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INTRODUCTION

In April 1999 the President’s Working Group on Financial Markets (the “PWG”), comprised of the Secretary of the U.S. Department of the Treasury and the respective chairs of the Board of Governors of the Federal Reserve System, the Securities and Exchange Commission and the Commodity Futures Trading Commission, published its report entitled *Hedge Funds, Leverage and the Lessons of Long-Term Capital Management* (“PWG Report”). This report recommended that a number of measures be implemented by financial institutions, regulators and hedge funds to enhance risk management practices. In a section entitled “Enhanced Private Sector Practices for Counterparty Risk Management,” the PWG Report stated:

“A group of hedge funds should draft and publish a set of sound practices for their risk management and internal controls. Such a study should discuss market risk measurement and management, liquidity risk management, identification of concentrations, stress testing, collateral management, valuation of positions and collateral, segregation of duties and internal controls, and the assessment of capital needs from the perspective of hedge funds. In addition, the study should consider how individual hedge funds could assess their performance against the sound practices for investors and counterparties.” (PWG Report, at p. 37)

This document has been prepared in response to this recommendation.

Objectives of this Document

*Respond to PWG Report.* Following the publication of the PWG Report, a group of certain of the largest independent hedge fund managers came together to address the PWG’s recommendation to develop and publish sound practices for risk management and internal controls. The views and recommendations set forth in this document reflect the input of this group.

The sound practices recommendations that follow (the “Recommendations”) are intended to respond to the PWG Report by contributing to a continuing evolution of hedge fund manager practices. Many recommended practices have already been adopted by a number of larger hedge fund managers in recent years, as their growth has resulted in the implementation of more formalized and sophisticated management policies and structures. Other practices were initiated following the market crisis of August 1998, which created a heightened awareness among all market participants of the need for regular stress testing of market risk models and liquidity analyses. Other recommended practices are aspirational and represent goals that hedge fund managers, depending on their size and objectives, should strive to achieve. Given that the practices recommended were developed by larger hedge fund managers based on their views and business models, many may not be applicable to smaller hedge funds.

*Strengthen Hedge Fund Business Practices.* As part of this process and as markets continue to evolve, it is anticipated that the Recommendations will be further adapted and refined. It is intended that hedge fund managers, by evaluating the Recommendations and
applying those that suit their particular business model, will strengthen their own businesses while contributing to market soundness by reducing the risk of their own default or failure. In this regard, this document complements the work of the Counterparty Risk Management Policy Group (the “CRMPG”) in its June 1999 report, which addressed many of these same issues from the perspective of a counterparty credit provider and proposed measures that seek to reduce the risk of defaults that could result in a systemic impact on financial markets.

**One Size Does Not Fit All.** It is important to recognize in evaluating the Recommendations that the hedge fund industry is global and that the strategies, investment approaches and organizational structures of hedge fund managers vary greatly. The variations in organizational structures can be attributed partly to differences in size and partly to the different strategies used by hedge fund managers, which are distinguishable both in terms of their complexity and their product focus. The major strategies include: “macro” or global directional investment strategies; market-neutral or arbitrage strategies; long only, short only or long/short strategies for trading in equities; event-driven strategies, which seek to profit from anticipated events, such as mergers or restructurings; regional strategies, which concentrate on a particular geographic region (such as emerging markets); sectoral strategies, which focus on a particular industry; and specific asset class strategies (such as currencies). The complexity of the strategy employed and the breadth of markets covered, combined with the amount of assets under management, will play a large part in determining the operational requirements of a hedge fund manager. For example, the infrastructure needs of a hedge fund manager managing several diversified macro funds with several billion in net assets will be significantly greater than those of a long-only fund manager that principally trades U.S. equities for a single fund of modest size.

The differences between Long-Term Capital Management (“LTCM”) and most other hedge fund managers should also be acknowledged. The scale of LTCM’s trading activities and the extent of leverage applied by LTCM at the time of its near collapse were unique. LTCM employed particularly high levels of leverage in connection with its arbitrage strategies in order to profit from small discrepancies in the pricing of certain instruments. LTCM sought to leverage such narrow pricing anomalies into attractive returns for its sizable investor base by borrowing and establishing very large positions to exploit the pricing “spread” it identified. LTCM’s massive use of leverage seriously compromised its ability to absorb losses when market conditions moved against it and spreads widened (rather than converging as predicted); its situation was further aggravated by its significant investments in illiquid instruments.

The hedge fund managers that developed the Recommendations employ primarily global macro trading strategies that involve taking positions in a wide variety of largely liquid markets based on perceived broad economic trends. If a portfolio manager accurately predicts the direction of a market using this strategy, a relatively modest position can generate substantial profits without the use of excessive leverage. Although certain hedge fund managers make use of market neutral or arbitrage/convergence strategies similar to those used by LTCM, the scale of LTCM’s trading using these strategies and the levels of leverage assumed by LTCM in connection with such strategies were extraordinary.

**Individualized Assessment and Application of Recommendations.** The Recommendations are not necessarily the only means of achieving sound practices, and they
should not be viewed as prescriptive requirements to be rigidly applied by all hedge fund managers. Rather, each hedge fund manager should assess the Recommendations based on the size, nature and complexity of its organization, its strategies and resources, as well as the objectives of the Funds it manages, and apply them as appropriate. Certain recommendations may not be relevant or appropriate to every hedge fund manager. In evaluating the relevance of the Recommendations and the ability to implement them, hedge fund managers should recognize that, while some recommendations can be implemented easily or unilaterally, others may require substantial planning and significant budgetary commitments, involve internal systems changes and infrastructure development, or negotiation with and cooperation by third parties. It should also be recognized that, while some recommendations have already been widely adopted, many are aspirational in nature or represent emerging practices that generally have not been implemented by hedge fund managers to date. Consequently, the Recommendations should not be construed as definitive requirements that could serve as a basis for either auditing hedge fund managers or assessing their financial stability.

**Background on Hedge Funds**

**Hedge Fund Defined.** This document employs the PWG’s general definition of a hedge fund (“Hedge Fund” or “Fund”): a pooled investment vehicle that is privately organized, administered by a professional investment management firm (referred to herein as a “Hedge Fund Manager”), and not widely available to the public. As the PWG Report observed, the term “Hedge Fund” is used to describe a wide range of investment vehicles, which can vary substantially in terms of size, strategy, business model and organizational structure, among other characteristics. This definition captures most of the types of investment pools that the Recommendations seek to address. Other capitalized terms and certain technical words and phrases are defined in the Glossary in Appendix III.

**The Nature of Hedge Funds.** In assessing the appropriateness of the Recommendations for risk management and internal controls, it is important to distinguish the needs of Hedge Fund Managers from those of credit providers, such as banks and other financial institutions that seek to eliminate or minimize the risks of their businesses through hedging and other risk management methods that seek to reduce risk. Hedge Fund Managers are in the business of seeking and assuming calculated risks and are retained by the Funds they manage to take on such risks in order to achieve the returns desired by their investors.

By participating in the market as risk seekers, Hedge Fund Managers play a unique and critical role in financial markets by providing needed liquidity and reducing systemic risk. In this sense Hedge Funds often act as “risk absorbers” in markets by serving as ready counterparties to those wishing to hedge risk, even when markets are volatile, and, in doing so, reduce pressure on market prices while increasing liquidity. In addition Hedge Fund Managers, through their trading based on extensive research, bring price information to the markets which translates into market price efficiencies. Without Hedge Fund Managers’ research and commitment of capital, the markets would have potentially wider price spreads, pricing inefficiencies and illiquidity. Perhaps most importantly, by standing ready to lose capital, Hedge Funds act as a buffer for other market participants in absorbing “shocks.”
The Hedge Fund Managers that developed the Recommendations have each been active investors and market participants for over ten years in a variety of market environments. Despite having been required to navigate difficult conditions and market crises, these firms have experienced substantial growth in assets and provided investors with attractive returns. Hedge Funds also can afford investors valuable portfolio diversification, given that the performance of many Hedge Fund investments is uncorrelated to that of traditional investments, such as stocks and bonds. Hedge Fund Managers, like other large investors, are known to market regulators and supervisory authorities. In connection with their trading activities, Hedge Fund Managers currently furnish significant information and reports to regulators (as detailed in Appendix II with respect to the United States).

**Relationship of Hedge Funds and Hedge Fund Managers.** The Recommendations assume that a Hedge Fund is governed by a board of directors, managing member, general partner, trustee or similar individual or entity with the legal authority and responsibility to direct and oversee the activities of the Fund (referred to as the Fund’s “Governing Authority”). In addition, it is assumed that the assets of each Fund are managed by an investment adviser or manager (the “Hedge Fund Manager”), pursuant to an advisory or management agreement with the Fund and that the Hedge Fund Manager is itself governed by a management committee, a group of executives or other body with the authority and responsibility to direct and oversee the Hedge Fund Manager’s trading activities on behalf of the Fund (“Senior Management”). It is recognized, however, that the nature and structure of Funds and their relationships with Hedge Fund Managers vary substantially. For example, in some cases a Hedge Fund may have a formal Board of Directors, while in other cases the Hedge Fund Manager conducts all material aspects of the Hedge Fund’s management. In addition, the nature and structure of Hedge Fund Managers vary substantially. Certain Hedge Fund Managers may be primarily governed by a board of directors or supervisory board, while others may be managed by their senior investment personnel. The Recommendations also assume the following:

- A Hedge Fund is a separate legal entity managed under contract by the Hedge Fund Manager. A Hedge Fund has an overall investment objective and may have investment restrictions that cannot be changed without notice to or approval by investors or a Governing Authority representing investors.

- Hedge Fund Managers may also be, and usually are, investors in the Hedge Funds they manage and usually are compensated in part based on the performance of the Hedge Fund. This structure, as well as reputational considerations, create a strong unity of interests between a Hedge Fund and its Hedge Fund Manager.
Risk Functions of Hedge Fund Managers. The activities of a Hedge Fund Manager must reflect the fact that the business of a Hedge Fund is to seek returns by assuming commensurate levels of risk. Hedge Fund Managers take investment risk, in accordance with their Funds’ expectations, in order to earn commensurate returns. In this regard, Hedge Fund Managers must understand the sources of the returns the Hedge Fund is earning and identify the types and levels of risk associated with these returns. Based on this understanding, Hedge Fund Managers should generally perform the following risk functions:

1. Consistent with its agreement with the Hedge Fund’s Governing Authority and disclosure made to investors, Senior Management of the Hedge Fund Manager should determine the appropriate overall level of risk for a particular Fund.

2. This overall level of risk should then be allocated (among portfolio managers, strategies, asset classes, etc.).

3. Once the risk allocation is determined, portfolio managers should choose the specific risks (consistent with the policies established by Senior Management) to be assumed, and enter into transactions in order to gain exposure to those risks.

4. The risk actually assumed by a Fund must then be analyzed and monitored by an independent risk analysis function, or “Risk Monitoring Function”. The resulting risk information must be disseminated to Senior Management and, as appropriate, portfolio managers.

5. Senior Management must ensure that risk levels are acceptable and consistent with established risk policies and parameters.

To summarize, Senior Management are responsible for setting, allocating and controlling risk (steps 1, 2 and 5); portfolio managers are responsible for putting the plan into action (step 3); and the Risk Monitoring Function is responsible for monitoring and analyzing the levels of risk actually assumed by the Hedge Fund in relation to the risk policies set by Senior Management, as well as reporting this information to Senior Management (step 4).

In the context of Hedge Fund Managers, certain individuals may perform more than one function. For example, a portfolio manager may also be a key member of a Hedge Fund Manager’s Senior Management. Likewise, overlap between Senior Management and Risk Monitoring often occurs, e.g., it is not uncommon for a senior manager to play an active role in the Risk Monitoring Function. In fact, the smaller the Hedge Fund Manager’s organization, the greater this overlap will likely be. It is, however, critical that internal controls ensure the integrity of the Risk Monitoring Function by enforcing its functional independence from the portfolio management (or trading) function.

The management and monitoring of risk is a complex and technical subject, and an exhaustive treatment of the topic is beyond the scope of this document. The Recommendations seek to address the risk functions of Hedge Fund Managers in a concise manner. Appendix I, “Risk Monitoring,” seeks to elaborate on the issues related to the Recommendations made with respect to Risk Monitoring.
**Organization of the Recommendations**

The Recommendations are divided into four major sections. The first addresses the responsibilities of Senior Management of the Hedge Fund Manager, particularly with respect to establishing risk parameters and monitoring trading activities. The second section proposes sound practices for risk measurement and monitoring to ensure that the risk policies set by Senior Management are observed. The third section recommends disclosure practices to be observed when dealing with fund investors and boards of directors, counterparties and credit providers, regulatory bodies and the public. The last section proposes sound documentation practices and addresses other legal and compliance issues.

The following key points are fundamental to the Recommendations:

- **Risk Allocation and Assessment Are Managed Together.** Senior Management, in assigning portfolio management and trading responsibilities, should allocate capital and risk based on defined investment objectives and risk parameters, and control the allocations based on information supplied by an independent risk monitoring function. The ultimate monitoring of risk is conducted by Senior Management and therefore should *not* be divorced from decisions to allocate risk. This approach may differ from a credit provider’s approach to risk management which strives for separation of these functions.

- **Recognize Interplay of Different Types of Risks.** Hedge Fund Managers must recognize that market, credit and liquidity risks are interrelated, requiring the Hedge Fund Manager to analyze the consequences of the Fund’s exposure to these risks in combination.

- **Assess Liquidity During Stress.** Hedge Fund Managers should assess how funding liquidity may be compromised during periods of stress and seek to establish reliable sources of financing in order to enhance financial stability in volatile market conditions. In particular, the Hedge Fund Manager should assess how unexpected events may cause losses that may force the liquidation of positions, and the potential “spiral” effects of such a forced liquidation on the value of the portfolios under management and sources of liquidity.

- **Use Risk-Based Leverage Measures.** Recognizing that the importance of leverage is the impact it can have on market risk, credit risk, and liquidity risk, Hedge Fund Managers should focus on measures of leverage that relate the riskiness of the portfolio to the ability of the Fund to absorb that risk — “risk based leverage.” Hedge Fund Managers should consider tracking the degree to which the fund is able to modify its risk-based leverage, by tracking the relation between the fund’s market risk and actions taken. Hedge Fund Managers also should track traditional, accounting-based measures of leverage, because those traditional measures provide insights into the source of risk-based leverage and how that leverage could be changed.
• **Develop Informational Reports for Counterparties.** Each Hedge Fund Manager should work with its counterparties to establish periodic reports that will strengthen relationship stability and, in doing so, contribute to market confidence.

• **Work with Regulators.** Hedge Fund Managers should work with regulators to address their specific market concerns and objectives. As significant participants in a broad array of global markets, Hedge Funds, like other major financial institutions and other large investors, should be prepared to cooperate with relevant regulators interested in monitoring the markets to reduce systemic risk while preserving the confidentiality of proprietary information.

• **Develop Consensus on Public Disclosure.** Hedge Fund Managers should coordinate with counterparties and regulators to reach a broad consensus on public disclosure which takes into account the benefits and costs to investors, creditors and the markets.

• **Standardize Documentation and Reflect Collateral and Default Triggers in Risk Analysis.** Each Hedge Fund Manager should seek to standardize its approach to negotiating transaction documentation in order to achieve appropriate levels of consistency with its different counterparties and so that the legal consequences of unexpected losses or market crises (e.g., collateral calls, defaults, termination events) are known and may be reflected in stress/scenario testing.
RECOMMENDATIONS

I. ORGANIZATIONAL STRUCTURE AND INTERNAL CONTROLS

Hedge Fund Managers should clearly define the investment objectives and risk parameters for each Fund, and the trading policies and risk limits necessary to achieve these objectives. Hedge Fund Managers should adopt an organizational structure that ensures effective monitoring of compliance with investment and valuation policies by allocating defined supervisory responsibilities and maintaining clear reporting lines. Suitably qualified personnel should be retained and adequate systems established to produce periodic reporting that permits Senior Management to monitor trading activities and operations effectively. Internal procedures and periodic independent review processes should seek to ensure the enforcement of policies and identify deviations from those policies. Appropriate controls, reporting and review processes should apply to internal and external managers or traders. Third-party service providers that perform key business functions (such as NAV calculation) also should be subject to appropriate controls and review processes.

Roles and Responsibilities of Senior Management

1. Senior Management should approve policies and procedures commensurate with the size, nature and complexity of the Hedge Fund Manager’s trading activities and consistent with the directives received from the Governing Authorities of the Hedge Funds it manages, and should review and update them when significant market events or changes in strategy occur and otherwise as appropriate.

   Policies and procedures should be developed for trading activities, risk analysis, documentation, employee compliance and other key business areas, as appropriate (see specific recommendations 9-18 below under “Risk Monitoring” and 25-34 below under “Legal & Compliance”).

2. Senior Management should determine the investment and trading policies to be observed, including targeted risk profiles and parameters, based on the investment objectives of each Hedge Fund under management.

   Senior Management should allocate capital and risk based on a Fund’s performance objectives and targeted risk profile, taking into account the risk analysis produced by the Risk Monitoring Function. Allocations should be reexamined and adjusted periodically (e.g., at least once annually and following major market events).

   Senior Management should have an understanding of risk analysis and undertake a rational and reasoned approach to the allocation and distribution of capital and risk among traders, strategies, asset classes and geographical regions.

3. Senior Management should impose appropriate controls over the Hedge Fund Manager’s portfolio management and trading activities to ensure that these activities are undertaken on a basis consistent with Senior Management’s allocated
investment and trading parameters and with the investment objectives/strategies disclosed to a Hedge Fund’s Governing Authority and investors.

Senior Management should analyze and evaluate trading activities by regularly reviewing reports produced by the Risk Monitoring Function. These reports should provide information regarding the risk and performance levels of the investment strategies employed and should identify deviations from trading parameters and risk limits.

If the Hedge Fund Manager changes or proposes to change its trading activities on behalf of a Fund in a way that is inconsistent with the expectations of the Fund’s Governing Authority or differs materially from the disclosure contained in the Fund’s offering documents, it should inform the Fund’s Governing Authority and if appropriate, investors through normal means of investor communication. Amendments should be made as deemed necessary to disclosure/offering documents to ensure that they accurately reflect the nature and risks of the Fund’s trading activities.

4. **Senior Management should formally approve the allocation of capital to all portfolio managers.**

   All portfolio managers, including external portfolio managers, should be subject to controls and review processes commensurate with the amount of assets managed and form of allocation. Where capital is invested with an external portfolio manager in a managed account, applicable trading restrictions/limits, reporting requirements and termination provisions should be clearly defined in written management agreements. The performance of all portfolio managers should be monitored on a periodic basis as appropriate, depending on the form of the allocation (e.g., monthly NAV review of a passive investment in a fund vs. daily or weekly review of a significant managed account investment).

5. **Senior Management should establish formal processes for the approval, monitoring and review of the use of third-party service providers for the performance of key business functions (e.g., those related to risk monitoring, valuation, prime brokerage or other administrative functions).**

   While Senior Management may decide to delegate the selection of actual service providers, they should approve the process by which the selection is made.

   Key third-party service providers’ roles, responsibilities and liability should be clearly defined in written service agreements, and their performance should be periodically reviewed.
Structure of Risk Monitoring Function

6. Senior Management should establish a Risk Monitoring Function that operates independently of portfolio management functions. The Risk Monitoring Function should be an independent source of information about and analysis of a Hedge Fund’s performance and current risk position, the sources of its risk and resulting exposures to changes in market conditions.

The Risk Monitoring Function should report directly to Senior Management and be staffed with persons having sufficient experience and knowledge to understand a Fund’s trading strategies and the nature and risks of its investments.

Comprehensive and centralized systems for position and global exposure reporting and risk analysis should function independently of risk selection/portfolio management personnel so that trading activities and operations may be effectively supervised and compliance with trading policies and risk limits can be controlled.

The Risk Monitoring Function should produce daily risk reports that present risk measures and appropriate breakdowns by category of risk for review by appropriate members of Senior Management.

Valuation

Proper valuation is material both to Hedge Fund investors and to the risk monitoring process. Hedge Fund Managers should develop procedures for capturing and verifying prices for the instruments they trade and rely on external pricing sources where available. For Net Asset Value (NAV) purposes, Hedge Fund Managers generally should value instruments at market value, making adjustments to such values in accordance with generally accepted accounting principles (“GAAP”) only where market conditions mandate adjustments, recognizing that investors will both buy and sell shares of a Fund on the basis of NAV. In contrast, Hedge Fund Managers may determine that adjustments to market value are appropriate for risk monitoring purposes in order to enhance the accuracy of risk assessment. Policies for making such adjustments should be approved by Senior Management. The concepts related to valuation are explored in greater detail in Appendix I.

7. Hedge Fund Managers should have pricing policies and procedures for determining a Hedge Fund’s Net Asset Value (NAV) on a periodic basis and for determining the Hedge Fund’s value for risk monitoring purposes on a daily basis. The policies regarding NAV determination should be approved by a Hedge Fund’s Governing Authority and reviewed by external auditors for compliance with applicable accounting practices.

Hedge Fund Managers should develop procedures and/or systems for capturing pricing data for their positions from independent sources on a daily basis where possible. Procedures for periodically verifying the accuracy of pricing data should also be adopted, and material discrepancies between price sources should
be investigated. Where an instrument is not traded actively or where obtaining price information requires significant effort, weekly (or less frequent) pricing may be appropriate depending on the nature and the size of the position.

**Net Asset Value**

Senior Management should determine policies for the manner and frequency of computing NAV based upon applicable GAAP and disclose such policies to investors. Such policies should establish valuation methods that are consistent and fair to both buyers and sellers.

Financial assets and liabilities should be valued at “fair value,” which is the price at which an item could be exchanged in a current transaction between willing parties, other than in a forced or liquidation sale. Consistent with GAAP, Senior Management should determine the valuation methods to be used where market prices are not available or are not indicative of fair value (e.g., private equity investments may be valued at the lower of cost or market) and disclose such methods to a Hedge Fund’s Governing Authority.

For an instrument that is actively traded, Hedge Fund Managers should use price quotes available from reliable data vendors. The fair value of a position should be based upon the quoted price for a single trading unit in the most active market.

Where price quotes are not available from data vendors, Hedge Fund Managers should attempt to obtain quotes from independent sources.

For thinly traded instruments or those priced using models, Hedge Fund Managers should document the valuation methods used and periodically subject them to independent validation.

Dealer quotes and prices generated by models or other estimation methods should be regularly checked against realized prices to gauge their accuracy.

NAV valuations performed by third party administrators should be regularly reviewed to ensure compliance with valuation policies.

Valuations should be periodically validated by independent internal or external review, preferably on a monthly basis, but no less frequently than annually. The accuracy of NAV calculations should be verified by external auditors at least annually to assure compliance with GAAP.

**Risk Monitoring Valuation**

Senior Management should establish policies for determining when risk monitoring valuation methods may differ from NAV for operational or risk
analysis reasons. Examples where valuations different from NAV may be appropriate include situations such as those involving unusual position size, legal sale or transfer restrictions, illiquidity, control premiums or unusual hedging or transaction costs.

Independent Review

8. A Hedge Fund Manager’s internal controls and risk monitoring processes should be subject to periodic independent reviews by either external auditors (at least once annually) or by internal compliance or other independent personnel to ensure that management reporting is complete and accurate and to identify material deviations from internal policies and procedures.

External auditors should report their findings and any recommended actions in writing in the form of a management letter or other appropriate report; the findings of internal reviews should be similarly recorded in writing. Such findings should be relayed to Senior Management and other recipients to whom they may delegate for appropriate resolution and action.

Review of the Risk Monitoring Function should verify compliance with the Hedge Fund Manager’s risk policies and procedures. Review of this function should also address the soundness of internal systems and the qualitative and quantitative methods used (e.g., models).
II. RISK MONITORING

Current market practice is to focus on three categories of risk that are quantifiable – “market risk,” “credit risk,” and “liquidity risk” – and on the less quantifiable “operational risk.” Market risk relates to losses that could be incurred due to changes in market factors (i.e., prices, volatilities, and correlations). Credit risk relates to losses that could be incurred due to declines in the creditworthiness of entities in which the Fund invests or with which the Fund deals as a counterparty. Liquidity risk relates to losses that could be incurred when declines in liquidity in the market reduce the value of the investments or reduce the ability of the Fund to fund its investments.

While current market practice is to treat the risks separately, it is crucial for Hedge Fund Managers to recognize and evaluate the overlap that exists between and among market, credit and liquidity risks. This overlap is illustrated in the following diagram (recognizing that the relative sizes of the circles will be different for different strategies):

Consequently, the Risk Monitoring Function should monitor three interrelated variants of market, liquidity and credit risks in combination:

- Market Risk - including asset liquidity and the credit risk associated with investments;
- Funding Liquidity Risk; and
- Counterparty Credit Risk.

In this framework, the risk sometimes referred to as “sovereign risk” would be included as “credit risk,” if the potential loss is related to the financial solvency of the sovereign, or as “market risk,” if the potential loss is related to policy decisions made by the sovereign that
change the market value of positions (e.g., currency controls). The term “event risk” is broader and could incorporate aspects of “credit risk” and “operational risk,” as well as some elements of “market risk.”

For a more detailed discussion of the concepts related to the Recommendations in this section, please see Appendix 1, “Risk Monitoring.”

**Market Risk**

*Encompasses interest rate risk, foreign exchange rate risk, equity price risk, and commodity price risk, as well as asset liquidity risk and the credit risk associated with investments.*

9. **Hedge Fund Managers should evaluate market risk, not only for each Hedge Fund portfolio in aggregate, but also for relevant subcomponents of a portfolio – e.g., by strategy, by asset class, by type of instruments used, by geographic region or by industry sector, as appropriate. In addition, the market risk assumed by each individual portfolio manager should be determined. Hedge Fund Managers should employ a “Value-at-Risk” (VAR) model or other consistent framework for measuring the risk of loss for a portfolio (and relevant subcomponents of the portfolio). While the choice of model should be left to each Hedge Fund Manager, the Hedge Fund Manager should be aware of the structural limitations of the model selected and actively manage these limitations, including the impact of any model breakdown.**

A sound market risk monitoring process should incorporate the confidence level(s) and holding period(s) deemed appropriate depending on the markets traded and the risks assumed. The holding period(s) should reflect the time necessary to liquidate and/or neutralize positions in the portfolio.

The role of the Risk Monitoring Function is to identify the factors affecting the risk and return of the Fund’s investments, both within individual portfolios and across the entire range of activities of the Hedge Fund Manager. Those factors should be incorporated into the risk monitoring process and, where appropriate, be included in the market risk model. Factors that are commonly incorporated in a market risk model include:

- Level and shape of the interest rate term structure in relevant currencies
- Foreign exchange rates
- Equity prices and/or equity indices
- Commodity prices
- Credit spreads
- Nonlinearities
- Volatilities
- Correlation

Hedge Fund Managers should consider incorporating “asset liquidity” (i.e., the change in the value of an asset due to changes in the liquidity of the market in
which the asset is traded) as an additional factor. Measures of asset liquidity that may be considered include:

- The number of days that would be required to liquidate and/or neutralize the position in question; and

- The value that would be lost if the asset in question were to be liquidated and/or neutralized completely within the holding period specified.

Positions managed as a separate account by external portfolio managers on behalf of the Hedge Fund should be incorporated in the routine risk assessment of the overall portfolio. Passive investments in funds managed by external portfolio managers should be monitored as appropriate.

Hedge Fund Managers should recognize that market risk measures such as VAR do not give a complete picture of risk in that they assess the risk of “standard” market movements rather than extreme events. Hedge Fund Managers should actively address these limitations by conducting relevant stress tests and backtesting (see Recommendations 10 and 11).

10. **Hedge Fund Managers should perform “stress tests” to determine how potential changes in market conditions could impact the market risk of the portfolio.**

Among the potential changes in market conditions that should be considered in stress testing are:

- Changes in prices
- Changes in the shape of term structures
- Changes in correlations between prices

If the portfolio contains options or instruments with options characteristics, additional changes that should be considered as part of stress testing are:

- Changes in volatilities
- Changes in nonlinearities (also referred to as convexity or gamma)

Hedge Fund Managers also should consider including the effects of changes in the liquidity of various assets in their stress testing.

For example, Hedge Fund Managers could examine the effects of changing the holding period. A horizon of several days may reveal strings of losses (or gains) that, while individually less than the one-day VAR, in total add up to a significant deviation from the market risk model’s predicted distribution.

Rather than changing the holding period to reflect the illiquidity of securities or derivatives, the Hedge Fund Manager could gauge the impact
of illiquidity by inputting changes for the appropriate market risk factors that are reflective of multiple-day market price movements (as opposed to single day changes).

If specific asset liquidity factors are incorporated in the market risk model (see above), these asset liquidity factors can be “stressed” to examine the impact of (1) changes in the value that could be lost if the position in question were to be liquidated and/or neutralized completely during the standard holding period, or (2) changes in the number of days required to liquidate and/or neutralize the position in question.

Hedge Fund Managers should incorporate the impact of correlated events into stress testing, where appropriate.

Hedge Fund Managers also should consider conducting “scenario analyses” to benchmark the risk of a Fund’s current portfolio against various scenarios of market behavior (historical or prospective) that are relevant to the Hedge Fund Manager’s trading activities (e.g., the October 1987 stock market event, the Asian financial crisis of 1997 or a scenario where concerns about general credit quality lead to dramatic declines in asset values combined with decreases in asset and funding liquidity).

Stress tests/scenario analyses should take into account the impact of legal and contractual relationships. (See Recommendation 31.)

11. **Hedge Fund Managers should validate their market risk models via regular “backtesting.”**

The distribution of observed changes in the value of the portfolio should be compared to the distribution of changes in value generated by a Hedge Fund Manager’s market risk model.

If the frequency of changes in the value of the portfolio exceeds the frequency generated by the market risk model (a statistical expectation based on the confidence level of the market risk model), such deviation should be scrutinized to determine its source. If appropriate after investigation, the market risk model should be modified. Potential sources of deviations include:

- A change in the composition of the portfolio between calculation and observation;
- Pricing models under/overstated obtainable prices;
- A change in the underlying market, including changes in the volatility, correlation, or liquidity of the factors used in the market risk model (Recommendation 9 contains a list of commonly-used market risk factors);
- Model(s) did not adequately capture sources of risk.
Even if the frequency of changes in value in excess of that generated by the market risk model is within the expected range, if the observed change in the value of the portfolio differs significantly from the change that would be expected, given the composition of the portfolio and the observed changes in the market factors, Hedge Fund Managers should reconcile the difference.

**Funding Liquidity Risk**

<table>
<thead>
<tr>
<th>Funding liquidity is critical to a Hedge Fund Manager’s ability to continue trading in times of stress. Funding liquidity analysis should take into account the investment strategies employed, the terms governing the rights of investors to redeem their interests and the liquidity of assets (e.g., all things being equal, the longer the expected period necessary to liquidate assets, the greater the potential funding requirements). Adequate funding liquidity gives a Hedge Fund Manager the ability to continue a trading strategy without being forced to liquidate assets when losses arise.</th>
</tr>
</thead>
</table>

12. **Cash should be actively managed.**

Hedge Fund Managers should know where a Fund’s cash is deployed and the reason for deploying it.

Hedge Fund Managers should centralize cash management and should evaluate the costs and benefits of leaving excess cash in trading accounts (e.g., margin accounts).

13. **Hedge Fund Managers should employ appropriate liquidity measures in order to gauge, on an ongoing basis, whether a Fund is maintaining adequate liquidity. Liquidity should be assessed relative to the size and riskiness of the Fund.**

Possible liquidity measures include the following:

- Cash\(^1\)/Equity
- VAR/(Cash+Borrowing Capacity)\(^2\)
- Worst Historical Drawdown/(Cash + Borrowing Capacity)

14. **Hedge Fund Managers should evaluate the stability of sources of liquidity and plan for funding needs accordingly, including a contingency plan in periods of stress.**

---

\(^1\) “Cash” refers to cash plus cash equivalents (short-term, high-quality investments).

\(^2\) “Cash + Borrowing Capacity” = Cash plus access to borrowings, e.g., under margin rules or credit lines.
Hedge Fund Managers should assess their Cash and Borrowing Capacity under the worst historical drawdown and stressed market conditions (e.g., by assuming worst case haircuts on securities used to collateralize margin borrowings), taking into account potential investor redemptions and contractual arrangements that affect a Fund’s liquidity (e.g., notice periods for reduction of credit lines by counterparties).

Hedge Fund Managers should periodically forecast their liquidity requirements and potential changes in liquidity measures.

Hedge Fund Managers should perform scenario tests to determine the impact of potential changes in market conditions on a Fund’s liquidity. Among these scenario tests, Hedge Fund Managers should consider including the potential response to a creditor experiencing a liquidity problem during times of market stress (e.g., reluctance to release collateral).

Hedge Fund Managers should take into account in their liquidity planning redemption “windows” or other rights of investors to redeem their interests. Hedge Fund Managers should also take into account the relationship between a Fund’s performance and redemptions and between a Fund’s performance and the availability of credit lines.

**Counterparty Credit Risk**

15. **Hedge Fund Managers should establish policies and procedures to manage the Fund’s exposure to potential defaults by trading counterparties.**

Hedge Fund Managers should identify acceptable counterparties based on a reasonable analysis of creditworthiness and set appropriate exposure limits.

Hedge Fund Managers should ensure that counterparties’ creditworthiness is actively monitored. In addition, credit concentrations relative to exposure limits should be monitored, taking into account settlement risk as well as pre-settlement risk. Procedures should be adopted and enforced to reduce or terminate trading with counterparties whose credit quality falls below an acceptable level or where exposure exceeds set limits.

Hedge Fund Managers should seek to establish appropriate collateral provisions or other forms of credit support in their counterparty agreements (see Recommendation 29) and put in place procedures for managing collateral calls between the Hedge Fund and its counterparties.
Leverage

Hedge Fund Managers must recognize that leverage is important, not in and of itself, but because of the impact it can have on market risk, credit risk and liquidity risk – i.e., leverage influences the rapidity of changes in the value of the portfolio due to changes in market risk, credit risk, or liquidity risk factors. Consequently, the most relevant measures of leverage are “risk-based” measures that relate the riskiness of a portfolio to the ability of the Fund to absorb that risk. Recognizing the impact that leverage can have on a portfolio’s exposure to market risk, credit risk, and liquidity risk, Hedge Fund Managers should assess the degree to which a Hedge Fund is able to modify its risk-based leverage in periods of stress or increased market risk. Hedge Fund Managers also should track traditional, accounting-based measures of leverage, which can provide insights into the source of risk-based leverage and how that leverage could be adjusted.

16. Hedge Fund Managers should develop and monitor several measures of leverage, recognizing that leverage, appropriately defined, can magnify the effect of changes in market, credit or liquidity risk factors on the value of the portfolio and can adversely impact a Fund’s liquidity.

Accounting-Based Leverage

Hedge Fund Managers should track traditional accounting-based measures of leverage. Not only are these measures routinely requested by counterparties and credit providers, but also these measures can contribute to understanding of leverage measures that incorporate risk. However, Hedge Fund Managers should be aware of the weaknesses of these accounting-based measures, particularly as stand-alone measures of leverage. Accounting-based measures that could be tracked include traditional “balance sheet leverage measures” -- e.g., “Gross Balance Sheet Assets to Equity” = On-Balance-Sheet Assets / Equity and “Net Balance Sheet Assets to Equity” = (On-Balance-Sheet Assets – Matched Book Assets) / Equity

Recognizing that the preceding measures do not capture off-balance-sheet transactions (e.g., forward contracts, swaps and other derivatives), Hedge Fund Managers may elect to track other accounting-based measures. While such measures can provide useful information if they are understood fully and interpreted correctly, Hedge Fund Managers must recognize that accounting-based measures of leverage which attempt to include off-balance-sheet transactions are, at best, imprecise measures (e.g., accounting-based measures may provide misleading information about offsetting futures positions if they do not have exactly the same expiration date).

Risk-Based Leverage

Hedge Fund Managers also should track each Fund’s leverage using “risk-based leverage” measures reflecting the relationship between the riskiness of a Fund’s
portfolio and the capacity of the Fund to absorb the impact of that risk. In this sense, some of the liquidity measures described in Recommendation 13 can also be viewed as risk-based leverage measures – e.g., \( \text{VAR}/(\text{Cash} + \text{Borrowing Capacity}) \). Other measures that could perform this function include the following:

- The simplest measure of the riskiness of the portfolio is the volatility in the value of the portfolio. This measure could be related to the Fund’s capital:
  
  \[
  \frac{\text{Volatility in Value of Portfolio}}{\text{Equity}}
  \]

- \( \text{VAR} \) has become a widely-recognized measure of market risk; so, this measure could be related to the Fund’s capital:
  
  \[
  \frac{\text{VAR}}{\text{Equity}}
  \]

- As noted above under Recommendation 9, market risk measures such as \( \text{VAR} \) are incomplete measures of market risk because they focus on “standard” market movements rather than extreme events. Consequently, the Hedge Fund Manager should consider assessing the impact of extreme events by comparing a market risk measure derived from analysis of extreme event scenarios (or stress tests) to the Fund’s capital:
  
  \[
  \frac{\text{Scenario-Derived Market Risk Measure}}{\text{Equity}}
  \]

The Hedge Fund Manager must be aware of limitations of the models used and must guard against placing too much reliance on mathematical measures of leverage alone. (As a case in point, analyses of extreme event scenarios will provide leverage information that is correct \textit{ex post} only if the “right” scenarios are considered \textit{ex ante}.) Consequently, it is essential that the Hedge Fund Manager incorporate judgement based on business experience, in conjunction with and in addition to quantitative measures of leverage.

A crucial factor influencing the Fund’s ability to absorb the impact of extreme market events is the degree to which the Fund can modify its risk-based leverage, especially during periods of market stress. During periods of market stress, the Hedge Fund Manager should understand its ability to reduce risk-based leverage by reducing traditional leverage resulting from either on- or off-balance-sheet transactions or by reducing the level of risk that is being accepted (e.g., by changing strategy or the types of assets being held in the portfolio). To track the degree to which the Fund is able to modify its risk-based leverage, the Hedge Fund Manager may wish to track variations in the Fund’s market risk measure (e.g., \text{VAR}) over time.
Operational Risk

17. Hedge Fund Managers should establish procedures to limit the Fund’s exposure to potential operational risks, including data entry errors, fraud, system failures and errors in valuation or risk measurement models.

Hedge Fund Managers should consider measures to limit or mitigate operational risk, including:

- Random spot checks of all relevant activities;
- Effective separation between the Risk Selection and Risk Monitoring functions either by having sufficient staff to avoid overlapping activities or by providing the appropriate level of checks and balances for Hedge Fund Managers that are too small to avoid overlapping staff;
- Maintenance of a single, centralized position data set (to avoid the errors inherent in maintaining multiple or regionalized data sets);
- Establishment of an internal review function.

18. Hedge Fund Managers should establish contingency plans for responding to failure of a third party administrator, credit provider or other party that would affect the market, credit, or liquidity risk of a Fund.

Contingency planning should address responses to a failure of a third party on a Fund’s ability to meet its obligation, including transfers of activity to back-up clearing systems, credit providers and other service providers and back-up providers.
## III. DISCLOSURE/TRANSPARENCY

Investors should receive periodic performance and other information about their Hedge Fund investments. Hedge Fund Managers should also consider whether investors should receive interim updates on other matters in response to significant events. Hedge Fund Managers should negotiate with counterparties to determine the extent of financial and risk information that should be provided to them based on the nature of their relationship in order to increase the stability of financing and trading relationships. They should also work with regulators and counterparties to develop a consensus approach to public disclosure. Agreements and other safeguards should be established in order to protect against the unauthorized use of proprietary information furnished to outside parties.

**Reporting to a Fund’s Governing Authority and Investors**

19. The investment objectives and approach plus the range of permissible investments should be clearly disclosed in a Fund’s offering documents. Material changes should be disclosed to a Fund’s Governing Authority and investors as appropriate.

20. Hedge Fund Managers should provide certain base-line standardized performance and other relevant information to all investors, such as:

   - Performance measures, such as quarterly or monthly net asset value calculations and periodic profit and loss;
   - Capital measures, such as total net assets under management and net changes to capital based on new subscriptions less redemptions and the effect of profit and loss; and
   - Annual audited financial statements.
   - Measures that give a view of the Fund’s risk, such as Sharpe ratios or VAR.

**Reporting to Counterparties/Credit Providers**

21. Hedge Fund Managers should furnish periodic reports to credit providers and counterparties that extend trading lines or other forms of credit. The extent of disclosure can vary depending on the extent and nature of the relationship with the credit provider.

   Measures that give a view of the Fund’s risk and return profile, rather than specific trading positions, should be most useful to credit providers and would not sacrifice the proprietary nature of Fund strategies and positions.
Possible disclosures include:

- Performance measures appropriate to the nature of the Funds managed, such as periodic changes in NAV; profit and loss volatility; performance attribution by broad product classes (e.g., currencies, fixed income, equities and commodities).

- Capital measures, such as total net assets under management and net changes to capital based on new subscriptions less redemptions and the effect of profit and loss.

- Market risk measures, such as Sharpe ratios, VAR or scenario-derived market risk measures for each relevant Fund.

- Liquidity measures, such as Cash plus Borrowing Capacity as a percentage of either equity or VAR.

22. **Appropriate safeguards against a counterparty’s unauthorized use of proprietary information should be adopted.**

Hedge Fund Managers should provide financial and other confidential information to a counterparty’s credit department only, and not to any member of a counterparty’s trading desk or department.

The counterparty’s credit department should confirm, preferably in a written confidentiality agreement or letter, its commitment to restrict the use of, and access to, information furnished by the Hedge Fund Manager to the credit desk and to ensure such information is not shared with any trading personnel within the counterparty’s organization or any third-party without the Hedge Fund Manager’s prior written consent.

**Reporting to Regulators**

23. **Hedge Fund Managers should work with appropriate governmental authorities to ensure that where large positions have a potential systemic impact, Hedge Fund Managers along with other financial institutions and investors with significant positions comply with applicable large position reporting requirements, while preserving the confidentiality of proprietary information.**

Appendix II details existing large trader and large position reporting requirements, as well as other United States regulatory filing requirements currently applicable to Hedge Fund Managers depending on either their trading activity or their status as a regulated entity. Similar requirements apply in certain of the other countries where Hedge Fund Managers do business.
Issues Relating to the Potential Impact of Public Disclosure on Market Integrity

24. Hedge Fund Managers should coordinate with counterparties and regulators to develop a broad consensus approach to public disclosure, evaluating both the benefits and the costs of such disclosure to investors, creditors and the markets.

The dialogue with Hedge Fund Managers, counterparties and regulators should assess the goals to be achieved by public disclosure. To the extent that the purpose of public disclosure is to assist creditors and investors in making informed decisions about the credit they extend or the investments they make, the benefits of the recommendations for improved risk management and internal controls by Hedge Fund Managers and for expanded disclosure to counterparties and investors should be considered. Issues relating to the potential relationship between market integrity and public disclosure should be addressed by broad classes of market participants so that a better understanding of the benefits and costs can be achieved.

Because of the broad recognition (including recognition in the PWG Report) that disclosure of Hedge Fund’s proprietary information on strategies or positions should not be required, any approach to public disclosure should consider what information can be collected, aggregated and disseminated without exposing sensitive strategies or positions.
IV. LEGAL AND COMPLIANCE

A Hedge Fund Manager’s legal/compliance personnel must have the authority and resources to operate independently and effectively. This function should seek to actively manage the legal risks presented by the Hedge Fund Manager’s trading, focusing on the documentation governing trading relationships and individual transactions. In particular, Hedge Fund Managers should pursue a consistent and methodical approach to documenting transactions so that the legal consequences of periods of market stress or performance declines may be more clearly anticipated and managed. The legal function should provide the Risk Monitoring Function with useful input in the evaluation of a Fund’s projected liquidity in stressed environments, including inputs derived from the Fund’s transaction documentation (e.g., terms regarding termination, collateral and margining).

25. A Hedge Fund Manager’s general counsel/senior compliance or legal officer should be recognized as a member of senior management and be granted sufficient authority to manage the legal and compliance affairs of the Hedge Fund Manager independently and effectively.

Documentation Policies

26. Hedge Fund Managers should establish transaction execution and documentation management procedures that ensure timely execution of necessary transaction documents and enforceability of transactions.

   Require that all trading counterparties be pre-approved prior to executing any transactions and verify counterparty authorizations.

   Establish formal documentation requirements for all trading (including confirmation requirements for all off-exchange trades where a master agreement has not been executed with a counterparty).

   Ensure that appropriate security interests are created and perfected when collateral is received as part of a transaction.

   Where transaction documentation is performed in the operations or similar area, appropriate liaison with the legal/compliance function should be established.

27. Hedge Fund Managers should track the status of documentation and the negotiation of key provisions and terms (e.g., termination events) using a database or other appropriate mechanism to ensure consistency and standardization across Funds and counterparties to the extent appropriate.

28. Hedge Fund Managers should clarify and standardize documentation on a bilateral basis with all counterparties to the extent possible in order to enhance stability during periods of market stress or declining asset levels. In particular, Hedge Fund Managers generally should evaluate the appropriateness of seeking the following in its counterparty documentation:
• Standardize termination and collateral events as well as events of default, cross-default clauses and the remedies available to a non-defaulting party to achieve consistency in documentation with different counterparties to the extent possible.

• Minimize the possibility of early termination or collateral calls based upon subjective determinations by avoiding provisions that permit counterparties to terminate or make demands for collateral in their “sole discretion” (e.g., avoid “material adverse change” clauses).

• Include the decline of a counterparty’s credit rating as a termination/collateral event.

• Ensure that provisions addressing NAV declines or other performance-based triggers are structured as collateral or termination events to avoid triggering cross-default provisions under other agreements.

• Seek grace periods in connection with performance or other termination events so that an orderly liquidation of positions may take place if necessary.

• Negotiate commitments from primary credit providers to ensure stability of credit facilities during temporary periods of market stress or declining assets, e.g., require that credit providers give written notice within a fixed period prior to termination or reduction of a credit line or other material changes to credit terms.

29. **Hedge Fund Managers should seek to negotiate bilateral collateral agreements that require each party to furnish collateral, taking into account the relative creditworthiness of the parties. In particular, Hedge Fund Managers generally should evaluate the appropriateness of seeking to:**

• Ensure satisfactory custodial arrangements are in place and that location and possible uses of collateral are clearly defined.

• Establish collateral management procedures which permit the Hedge Fund Manager to effectively and regularly value collateral and make calls for collateral from counterparties when permitted.

• Negotiate thresholds that adjust with the counterparties’ credit rating.

• Ensure that the responsibilities for valuing collateral and determining the amounts of collateral to be delivered or returned are appropriately allocated between the parties to a collateral agreement (e.g., by allocating such role to the secured party or the party that is owed collateral).

• Negotiate provisions requiring prompt payment of collateral.
30. Where operational, legal or economic efficiencies would result, Hedge Fund Managers should seek to establish “master/master” or “umbrella” cross-product netting and collateral agreements with counterparties dealing in multiple products using different agreements.

31. Hedge Fund Managers should provide input to the Risk Monitoring Function for use in stress/scenario testing as well as liquidity analyses based on legal or contractual relationships (see Recommendation 10) including:

- The contractual rights of counterparties to increase margin/collateral requirements, declare events of default or declare termination events in response to a Fund’s declining assets or other stress scenarios;
- The legal or contractual sales restrictions applicable to any investments;
- The enforceability of netting provisions in the event of a counterparty’s bankruptcy;
- Redemption windows for investors.

32. Hedge Fund Managers should have appropriate documentation and approval processes for retaining external traders as well as administrators, prime brokers or other third-party service providers.

Compliance

33. Hedge Fund Managers should identify all actual and potential required regulatory filings and clearly allocate responsibility for such filings to appropriate personnel who will supervise and ensure timely compliance with applicable regulations and filing requirements.

34. Hedge Fund Managers should require all employees to attest in writing upon hiring and on an annual basis to their acceptance of a “code of conduct” or compliance manual, which should address, where applicable, trading rules and restrictions, confidentiality requirements, procedures to prevent the flow of non-public information from one function to another, compliance with internal policies and procedures and compliance with securities (e.g., insider trading) and related laws. The compliance manual/code of conduct should be regularly updated.
CONCLUSION

In developing the Recommendations, the primary goal has been to promote sound risk management and internal controls for the Hedge Fund industry by identifying practices that would contribute to enhancing the financial stability of Funds managed by large Hedge Fund Managers and, in turn, reduce the possibility of their failure due to unexpected market events. While the adoption of the Recommendations by Hedge Fund Managers will not reduce market volatility or eliminate the prospect of events leading to unanticipated Hedge Fund losses, defaults or failures, it is hoped that the adoption of these practices by the largest Hedge Fund Managers, in combination with the implementation by their counterparties of the CRMPG recommendations, will serve to reduce the likelihood of systemic consequences resulting from a Hedge Fund’s default or failure.

The Recommendations also seek to emphasize the importance of managerial expertise and discipline to weathering market shocks and crises. While thorough and thoughtful risk measurement and analysis are critical elements of sound Hedge Fund management, they will not spare the Hedge Fund Manager who refuses to take the steps necessary to preserve appropriate levels of liquidity when faced with stressed market conditions or unexpected losses. For this reason internal controls and policies for addressing stressed market conditions are at least as important as the mechanisms used to anticipate and analyze them.

While most of the recommendations contained in the first two sections may be adopted unilaterally by individual Hedge Fund Managers, the ability to implement them may depend on the availability of qualified personnel and other resources and, consequently, their implementation may not be feasible for smaller Hedge Fund Managers. Furthermore, many of the recommendations relating to disclosure and documentation policies will require negotiation with and acceptance by third parties, and it is hoped that the publication of this document will contribute to generating the industry support and regulatory dialogue that may be necessary to implement these recommended practices.

The Recommendations were developed in the belief that the most effective form of oversight is self-evaluation combined with self-discipline. The first line of defense to market stress will always be the Hedge Fund Manager itself, and the Recommendations are intended to provide a framework of internal policies and controls that will enhance the ability of Hedge Fund Managers to prudently address unexpected market events or losses.
APPENDIX I

RISK MONITORING PRACTICES FOR HEDGE FUND MANAGERS

The objective of this appendix is to elaborate upon the discussion of risk monitoring practices contained in the Recommendations. In so doing, this appendix describes the general array of risk management techniques and methodologies currently available, in addition to addressing the specific techniques and methodologies that should be considered as part of sound risk monitoring practices for Hedge Fund Managers. The latter discussion includes further explanations of valuation, liquidity and leverage from the perspective of Hedge Fund Managers.

This appendix begins by providing an overview of the risks faced by a Hedge Fund Manager in Section 1.

Valuation procedures are discussed in Section 2. While not explicitly part of the Risk Monitoring Function, proper valuation processes are crucial to effective risk monitoring.

The descriptions of the practices for monitoring Market Risk (Section 3), Funding Liquidity Risk (Section 4) and Leverage (Section 5) form the core of this appendix and address the following key issues:

- Techniques for monitoring market risk that are becoming well-accepted in financial markets – VAR, scenario analyses and stress tests, and backtesting.

- The importance of analyzing funding liquidity risk. While the measures for monitoring funding liquidity described in this appendix are used in other industries, Hedge Fund Managers should focus significant attention on funding liquidity given the impact it can have on the viability of a Hedge Fund.

- Leverage in the context of Hedge Funds. While leverage is not unique to Hedge Funds, the market risk inherent in a Hedge Fund, coupled with the constraints imposed by funding liquidity, make the amplifying effect of leverage of particular concern to a Hedge Fund Manager. This appendix describes a group of static leverage measures, both accounting-based and risk-based leverage measures. Also described in this appendix are dynamic leverage measures that can provide additional information to the Hedge Fund Manager.

This appendix concludes with a description of procedures for monitoring Counterparty Credit Risk (Section 6). Because Hedge Funds generally deal with counterparties having high credit quality, the credit risk of counterparties may be of less concern to Hedge Fund Managers than the other sources of risk but should nonetheless by appropriately monitored.
1. Overview -- The Risks Faced by a Hedge Fund Manager

Effective risk management requires that the Hedge Fund Manager recognize and understand the source of the returns the Fund is earning – i.e., the risks to which the Fund is exposed. Consequently, one of the primary responsibilities of the Risk Monitoring Function is to identify and quantify the sources of risk.

While observers often distinguish four broad types of risk – Market Risk, Credit Risk, Liquidity Risk and Operational Risk – it is important to recognize that these risks are interrelated. Indeed, Hedge Fund Managers should recognize that “market risk” incorporates elements of credit risk and liquidity risk. Defined most narrowly, market risk focuses on the impact of changes in the prices of (or rates for) securities and derivatives, the volatilities of those prices, and the correlations between pairs of prices on the value of the portfolio. However, elements of liquidity risk and credit risk have a similar focus:

- Changes in liquidity impact on the value of a security or derivative. This element of liquidity risk is sometimes referred to as asset or “market” liquidity risk.
- Changes in the creditworthiness of an entity impact on the value of a security or derivative issued by or indexed to that entity.

Because these three risks all focus explicitly on changes in the value of an asset or the portfolio, Hedge Fund Managers should integrate the monitoring and management of them (i.e., view them as a group, rather than individually). Hence, in Section 3 of this appendix, “market risk” will encompass the credit risk associated with assets held in the portfolio and asset (or market) liquidity risk, as well as the more commonly-cited market risk factors: interest rate risk, foreign exchange rate risk, equity price risk and commodity price risk.

In addition to having an impact on the value of securities or derivatives held by the Hedge Fund, changes in funding liquidity can impact on the Hedge Fund Managers’ ability to finance its positions. Section 4 will indicate why this risk is of greater concern to Hedge Fund Managers than to other entities and will describe the techniques that should be used by Hedge Fund Managers to monitor funding liquidity risk.

The Hedge Fund Manager must also consider “leverage.” However, leverage is not an independent source of risk; rather, it is a factor that influences the rapidity with which changes in market risk, credit risk or liquidity risk factors change the value of the portfolio. Indeed, it is essential to consider what leverage means – or doesn’t mean – in the context of a Hedge Fund:

- **A single leverage number may not contain very much information.** As will be illustrated in this appendix, a risk-reducing transaction can increase some leverage measures while decreasing others.

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1 As was noted in the Recommendations, “sovereign risk” may be viewed either as “credit risk,” if the potential loss is related to the financial solvency of the sovereign, or as “market risk,” if the potential loss is related to policy decisions made by the sovereign that change the market value of positions (e.g., currency controls). “Legal risk,” other than those covered by the preceding discussion of “sovereign risk,” would be included as “operational risk.”
• **The liquidity or price volatility of the position being leveraged is relevant to assessing effective leverage.** The leverage employed by a Hedge Fund that holds one-year Treasury bills with ten-to-one leverage may be of less concern than that employed by a Fund levered two-to-one in Russian Ministry of Finance bonds.

• **A Hedge Fund’s capacity to absorb losses—its “funding liquidity”—is relevant to assessing its effective leverage.** Leverage should be measured relative to a Fund’s capacity to absorb losses. A relatively highly leveraged Fund in conventional balance sheet terms may pose a smaller risk than a less levered Hedge Fund with low cash positions, limited borrowing capacity, or investors that can withdraw their funds on short notice.

**Stylized Portfolios**

In Sections 3, 4, and 5, a collection of stylized portfolios and balance sheets are used to illustrate and compare the measures of market risk, funding liquidity risk and leverage that are discussed in the Recommendations and this appendix. As described below, these simple portfolios are composed of various combinations of three hypothetical securities (which are denoted as Asset 1, Asset 2 and Asset 3) and two derivative contracts. Two of the securities are lower risk assets, with annualized volatility of 30% and 25%, respectively. The third asset is a higher risk asset with annual volatility of 60%. The two derivatives are simple futures contracts on the two low risk securities; therefore they have the same volatility as those securities.

Each portfolio is part of a simple balance sheet. It is assumed that $100 of investor equity funds each strategy. To calculate all of the various risk measures, the stylized balance sheets also indicate a cash position, a futures margin position, and a liability account that reflects any financing transactions. The required futures margin is 10% in cash, which is not counted as liquidity. In addition, up to 50% of Assets 1, 2, or 3 can be borrowed, and 50% of the proceeds from a short sale are available to finance investments.

For each portfolio various measures of market risk, liquidity and leverage have been calculated. Note that not all the risk measures are relevant for every portfolio.

• Portfolios 1 and 2 illustrate positions with identical market risk but different investments to implement the strategy. Portfolio 1 is an un-leveraged investment in Asset 1 while Portfolio 2 uses the futures contract on Asset 1 to implement the same strategy.

• Portfolios 3 and 4 are leveraged versions of Portfolios 1 and 2. The use of balance sheet leverage (Portfolio 1) or additional derivatives contracts (Portfolio 2) has the effect of increasing the market risk of both portfolios.

• Like Portfolios 3 and 4, Portfolio 5 is more risky than Portfolios 1 and 2; but, instead of employing traditional leverage, the additional risk arises because the manager switches from a lower-risk strategy (invest in Asset 1) to a higher-risk investment strategy (invest in Asset 3).

• Portfolios 6 and 7 use long and short investments to illustrate the effect of a type of hedging by being long in one asset and short in another, that is positively correlated with the first. In Portfolio 6 the strategy is implemented in the cash market, while Portfolio 7 achieves identical market risk using a combination of cash and futures. As discussed later, these
portfolios illustrate the complexity that can appear as the portfolio increases in size — although Portfolios 6 and 7 are generally less risky than Portfolios 3 and 4, there are conditions under which they can become significantly more risky.

- Portfolios 8 and 9 are used to illustrate the effect of matched book assets—either in the futures market or the cash market—on traditional leverage and liquidity measures. Portfolios 8 and 9 represent the same net positions as Portfolios 1 and 2; but, the positions are established by combining a short position in Asset 1 or futures on Asset 1 (i.e., -20) with long positions in the same asset (i.e., 100), rather than only long positions (i.e., 80).

| TABLE 1 |
| Stylized Portfolios |

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<th>Unlevered Cash Futures</th>
<th>Levered Cash Futures</th>
<th>Unlevered High Risk Cash</th>
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<td></td>
</tr>
<tr>
<td>Capital</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Borrowing (outright or repo)</td>
<td></td>
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</tr>
<tr>
<td>Investments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash Market Transactions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asset 1</td>
<td>80</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asset 2</td>
<td></td>
<td></td>
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<tr>
<td>Asset 3</td>
<td></td>
<td></td>
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<tr>
<td>Derivatives Market Transactions</td>
<td></td>
<td></td>
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<tr>
<td>Futures on Asset 1</td>
<td>80</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Futures on Asset 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>20</td>
<td>92</td>
<td>10</td>
<td>88</td>
</tr>
<tr>
<td>Futures Margin</td>
<td>0</td>
<td>8</td>
<td>0</td>
<td>12</td>
</tr>
</tbody>
</table>

As noted above, for Hedge Fund Managers, changes in credit quality that affect the value of the portfolio through a change in the price of securities owned are incorporated into “market risk.” However, Hedge Fund Managers are also exposed to counterparty credit risk. Changes in the credit quality of counterparties can impose costs on the Hedge Fund either in the form of an increase in expected losses due to counterparty failure to perform or by forcing the Hedge Fund Manager to find alternative counterparties.

Operational risks faced by Hedge Fund Managers are much the same as those faced by other financial institutions – data entry errors, fraud, system failures and errors in valuation or risk measurement models. The appropriate techniques and procedures to deal with these risks are, likewise, the same techniques and procedures used by other entities. As noted in the Recommendations, these include random spot checks, maintenance of a single, centralized data set, contingency plans for responding to failures in the Hedge Fund Manager’s systems or for responding to the failure of a third party service provider.
2. Valuation

As noted in the Recommendations, the valuation of positions serves two distinct purposes for the Hedge Fund Manager. In addition to providing the base input to the risk monitoring process, valuation of positions is required for the calculation of Net Asset Value (NAV), which is the basis for investor subscriptions and redemptions.

Hedge Fund Managers’ valuation policies should be objective, fair, and consistent.

- Objectivity requires that Hedge Fund Managers either calculate or verify the accuracy of prices independent of the trading/risk selection function. To that end, Hedge Fund Managers should look to reliable price quotes from external sources wherever possible and cost effective to do so.

- Fairness recognizes that valuation for NAV purposes will determine the prices at which investors subscribe to or redeem from the Fund.

- Consistency can be achieved through the establishment of recognized procedures or practices. This section will provide more detail on valuation issues than was provided in the Recommendations, particularly with respect to valuation for risk monitoring purposes. After restating the principles of NAV valuation, Price Sources and Price Validation will be reviewed. Then, the discussion turns to valuation for risk monitoring purposes.

Net Asset Valuation

Fair Value. As described in the Recommendations, for NAV purposes, Hedge Fund Managers generally should value instruments according to generally accepted accounting principles (GAAP) for the appropriate jurisdiction, recognizing that investors will both buy and sell shares of a Fund on the basis of NAV and that its financial statements must reflect NAV. This generally requires the use of “fair value”. For example, under FASB Statement of Financial Accounting Standards No. 107, the “fair value” of financial assets and liabilities under U.S. GAAP is the amount at which the item could be exchanged in a current transaction between willing parties, other than in a forced or liquidation sale.

Calculation of NAV must take into account not only the value of the financial instruments in the portfolio (sometimes referred to as “trading P&L”), but also accruals of interest, dividends and other receivables and fees, expenses and other payables.

Prices. Where market prices exist and are indicative of fair value, they should generally be used to compute NAV. For instruments that are actively traded, the fair value should be the product of the number of trading units times the quoted price for a single trading unit in the most active market, even if placing an order to sell (or buy, if short) the holding might affect the price if a market’s normal one-day volume might not be sufficient to absorb the quantity held.

For instruments traded in the over-the-counter market, Hedge Fund Managers should, to the extent possible, attempt to obtain multiple quotes from dealers active in that market. Where appropriate, the model parameters that the dealer used in determining its valuation should be obtained and analyzed.
Further considerations on price data are discussed below under “Price Sources”.

Senior Management should establish the valuation methods to be used for NAV purposes where market prices do not exist or are not indicative of fair value. These methods should be disclosed to a Hedge Fund’s Governing Authority. For investments in non-traded assets or assets that are extremely illiquid or otherwise difficult to value, Hedge Fund Managers should document the valuation methods used and periodically subject them to independent validation. For example, because there are no objective external price references for private equity investments, Hedge Fund Managers may determine they should be carried at historical cost.¹

**Frequency.** Senior Management should determine the frequency of computing NAV, which will be needed on each date for which balance sheets are prepared and each interim date on which NAV is disclosed to the Governing Authority or investors. Some Hedge Fund Managers calculate a daily NAV, while others calculate NAV less frequently.

If initial end-of-day values for portfolio instruments are obtained from the Hedge Fund Manager’s trader or other front-office staff, such values should be verified with a frequency determined by the materiality of the position. Significant differences between front- and back-office valuations should be investigated and reconciled. Alternatively, end-of-day valuation may be exclusively the role of back-office staff.

Portfolio values used to calculate NAV should also be used for risk monitoring valuation, except as expressly determined otherwise by Senior Management due to operational or risk analysis reasons as discussed below under “Valuation for Risk Monitoring”. However, valuation for risk monitoring purposes will be performed daily even though NAV may be calculated less frequently. Also, the daily expense accruals that must be reflected in NAV are generally not included in the portfolio valuation for Risk Monitoring purposes, which is instead based on the concept of trading P&L.

**Price Sources**

The appropriate source of price data depends on the position in question:

- Many of the positions held by Hedge Funds are securities or derivatives that are listed on organized exchanges or in over-the-counter markets for which reliable price quotes can be obtained from third-party data vendors. For those securities and derivatives, fair value can be based on the “closing” quotation or official closing price of an exchange or prices in the OTC market or other 24-hour markets as they appear on a data vendor screen (observed at the same time on each day).

- Data vendors may also provide quotations for less actively traded instruments based on a method known as “matrix pricing.” Matrix pricing uses market quotes for actively traded securities to approximate the value of a less actively traded security based on comparable characteristics, such as coupon, maturity, and risk. Matrix prices can be a useful source of

¹ Since illiquid instruments with long holding periods will generally not be included in the daily risk monitoring model, valuing these instruments on a daily basis for Risk Monitoring is not necessary.
third-party price information, but they should be recognized as modeled prices not transaction prices.

- Reliable quotes for certain over-the-counter derivative instruments and structured securities may not be available from data vendors, either because the transactions are “one of a kind” or not actively traded. In many cases the only “market” for these securities is with the original counterparty to the transaction. Such instruments can be valued either by obtaining a quote from the originating counterparty or from a pricing model. While a Hedge Fund Manager might be able to obtain quotes from other dealers not party to the original transaction (which would provide a more independent source of pricing information), such an approach may not be practical, for example because it would require disclosure of proprietary position data.

**Price Validation**

Hedge Fund Managers should establish procedures for verifying the accuracy of prices obtained from data vendors, dealers, or other sources. For actively traded instruments, it may be sufficient to establish multiple feeds from data vendors in order to compare and verify their prices. In other cases, the Hedge Fund Manager should establish procedures for verifying the inputs to models and for validating modeled prices. Modeled prices could be validated by comparing them to prices observed in the market or to prices obtained from third parties where possible. As noted in the Recommendations, dealer quotes and prices generated by models or other estimation methods also should be regularly checked against realized prices to gauge their accuracy. Hedge Fund Managers may elect to use external auditors to verify aspects of their pricing and modeling, either as part of an annual audit or an independent review.

Valuation is typically independent of the trading function. However, for certain illiquid or hard to value investments, such as private equity investments, the valuation process may begin with a price obtained from those most familiar with a particular position, i.e., the trader or analyst. However, in such situations, the Hedge Fund Manager should take steps to independently (either internally or externally as appropriate) assess the reasonableness of that price.

**Valuation for Risk Monitoring**

The Risk Monitoring Function typically values positions consistent with the approach taken for the NAV calculation. However, the Risk Monitoring Function is not constrained by the requirements of GAAP. Consequently, in order to examine potential effects on the portfolio of changes in market conditions, the Risk Monitoring Function may use alternative values or may make adjustments to the position values calculated for NAV purposes. Senior Management should establish policies for determining when risk management valuation methods may differ from NAV for operational or risk analysis reasons. It would not be appropriate, however, to adjust a long position upward or a short position downward, from its fair value for Risk Monitoring purposes.

- Rather than using mid-market prices, bid prices could be used for long positions and ask prices used for short positions.
- Prices may be discounted to reflect the size of a position relative to the market, for example by using “exit values” rather than fair value. Exit value reflects the likely impact on the
market price where the position must be liquidated quickly, such as where the position is significantly larger than historical trading volume during the assumed required exit period.

- For an actively traded security held in a large enough quantity and/or involving sufficient indicia of control that a Schedule 13D or similar public disclosure has been made of the position, and therefore where a sale of a portion could not be made anonymously, a downward adjustment from market value may be appropriate.

- For instruments subject to legal restrictions on sale or where the market is illiquid or has become disorderly, it may be appropriate to make a downward adjustment from the fair value.

- In volatile markets, prices may be discounted if the Risk Monitoring Function does not believe that quoted bids or offers are prices at which a trade could actually be done.

- For a less actively traded instrument representing only a small position, and where obtaining price information requires significant effort, weekly (or even less frequent) pricing may be appropriate.
3. Market Risk

Encompassing the credit risk associated with securities and derivatives in the portfolio and asset liquidity risk, as well as interest rate risk, foreign exchange rate risk, equity price risk, and commodity price risk.

In order that Senior Management of the Hedge Fund Manager be able to oversee the risks that the Hedge Fund faces, the Risk Monitoring Function needs to provide them with some useful measure of risk. Measuring the degree to which the portfolio is diversified (e.g., the percentages of the portfolio allocated to different asset classes or to different geographical regions) may be useful; however, it is important for the Hedge Fund Manager to recognize and understand the correlations between positions. For complex portfolios, many summary measures of market risk do not reflect such correlations. Value-at-Risk (VAR) is a tool which is intended to provide a summary market risk measure which incorporates correlations between positions.

VAR measures the maximum change in the value of the portfolio that would be expected at a specified confidence level over a specified holding period. For example, if the 95% confidence level, one-day VAR for a portfolio is $500,000, one would expect to gain or lose more than $500,000 in only 5 of every 100 trading days on average.\(^1\)

Since first being discussed in the Group of 30 Report in 1993\(^2\), VAR has become a widely-used risk measurement tool among virtually all commercial banks and investment banks.\(^3\) Other market participants are increasingly using the VAR measure as well. A 1998 survey of pension, endowments, and foundations reported that 23% of “large” institutional investors used VAR.\(^4\) Use of VAR by Hedge Funds is believed to be substantial, if not universal among the larger funds.

Parameter Selection

In order to calculate a VAR measure, a numbers of parameters must be input; these parameters describe the positions in the portfolio and the underlying markets. For a given portfolio, the parameters most likely to have a significant impact on the VAR value are the time horizon or holding period (the period of time that would be necessary for the portfolio to be liquidated or neutralized), the confidence level (the probability that the change in the value of the portfolio would exceed the VAR), and the variance-covariance data (which reflects the volatility of the individual market factors and the correlation between pairs of factors). These parameters are explained further below.

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3. Since 1995, the Basle Committee on Banking Supervision and an IOSCO technical committee have been examining the risk management procedures and disclosures of leading banks and securities firms in the industrialized world. The latest survey, released in December 1999, indicated that virtually all banks and securities firms covered by the survey used VAR techniques to measure market risk.
Time Horizon
The time horizon or holding period used in the VAR calculation is intended to reflect the time period necessary to liquidate (or neutralize) the positions in the portfolio. In practice, if the Hedge Fund has positions in thinly traded or illiquid instruments, it is difficult to determine the correct liquidation/neutralization period for the portfolio. Consequently, good practice is to use standard holding periods – e.g., one day, three days, 5 days, and 10 days in the base-case VAR calculation and then employ stress tests to determine the degree of holding period risk in the portfolio.

Confidence Level
There is no mathematical formula that defines the appropriate confidence level; the appropriate confidence level is determined by the business circumstances of the entity. Different types of businesses should and do use different confidence levels. The appropriate confidence level for a specific Hedge Fund will be a business decision that is determined by the specific circumstances of the Fund; and Senior Management of the Hedge Fund Manager should be actively involved in this determination.

Variance-Covariance Data
While the measure of the riskiness of individual market factors (i.e., the variances of the market factors) is important, the question of the degree of correlation (i.e., covariance) between pairs of market factors is critical, because correlation has such a large impact on the VAR calculation. A number of VAR models use historic correlations. However, since historic correlations are unstable (especially during periods of market stress), the Hedge Fund Manager should employ scenario analyses and stress testing (see below) to ascertain the impact of inaccurate correlation assumptions.

Beyond a Single VAR Number
Scenario Analysis, Stress Testing and Backtesting
Hedge Fund Managers must recognize that a single VAR number is not sufficient to capture all risks faced by the Hedge Fund and that successful risk management requires the Risk Monitoring Function to analyze both the sensitivity of the VAR to alternative market conditions and the reliability of the VAR calculations.

Scenario Analysis
By their nature, VAR calculations are based on “typical” market days. Periods of market stress or crisis – the very times of greatest concern – will not be well represented in the data for a typical period; so the resulting VAR number will underestimate the risks of severe markets. To address this limitation, the Hedge Fund Manager should perform scenario analyses regularly, to assess the VAR for the current portfolio in periods of market stress.

In creating scenario analyses, a Hedge Fund Manager should use both historical stress periods – e.g., October 19, 1987 when the equity markets “crashed,” February 4, 1994 when the US Federal Reserve changed direction and started increasing US interest rates, December 20, 1994...
when the Mexican Peso was devalued – as well as hypothetical periods, designed perhaps to put the most pressure on the current portfolio.

**Stress Testing**

Hedge Fund Managers should stress test the VAR number by changing the parameters of the VAR model. Stress tests permit the Hedge Fund Manager to see what will happen to the VAR number if the actual values of market factors (i.e., prices, rates, volatilities, etc.) differ from the values used as inputs in the base-case VAR calculation.

Of particular concern to Hedge Fund Managers are “breakdowns” in the correlations reflected in current market data. In times of market crisis the correlations between asset prices or rates can change dramatically and unexpectedly, with the result that positions that were thought to be diversifying – or even hedging – end up compounding risk. While it remains difficult to hedge correlation risk, stress tests to evaluate the impact of correlation changes permit the Hedge Fund Manager to help ensure that, when the Hedge Fund Manager selects the assets to be included in the portfolio, the Fund is accepting the desired level of correlation risk (and is being compensated for bearing that risk).
Illustrative Risk Measures

Table 2 contains several illustrative VAR measures for each of the nine stylized portfolios introduced earlier:

- **Standard VAR** – A 95% One-Day VAR is calculated using the historical volatilities for the assets and assuming the correlation between Assets is 0.3.

- **Stressed VAR 1** – The 95% One-Day VAR is recalculated increasing the volatility of each asset by 50% (i.e., to 45% for Asset 1, to 37.5% for Asset 2 and to 90% for Asset 3) and increasing the correlation between all assets to 0.9.

- **Stressed VAR 2** – The 95% One-Day VAR is recalculated again increasing the volatilities by 50% as above, but decreasing the correlation between assets to zero.

<table>
<thead>
<tr>
<th>TABLE 2</th>
<th>Markets of Market Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unlevered Cash versus Futures</td>
<td>Levered Cash versus Futures</td>
</tr>
<tr>
<td></td>
<td>Cash Only</td>
</tr>
<tr>
<td>Summary Balance Sheet</td>
<td></td>
</tr>
<tr>
<td>Portfolio 1</td>
<td>2</td>
</tr>
<tr>
<td>Capital (outright or repo)</td>
<td>100</td>
</tr>
<tr>
<td>Borrowing (outright or repo)</td>
<td>0</td>
</tr>
<tr>
<td>Cash Market Transactions</td>
<td></td>
</tr>
<tr>
<td>Asset 1</td>
<td>80</td>
</tr>
<tr>
<td>Asset 2</td>
<td></td>
</tr>
<tr>
<td>Asset 3</td>
<td></td>
</tr>
<tr>
<td>Derivatives Market Transactions</td>
<td></td>
</tr>
<tr>
<td>Futures on Asset 1</td>
<td>80</td>
</tr>
<tr>
<td>Futures on Asset 2</td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>20</td>
</tr>
<tr>
<td>Futures Margin</td>
<td>0</td>
</tr>
<tr>
<td>Risk Measures</td>
<td></td>
</tr>
<tr>
<td>Standard VAR (asset Correlation = 0.3)</td>
<td>2.50</td>
</tr>
<tr>
<td>Stressed VAR 1 (Vol = 50%; Asset Correlation = 0.95)</td>
<td>3.76</td>
</tr>
<tr>
<td>Stressed VAR 2 (Vol = 50%; Asset Correlation = 0)</td>
<td>3.76</td>
</tr>
<tr>
<td>Sharpe Ratio</td>
<td>1.05</td>
</tr>
</tbody>
</table>

Table 2 provides confirmation of some general propositions regarding the VAR measures:

- Identical positions have the same VAR regardless of whether they are implemented in the cash market (e.g. Portfolio 1) or the futures market (e.g. Portfolio 2). Identical in this case refers to the fact that the cash and futures positions represent the price risk associated with the same asset and in the same amount. (As discussed below, other risk measures, such as liquidity, are not identical.)

- VAR can be increased via traditional balance sheet leverage or the use of additional derivatives contracts. Portfolios 3 and 4 illustrate the effect of leverage on the first two portfolios.

- VAR can be increased by choosing higher risk assets, regardless of leverage, as illustrated in
Portfolio 5.

- A hedge is not always a hedge. The “hedge” established via Portfolios 6 and 7 presumes that Assets 1 and 2 are positively correlated. Under normal conditions (i.e. when correlation equals 0.3 in this example) the tendency of Asset 1 and Asset 2 to move together results in the VAR of Portfolio 6 being similar to the VAR of Portfolio 3 even though the total position size is larger. When the correlation gets more positive (Stressed VAR 1), the hedge is better, and VAR stays relatively unchanged even though overall volatility in the market has increased by 50%. But, when the correlation gets less positive (Stressed VAR 2), the hedge is much less effective and the combined effect of higher volatility and lower correlation results in a significantly larger VAR. As was the case with the earlier portfolios, the use of futures or cash market investments does not change the market risk measure, as evidenced by the identical VAR of Portfolios 6 and 7.

Back Testing

Perhaps even more important than analyzing the sensitivity of the VAR number is “back testing” the VAR to see how it performed. By comparing actual changes in the value of the portfolio to the changes generated by the VAR calculation, the Hedge Fund Manager can gain insight into whether the VAR model is accurately measuring a Fund’s risk.

In back testing, one expects that the portfolio will lose more than the VAR from time to time. For example, a 95% one-day VAR should be exceeded 5 days in every 100 trading days on average. When the actual changes in the value of the portfolio exceed VAR, the Hedge Fund Manager should determine the source of the discrepancy, i.e., whether the VAR measure is flawed or whether this loss is simply one which was expected given the confidence level employed or is attributable to a change in the composition of the portfolio or the market.

Relating Earnings and Risk

It was noted at the outset that effective risk management requires the Hedge Fund Manager to recognize and understand the risks the Fund faces. That, in turn, requires the Hedge Fund Manager to understand the various sources of the Fund’s earnings, both the size of the earnings and their volatility.

One way that Hedge Fund Managers can accomplish this attribution is by decomposing the daily value changes by market factors. The objective is to determine if the actual changes were what would have been predicted, given the now known changes in the market factors. If the observed change in the value of the portfolio differs significantly from the change that would be expected, given the composition of the portfolio and the observed changes in the market factors, the differences should be reconciled.

Such a source-of-return and source-of-risk attribution process sets the stage for linking performance measurement with risk measurement. The Sharpe Ratio is widely-used by investors to measure a portfolio’s risk-adjusted performance over a specific period. The numerator of the Sharpe Ratio is attributed to William F. Sharpe, who described a measure of “return to variability” for use in comparing investment performance.
Sharpe Ratio is a measure of portfolio return during the period; the denominator is a measure of the risk incurred in achieving the return. (For example, over the past decade the Sharpe Ratio for the S&P 500 has been approximately 1.2.) Investors prefer high Sharpe Ratios to low, since a higher Sharpe ratio indicates that the portfolio earned superior returns relative to the level of risk incurred.

There are a number of ways in which return and risk could be calculated. Below is the Sharpe Ratio for some arbitrary portfolio – designated as Portfolio j -- calculated using the most common conventions for measuring return and risk. The numerator is the return earned on the portfolio ($R_j$) in excess of the risk-free rate of return ($R_f$) – i.e., the interest rate earned on risk-free securities such as U.S. Treasury securities -- over the same period. The denominator – the risk incurred -- is measured as the standard deviation of the portfolio’s daily return ($\sigma_j$).

$$\text{(Sharpe Ratio)}_j = \frac{R_j - R_f}{\sigma_j}$$

While Value at Risk and the Sharpe Ratio contain some similar information, the two measures are different tools, designed for different purposes. VAR is primarily a risk measurement tool. The Sharpe Ratio is a summary measure, combining both risk and return information. Moreover, while VAR is a risk measure and the denominator of the Sharpe Ratio contains a risk measure, these two risk measures are quite different. The risk measure used in the denominator of the Sharpe ratio is a historical measure; it characterizes the actual volatility of the return over some historical period. In contrast, VAR is intended to be a prospective measure of risk.
4. **Funding Liquidity Risk**

While other entities face funding liquidity risk, this risk is a more central concern to Hedge Fund Managers than others, because funding liquidity problems can rapidly increase a Hedge Fund’s risk of failure. As is described in the following box, a lack of funding liquidity can contribute to a crisis situation for the Hedge Fund.

<table>
<thead>
<tr>
<th>Liquidity Crisis Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hedge Fund Managers should be concerned about a confluence of risks – i.e., market or credit risk events affecting illiquid positions that are leveraged. Such a confluence of events could require the Hedge Fund to liquidate positions into a market that cascades in price because of a high volume of liquidation orders. Such a situation could be decomposed into three stages:</td>
</tr>
<tr>
<td>1. A loss that acts as the triggering event.</td>
</tr>
<tr>
<td>2. A need to liquidate positions to raise cash, because of this loss. The liquidation may be required either because the Fund must post margin with its counterparties or because of redemptions by investors due to the loss.</td>
</tr>
<tr>
<td>3. A further drop in the Fund’s net asset value as the market reacts to actions by the Fund. Obviously, attempts by the Fund to sell in too great a quantity or too quickly for the market liquidity to bear can cause a further drop in prices, precipitating a further decline in the Fund’s net asset value, and leading in turn to yet a further need to liquidate to satisfy margin calls or redemptions. This downward spiral can be exacerbated if other market participants have information about the Fund’s positions.</td>
</tr>
<tr>
<td>The point of no return comes when the effect of liquidation has a greater impact on the value of the remaining Fund position than the amount of cash raised from the liquidation. If this happens, the Fund is caught in an accelerating, downward spiral; and eventually it will not be able to satisfy the demands of its creditors or investors. Once the losses move beyond a critical point, it becomes a self-sustaining crisis that feeds off of the need for liquidity, a need imposed by the demands of the Fund’s creditors and investors.</td>
</tr>
</tbody>
</table>

Because of its importance, Hedge Fund Managers should focus significant attention and resources on measuring and managing funding liquidity risk. There exist a range of measures Hedge Fund Managers can use to track funding liquidity risk. Hedge Fund Managers should monitor the liquidity available in the Fund by tracking its cash position (i.e., cash and short-term securities issued by high-credit-quality entities) and its borrowing capacity (e.g., access to borrowings under margin rules or credit lines).

Beyond measures of available liquidity, Hedge Fund Managers should also monitor measures of relative liquidity. Hedge Fund Managers should relate the measures of liquidity (Cash or Cash + Borrowing Capacity) to the need for that liquidity. The following measures are indicators of a Fund’s potential need for liquidity:
• **Equity or NAV.** Generally, a larger Fund will require greater levels of liquidity. However, a Fund’s need for liquidity during periods of market stress is determined not only by the size of the portfolio but also by the characteristics of the assets it holds. Consequently, Hedge Fund Managers need to have measures of potential liquidity needs that reflect the riskiness of the portfolio.

• **Worst Historical Drawdown.** This indicator provides a measure of risk and of the amount of liquidity the Fund has required in the past. This measure is, however, a backward-looking measure of risk and may not be indicative of the Fund’s current exposure.

• **VAR.** As has been argued earlier, VAR is currently the most widely-used prospective measure of market risk. Consequently, tracking the ratio of Cash or Cash + Borrowing Capacity to VAR provides the Hedge Fund Manager with an indication of whether the Fund’s liquidity relative to its need for liquidity is rising or falling.
Illustrative Liquidity Measures

Table 3 contains the results of calculating five of the liquidity measures discussed in this section for each of the nine stylized portfolios.

Available liquidity is measured by cash that is not committed as margin, and by cash plus the “borrowing capacity” of the assets. For the three cash market assets, it is assumed that 50% of the value of a long position can be borrowed (i.e. assume current Regulation T margin requirements if the three assets were equities). For simplicity, short positions in the assets are assumed to have a 50% margin requirement, in effect, allowing 50% of short trades to be used to fund long positions, or for cash.

Several features of funding liquidity risk measurement are evidenced by the stylized portfolios.

- Other things equal, futures (and derivatives in general) require the Hedge Fund Manager to use significantly less cash (at origination) than would an equivalent position established via a cash market transaction. This is evidenced by Portfolios 1 and 2. (However, not reflected in these numbers is the interrelation of market risk, funding liquidity risk and leveraging. While the cash position uses more cash at origination than does the futures position, if the value of the underlying asset were to change dramatically, the resulting margin call on the futures position could have a significant impact on the Fund’s cash position.)

- For the same amount of initial capital, the use of leverage (e.g., Portfolios 3 and 4) both consumes borrowing capacity and increases VAR; so, measures of available liquidity and relative measures indicate that liquidity declines.

- Use of leverage in the cash market decreases available cash faster than the identical strategy implemented with futures. The increase in traditional balance sheet leverage (i.e. use of margin to buy assets) in Portfolio 3 sharply reduces both absolute and relative measures of liquidity since either cash or borrowing capacity is consumed in the process. The identical economic leverage is obtained using futures in Portfolio 4, but the decrease in liquidity is less pronounced. (The caveat about future cash requirements for futures positions that was raised in the first point applies here as well.)

- Use of a relative liquidity measure, e.g. VAR/(Cash +Borrowing Capacity) captures the impact of investing in higher risk assets while holding the amount invested constant. Portfolio 5 shows that while absolute liquidity is the same as for Portfolio 1, liquidity relative to VAR has decreased (that is, VAR is a higher percentage of available cash).

- Portfolios 6 and 7 illustrate once again that identical market risk portfolios present different funding liquidity risk profiles. Portfolio 7, which uses futures to short Asset 2 while borrowing against Asset 1 is less liquid than Portfolio 6 which shorts Asset 2 in the cash market. The difference is simply that short positions in futures (and derivatives in general) do not generate cash.
### TABLE 3
Measures of Liquidity

<table>
<thead>
<tr>
<th></th>
<th>Unlevered Cash versus Futures</th>
<th>Levered Cash versus Futures</th>
<th>Unlevered Long/Short Strategy Cash versus Futures</th>
<th>Unlevered Strategy with Matched Book Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cash Only</td>
<td>Futures Only</td>
<td>High Risk Cash</td>
<td>Hedged Cash</td>
</tr>
<tr>
<td>Summary Balance Sheet</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Borrowing (outright or repo)</td>
<td>0</td>
<td>0</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Investments</td>
<td></td>
<td></td>
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<tr>
<td>Cash Market Transactions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asset 1</td>
<td>80</td>
<td>120</td>
<td>120</td>
<td>120</td>
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<tr>
<td>Asset 2</td>
<td></td>
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<td>Asset 3</td>
<td></td>
<td></td>
<td>80</td>
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<td>Derivatives Market Transactions</td>
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</tr>
<tr>
<td>Futures on Asset 1</td>
<td>80</td>
<td>120</td>
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<td>100 , 20</td>
</tr>
<tr>
<td>Futures on Asset 2</td>
<td></td>
<td></td>
<td></td>
<td>-60</td>
</tr>
<tr>
<td>Cash</td>
<td>20</td>
<td>92</td>
<td>10</td>
<td>88</td>
</tr>
<tr>
<td>Futures Margin</td>
<td>0</td>
<td>8</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Standard VAR (asset Correlation =0.3)</td>
<td></td>
<td></td>
<td></td>
<td>2.50 2.50</td>
</tr>
<tr>
<td>Liquidity Measures</td>
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<td></td>
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<td></td>
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<tr>
<td>Measures of Available Liquidity</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Cash</td>
<td>20</td>
<td>92</td>
<td>10</td>
<td>88</td>
</tr>
<tr>
<td>Cash + Borrowing Capacity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>92</td>
<td>40</td>
<td>88</td>
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<td>Relative Measures</td>
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</tr>
<tr>
<td>Cash/Equity</td>
<td>20%</td>
<td>92%</td>
<td>10%</td>
<td>88%</td>
</tr>
<tr>
<td>(Cash + Borrowing Capacity)/Equity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60%</td>
<td>92%</td>
<td>40%</td>
<td>88%</td>
<td>60%</td>
</tr>
<tr>
<td>VAR/(Cash + Borrowing Capacity)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2%</td>
<td>2.7%</td>
<td>9.4%</td>
<td>4.3%</td>
<td>8.3%</td>
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</table>

Additional insight about funding liquidity can be gained by looking at the variability in the relative liquidity measure over time. A relative liquidity measure that varies over time is evidence consistent with “effective liquidity” – i.e., the assets are liquid and the manager is willing to take advantage of that liquidity.

Beyond simply monitoring liquidity, Hedge Fund Managers should manage liquidity in several dimensions. Foremost is the use of the Hedge Fund Manager’s experience and judgment to maintain liquidity levels that are adequate given the risk of loss and/or the likelihood of investor redemptions. Also, Hedge Fund Managers should strengthen lines of communication with their credit providers, providing them with summary measures of the Fund’s risk and liquidity consistent with the nature of the relationship. Hedge Fund Managers should actively manage (or monitor) the cash in margin accounts. Similarly, Managers should negotiate haircuts and two-way collateral agreements, where appropriate, to further reduce the likelihood of running out of liquidity.
5. **Leverage**

As the Recommendations made clear, leverage is not a concept that can be uniquely defined, nor is it an independently useful measure of risk. Nevertheless, leverage is important to Hedge Fund Managers because of the impact it can have on the three major quantifiable sources of risk: market risk, credit risk, and liquidity risk.

That leverage is not a uniquely defined concept is evidenced by the variety of “leverage” measures used in banking and finance. These measures, which are described in more detail below, may be accounting-based (also referred to as “asset-based”) or risk-based. The accounting-based measures attempt to capture the traditional notion of leverage as “investing borrowed funds.” Using borrowed money (or its equivalent) enables an investor to increase the assets controlled for a given level of equity capital. Accounting-based measures of leverage relate some measure of asset value to equity. Both returns and risk, relative to equity, are magnified through the use of traditional, accounting-based leverage. The risk-based measures of leverage capture another aspect associated with leverage, namely, the risk of insolvency due to changes in the value of the portfolio. The risk-based measures relate a measure of a Fund’s market risk to its equity (or liquidity). Although useful in this capacity, as described below, risk-based leverage measures do not convey any information about the role borrowed money plays in the risk of insolvency.

No single measure captures all of the elements that market participants, regulators, or market observers attribute to the concept of leverage. Indeed, examples will be presented in which a risk-reducing transaction increases some leverage measures while decreasing others. This leads to the observation that leverage is not an independently useful concept, but must be evaluated in the context of the quantifiable exposures of market, credit and liquidity.

While continuing to track and use accounting-based measures of leverage, Hedge Fund Managers should focus their attention on measures of leverage that relate the riskiness of the portfolio to the capacity of the Fund to absorb that risk – i.e., the measures must include elements of market risk (including the credit risk associated with assets in the portfolio) and funding liquidity risk. Hedge Fund Managers should focus on such measures because traditional accounting-based leverage by itself does not necessarily convey risk of insolvency. To say that one Fund is levered 2-to-1 while another is unlevered does not necessarily mean that the levered Fund is more risky or more likely to encounter liquidity problems. If the levered Fund is invested in government securities while the unlevered Fund is invested in equities, accounting-based leverage would lead to erroneous conclusions about the riskiness of the two Funds. In this sense, accounting-based measures of leverage are arguably deficient since they convey the least information about the nature and risk of the assets in a portfolio.

Risk-based measures (see below) present a measure of market risk (usually VAR) relative to a measure of the resources available to absorb risk (cash or equity). However, in doing so, risk based measures effectively condense several dimensions of risk into a single number. The result of this compression is that some of the detail is lost; the specific effect of leverage is intertwined
with dimensions of market, credit and liquidity risk. To illustrate, consider two Funds with identical risk-based leverage. One Fund employs 2-to-1 accounting leverage while investing in “low risk” strategies (e.g. long/short strategies) using borrowed funds, while the other Fund uses no accounting leverage but employs “high risk” strategies (e.g. macro directional) and large cash reserves. One is “high risk” and “high cash” and the other is “low risk” and “low cash/high borrowing,” yet each achieves the same risk-based leverage. This comparison highlights the second reason why leverage measures are not independently useful: more comprehensive measures blend the effect of multiple risk dimensions. To assess the contribution of leverage requires additional information.

**Accounting-Based Leverage Measures**

There exist a number of accounting-based measures of leverage. In addition to the pragmatic recognition that counterparties and credit providers routinely request these measures, a more compelling rationale for calculating these measures is that they can contribute to an understanding of leverage measures that incorporate risk. This is particularly true when accounting and risk-based leverage are tracked over time.

Certain accounting measures can also provide information regarding how much direct or indirect credit in the form of repurchase agreements, short sales, or derivatives are employed by a Fund. However, it must be recognized that even these accounting-based measures have serious weaknesses, discussed below, particularly as stand-alone measures of leverage.

The most widely used and generally accepted accounting-based measures of leverage are those that relate items from a Fund’s balance sheet:

- **“Gross Balance Sheet Assets to Equity”: On-Balance-Sheet Assets / Equity**

  *This straightforward measure is easily calculated from published financial statements; however, it fails to incorporate two important elements of a Fund’s effective leverage.*

  - The risk reducing effect of on-balance-sheet hedges is not recognized. Adding a hedge to the balance sheet increases assets and thereby increases this leverage measure, even though the transaction may substantially offset the risk of another asset.

  - Derivative instruments, which have historically been carried off-balance-sheet, are not captured.¹ To the extent derivatives are used to hedge on-balance-sheet assets, this measure will overstate the Fund’s effective leverage. By the same token, if a Fund’s derivatives are used to take outright positions, i.e. not as hedges, this measure will understate the Fund’s effective leverage.

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¹ Derivative instruments will be required to be carried on balance sheet under Financial Accounting Standard 133, which is scheduled to become effective in 2000.
• “Net Balance Sheet Assets to Equity”: (On-Balance-Sheet Assets – Matched Book Assets) / Equity

While this measure requires more detailed information about the positions in a Fund’s portfolio, it does provide a partial solution to the shortcomings of the Gross Balance Sheet Assets to Equity measure by including offsets and direct hedges as reflected in “Matched Book Assets.” However, important elements of the Fund’s effective leverage are still not incorporated:

• This measure does not reflect portfolio correlation or less direct hedges that fall outside the definition of matched book assets.

• This measure does not incorporate off-balance-sheet instruments.

Other accounting-based measures have been proposed to capture off-balance-sheet transactions (e.g., forward contracts, swaps and other derivatives). Among those measures are the following:

• “Gross Accounting Leverage”: ( On-Balance-Sheet Assets + On-Balance-Sheet Liabilities + Gross Off-Balance-Sheet Notional) / Equity

Gross Accounting Leverage incorporates the gross amount of off-balance-sheet derivatives. Such a measure cannot reliably indicate the effective amount of leverage obtained from off-balance sheet transactions because that type of offsetting exposures are not netted. An active derivative user that uses offsetting transactions rather than closeouts to reduce or eliminate positions will accumulate a substantial notional amount of derivatives even though the risk of the position and its effective leverage are quite low.

• “Net Accounting Leverage”: ((On-Balance-Sheet Assets – Matched Book Assets) + (On-Balance-Sheet Liabilities – Matched Book Liabilities) + (Gross Off-Balance-Sheet Notional Principal – Notional Principal of Off-Balance-Sheet Transactions Used to Hedge On-Balance-Sheet Assets or Liabilities)) / Equity

Net Accounting Leverage requires still more detail to calculate. Although it reflects Matched Book Assets (liabilities) and off-balance-sheet hedges of balance sheet assets, it still misses off-balance sheet hedges and correlation.

**Risk-Based Leverage Measures**

Risk-based leverage measures reflect the relation between the riskiness of a Fund’s portfolio and the capacity of the Fund to absorb the impact of that risk. While not the only measure that could be used, the Hedge Fund’s equity provides a useful measure of “capacity.” There are, however, different measures of market risk that could be used as the “riskiness” measure:

• (Volatility in Value of Portfolio) / Equity

This is a measure of actual performance volatility over a given horizon relative to equity. While useful, it is subject to criticism. Since it is a retrospective measure, it is less useful if
the composition of the portfolio changes or if future market conditions are not like historical conditions. Moreover, it does not isolate the effect of financing on the risk of the fund since it includes financed assets.

- **VAR / Equity**

  This measure gives a picture of the Fund’s capacity to absorb “typical” market movements. The criticism of such a measure is that it does not reflect the risk of the Fund’s portfolio in extreme markets.

- **(Scenario-Derived Market Risk Measure)/Equity**

  To assess the impact of extreme events, the leverage measure could be calculated using a market risk measure derived from analysis of extreme event scenarios (or stress tests). This measure gives Senior Management information about the Hedge Fund’s ability to absorb extreme market events.

### Illustrative Leverage Measures

Table 4 contains the results of calculating all of the accounting-based leverage measures and two of the risk-based leverage measures discussed in this section. Note that “Net balance sheet leverage” and “Net accounting leverage” are only relevant for Portfolios 8 and 9, because these portfolios are the only ones in which the long and short positions can be netted under accounting rules.

Leverage can be interpreted in several ways: as the use of borrowed money to fund larger asset positions than would otherwise be achievable, and as the use of economic leverage to increase effect of a given change in market prices on the value of Fund’s equity.

The illustrative portfolios demonstrate several common features of accounting-based and risk-based leverage.

- The most common leverage measure, Gross Balance Sheet Leverage (or assets/equity) is not indicative of the types of assets employed or the amount of risk assumed. In the illustration, Gross Balance Sheet Leverage is the same in Portfolios 1, 2, 4, 5, and 9 even though the risk and investment strategy differ significantly across portfolios. Similarly, while the amount of risk assumed in Portfolio 8 is identical to the risk assumed in Portfolio 1, the levels of Gross Balance Sheet Leverage differ.

- The purpose of the Net Balance Sheet Leverage measure is to adjust for matched book assets. Comparison of Net Balance Sheet Leverage with Gross Balance Sheet Leverage for Portfolio 8 shows an instance where this occurs.

- Gross Accounting Leverage, which sums assets, liabilities, and futures is not informative about investment strategy (cash versus futures) or the market risk of the portfolio. Note that the riskiest portfolio as measured by VAR, Portfolio 5, has the lowest accounting leverage. Similarly, Portfolios 1 and 2 are low risk, yet Gross Accounting Leverage varies by 80% between them.
That Net Accounting Leverage adjusts for matched book assets and derivatives that hedge on-balance-sheet positions is seen by comparing Gross Accounting Leverage with Net Accounting Leverage for Portfolios 8 and 9. Note that this measure does not capture the use of a futures position to offset an identical futures position, i.e., the matched futures in Portfolio 9. The risk-based leverage measures come closer to capturing the nature of the risks as reflected in the specific strategies. (Note Portfolios 1, 2, 8, and 9.) However, they too miss certain aspects of the risk picture. For example, Portfolios 3 and 4 have the same VAR/Equity, but the cash market strategy employed in Portfolio 3 uses more cash and borrowing capacity, and is therefore riskier from a liquidity standpoint (VAR is 9.4% of liquidity in Portfolio 3 compared to only 4.3% of liquidity in Portfolio 4).

Stress and scenario analysis are essential elements of liquidity and leverage analyses. The long/short strategy employed in Portfolio 6 and 7 is similar in risk-based leverage to Portfolios 3 and 4 until one looks at the stress scenarios. Because of the reliance on correlation, the leverage of Portfolios 6 and 7 is potentially much larger in a period of market stress.

### TABLE 4

**Measures of Leverage**

<table>
<thead>
<tr>
<th></th>
<th>Unlevered Cash versus Futures</th>
<th>Levered Cash versus Futures</th>
<th>Unlevered High Risk Cash</th>
<th>Long/Short Strategy Mixed</th>
<th>Unlevered Strategy with Matched Book Assets</th>
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<tbody>
<tr>
<td><strong>Portfolio</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<td><strong>Unlevered Cash</strong></td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td><strong>Summary Balance Sheet</strong></td>
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<td></td>
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<tr>
<td>Capital</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Borrowing (outright or repo)</td>
<td>0</td>
<td>0</td>
<td>30</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Investments</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Cash Market Transactions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asset 1</td>
<td>80</td>
<td>120</td>
<td>120</td>
<td>120</td>
<td>100 100</td>
</tr>
<tr>
<td>Asset 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asset 3</td>
<td>80</td>
<td>120</td>
<td>120</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>Derivatives Market Transactions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Futures on Asset 1</td>
<td>80</td>
<td>120</td>
<td>120</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>Futures on Asset 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash Margin</td>
<td>20</td>
<td>92</td>
<td>10 88</td>
<td>10 4</td>
<td>10 88</td>
</tr>
<tr>
<td>Futures Margin</td>
<td>0</td>
<td>8</td>
<td>0 12</td>
<td>0 6</td>
<td>0 12</td>
</tr>
<tr>
<td><strong>Standard VAR (asset Correlation =0.3)</strong></td>
<td>2.50</td>
<td>2.50</td>
<td>3.76 3.76</td>
<td>5.01 3.61 3.61</td>
<td>2.50 2.50</td>
</tr>
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<td><strong>Leverage Measures</strong></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Accounting-Based Measures</td>
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<td></td>
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<td></td>
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<tr>
<td>Gross Balance Sheet Leverage</td>
<td>1</td>
<td>1</td>
<td>1.3</td>
<td>1</td>
<td>1.6 1</td>
</tr>
<tr>
<td>Net Balance Sheet Leverage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.2 1</td>
</tr>
<tr>
<td>Gross Accounting Leverage</td>
<td>1</td>
<td>1.8</td>
<td>1.6 2.2</td>
<td>1</td>
<td>2.2 1</td>
</tr>
<tr>
<td>Net Accounting Leverage</td>
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<td></td>
<td></td>
<td></td>
<td>1.4 2</td>
</tr>
<tr>
<td>Risk-Based Measures</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAR/Capital</td>
<td>2.50% 2.50%</td>
<td>3.76 3.76</td>
<td>5.01</td>
<td>3.61 3.61</td>
<td>2.50% 2.50%</td>
</tr>
<tr>
<td>Stress 1 VAR/Capital</td>
<td>3.76 3.76</td>
<td>5.64 5.64</td>
<td>7.51</td>
<td>3.67 3.67</td>
<td>3.76 3.76</td>
</tr>
<tr>
<td>Stress 2 VAR/Capital</td>
<td>3.76</td>
<td>3.76</td>
<td>5.64 5.64</td>
<td>7.51</td>
<td>6.10 6.10</td>
</tr>
</tbody>
</table>

While the preceding leverage measures are the ones most commonly used by Hedge Fund Managers, other measures may be used to analyze leverage. Indeed, because of the interrelation between market risk, funding liquidity risk and leverage, measures of funding liquidity risk described in Section 4 – particularly Cash + Borrowing Capacity relative to VAR – also provide the Hedge Fund Manager with insights about a Fund’s leverage.
Dynamic Measures of Leverage

A crucial factor influencing a Fund’s ability to absorb the impact of extreme market events is the degree to which a Fund can modify its risk-based leverage, especially during periods of market stress.

Treating equity as constant, there are two ways a Hedge Fund Manager could reduce risk-based leverage:

1. If a Hedge Fund Manager wishes to continue an existing investment strategy, risk-based leverage could be reduced by reducing traditional leverage resulting from either on- or off-balance-sheet transactions.

2. A Hedge Fund Manager could reduce risk-based leverage by reducing the level of risk that is being accepted (e.g., by changing strategy or the types of assets being held in the portfolio). To track the degree to which the Fund is able to modify its risk-based leverage, the Hedge Fund Manager should track variations in the Fund’s market risk measure (e.g., VAR) over time.

The following two measures could be used to track the relationship over time between measures of market risk and actions taken by the Hedge Fund Manager to adjust leverage. Both of these measures consider a short time interval (1 day, 2 days, …, 1 week); and, both assume that equity is constant.

- **Changes in Portfolio Market Risk**

  A decline in a portfolio’s market risk measure (e.g., VAR) in a period following an increase in that market risk measure in the preceding period could be evidence of the Hedge Fund Manager’s ability to de-lever the portfolio during a period of market stress. (The market risk measure could be VAR or the observed volatility of the value of the portfolio during the relevant period.)

- **Relationship between a Change in Market Risk and a Subsequent Change in Cash + Borrowing Capacity**

  All other things equal, if a Hedge Fund Manager is able to reduce the portfolio’s accounting-based leverage, the result would be an increase in cash or in borrowing capacity. Therefore, an increase in Cash + Borrowing Capacity in a period following an increase in the market risk measure for the portfolio (e.g., VAR) could be evidence of the Hedge Fund Manager’s reacting to market stress by reducing leverage.
6. Counterparty Credit Risk

Hedge Fund Managers enter into transactions with a variety of counterparties including banks, securities firms, exchanges, and other financial institutions. The risk of loss to the Fund as a result of the failure of a counterparty to perform as expected constitutes counterparty credit risk. Credit risk is present to some extent in almost any dealing with a third party, including the settlement of securities and derivatives transactions, repurchase agreements, collateral arrangements, and margin accounts. It is also present in open derivatives positions where the exposure of one counterparty to another will change over the life of the contract as the contract’s value fluctuates. Hedge Fund Managers should be aware of, and track, concentrations of credit risk with particular counterparties, and where applicable, different regions of the world.

The willingness of the Hedge Fund Manager to enter into a transaction with a specific counterparty should depend on the loss the Hedge Fund would suffer were the counterparty to default. That, in turn, depends on the magnitude of the Hedge Fund’s exposure to the counterparty and the likelihood of default, i.e. the counterparty’s creditworthiness.

An assessment of exposure to a particular counterparty should include analysis of the following elements of exposure:

- **Current replacement cost.** The amount the Fund would lose if its counterparty were to become insolvent immediately and the Hedge Fund Manager had to replace the contract in the market.

- **Potential exposure.** A probabilistic assessment of the additional exposure that could result if the counterparty does not default immediately but instead defaults at some date in the future. Potential exposure is particularly applicable to derivatives transactions where exposure is reciprocal and likely to change substantially before the contract expires.

- **The probability of loss.** The likelihood of a default by the counterparty over the relevant time horizon. This is a function of the counterparty’s current credit quality, the length of the transaction, and possibly the nature of the transaction itself.

- **Risk mitigation and documentation.** The extent to which collateral, netting provisions or other credit enhancement reduces the magnitude of the exposure to a counterparty. Hedge Fund Managers can greatly reduce their credit exposure to counterparties by negotiating bilateral netting and collateral provisions in their documentation and establishing document management processes to ensure transactions are documented consistently and in a timely manner.
APPENDIX II

U.S. REGULATORY FILINGS BY HEDGE FUND MANAGERS

Listed below are regulatory filings (excluding tax-related and state “blue sky” filings) that Hedge Fund Managers may be required to make in the United States depending on either their trading activity or their status as a regulated entity. The filings made to regulators by individual Hedge Fund Managers will vary depending on the type and volume of trading in which they engage, their business model and the jurisdictions in which they operate. For example, like other market participants and institutional investors, Hedge Fund Managers are required to make certain filings in the United States if the size of the positions they hold in certain markets reaches “reportable” levels. In addition, some Hedge Fund Managers are regulated entities in the United States or are otherwise subject to a regulatory regime, and, like other similarly situated entities, are required to make certain filings in that capacity. This appendix lists filings required in the United States where the above circumstances apply to a Hedge Fund Manager. Hedge Fund Managers may also be subject to regulatory reporting and filing requirements in the foreign jurisdictions in which they conduct their business.

Federal Reserve

Treasury Securities Position and Foreign Exchange Transaction Reporting

1. Large Position Reporting

   Report of positions in specific Treasury security issues that exceed the large position threshold specified by the U.S. Treasury Department (minimum $2 billion).

   Reports are filed in response to notices issued by the U.S. Department of the Treasury if such threshold is met.

   Reports are filed with the Federal Reserve Bank of New York and are not public.

2. Form FC-1

   Report of weekly, consolidated data on the foreign exchange contracts and positions of major market participants.

   Reports to be filed throughout the calendar year by each foreign exchange market participant which had more than $50 billion equivalent in foreign exchange contracts on the last business day of any calendar quarter during the previous year.

   The report is filed with the appropriate Federal Reserve Bank acting as agent for the U.S. Department of the Treasury and is confidential.
3. **Form FC-2**

Report of monthly, consolidated data on the foreign exchange contracts and foreign currency denominated assets and liabilities of major market participants.

Reports to be filed throughout the calendar year by each foreign exchange market participant which had more than $50 billion equivalent in foreign exchange contracts on the last business day of any calendar quarter during the previous year.

The report is filed with the appropriate Federal Reserve Bank acting as agent for the U.S. Department of the Treasury and is confidential.

4. **Form FC-3**

Report of quarterly, consolidated data on the foreign exchange contracts and foreign currency denominated assets and liabilities of major market participants.

Reports to be filed throughout the calendar year by each foreign exchange market participant which had more than $5 billion equivalent in foreign exchange contracts on the last business day of any calendar quarter during the previous year and which does not file Form FC-2.

The report is filed with the appropriate Federal Reserve Bank acting as agent for the U.S. Department of the Treasury and is confidential.

**Treasury Auction Filings**

5. **Treasury Auction**

Treasury security reports filed as necessary. Confirmations must be filed by any customer who is awarded more than $500 million of U.S. government securities in a Treasury auction. The confirmation must include its reportable net long position, if any.

The confirmation is filed with the Federal Reserve Bank to which the bid was submitted and is not public.

**Treasury International Capital Forms**

6. **Forms CM, CQ-1 and CQ-2**

Forms filed by U.S. persons who have claims on, or financial liabilities to unaffiliated foreigners, have balances on deposit with foreign banks (in the U.S. or abroad) or otherwise engage in transactions in securities or other financial assets with foreigners. Forms CQ-1 ("Financial Liabilities to, and Claims on, Unaffiliated Foreigners") and CQ-2 ("Commercial Liabilities to, and Claims on, Unaffiliated Foreigners")
on, Unaffiliated Foreigners”) are quarterly reports, which collect data on financial and commercial liabilities to, and claims on, unaffiliated foreigners held by non-banking enterprises in the United States, which must be filed when the consolidated total of such liabilities are $10 million or more during that period. Form CM (“Dollar Deposit and Certificate of Deposit Claims on Banks Abroad”) is a monthly report whereby non-banking enterprises in the U.S. report their total dollar deposit and certificate of deposit claims on foreign banks, which must be filed when the consolidated total of such claims are $10 million or more during that period.

The forms are filed with the Federal Reserve Bank of New York are non-public except for aggregate information.

7. Form S

Form filed by any U.S. person who purchases or sells $2 million or more of long-term marketable domestic and foreign securities in a month in direct transactions with foreign persons.

The form is filed with the Federal Reserve Bank of New York and is non-public except as to aggregate information.

**Securities and Exchange Commission (“SEC”)**

Sale of Securities by an Issuer Exempt from Registration under Reg. D or 4(6)

8. Form D

Notice of sale filed after securities, such as interests in a private hedge fund, are sold in reliance on a Regulation D private placement exemption or a Section 4(6) exemption from the registration provisions of the 1933 Act. The form is filed with the SEC and relevant states and is publicly available.

Secondary Sale of Restricted and Control Securities Under Rule 144

9. Form 144

Form filed as notice of the proposed sale of restricted securities or securities held by an affiliate of the issuer in reliance on Rule 144 when the amount to be sold during any three month period exceeds 500 shares or units or has an aggregate sales price in excess of $10,000. The form is filed with the SEC and the principal national securities exchange, if any, on which such security is traded and is publicly available.

Ownership of Equity Securities Publicly Traded in the United States

10. Schedule 13D

Disclosure report for any investor, including a hedge fund and its fund manager, who is considered beneficially to own more than
5% of a class of equity securities publicly traded in the U.S. The report identifies the source and amount of the funds used for the acquisition and the purpose of the acquisition.

This reporting requirement is triggered by direct or indirect acquisition of more than 5% of beneficial ownership of a class of equity securities publicly traded in the U.S. Amendments must be filed promptly for material ownership changes. Some investors may instead report on short-form Schedule 13G if they are eligible. See “11. Schedule 13G”

The report is filed with the SEC and is publicly available.

11. Schedule 13G

Short form disclosure report for any passive investor, including a hedge fund and its fund manager, who would otherwise have to file a Schedule 13D but who owns less than 20% of the subject securities (or is in certain U.S. regulated investment businesses) and has not been purchased for the purpose of influencing control.

This reporting requirement is triggered by direct or indirect acquisition of beneficial ownership of more than 5% of a class of equity securities publicly traded in the U.S. Amendments must be filed annually if there are any changes, and either monthly (for U.S. regulated investment businesses) or promptly (for other passive investors) if ownership changes by more than 5% of the class.

The report is filed with the SEC and is publicly available.

12. Forms 3, 4 and 5

Every director, officer or owner of more than 10% of a class of equity securities of a domestic public company must file a statement of ownership. The initial filing is on Form 3 and changes are reported on Form 4. The Annual Statement of beneficial ownership of securities is on Form 5. The statements contain information on the reporting person's relationship to the company and on purchases and sales of the equity securities.

Form 3 reporting is triggered by acquisition of more than 10% of the equity securities of a domestic public company, the reporting person becoming a director or officer, or the equity securities becoming publicly traded, as the case may be. Form 4 reporting is triggered by any open market purchase, sale, or an exercise of options of those reporting under Form 3. Form 5 reporting is required annually for those insiders who have had exempt transactions and have not reported them previously on a Form 4.
The statements are filed with the SEC and are publicly available.

Registered and Unregistered Institutional Investment Managers

13. *Form 13F* Quarterly position report for registered and unregistered institutional investment managers (*i.e.*, any person, other than a natural person, investing in or buying and selling securities for its own account, and any person exercising investment discretion with respect to the account of any other person) with investment discretion over $100 million or more in equity securities publicly traded in the U.S. Reports contain position information about the equity securities under the discretion of the fund manager, and the type of voting authority exercised by the fund manager.

The reporting requirement is triggered by an institutional investment manager holding equity securities having an aggregate fair market value of at least $100 million on the last trading day of a calendar year and require a report as of the end of that year and each of the next three quarters.

The reports are filed with the SEC and are publicly available.

Material Associated Persons of Registered Broker-Dealers

14. *Form 17-H* Material Associated Persons (MAP) reports, filed by registered broker-dealers. Some Hedge Fund Managers are affiliated with registered broker-dealers. MAPs generally include material affiliates and parents and may therefore include an affiliated Hedge Fund Manager or the related hedge fund. Broker-dealers must report (1) organizational chart of the broker-dealer, (2) risk management policies of the broker-dealer, (3) material legal proceedings and (4) additional financial information including aggregate positions, borrowing and off-balance sheet risk for each MAP.

The reporting requirement is triggered by status as broker or dealer registered under Section 15 of the Exchange Act.

This report is filed with the SEC quarterly and cumulatively at year-end and is not public.

There are also a variety of filings with the SEC and the securities self-regulatory organizations that must be made by registered broker-dealers and their employees who are associated persons.
Commodity Futures Trading Commission ("CFTC") and National Futures Association ("NFA")

Registered Commodity Trading Advisors ("CTAs") and Commodity Pool Operators ("CPOs")

15. Commodity Pool Operator and Commodity Trading Advisor Registration

An individual or entity that operates or solicits funds for a commodity pool is generally required to register as a Commodity Pool Operator. As a result, a Hedge Fund Manager may be required to register as a Commodity Pool Operator if the Hedge Fund trades futures or options on futures and the Hedge Fund Manager operates the Fund.

An individual or entity that, for compensation or profit, advises others as to the value of or advisability of buying or selling futures contracts or options on futures must generally register as a Commodity Trading Advisor unless it has provided advice to 15 or fewer persons (including each person in an advised fund or pool) in the past 12 months and does not generally hold itself out to the public as a CTA. Providing advice indirectly includes exercising trading authority over a fund or account. A Hedge Fund Manager, therefore, may also be required to register as a CTA if the related hedge fund trades futures or options on futures.

The documents required for registration as a Commodity Pool Operator or Commodity Trading Advisor are: a completed Form 7-R (which provides CPO or CTA information), a completed Form 8-R (which provides biographical data) and fingerprint card, for each principal (defined to include executive officers, directors and 10% owners), branch office manager and associated person (defined to include persons soliciting fund interests or accounts or supervising persons so engaged), and proof of passage of the "Series 3" exam for each associated person and proof of passage of the "Series 3" and futures branch office manager exams for each branch office manager.

Applications for registration are filed with and approved by the NFA under authority granted to it by the CFTC and the registration documents are generally public except for fingerprint cards, although confidentiality may be requested for certain information relating to the principals.

16. Form 3-R amend. 7-R

Form used to report any changes to information contained in the basic registration Form 7-R.
The requirement to file this form is triggered by changes in the information provided in Form 7-R.

The form is filed with the NFA and is public, though confidentiality may be requested for certain information relating to the principals.

17. **Form 8-T Associated Person Termination**

Form that must be filed within 20 days of the termination of an Associated Person, principal or branch manager. The form is filed with the NFA and is generally public.

18. **Ethics Examination for all Registered Persons**

Ethics training is required under CFTC Reg. §3.34 for all associated persons and any individual registered as a CPO or CTA. In connection with the annual registration update, each NFA member will receive a report indicating ethics training due or overdue for its associated persons. The member is responsible for providing proof of ethics training to the NFA, and the NFA will confirm this information to the public.

19. **Annual Report**

Annual report of a fund that must be filed pursuant to Reg. §4.22(c) by that fund’s CPO. The Annual Report must contain certain information, such as actual performance information and fees, and must be distributed to each participant in the fund.

The annual report must be filed by a registered CPO with the CFTC within 60 days of the fund’s fiscal year-end and is generally publicly available; however, the CFTC is prohibited from disclosing information that would separately disclose the business transactions or market positions of any person or trade secrets or names of any investors.

20. **CPO/CTA Questionnaire**

Annual compliance questionnaire concerning its business activities for applicants registered as CPOs or CTAs. The questionnaire is filed with the NFA and is not public.

21. **NFA self-audits**

In order to satisfy their continuing supervisory responsibilities, NFA members must review their operations on an annual basis using a self-examination checklist. The checklist focuses on a member’s regulatory responsibilities and solicits information on whether the a member’s internal procedures are adequate for meeting those responsibilities.

Registered CPOs and CTAs as members of the NFA are required to conduct such self-audit annually.
A written attestation is then signed and dated by the supervisory personnel that they have reviewed the operations in light of the checklist. This attestation is retained by the member and not forwarded to the NFA and as such is not public.

22. **Claims for exemption**

Filings made pursuant to Reg. §4.12(b)(3) (notice of claim for exemption from certain requirements by a CPO that complies with the Securities Act and manages a fund with limited trading in commodity futures and options), Reg. §4.7(a)(3) (notice of claim for exemption by a CPO with “qualified eligible participants” as investors), and Reg. §4.7(b)(3) (notice of claim for exemption by a CTA advising “qualified eligible clients”). Reg. §4.7 provides exemptions for qualifying CPO/CTO applicants from most disclosure and other requirements of CPOs and CTAs.

These statements are filed with the CFTC and NFA and are public.

23. **Disclosure Document**

CPOs and CTAs are generally required to prepare detailed Disclosure documents containing specified information. Such documents are filed with the CFTC and NFA and provided to investors but are not publicly available.

CPOs and CTAs operating under Reg. §4.7, however, are exempt from the disclosure document requirement and are required only to provide all material disclosures. In addition, under the exemption provided in Reg. §4.8, funds (which would otherwise be treated as commodity pools) with exemptions under Reg. §4.12(b) (compliance with the requirements of the Securities Act and certain limits on the trading of commodity futures and options) or which sell interests solely to “accredited investors” and rely on the safe harbor provisions of Rule 506 or 507 of Regulation D under the Securities Act may begin soliciting, accepting and receiving money upon providing the CFTC and the participants with disclosure documents for the fund, which requirement may be satisfied by a private placement memorandum.

24. **Year-End Financial Reports for §4.7 Funds**

Annual Report requirements for §4.7 funds (i.e., funds, which by having only qualified eligible participants, are exempt from the normal disclosure requirements applicable to commodity pools). The form must contain a Statement of Financial Condition, a Statement of Income (Loss), appropriate footnote disclosure and other material information and a legend as to any claim made for exemption.
The annual report is filed with the CFTC, NFA and distributed to each investor, and the report is not public.

**Position Reports**

25. **Form 40**

“Statement of Reporting Trader” for persons who own or control reportable positions in futures. A hedge fund and/or Hedge Fund Manager will be required to file a Form 40 if it holds reportable positions. The form must be filed within ten business days following the day that a hedge fund’s and/or its managers’ position equals or exceeds specified levels. Such specified levels are set separately for each type of contract. For example, the reportable level for S&P 500 futures is 600 contracts. The Form 40 requires the disclosure of information about ownership and control of futures and option positions held by the reporting trader as well as the trader’s use of the markets for hedging. Hedging exemptions from speculative position limits must be reported.

The form is filed with the CFTC and is not publicly available.

26. **Form 102**

Form filed by clearing members, futures commission merchants (FCMs), and foreign brokers, which identifies persons, including Hedge Funds, having financial interest in, or trading control of, special accounts in futures and options, informs the CFTC of the type of account that is being reported and gives preliminary information regarding whether positions and transactions are commercial or noncommercial in nature. The form must be filed when the account first becomes “reportable” (i.e., when it first contains reportable futures or options positions), and updated when information concerning financial interest in, or control of, the special account changes. In addition, the form is used by exchanges to identify accounts reported through their large trader reporting systems for both futures and options.

The form is filed with the CFTC and is non-public.

**Selected Stock and Futures Exchange Reports**

**Application for Exemption from Speculative Position Limits**

27. **Spec. Position Limit Exemption**

Application filed for exemption from speculative position limits. Exchanges generally have speculative position limits for physical commodities and stock index contracts, and the CFTC has speculative position limits for agricultural commodities. Exemptions from such limits are generally available for hedging
transactions. Financial contracts, such as interest rate contracts, do not have such position limits.

For example, under Rule 543 of the Chicago Mercantile Exchange (“CME”), persons intending to exceed speculative position limits on S&P 500 contracts must either file the required exemption application and receive approval prior to exceeding such limits or receive verbal approval prior to exceeding such limits and, if approved, file the required application promptly thereafter. Generally, an application for any speculative position limit exemption must show that such position is a bona fide hedging, risk management, arbitrage or spread position.

The filing is made with the appropriate exchange in the case of physical commodities and stock index contracts and with the CFTC in the case of agricultural commodities.

**Federal Trade Commission (“FTC”)**

**Filings Made Prior to Mergers and Acquisitions**

28. **Hart-Scott-Rodino Notice**

Notice filed prior to the consummation of certain mergers, acquisitions and joint ventures. After notice is filed there is a waiting period while the FTC and Department of Justice review the competitive effects of the transaction. The notice includes information about the transaction and the participants in the transaction.

The notice and waiting period requirement are generally triggered by the following tests: either the acquiring person or the acquired person must be engaged in U.S. commerce or an activity affecting U.S. commerce, a person with total assets or net sales of $100 million or more is acquiring voting securities or assets of a person with total assets of $10 million or more, and as a result of the transaction, the acquiring person will hold 15% or more of the voting securities or assets of the acquired person or an aggregate of $15 million or more of assets and voting securities of the acquired person. A notice would generally have to be filed for an over $15 million purchase by a hedge fund with $100 million in assets if an exemption were not available. Acquisitions of voting securities are exempt from filing if they are made “solely for the purpose of investment” and if, as a result of the acquisition, the securities held do not exceed 10% of the outstanding voting securities of the issuer. Securities are acquired “solely for investment purposes” if the person acquiring the securities has no intention of participating
in the formulation, determination, or direction of the basic business decisions of the issuer.

The notice is filed with the FTC and the Department of Justice and is confidential.
APPENDIX III

GLOSSARY

Terms contained in this glossary are defined for the purpose of the Recommendations and may have a wider or different meaning outside the context of the Recommendations. Italicized terms in the definitions are defined elsewhere in the Glossary.

**Accounting-Based Leverage**  See Leverage Measures.

**Arbitrage**  A type of financial transaction or strategy that seeks to profit from a price differential perceived with respect to related or correlated instruments in different markets and typically involves the simultaneous purchase of an instrument in one market and the sale of the same or related instrument in another market.

**Arbitrage Strategy**  See Hedge Fund Strategies.

**Asset Liquidity**  See Liquidity and Liquidity Risk.

**Assignment**  The act of transferring property, an interest or a right to another party.

**Backtest (Backtesting)**  An examination of the results generated by a model (e.g., a Value-at-Risk model) as compared to actual or realized results in order to assess the accuracy of the model.

**Balance Sheet Leverage**  See Leverage Measures.

**Borrowing Capacity**  The amount of money a Hedge Fund can borrow from a broker or dealer or other credit provider (e.g., in order to fund purchases of securities). For example, according to Regulation T of the Federal Reserve Board (12 C.F.R. 220.4), a borrower may borrow up to 50% of the value of a security, depending on the type of security.

**Capital**  The total assets of a Hedge Fund net of liabilities but including assets such as deferred compensation owed to the Hedge Fund Manager. In the Recommendations, capital and equity are often used interchangeably.

**Cash**  Cash balances held in bank accounts and short-term, high-quality marketable securities, such as government bonds.

**Cash Market**  A market in which goods are purchased either immediately for cash, as in a cash and carry contract, or where they are contracted for presently, with delivery and payment occurring shortly thereafter. All terms of the contract are negotiated between buyer and seller.

**Close-out Netting**  See Netting.
**Collateral**  An asset that is pledged as security, or whose title is transferred to a secured party, in order to secure payment or performance obligations. If the party providing collateral defaults, the asset pledged or transferred may be taken and sold by the secured party to satisfy obligations of the pledgee/transferee. Instruments that are typically accepted as collateral include government securities, cash and, to a lesser extent, corporate debt and equities. Collateral generally serves to mitigate counterparty credit risk (see **Credit Risk**).

**Collateral Agreement**  An agreement between two parties that governs the delivery and use of collateral. Key provisions of such agreements are: collateral delivery and return requirements, the rights of the secured party in the collateral, the level of unsecured credit risk that each party is willing to assume (i.e., exposure thresholds above which the transfer of collateral is required), the type of instruments that can be posted as collateral, minimum transfer amounts, haircut provisions, among others.

**Collateral Call**  A notice given by a secured party to the provider of collateral informing the latter that the change in the market value of a position has required the posting of collateral.

**Collateral Event**  An event that triggers an obligation to post additional collateral (rather than causing a termination of all transactions that are subject to a **Master Agreement**, for example).

**Commodity**  Generally, an article of commerce or a product that can be used for commerce. In the United States the term often is narrowly used to refer to products underlying futures contracts traded on regulated futures exchanges. The types of “commodities” that underlie such contracts include both physical and financial commodities such as agricultural and energy products, metals, foreign currencies, and interest rate and equity instruments (see **Futures**). Commodities are also traded in the forward and cash markets.

**Concentration**  Arises when a significant percentage of a Hedge Fund’s portfolio is exposed to the same or similar market factors or other risk factors, increasing the risk of losses caused by adverse market or economic events affecting such risk factors. Hedge Fund Managers may track concentration levels with respect to asset classes, industry sectors, regions or other relevant areas.

**Control Premium**  The price difference between the market price per share of an individual security and the price per share of a block of such securities that carries the power to control a corporation.

**Convergence**  See **Hedge Fund Strategies**.

**Correlation**  A standardized measure of the relative movement between two variables, such as the prices of two different securities. The level of correlation between two variables is measured on a scale of –1 to +1. If two variables move up or down together, they are positively correlated. If they tend to move in opposite directions, they are negatively correlated.

**Counterparty**  A third party that enters into transactions with a Hedge Fund.
Credit Provider  A bank, securities firm or other third party that extends credit to a Hedge Fund, either in connection with financing a Hedge Fund’s purchases of securities or other instruments or through stand-alone loan facilities. A counterparty may be viewed as a credit provider when it engages in uncollateralized or partially collateralized OTC derivatives transactions with a Hedge Fund.

Credit Risk  The risk that an issuer of a security (asset credit risk) or a counterparty (counterparty credit risk) will not meet its obligations when due. Asset credit risk also includes sovereign risk where the potential loss is related to the financial solvency of a sovereign issuer of a security. Counterparty credit risk is frequently broken down into component risks for monitoring purposes (see, e.g., Settlement Risk and Pre-Settlement Risk).

Credit Spread  The difference between the yield (the percentage rate of return) of a Treasury security and a non-Treasury debt security (e.g., corporate bonds) that are identical in most respects (particularly the term of the obligation), except with respect to credit rating.

Credit Support  An arrangement offered by a party to reduce the credit risk related to it in a transaction between two parties. Credit support may take the form of a letter of credit, collateral, guarantee, margin requirements or any other arrangement which reduces the likelihood of a party’s default or the magnitude of its counterparty’s potential loss.

Cross Default Clause  A contractual term included in an agreement between two parties specifying that a default by one of the parties on its obligations under another transaction or to a third party will be treated as a default with respect to the transaction(s) governed by the contract in question. For example, a contract between A and B may provide that a default by B under a contract with C will be treated as a default by B under the contract with A.

Cross Product Netting  See Netting.

Custodial Arrangement  An agreement between a Hedge Fund and a custodian that governs the relationship between them and the custodian’s roles and responsibilities with respect to the Hedge Fund and any Hedge Fund assets held by the custodian.

Custodian  A bank or other financial institution that is responsible for holding a Hedge Fund's assets and/or performing services on behalf of a Hedge Fund. A custodian may provide various services, including receiving subscription monies and paying out redemption proceeds, making margin payments, collecting dividends, effecting payment of the Hedge Fund's expenses, registering investments in the Hedge Fund's name, safeguarding share certificates and transferring investments and exercising rights or options. In practice, a significant portion of a Hedge Fund’s assets are often held in sub-custody accounts with various brokers.

Derivatives  A derivative is a financial instrument whose value depends on, or is derived from, the value of an underlying asset, index, rate or instrument. There are four basic types of derivative instruments:

- **Forward Contract:** A contract that obliges one party to sell and the other party to buy a
financial instrument or commodity at an agreed price with delivery and payment occurring at a specified future date (see Commodity). Forward contracts are privately negotiated in the over-the-counter markets (rather than on organized exchanges) and incorporate terms that are tailored to the requirements of the parties (see Over-the-Counter).

- **Futures Contract**: Like a forward contract, a futures contract involves the sale of a financial instrument or commodity with delivery and payment occurring at an agreed price on a specified future date. Unlike forward contracts, futures contracts are traded on exchanges and are standardized as to their terms. In addition, futures contracts may provide for the making of cash payments based on the value or level of an asset, rate, instrument or index. Exchanges seek to minimize the risk of default on such contracts by requiring buyers and sellers to deposit assets (e.g., cash, Treasury securities) as margin. An amount of “initial margin” is generally required upon establishment of a futures contract position. Additional “variation margin” is required (or repaid), if the value of a futures contract position declines (or rises).

- **Swap Contract**: An agreement by two parties to exchange currencies, commodities, interest payments or cash flows based on these or other underlying assets, rates or indices on one or a series of future dates. The most common form of swap is an interest-rate swap, in which two parties agree to exchange two cash flows that are determined by two different interest rates. For example, one party agrees to pay a fixed rate of interest to the other party in exchange for a variable rate of interest.

- **Option Contract**: Generally, a contract that gives a holder the right, but not the obligation, to buy or sell the underlying asset for a fixed price on or before a specified date or time. An example of an option is the right to buy the stock of a company over a two-month period for a set price. Certain options (e.g., options on stock indices) are settled in cash rather than through physical delivery of that asset or other instrument which underlies it.

**Diversification** An investment strategy that involves buying a variety of investment instruments that are not highly correlated to each other in order to reduce the risk of a portfolio (see Correlation).

**Equity** In the context of investing, a synonym for stocks or shares of companies. When used in connection with accounting, equity refers to the amount by which the assets of an entity exceeds its liabilities. With respect to Hedge Funds, see also Capital.

**Event Risk** The risk that the value of a security or other instrument will change due to an unexpected takeover or corporate restructuring or an unanticipated change or event in the market environment (e.g., a natural disaster or industrial accident) or in the regulatory environment.

**Event-Driven Strategy** See Hedge Fund Strategies.

**Fair Value** Generally refers to the price at which a single unit of an instrument would trade between disinterested parties in an arm’s length transaction. Fair value does not generally take
into account control premiums or discounts for large or illiquid positions (see Illiquid Instrument).

**Fixed Income Instrument**  A fixed income instrument or security pays a specified rate of return (which may either be fixed or determined by reference to a floating rate or formula) over the life of its term. Fixed income securities include bills, notes, bonds and commercial paper. The value of a fixed income investment changes as interest rates and inflation change, as the credit risk of the issuer changes or as the amount investors require for bearing interest rate or credit risk changes.

**Forward Contract**  See Derivatives.

**Funding Liquidity**  See Liquidity and Liquidity Risk.

**Futures Contract**  See Derivatives.

**Global Macro Trading Strategy**  See Hedge Fund Strategies.

**Governing Authority**  The board of directors, managing member, general partner, trustee or similar individual or entity with the legal authority and responsibility to direct and oversee the activities of a Hedge Fund or a Hedge Fund Manager (as applicable).

**Gross Balance Sheet Assets**  See Leverage Measures.

**Haircuts**  The difference between the market value of an asset posted as collateral and the value attributed to such an asset by a party in determining whether the collateral requirements of such party have been met. A haircut is intended to protect a party that receives collateral from fluctuations in the value of the instruments posted as collateral.

**Hedge Fund**  Generally, a pooled investment vehicle that is privately organized, administered by investment management professionals and not widely available to the public. Many Hedge Funds share a number of characteristics with each other: they hold long and short positions, employ leverage to enhance returns, pay a performance or incentive fee to their Hedge Fund Managers, have high minimum investment requirements, target absolute (rather than relative) returns and/or may be organized off-shore. In addition, Hedge Funds are generally not constrained by legal limitations on their investment discretion and can adopt a variety of trading strategies. The Hedge Fund Manager will often have its own capital (or that of its principals) invested in the Hedge Fund(s) it manages.

**Hedge Fund Manager**  An entity that serves as investment advisor to a Hedge Fund and manages its assets and investments. Offshore Hedge Funds typically have Hedge Fund Managers that are separate legal entities, while many U.S. Hedge Fund Managers may be part of the Hedge Fund structure (e.g., as general partner of a limited partnership or managing member of a limited liability company). Hedge Fund Managers are often investors in the Hedge Funds they manage and are compensated in part based on the performance of the Hedge Fund.
Hedge Fund Strategies  Major Hedge Fund strategies include:

- Global Macro (also referred to as “macro” or global directional investment strategies) – A strategy that involves establishing market positions to take advantage of perceived broad economic trends and changes anticipated by the Hedge Fund Manager.

- Fund of Funds – A strategy that aims to enhance returns while reducing risk by allocating capital among different Hedge Funds.

- Market-Neutral (also referred to as arbitrage strategies) – A strategy that involves establishing market positions to take advantage of perceived mispricings of related or correlated assets. “Perceived mispricings” are situations in which the Portfolio Manager believes that a *market factor* is out of equilibrium and will revert over time. Mathematically-calculated “arbitrages” can exist between the *cash market* and *derivatives* markets, where the price in one market is different from the price implied by the other. See **Arbitrage**. The following are examples of arbitrage strategies:
  - Long/Short Equities – A Portfolio Manager is long one portfolio of equities and is short another. If the returns of the two portfolios are positively correlated, the riskiness of the entire portfolio will be reduced.
  - Stock-Futures Arbitrage – A Portfolio Manager buys a basket of stocks and sells the corresponding stock index futures or vice versa.
  - Bond-Futures Arbitrage – A Portfolio Manager buys a particular bond and sells the futures contract on the bond.
  - Convertible Arbitrage – A Portfolio Manager buys convertible securities and sells the underlying equities, believing the convertibles to be underpriced.
  - Convergence Strategies – A Portfolio Manager believes that a market factor (e.g., equity volatility) is too high or too low and will revert to more normal levels. It buys the underpriced asset and sells the corresponding overpriced asset.

- Long Only – A Portfolio Manager seeks to purchase undervalued stocks or stocks likely to appreciate.

- Short Only – A Portfolio Manager sells stocks that it believes will decline in value.

- Event-Driven – An investment strategy that seeks to profit from anticipated events, such as mergers or restructurings.
  - Risk Arbitrage – A Portfolio Manager buys the stock of a company that it believes will be acquired and sells the stock of the company that it believes will be the acquiror.
  - Distressed Securities – A Portfolio Manager purchases securities of companies that are restructuring, being reorganized, or have filed for bankruptcy protection in the belief that they are undervalued.

- Regional – A strategy that concentrates on a particular geographic region or regions. Such strategies are often distinguished on the basis of:
  - Established Markets (e.g., Europe, North America, G-7); and
• Emerging Markets.
• Sector – A strategy that focuses on a particular industry or industries.

**Holding Period** The period over which Value-at-Risk is calculated – e.g., one day, three days, one week, 10 days. The holding period should reflect the amount of time it would take to liquidate or neutralize the positions in the relevant portfolio.

**Illiquid Instrument** See Liquidity.

**Interest Rate Term Structure** The relationship among interest rates of fixed income instruments with different maturities usually depicted as a graph, also referred to as a “yield curve”.

**Legal Risk** The risk of loss arising from uncertainty in laws, regulations or legal actions which may affect transactions between parties. Legal risk may include issues related to the enforceability of netting agreements, the perfection of collateral, the capacity of parties, the legality of contracts, among others.

**Leverage** A factor (rather than an independent source of risk) that influences the rapidity with which changes in market risk, credit risk or liquidity risk change the value of a portfolio.

**Leverage Measures** Generally, Hedge Funds use two types of leverage measures. Accounting-based leverage measures compare the nominal sizes of Hedge Fund balance sheet positions to a Hedge Fund’s equity. Risk-based leverage measures assess the relationship between the riskiness of a Hedge Fund’s portfolio and its capacity to absorb the impact of that risk.

**Liquidity** There are two separate but related types of liquidity. Funding liquidity is the ability of a Hedge Fund to hold its market positions and meet the cash and/or collateral demands of counterparties, other credit providers and investors (see Collateral Call and Redemption). Asset liquidity refers to the ability to liquidate an asset quickly, and in large volume, without substantially affecting the asset’s price. An asset that cannot be liquidated in a short period of time without substantially affecting the asset’s price is considered an illiquid instrument.

**Liquidity Risk** With respect to asset liquidity, the inability to sell an asset quickly and/or in large volume at a reasonable price. With respect to funding liquidity, the risk that a party will not have or cannot obtain sufficient funds to meet its obligations.

**Long-Only Strategy** See Hedge Fund Strategies.

**Long-Short Strategy** See Hedge Fund Strategies.

**Macro (Global) Directional Investment Strategy** See Hedge Fund Strategies.
Margin  A certain amount of assets that must be deposited in a margin account in order to secure a portion of a party’s obligations under a contract (see Margin Account). For example, to buy or sell an exchange-traded futures contract, a party must post a specified amount which is determined by the exchange, referred to as an “initial margin”. In addition, a party will be required to post “variation margin” if the futures contracts change in value. Margin is also required in connection with the purchase and sale of securities where the full purchase price is not paid upfront or the securities sold are not owned by the seller.

Margin Accounts  The account in which margin is held for securities or exchange-traded futures or options. Positions that are subject to margin requirements are generally valued, or “marked to market,” daily, and additional margin may be required if the market value of a position declines.

Market Factors  Refers collectively to interest rates, foreign exchange rates, equity prices, commodity prices and indices constructed from these rates and prices, as well as their volatility and correlation.

Market Risk  Narrowly defined, it is the risk of a decline in value of a Hedge Fund’s portfolio resulting from changes in market factors. Since asset liquidity risk and the credit risk of an asset's issuer may also affect the value of instruments in a portfolio, Hedge Funds frequently manage all of these risks jointly as market risk.

Market Neutral Strategy  See Hedge Fund Strategies.

Master Agreement  An agreement that sets forth the standard terms and conditions of privately negotiated, bilateral transactions between two parties, such as the “1992 ISDA Master Agreement” form published by the International Swaps and Derivatives Association, Inc. (“ISDA”) for OTC derivatives transactions (see OTC). These agreements typically include payment netting and close-out netting provisions (see Netting).

Master-Master Agreement  An agreement that provides for payment and /or close-out netting of transactions governed by different master agreements (see Netting). For example, where parties have used separate master agreements for different types of transactions, e.g., for foreign exchange transactions and OTC swap transactions, the parties may seek to enter into a master-master agreement in order to further reduce credit risk between them by providing for the netting of all exposures under master agreements that are subject to the master-master agreement.

Matched Book Assets  See Leverage Measures.

Maximum Drawdown  See Worst Historical Drawdown.

Model  A program or process that is designed to create a depiction of reality through graphs, pictures or mathematical representations.

Net Asset Value (NAV)  The fair value of a Hedge Fund’s assets minus the fair value of its
liabilities. NAV is the basis for determining the prices applicable to investor subscription and redemptions. NAV would generally not include special adjustments that may be made to valuations for risk monitoring purposes, such as adjustments for illiquidity concerns. Under generally accepted accounting principles, NAV computations should include accrued interest, dividends and other receivables of the Hedge Fund, as well as accrued expenses and other payables.

**Net Balance Sheet Assets** See Leverage Measures.

**Netting** Netting involves aggregating exposures on multiple transactions between the same two counterparties and reducing them down to a single net exposure amount by offsetting the positive exposures with the negative. Netting provisions are typically included in master agreements between two parties and provide that positive mark-to-market values on transactions for one counterparty will be offset by negative mark-to-market values for the same counterparty on other transactions for purposes of determining net payments to be made or amounts of collateral to be delivered, for example. Bilateral netting arrangements can take the following forms:

- **Payment netting.** This form of provision generally provides that payments to be made between parties with respect to one or more transactions governed by a master agreement may be netted to a single net payment amount where payments are scheduled to occur on the same day and in the same currency. Some provisions also permit netting of payments in different currencies.

- **Close-out netting.** This form of netting becomes operative only in an event of default or a “termination event,” such as a credit rating downgrade. Under a master agreement, the positive contract values for a particular counterparty are netted against the negative contract values for the same party for all transactions subject to the master agreement. For example, the current ISDA master agreement specifies that, if a default or termination event occurs, all transactions covered by the master agreement will be terminated and the values of the various transactions will be netted to a single closeout amount.

- **Netting by novation.** Two counterparties agree that “matched” pairs of transactions (e.g., transactions that have the same settlement date) will be deemed terminated and replaced by a single transaction requiring a payment equal to the difference between the values of the two original transactions. Netting by novation is common in foreign exchange transactions in which parties (typically banks) are likely to have a large number of offsetting payments due in the same currency on the same settlement date.

- **Cross-product netting.** Bilateral netting arrangements are increasingly being extended to permit netting across products, often through the use of master-master agreements. For example, a party could reduce its current exposure to another party by offsetting positive mark-to-market values for its OTC swap positions under one master agreement against its foreign exchange positions which have negative mark-to-market value under a different master agreement, provided both master agreements have been executed between the same parties.

**Neutralize** To purchase or sell an instrument or security in order to reduce or neutralize all or some portion of the risk of holding another instrument or security.
Off-Balance-Sheet Transaction A transaction entered into by a Hedge Fund that does not appear on its balance sheet. Until the adoption of Financial Accounting Standards Board’s Statement 133, most derivatives had been treated as off-balance-sheet transactions.

On-Balance-Sheet Transaction A transaction that is recorded as an asset or liability on a Hedge Fund’s balance sheet.

Operational risk The risk of loss due to system breakdowns, employee fraud or misconduct, errors in models or natural or man-made catastrophes, among other risks. It may also include the risk of loss due to the incomplete or incorrect documentation of trades. Operational risk may be defined by what it does not include: market risk, credit risk and liquidity risk.

OTC See Over-the-Counter Transaction.

Over-the-Counter (OTC) Transaction A transaction between parties that is not executed on an organized exchange but rather is privately negotiated on a bilateral basis between the parties. Stocks of smaller companies, as well as forward contracts and other derivatives, are traded in OTC markets.

• Passive Investment The allocation of capital by a Hedge Fund Manager to an external portfolio manager which is not actively supervised or controlled on a day-to-day basis by the Hedge Fund Manager (e.g., an investment by a Hedge Fund Manager in an external portfolio manager’s fund).

Performance Trigger A contractual provision specifying the consequences of a Hedge Fund’s or Hedge Fund Manager's performance falling below a certain threshold.

Pooled Investment Vehicle An investment entity, such as a limited partnership, trust, corporation or similar form of enterprise operated for the purpose of trading securities or other investment instruments, and which is exempt from registration under the Investment Company Act of 1940.

Portfolio Manager A person who invests and manages an amount of capital allocated to it by a Hedge Fund Manager on behalf of a Hedge Fund. Portfolio Managers may be either employees of the Hedge Fund Manager itself or external managers who are actively managed by the Hedge Fund Manager or with whom the Hedge Fund Manager makes a passive investment.

Pre-settlement Risk A form of credit risk; the risk that a counterparty will default on an OTC derivative contract prior to the contract's settlement at expiration.

Prime Broker A brokerage firm that provides multiple services to a Hedge Fund which are beyond the scope of those offered by a traditional broker, such as clearing and settlement of securities transactions, financing, recordkeeping, custodial services and research capabilities.

Redemption The redemption of shares or other interests in, or withdrawals of funds from, a
Hedge Fund by an investor.

**Redemption Window**  The time period during which an investor can redeem shares or other interests in, or otherwise withdraw funds from, a Hedge Fund. Investments in a Hedge Fund are often “locked-up” for a minimum period or during certain intervals, meaning withdrawals or redemptions can only be made during prescribed periods (e.g., once per year) provided sufficient notice is given by the investor.

**Risk Based Leverage Measure**  See Leverage Measures.

**Risk Monitoring Function**  A Hedge Fund employee or a team of employees that is responsible for measuring and tracking the risk assumed by a Hedge Fund. In most cases, the *risk monitoring function* provides an independent source of information about, and analysis of, a Hedge Fund’s performance, current risk position, sources of risk and exposures to changes in Market Factors. The *risk monitoring function* generally does not make decisions about how much risk or the types of risk the Hedge Fund should assume.

**Risk Selection Function**  A Hedge Fund employee or group of employees that is responsible for risk selection, i.e., the choice of investments and execution of transactions. Depending on the organization of a particular Hedge Fund, the execution of transactions may be performed by different individuals than those making investment decisions, but both fall under the category of “risk selectors”.

**Scenario Analysis**  Similar to a “stress test,” the practice of subjecting a model (e.g., a Value-at-Risk model) to adjusted inputs in order to assess the impact of a specified scenario of market events on a Hedge Fund’s portfolio. (See Stress Test, Value-at-Risk and Model). A scenario could be historical (e.g., by reproducing the events of October 1987) or hypothetical (e.g., by simulating an event that would stress the *market factors* to which the Hedge Fund is most exposed).

**Sector Strategy**  See Hedge Fund Strategies.

**Senior Management**  A group of executives or other management body with the authority and responsibility to direct and oversee a Hedge Fund Manager’s day-to-day activities on behalf of a Hedge Fund (or Funds). *Senior Management* is typically responsible for risk allocation among portfolio managers, or “risk selectors” (see Risk Selection).

**Settlement Date**  The date upon which final payment and/or delivery are due with respect to a transaction.

**Settlement Risk**  The risk that a counterparty will fail to perform its obligations under a contract on the *settlement date*; a form of credit risk.

**Sharpe Ratio**  A measure that is widely used by investors to evaluate the performance of a portfolio or to compare the performance of different portfolios on a “risk-adjusted” basis. The numerator of the *Sharpe Ratio* is a measure of a portfolio’s return during a given period,
generally the return earned on the portfolio in excess of the risk-free rate of return over one year. The denominator of the ratio is a measure of the risk incurred in achieving the return, usually measured as the standard deviation of the portfolio’s daily return. The higher the Sharpe Ratio, the better the portfolio’s return in risk-adjusted terms. While the Sharpe Ratio contains information similar to that contained in a Value at Risk measure, the two measures have different purposes and different perspectives. VAR is a forward-looking measure which is strictly a risk measurement tool; the Sharpe Ratio is a retrospective measure that compares risk and return information for an elapsed period.

**Short Only Strategy**  See Hedge Fund Strategies.

**Sovereign Risk**  See Credit Risk and Market Risk

**Spread**  The excess of the price or yield on a particular security or instrument relative to a benchmark. For example, the “spread over Treasury” is the difference between the yield for a certain fixed income instrument and the yield for a comparable U.S. Treasury security.

**Standard Deviation**  Technically, a statistical measure of the dispersion of a set of numbers around a central point. Standard deviation measures the volatility, or uncertainty, of investment returns, and is therefore commonly used to measure the risk of a portfolio. The higher the standard deviation of a portfolio, the higher the uncertainty of the portfolio’s return.

**Stress Test**  A general term for the practice of subjecting a model (e.g., a Value-at-Risk model) to inputs that are adjusted to represent extreme or unusual changes in market factors. The sources of stress may be actual historical changes in market factors or hypothetical changes.

**Stressed Cash**  The amount of cash and cash equivalents available to a Hedge Fund under a pre-defined stress scenario, such as a scenario where haircuts on collateral or margin requirements are increased.

**Subscription Agreement**  An agreement to buy shares or other interests, or otherwise invest money in, a Hedge Fund.

**Swap**  See Derivatives.

**Systemic Risk**  The risk that the failure of a significant market participant in a payment or settlement system to meet its obligations when due will cause other participants or financial institutions to be unable to meet their obligations. Such a failure could potentially cause significant market liquidity or credit problems and threaten the stability of financial markets generally.

**Third Party Service Provider**  A firm that provides certain administrative, technical, financial or other services to a Hedge Fund that chooses to outsource parts of its operations.

**Trading Account**  See Margin Account.
Umbrella Agreement  See Master-Master Agreement.

Valuation  The process of determining the value of positions in a Hedge Fund portfolio. Valuation serves two distinct purposes: it provides the base input for both the risk monitoring process and the calculation of a Hedge Fund’s Net Asset Value, which serves as the basis for pricing investor subscriptions and redemptions.

Valuation Agent  The party or entity responsible for valuing collateral and/or the relevant transaction(s) for the purposes of determining the amount of collateral to be delivered or returned or the amount of payments to be made between parties pursuant to a bilateral agreement between them. The valuation agent may be a party to the transaction or a third party.

Value at Risk (VAR)  An integrated measure of the market risk of a portfolio of assets and/or liabilities. At the most general level, VAR is a measure of the potential change in value of a specified portfolio over a specified time interval or holding period, resulting from potential changes in market factors (e.g., prices and volatilities). The VAR measure is based on the distribution of potential changes in the value of the portfolio and is expressed in terms of a confidence level. A Hedge Fund Manager’s risk monitoring function should use VAR to estimate the maximum expected amount a Hedge Fund could lose over a specified time horizon at a specified probability level. For instance, the risk monitoring function could calculate the maximum expected loss for a one-day period at a 95% probability level – i.e., the level of loss that should be exceeded on only five trading days out of 100.

The challenge in calculating an accurate VAR is determining the distribution of potential value changes for market factors, which requires the risk monitoring function to choose a methodology for modeling potential changes in market factors. Different methods are currently used to determine such distribution when calculating VAR (e.g., Historical Simulation Method, Monte Carlo Simulation Method, Analytic Variance – Covariance Method).

Volatility  A measure of risk based on the standard deviation of an asset’s return (see Standard Deviation). The greater the degree of an asset’s volatility, the greater the risk of the asset.

Volatility Risk  The risk of a derivatives portfolio attributable to unpredictable changes in the volatility of underlying assets (see Volatility).

Worst Historical Drawdown  The largest decrease in the net asset value of a Hedge Fund measured as the difference between the highest and lowest value since its inception or during a given period of time (e.g., last five years).