to a portfolio rebalanced each quarter. Portfolios using any sort of rebalancing rule track much more closely to each other.
- Further, the analysis examines the trade-off between the cost of rebalancing (using turnover as a proxy) and the tracking error the portfolio experiences relative to policy targets using the above rebalancing rules. Tracking error is defined as the sum of the absolute value of the difference between actual and target allocations for each asset class as a percentage of portfolio market value. For this portfolio, an investor rebalancing only through spending cash flows would experience a relatively high degree of tracking error over the full period. However, using spending cash flows to rebalance *and* rebalancing when market values fell outside of the prescribed ranges nearly cut the tracking error in half while producing a relatively modest amount of turnover.

Exhibit 1

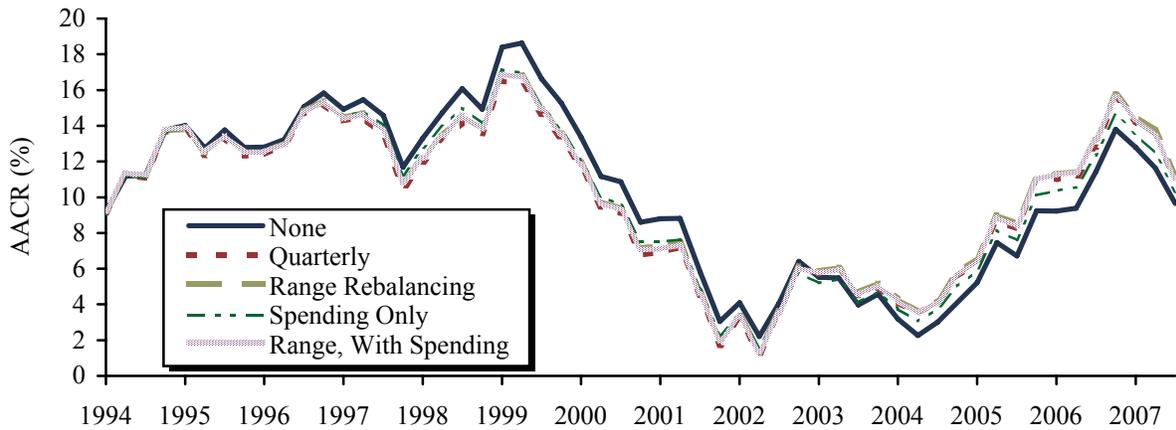
PERFORMANCE STATISTICS UNDER VARIOUS REBALANCING RULES

January 1, 1990 – June 30, 2008

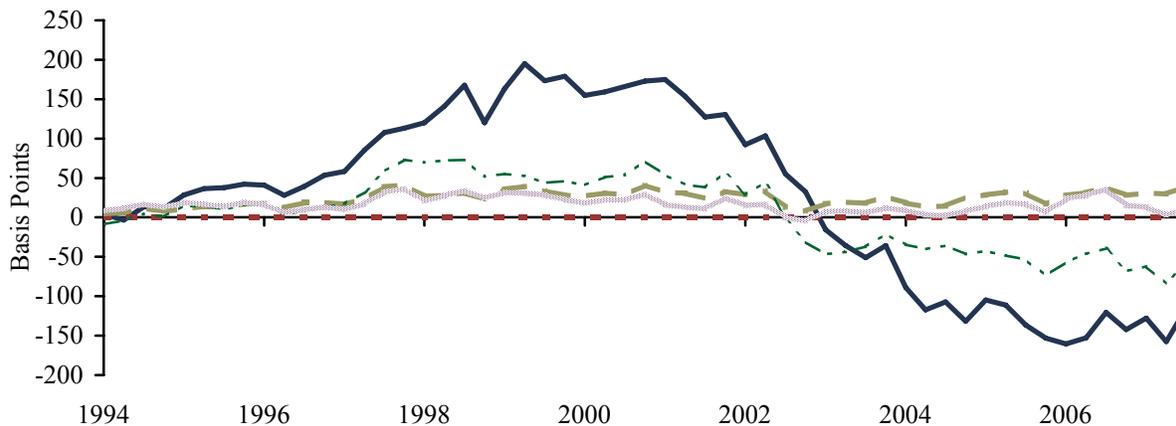
Full Period Return vs Standard Deviation



Rolling Five-Year AACR



Rolling Five-Year Relative Return to Quarterly Rebalancing

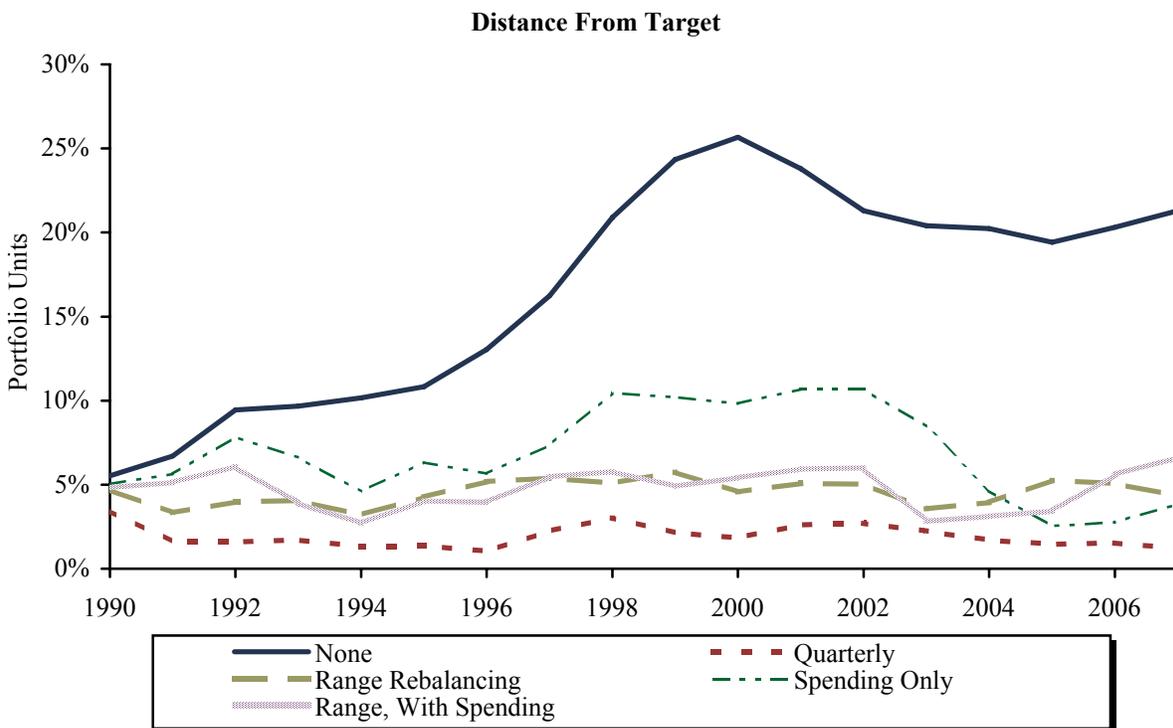
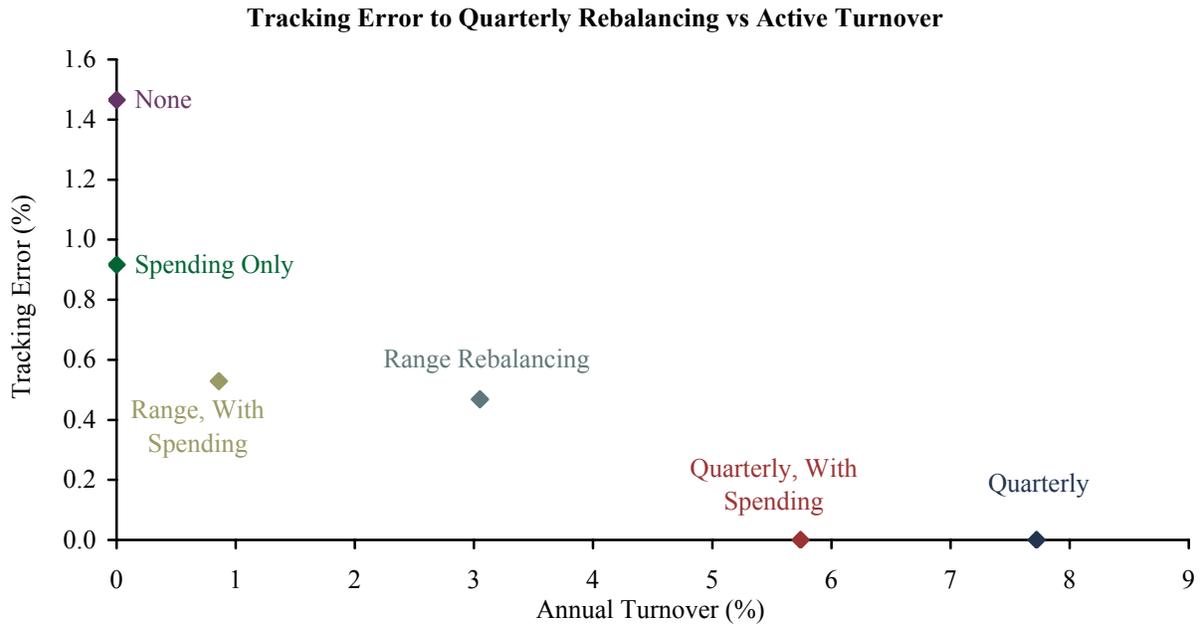


Source: Cambridge Associates LLC.

Exhibit 2

TRADE-OFF BETWEEN TRACKING ERROR AND COST OF REBALANCING

January 1, 1990 – June 30, 2008

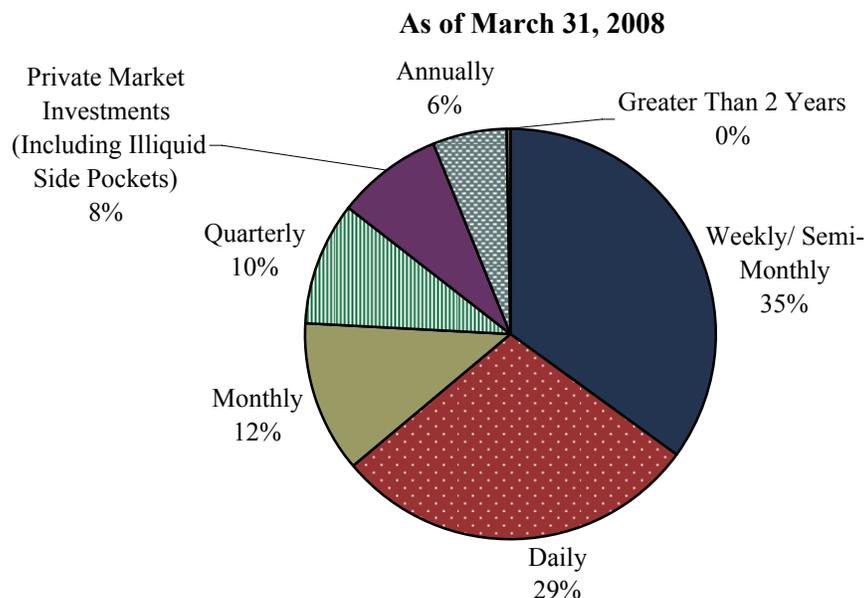


Source: Cambridge Associates LLC.

Note: Active turnover excludes turnover that is covered by cash flows (spending, etc.).

Exhibit 3

TOTAL PORTFOLIO MANAGER LIQUIDITY ANALYSIS



Relatively Liquid Assets	
Manager	MV (\$ mm)
<i>Daily</i>	290.0
Managers 1–15	
<i>Weekly/Semi-Monthly</i>	350.0
Managers 16–20	
<i>Monthly</i>	118.9
Manager 21	16.0
Manager 22	25.4
Manager 23	28.9
Manager 24	11.8
Manager 25	18.0
Manager 26	18.9
<i>Quarterly</i>	96.7
Manager 27	9.1
Manager 28	8.8
Manager 29	17.1
Manager 30	5.6
Manager 31	8.0
Manager 32	20.0
Manager 33	11.6
Manager 34	10.0
Manager 35	6.5

Relatively Illiquid Assets	
Manager	MV (\$ mm)
<i>Annually</i>	58.0
Manager 36	14.1
Manager 37	13.1
Manager 38	11.3
Manager 39	8.2
Manager 40	11.3
<i>Greater than 2 Years</i>	3.3
Manager 40	3.3
<i>Illiquid Side Pockets</i>	3.1
Manager 37	1.2
Manager 36	1.9
<i>Private Market Investments</i>	80.0
Current Net Asset Value	80.0
<i>Outstanding Commitments</i>	95.0
Unfunded Commitments	95.0

Source: Cambridge Associates LLC.

Notes: Liquidity for marketable alternative assets is classified by availability of funds in the upcoming month, quarter, or year, and not by exit frequency. Unfunded private market commitments are not shown in the graph above.

Exhibit 4

CLIENT ABC MARKETABLE ALTERNATIVES LIQUIDITY IN ORDER OF EXIT DATE

As of March 31, 2008

Fund Code	Market Value (\$ mm)	Hard Lock-Up	Soft Lock-Up	Exit Without Fees				Days Until Exit as of 03/31/08
		Remaining	Remaining	Exit Frequency	Next Available Redemption	Notice (Days)	Notification By	
26	\$18.9	N/A	Expired	Monthly	4/30/2008	15	4/15/2008	30
27	\$9.1	N/A	Expired	Calendar Quarter	6/30/2008	90	4/1/2008	91
28	\$8.8	N/A	N/A	Calendar Quarter	6/30/2008	65	4/26/2008	91
29	\$17.1	N/A	N/A	Calendar Quarter	6/30/2008	65	4/26/2008	91
30	\$5.6	Expired	N/A	Annually June	6/30/2008	60	5/1/2008	91
31	\$8.0	Expired	Ongoing	Annually June	6/30/2008	45	5/16/2008	91
32	\$20.0	Expired	N/A	Calendar Quarter	6/30/2008	45	5/16/2008	91
33	\$11.6	N/A	Expired	Calendar Quarter	6/30/2008	45	5/16/2008	91
34	\$10.0	Expired	N/A	Calendar Quarter	6/30/2008	30	5/31/2008	91
35	\$6.5	Expired	N/A	Calendar Quarter	6/30/2008	30	5/31/2008	91
36	\$14.1	Expired	N/A	Qtr End on/after Anniversary	12/31/2008	90	10/2/2008	275
37	\$13.1	N/A	N/A	Annually December	12/31/2008	45	11/16/2008	275
38	\$11.3	N/A	Rolling	Every 12 Months	3/31/2009	45	2/14/2009	365
39	\$8.2	N/A	N/A	Annually December	3/31/2009	30	3/1/2009	365
40	\$11.3	10 Months	N/A	Annually June	6/30/2009	60	5/1/2009	456
40	\$3.3	36 Months	Rolling	Annually June	6/30/2011	60	5/1/2011	1186
Subtotal	\$176.9							
Illiquid Side Pockets								
37	\$1.2							
36	\$1.9							
Illiquid	\$3.1							
Total Program	\$180.0							

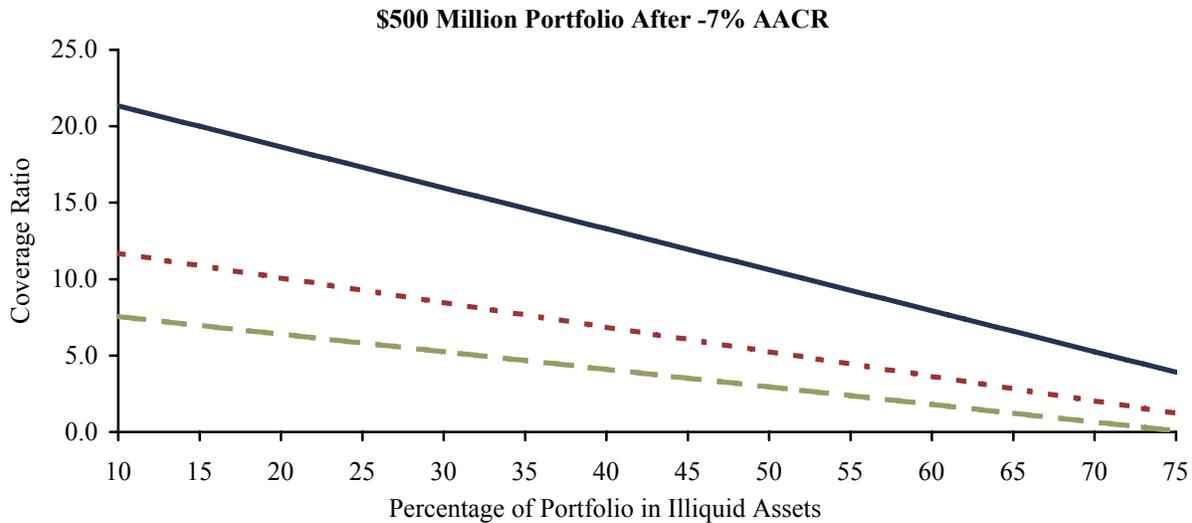
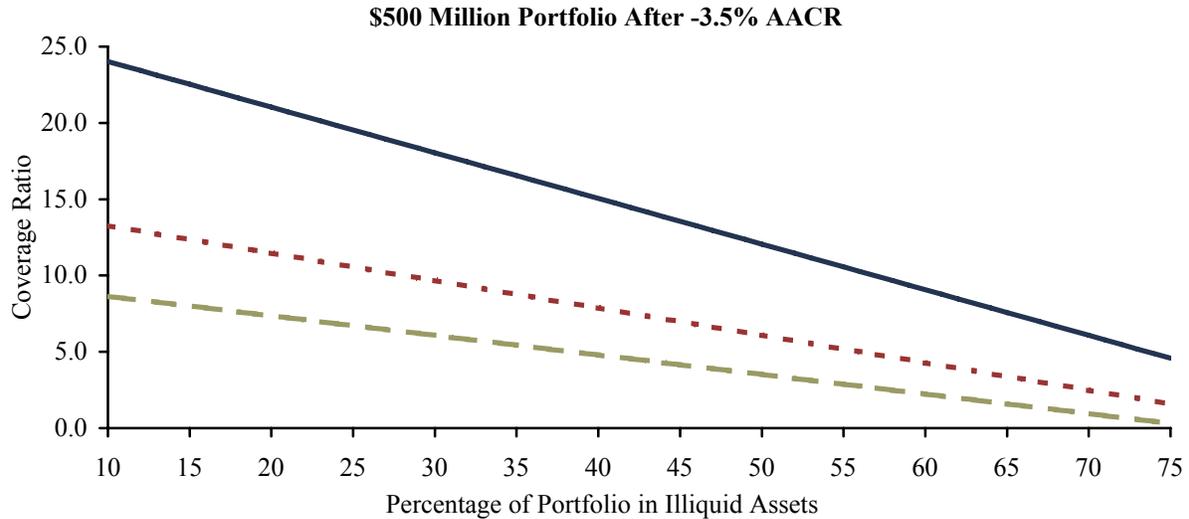
Source: Cambridge Associates LLC.

Notes: Market values are estimated for funds with more than one tranche. Illiquid side pocket values are as of December 31, 2007.

Exhibit 5

PORTFOLIO LIQUIDITY ANALYSIS AFTER THREE-YEAR BEAR MARKET

Year Four Cash Flow Coverage Ratio Varied by Portfolio Illiquidity and Cash Flow Needs



Source: Cambridge Associates LLC.

Notes: Pages 8–10 of the text describe scenario assumptions in detail. Key Assumptions: Institution spends 5% of beginning market value of assets, or \$25 million at the end of each year. All spending is sourced from the remainder of the portfolio that is not illiquid. There are no net capital requirements for the non-marketable alternatives program, as distributions are assumed to perfectly offset capital calls. The cash flow coverage ratios reflect the ratio of the assets that are not illiquid at the start of year four relative to spending requirements of \$25 million. Coverage ratio is defined as the ratio of liquid assets to cash flow needs.