

## SECTION III: RISK MANAGEMENT AND RISK-RELATED DISCLOSURE PRACTICES

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### *A. Introduction*

The purpose of this section is to review the recommendations contained in Sections I and II of the 1999 CRMPG I report and provide an update on the status of their adoption by financial institutions and their clients. The areas under consideration are: Transparency and Counterparty Risk Assessment (Section I) and Internal Risk Measurement, Management and Reporting (Section II). This section also contains a discussion of post-1999 developments in the area of prime brokerage.

One of the aims of the CRMPG I report was to recommend risk management best practices in order to reduce the risk of significant future market disruptions. A preliminary step to gaining insight into the level of systemic risk inherent in today's market environment is the evaluation of the extent to which firms have embraced the original recommendations. Market developments — such as growth in credit derivatives, an increase in the usage of complex products, and the rising prominence of hedge funds in general, and funds of funds in particular — also raise the question of how counterparty practices have adapted to these market changes, and whether the CRMPG I recommendations need to be modified or enhanced accordingly.

In order to address these issues, a working group was created, composed of risk and other professionals at several global financial institutions and hedge funds. More specifically, the group's analysis has focused on the following objectives:

- Exploring the current relevance of the CRMPG I recommendations;
- Evaluating the extent to which current practice is consistent with these recommendations;
- Identifying and analyzing new issues that have arisen since 1999 (limited to the areas covered by Sections I and II);
- Reviewing the original recommendations and making revisions where necessary; and

- Proposing new Recommendations and Guiding Principles in response to the changing market environment.

Information was gathered through interviews and discussions with representatives of seven financial intermediaries and two hedge funds, who either joined the working group or agreed to serve as a “sounding board” for ideas and conclusions. In addition, input was solicited on a less formal basis from other entities, including Mercer Oliver Wyman. The choice of participants was influenced by the desire to incorporate the viewpoints of a geographically diverse range of institutions, including “credit providers” (typically financial intermediaries), as well as of clients and “credit receivers” (leveraged institutions).

Recommendations contained in Sections III and IV of the original CRMPG are discussed in other sections of this Report. However, it is difficult to entirely separate the various components of the original recommendations, and the observations contained in this section touch upon themes beyond those strictly confined to 1999 Sections I and II. As a result, this section of the Report will occasionally comment on areas such as documentation or market practices as they relate to its stated objectives, while recognizing that they will be analyzed more comprehensively in other sections.

The views, observations and recommendations contained in this document primarily reflect the input of CRMPG II members, although publications that discuss topics related to CRMPG I recommendation groups I and II have also been reviewed. These have included the Deloitte & Touche *2004 Global Risk Management Survey* and the IMF’s *Hedge Fund Industry Survey*. In general, the findings contained in those surveys were in line with the observations and views of the Policy Group.

## ***B. General Observations***

Among large financial institutions, the overall level of consistency in practice with Sections I and II of the original CRMPG recommendations is high. However, while firms have generally reported that they are in compliance with the key recommendations, the path to implementation has varied considerably. Some firms used the recommendations as a key “road map” to optimally manage credit risk and created cross divisional teams to implement changes to processes, analytical tools and reporting systems. Other firms report that they continued normal development of their credit risk infrastructure without a rigorous process to track progress against

the recommendations. Regardless of the path to implementation, the majority of firms report that the CRMPG recommendations provide a useful framework in which to discuss “best practice” policies with management, auditors and regulators.

Of the original recommendations discussed in this paper, progress has been most significant in the areas of exposure calculations (including the use of more advanced potential exposure and stress testing models) and in providing more comprehensive management reporting. In contrast, progress has been slowest in the areas of identifying crowded trades in the market and calculation of liquidity-adjusted risk metrics. Furthermore, there are numerous areas where, while progress has been made, firms could usefully recommit themselves to best practices as set out in the original recommendations where they remain relevant.

Assessing the relevance of the recommendations first requires a reflection on changes in market structure and participant practices since 1999. CRMPG II believes that there have been substantial developments, both positive (in terms of aggregate risk) and negative.

Among the many positive developments is a greater focus on liquidity-based adjustments to close-out values and on the interaction of asset liquidity and funding liquidity.<sup>2</sup> This has reduced firms’ sometimes excessively optimistic assumption of high and stable liquidity as incorporated into their calculations of mark-to-market exposures and the value of applicable collateral, and it may be contributing to a reduction in overall levels of risk in the system. Additionally, financial intermediaries have embraced portfolio margining regimes that allow for a better understanding of the underlying risk positions and provide incentives for clients to maintain balanced portfolios with each dealer.

However, market developments have also introduced new risks, including risks having potential systemic implications. For example, while risk mitigation infrastructure across the industry has unquestionably improved, recent evolution in the financial markets has challenged even the best firms to continue to adapt their

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<sup>2</sup> Asset liquidity signifies market capacity to sell or hedge a financial instrument or portfolio. It can be assessed by observing the size of the bid/offer spread and by analyzing the volume of transactions that can be completed in a given timeframe without a material impact on price. Funding liquidity is the ability to maintain financing for a financial instrument or portfolio. It can be assessed by relating the stressed holding period for an investment — which could be equal to the time to its final maturity — to the term of credit and equity available to finance that investment. The greater the liquidation horizon for an asset or portfolio, the greater the need for extended financing of such asset or portfolio.

risk systems at a sufficient pace. Among the noteworthy developments are the following:

- The market shift from a more qualitative and fundamental investment approach to a more quantitative, technical, model-driven approach has contributed to significantly higher overall trading volumes and shorter reaction periods, and has in turn contributed to the proliferation of new products, including CDS and numerous varieties of complex products.
- The design of these products allows risks to be divided and dispersed among counterparties in new ways, often with embedded leverage. Transparency as to where and in what form risks are being distributed among industry participants may be lost, as risks are fragmented and dispersed more widely.
- Associated hedging activities, especially with respect to the structured CDS market, tend to amplify liquidity measures.

Collectively, these developments challenge the credit risk model assumptions that are incorporated in stress-test and VaR models by potentially changing the liquidity and correlation characteristics of markets. To a credit analyst, they also increase the complexity of measuring and analyzing the directionality and magnitude of a client's trading portfolio. To compensate, credit analysis techniques must evolve to allow analysts to "look through" a portfolio of assets to identify the key factors that determine risk, irrespective of the form of the financial instrument.

Operational risks have also increased due to substantial growth in volume and complexity of transactions. As a component of this, one would include the increased reliance on, and concentration in, hedge fund administrators.

Taken together, these market developments require risk management policies and procedures that go beyond the scope of the CRMPG I recommendations. The following sections attempt to address these issues and discuss the original 1999 recommendations, their relevance in the current market and recommended additions and enhancements.

## C. Improving Transparency and Counterparty Credit Assessments

### **CRMPG I Recommendation 1: Information Sharing**

- 1a. *Financial Intermediaries should perform robust credit evaluations of trading counterparties prior to engaging in dealings likely to entail significant credit exposure. In doing so, they should obtain and evaluate various types of information from counterparties, particularly those whose creditworthiness depends heavily upon the performance of a leveraged portfolio of financial assets.*
- 1b. *The scope, quality and timeliness of information availability should be an important ongoing consideration in determining the amount and terms of credit to be provided.*

The level of information disclosure on individual counterparties has generally improved in the post-1999 period. This reflects a mutual recognition, by credit providers and clients, of the benefits of an improved understanding of risk positions, risk appetite, available mitigants and other determinants of credit risk. In particular, hedge funds have become more aware of the necessity to provide qualitative and quantitative data to counterparties and to assist the counterparties in interpreting this data. For example, there is an increased willingness on the part of hedge funds to facilitate due diligence, including making available senior fund managers and other key operating and strategic personnel. Some participants (typically from the larger funds) have even established units with the sole or primary purpose of communicating with credit providers. However, this is not to imply that there is consensus on this issue across the industry — due to practical limitations imposed by confidentiality and competitive considerations, there remains considerable variability across counterparties, with some of them continuing to be reluctant to share meaningful portfolio information.

Hedge funds' ability to generate credit-relevant information (e.g., VaR and stress-tested exposures) has generally improved. In part this is due to an increasing focus on risk-related metrics on the part of the fund managers themselves, who use such information for their own risk management or in their interaction with investors and other constituents. In addition, responsibility for the preparation of an expanding range of data is being outsourced to external providers, resulting in enhanced calculation capabilities. This latter trend, however, gives rise to service provider-related concentration risk and a need for explicit discussion of the capabilities of the administrator and other infrastructure providers as part of the due diligence process.

In order to fully understand the positions of hedge funds in particular, credit providers would ideally obtain comprehensive position details, including physical and derivatives positions held by each credit provider. However, it is rare to be able to obtain this position information from a hedge fund, even when a financial institution is serving as its prime broker. Therefore, there remains a high degree of reliance on risk measures provided by the counterparties themselves, which can be very difficult to compare across entities and which can be of uneven sophistication and quality.

*1. Recommendation (Category I)*

Where market participants lack sufficient relevant information prior to making a credit decision, CRMPG II recommends that they seek entity-level portfolio and other data from counterparties on a private and confidential basis, to the extent such information is needed to accurately assess credit quality. CRMPG II further recommends that market participants attempt to periodically review the risk metrics, stress test methodologies, behavioral characteristics of models and other analytics used by their counterparties' risk managers in assessing the entity's overall risk profile; that they assess both the quality of the processes and systems that generate the counterparties' data, as well as the details of the associated market scenarios; and that they run their own sensitivities on the institution-specific portfolio, when required. Where appropriate, additional information should be requested from counterparties based on the results of running these sensitivities. As part of the due diligence process, CRMPG II recommends that credit providers also obtain disclosure of contingencies that may have a material impact on the credit quality of the counterparty (e.g., increases in collateral requirements due to rating triggers, etc.). The scope of requests for information may depend on the quality and availability of data on a given counterparty in the public domain, as well as the size and nature of exposure. Where satisfactory information is not available, market participants should adjust their credit parameters accordingly.

When determining how much information to provide on a confidential basis to their counterparties, market participants should recognize that provision of relevant credit data increases the level of the counterparties' comfort and improves the likelihood that access to credit will remain during periods of systemic and institutional stress. CRMPG II recommends that credit users and OTC market participants seek a proper balance between preserving proprietary information and providing information that will enable their counterparties to gain an appropriate level of understanding of their management, investment process and philosophy and material risks.

**CRMPG I Recommendation 2: Confidentiality**

- 2a. *FIs should have internal written policies and procedures in place governing the use of and access to proprietary information provided to them by trading counterparties as a basis for credit evaluations.*
- 2b. *To encourage the flow of adequate proprietary information, FIs should be prepared to reach understandings with their counterparties regarding the use of counterparty proprietary information and on safeguards against its unauthorized use.*

Maintaining confidentiality of information remains an important consideration for market participants. The challenges of managing client information have increased as the range of contacts between financial intermediaries and their counterparties (including, for example, prime brokers, derivatives trading counterparties and investors, etc.) have proliferated. Practices in the industry have generally improved, and there appears to be a high level of comfort among clients that financial intermediaries have implemented and are enforcing appropriate policies with regard to client information.

Notwithstanding this general comfort, however, counterparties on occasion propose individual confidentiality agreements, either as part of the ISDA documentation or through separate agreements. Such customized documentation can introduce legal and operational risks, as difficulties in reliably tracking individual provisions in confidentiality agreements may lead to inadvertent breaches.

**2. Recommendation (Category I & II)**

CRMPG II recommends that trade associations, such as the Global Documentation Steering Committee, continue efforts to attract widespread acceptance of documentation standards for the treatment of confidential information. Individual firms should also continue to independently develop and refine their internal policies and procedures for managing sensitive client data and endeavor to address confidentiality issues raised by counterparties by disclosing and following such policies and procedures with regard to confidential materials. CRMPG II further recommends that firms evaluate and understand the operational risks associated with customized legal documents that deviate from the firm's existing procedures for the handling of confidential counterparty information and take such risks into account when considering such agreements.

**CRMPG I Recommendation 3: Leverage, Market Risk and Liquidity**

- 3 *FIs should deepen and strengthen the ongoing monitoring of their own risk and the risk posed by their large trading counterparties by utilizing an integrated framework for evaluating the linkages between leverage, liquidity and market risk. Specifically:*
  - 3a *FIs and large trading counterparties should manage the risk arising from their use of leverage by considering, among other factors, the magnifying and interconnected effects of leverage, under normal and stress conditions, on their (i) market risk, (ii) funding arrangements and collateral requirements, and (iii) asset liquidity risk. They should also evaluate factors that may mitigate the effects of leverage.*
  - 3b *FIs and large trading counterparties should prepare regular, comprehensive estimates of their market risk, applied systematically across their trading portfolios. They should be prepared to share with key credit providers, as appropriate, information on the methodologies employed and periodic updates on the level of their market risk.*
  - 3c *FIs and large trading counterparties should conduct regular and rigorous assessments of their funding and asset liquidity risk that take into account: (i) duration, stability and breadth of their funding, (ii) degree of reliance on collateral, (iii) strength and permanence of their capital, and (iv) potential for market losses under stress conditions including the additional impact of partial asset liquidation. They should be prepared to share with key credit providers information on their liquidity risk assessment methods, periodic updates of summary results and key elements of their contingency funding plans.*

The vivid manifestation of the interrelationship between leverage, market risk and liquidity provided an enduring lesson of the LTCM crisis. Among others, the concept of “crowded trades” entered the lexicon as one of the most significant risks to be identified and mitigated. For the purposes of this analysis, a crowded trade is defined as multiple parties entering into correlated trading strategies across one or more markets, where the aggregate volume of trades in the market(s) is sufficient to constrain the ability of traders to exit from the position on a simultaneous basis without significantly impacting prevailing prices. Further, until traders seek to unwind positions, crowded trades are often characterized by a dampening of volatilities and an increase in perceived liquidity measures, leading to misleadingly low risk calculations in conventional VaR (including liquidity-adjusted VaR) and other risk models. A final characteristic of crowded trades is that, as spreads narrow, traders



have a greater economic incentive to increase leverage levels in order to achieve comparable returns.

The post-1999 period has been characterized by increased awareness among market participants of the need to manage liquidity and close-out issues. This is especially true with regard to collateralized transactions, where the preservation of liquidity under stressed conditions has become of paramount concern. This, in turn, has led to wider acceptance of term funding arrangements, fixed haircuts, bilateral mark-to-market arrangements and other provisions which have the effect of shifting liquidity risk away from clients to dealers, adding complexity to collateral structures and increasing the amount of leverage that some counterparties may feel it appropriate to incur.

Further, collateral arrangements relying on portfolio metrics, such as stress analyses or VaR, are not uniform across institutions and have generally not been tested in turbulent markets. The correlations, volatilities, liquidity and other position characteristics that will actually materialize in stressed periods are therefore uncertain and subject to ongoing change.

The more complex products and structures referenced above further complicate the assessment of portfolio characteristics. For example, the ability to isolate and transfer risks to market participants willing to hold them, which is facilitated by the multiple varieties of complex products now available, has made it difficult for dealers to understand and measure the relationship between different transactions, i.e., to link a portfolio of complex transactions together in a way that will give meaningful risk data. Therefore, firms must continue to invest in systems that enable them to isolate the risks embedded in complex transactions and to aggregate them in a meaningful way across single and multiple counterparties.

Finally, it is worth noting that despite the attention paid to managing crowded trades, relatively little new information is available to market participants to assist them in identifying such trades; accordingly they remain difficult to detect, measure and analyze. Therefore, while firms need to continue to incorporate liquidity considerations into their risk measures, a lack of knowledge about crowded trades makes it difficult to accurately or with certainty estimate a liquidity stress.

*3. Recommendation (Category I)*

CRMPG II recommends that market participants continue to work to improve their understanding of their own portfolios, and to identify portfolio concentrations to a security or a market factor. Credit and market systems should be enhanced to better approximate directionalities across clients and products by risk factor. Credit systems should isolate the key risk factors that drive exposures, including exposures arising from complex transactions, and ensure that risk metrics fully reflect the impact on performance, based on movement of the underlying factors. Those key risk factors should be aggregated across the portfolio to assess the degree to which concentrations exist. This information is useful in assessing the credit quality of counterparties, in addition to providing some insight into crowded trades.

## D. Improving Risk Measurement, Management and Reporting

### **CRMPG I Recommendations 5 and 6: Counterparty Exposure and Risk Estimation; Market and Credit Risk Stress Testing**

- 5a *When exposures to a counterparty are large or illiquid, the information provided by current mark-to-market replacement value should be supplemented by an estimate of liquidation-based replacement value. Such an estimate should incorporate:*
- *The potential for adverse price movement during the period until liquidation value of the contracts with the counterparty is set and value from the counterparty collateral can be realized; and*
  - *The liquidity characteristics of the contracts and collateral involved under both normal and stressed market conditions.*
- 5b *FIs should upgrade their ability to monitor and, as appropriate, set limits for various exposure measures including: current replacement cost, current net of collateral exposure, current liquidation exposure, and potential exposure.*
- 6a *When measuring exposure to stress events, FIs should estimate both market and credit risks. Tests should assess:*
- *Concentration risk both to a single counterparty and to groups of counterparties;*
  - *Correlation risk among both market risk factors and credit risk factors; and*
  - *Risk that liquidating positions could move the market.*
- 6b *Risk managers should work with trading and credit book managers to develop stress scenarios that probe for vulnerabilities within and across key portfolios, with particular analytical focus on the impact of stress events on large or relatively illiquid sources of risks.*

In general, firms have invested heavily in credit systems since 1999 and accordingly have significantly enhanced their ability to measure credit exposures through potential exposure and alternative metrics. Typically, this includes substantial progress in implementing stress testing, scenario analysis and other risk analytics. However, in most cases considerable work remains necessary to enable calculation of correlated potential exposures, accurate reflections of netting and collateral enforceability and other components of a fully developed credit exposure system. Furthermore, the continued development of more complex products may result in credit systems that are perpetually “behind the curve” in terms of keeping up with the business units, leading to a persistent level of un-modeled or imprecisely modeled trades with consequent deficiencies in exposure reporting. Another concern is the

reliance of these models on underlying assumptions and inputs, including market risk factors, which are susceptible to underestimating risk during apparently benign market conditions, as discussed above.

Finally, in circumstances where similar risk management models are used across institutions, pro-cyclical systemic issues can ensue when multiple counterparties react to a market shock in a similar manner.

#### *4. Guiding Principle (Category I)*

Investment in risk management systems should continue to be a high priority and will almost certainly require greater resources in the future. Full testing and validation prior to use is essential, keeping in mind that model verification should be performed independently of the business units. Market participants should avoid over-reliance on any one model or metric when analyzing risk; rather, a portfolio of analytics including stress tests, scenario analysis and expert judgment should be employed. Special attention should be paid to the assumptions underlying these models and on understanding the impact on the results if inputs and assumptions turn out to be incorrect. The resiliency and reliability of such models should be regularly reviewed through independent periodic verification of both pricing and risk models, given that the former often provide multiple inputs for the latter.

### **CRMPG I Recommendation 7: Credit Practices**

- 7a Recognizing the need for individual counterparty creditworthiness assessments, FIs should, as a general practice, require initial collateral for credit intensive transactions with counterparties whose creditworthiness depends heavily upon the performance of leveraged portfolios of financial assets.*
- 7b When initial collateral is called for, the amount may be set on a transaction or portfolio basis and should take into account the factors used to develop estimates of liquidation-based replacement values.*
- 7c Especially when initial collateral is not called for, the credit decision should reflect explicit risk tolerance limits for the size of potential liquidation (close-out) costs.*
- 7d In cases where documentation specifies a threshold level of exposure that triggers an obligation to transfer collateral, limits on unsecured exposure should reflect updated estimates of liquidation costs and not just current mark-to-market values.*
- 7e In cases where FIs participate in two-way variation collateral arrangements, estimates of liquidation costs and related credit limits should take account of the buy-in costs of collateral pledged.*

While financial intermediaries continue to request initial margin for most leveraged counterparties, not all clients post initial margin for all of their transactions. Furthermore, in situations where initial margin is obtained, margin terms have generally tended to become more competitive, as the industry is moving toward extending credit based on VaR- or stress test-based margining in certain cases. Market participants have also proved willing to agree to cross-product or even cross-entity collateral techniques, thereby giving counterparties the benefit of a wider range of potential trade offsets. These practices, while conceptually logical, almost invariably result in counterparties posting less margin than would be required under alternative formulations. They may also expose the credit provider to a higher level of operational and legal risk, particularly where the operational systems lag in their ability to handle complex margin arrangements on an automated and reliable basis. However, the very high operational demands of complex trade-level margining are one of the factors driving expanded use of portfolio-level collateral arrangements, which, together with other considerations discussed below, offer potentially significant risk-reducing aspects as well. It is incumbent on each counterparty to

understand where it is taking risks associated with more sophisticated collateral mechanisms and to manage these risks appropriately.

An advantage of portfolio margining processes is that they provide an incentive for credit takers to execute arbitrage or other fully or partially offsetting positions with a single counterparty. CRMPG II has observed greater sensitivity by counterparties to having balanced portfolios and cross-product arrangements with dealers, with the objective of reducing amounts of collateral that would have to flow in a distressed scenario (the “traffic cop problem”). Fund managers are also increasingly focused on managing risk and structuring portfolios to prevent being “held hostage” by margin flows. The more sophisticated leveraged institutions undertake active portfolio risk management with each of their financial institution counterparties, a process which tends to result in lower credit and liquidity risk.

These sophisticated margin terms, however, also provide the potential for counterparties to increase leverage. Therefore, an added level of due diligence is required on the part of the market participants to ensure that their counterparties are not mismanaging the incremental liquidity provided in these arrangements.

Despite some relaxation of initial margin levels and the growth of complex margining methodologies, CRMPG II would not conclude that financial risk among leveraged counterparties has at present reached excessive levels. In fact, leverage among hedge funds appears to be relatively modest, although this conclusion must be tempered by the observation that the lack of transparency inherent in more sophisticated products makes a definitive conclusion problematic. However, collateral standards based on insufficient information or inappropriate risk evaluation clearly pose the potential for leverage to reach levels that could increase systemic risk.

Another consequence of the focus being given to the management of liquidity risk by leveraged institutions arises through the increasing requests for term commitments and fixed haircuts for margin financing. While this represents an understandable attempt on the part of leveraged institutions to avoid being subject to rapid changes in collateral requirements, it also has the effect of shifting the liquidity burden onto the credit provider, as well as reducing their credit cushion.

*5a. Recommendation (Category I)*

CRMPG II recommends that collateral be used as a tool to address material differences in transparency and credit quality of counterparties, as well as to reflect asymmetry of exposure profiles. Credit terms, including margin arrangements, should be established at levels that are likely to be sustainable over time. The Policy Group believes that initial margin is an important credit risk mitigant and that the establishment of prudent initial margin requirements at the commencement of a trading relationship can play an important role in promoting financial stability during periods of stress. In addition, CRMPG II recommends that market participants continually review their collateral policies, practices and systems, and where necessary formulate remediation plans.

The development of model-based portfolio margining programs is useful in mitigating counterparty risk by relating the amount of initial margin to the underlying risks. However, because the amounts of required margin may increase with changes in volatility, users should fully analyze the liquidity and risk management impact of potential margin requirements during times of market stress.

*5b. Recommendation (Category I)*

CRMPG II recommends that financial institutions be alert to the potential for overall leverage in the system to increase (arising from a liberalization of credit terms, increased utilization of credit facilities under pre-existing terms or the development of new structures that facilitate the taking of leveraged positions in new forms); that financial institutions carefully monitor their resulting actual and potential credit exposures; and that, in determining what actions are appropriate, they take into consideration both individual counterparty and sectoral risk issues. CRMPG II recommends that financial institutions understand how counterparties analyze their own funding liquidity and leverage levels, and consider whether collateral levels are appropriate relative to funding flexibility.

*5c. Recommendation (Category I)*

CRMPG II recommends that financial institutions ensure that their risk measures and analyses comprehensively capture a full range of actual and contingent exposures, such as committed funding arrangements. As further discussed in Section IV, market participants should ensure that netting and collateral enforceability are appropriately reflected in risk measures. Dealers should also make certain that in the context of term commitments and similar arrangements, their credit policies appropriately reflect the creditworthiness of the counterparty. These commitments, as well as collateral policies and practices, should be reported periodically to senior management.



**CRMPG I Recommendation 8: Valuation and Exposure Management**

- 8a *FIs should establish internal counterparty credit risk cost allocation and valuation practices that provide incentives for trading business and credit risk managers to manage proactively their counterparty credit risks. This could include methods for recognizing the cost of credit risk in internal risk or capital charges, proactive adjustments to limits, as well as tools for periodically evaluating the adequacy of credit valuation adjustments to asset carrying values.*
- 8b *Both FIs and large trading counterparties should develop and apply strong, consistent independent price verification procedures. These procedures should include fair value adjustments to mid-market values which should be assessed dynamically and consistently to account for:*
- Open risks that are marked to either the bid or offer side of the market;*
  - Illiquidity characteristics of complex instruments or positions;*
  - Credit valuation adjustments to address credit quality, generic credit market spreads and any substantial specific repayment concerns;*
  - Operational and model risks associated with complex or large positions; and*
  - Servicing costs associated with the ongoing hedging of transactions.*

*While significant progress has been made across financial institutions on credit valuation, sophisticated pricing of credit risk is not universal across dealer firms.*

**6. Recommendation (Category I)**

CRMPG II recommends that financial institutions implement robust credit pricing models, as recommended by CRMPG I, and measure and report returns adjusted for credit costs. Firms should expand their models to incorporate the risk of counterparty default and portfolio volatility and carefully evaluate the correlation of exposures to the likelihood of counterparty failure. The impact of collateral should be considered, such that increases in collateral reduce expected counterparty loss and therefore the implied credit cost.

**CRMPG I Recommendations 9-12: Management Reporting**

- 9 *Senior management should convey clearly information on its overall tolerance for risks, including loss potential in adverse markets. This type of information should also be conveyed to the firm's Board of Directors, as appropriate. The independent risk management function should be responsible for designing a flexible reporting framework to enable senior management to monitor its risk profile relative to its expressed risk tolerance.*
- 10 *Senior management should receive periodic information on large counterparty exposures/risks. These reports should meet the following standards:*
  - *Aggregate exposure to a counterparty should include all material on- and off-balance sheet exposures relating to such counterparty.*
  - *Exposures should be measured under conservative assumptions as to the efficacy of netting and collateral arrangements.*
  - *Position replacement cost and collateral values should be measured both at market and estimated liquidation value.*
  - *Potential exposure measures should be robust and appropriately reflect risk reduction and risk mitigation arrangements.*
  - *Quantitative and qualitative analysis should be used to identify counterparties for which large moves in specific market risk factors would result in large exposure levels, a material deterioration in credit quality or both.*
- 11 *Senior management information should highlight possible concentrations of market and credit risk resulting from positive correlation among the firm's own principal positions, counterparties' positions with the firm and collateral received or posted. In preparing such reports, due regard should be given to understandings reached with counterparties on access to and uses of counterparty proprietary information.*
- 12 *Senior management should periodically receive contextual information sufficient to assess the degree of reliance placed on quantitative risk management information, to highlight key judgments and assumptions involved in developing the quantitative risk information, and to shed additional light on a firm's overall risk profile.*

CRMPG I recommendations on management reporting remain as valid and appropriate now as they were in 1999. In general, as a result of internal initiatives and external mandates (including Sarbanes-Oxley, aspirations for more efficient regulatory capital treatment and other motivations), senior management oversight of

risk incurrence and mitigation has increased meaningfully. For example, in its 2004 survey, Deloitte & Touche noted an increased involvement of the Board in risk oversight at financial institutions. In consequence, risk reporting has become meaningfully more detailed, robust and frequent. The survey observed an increase in the proportion of participants with a Chief Risk Officer or equivalent; in addition, of those institutions with CROs, 75% indicated that the CRO reported directly to the CEO, the Board or a Board-level risk management committee. This senior-level reporting corresponds with the Policy Group's own observations.

The sophistication of reporting to senior management has increased as well, with exposure reporting across counterparties, including industry and risk factor aggregations, more commonly incorporated. In addition, there is more frequent reporting of metrics such as VaR, liquidity-adjusted VaR and stress tests / scenario analysis, which provide greater insight into both the magnitude and the directionality of credit exposures. Scenarios describe unusual or difficult market environments, often associated with a plausible but unexpected geopolitical event or macroeconomic shock, while stress tests provide quantification, through identification of changes in risk factors that would be associated with a scenario, of the impact on values of portfolios. While progress has been made, the scope, content and quality of reporting to senior management varies significantly across financial institutions and is not necessarily sufficient even among the most advanced. For example, certain measures, including VaR and potential exposure, remain difficult to aggregate across counterparties on a meaningful (such as correlation-adjusted) basis. Moreover, because these measures are complex in nature, management must be made aware and reminded of their limitations.

Finally, many of the most significant losses in the industry over the past four years were not credit losses per se, but rather were due to inadequate underwriting standards or similar deficiencies, which would escape conventional current, potential or other risk measures.

*7. Guiding Principle (Category I)*

The sophistication of stress tests, scenario analyses and liquidity-adjusted metrics as alternative and sometimes more appropriate measures for credit exposures should continue to be enhanced, and the exposure information that they contain should be carefully and regularly considered by risk practitioners and senior management, with additional elevation of stress test findings to senior management when appropriate. Whether based on historical events or hypothetical events, scenarios used for stress testing should be plausible, so as to resonate with the users and senior management. When analyzing exposure measures, institutions should consider the status and adequacy of trade-related documentation.

**CRMPG I Recommendation 4: Credit Risk Analysis Skills**

- 4 *FIs should ensure an appropriate level of experience and skills in the risk managers involved in credit decisions on trading counterparties for whom this expanded information is significant and provide those managers with access to: analytical capabilities in derivatives and other financial instruments; and risk management expertise sufficient to assess the robustness of the risk management frameworks and methods employed by such counterparties.*

As discussed above, increasing product complexity and the need to consider market risk, liquidity issues and a multitude of other factors have placed new and unprecedented demands on credit analysts. The need for high quality credit risk managers who are able to handle these demands has been generally recognized by financial institutions across the industry. Many institutions are also hiring professionals with quantitative backgrounds for their credit risk departments in order to assist in interpreting quantitative data and to be able to access their expertise when evaluating individual transactions and portfolios.

Generally, the dialogue between financial market participants has become more sophisticated since 1999. Financial institutions have improved their counterparty risk information systems and have continued to invest in skilled analysts. However, demand for qualified credit professionals continues to intensify (both within financial institutions as well as at hedge funds and funds of funds). At the same time, complexities in analysis, coupled with growth in the industry, put an ever increasing demand on practitioners. These factors challenge firms' ability to maintain staffing at desired levels. As a result, some leveraged institutions report concerns regarding the lack of adequate communication with their financial institution counterparties. Additionally, these firms report a lack of sophistication among some of the smaller or newer entrants in the field.

*8. Guiding Principle (Category I)*

Financial market participants should re-emphasize recruitment, training and retention of skilled credit analysts and market risk managers who understand their clients and the strategies clients employ, as well as the dynamics of complex portfolios under stressed circumstances. Firms should ensure adequate staffing levels, independent of the trading units, to allow credit analysts to spend sufficient time with clients in order to obtain and maintain a comprehensive understanding of their business and credit characteristics. Additionally, operations and risk management areas need to be staffed so that they can function adequately through periods of market stress.

## ***E. Prime Brokerage***

The number and size of hedge funds has grown significantly during the past five years and has been accompanied by profound growth in prime brokerage arrangements. Prime brokerage arrangements have also now been extended to include derivative and fixed income transactions that raise additional considerations for market participants. The use of prime brokers by hedge funds and other substantial end users often includes the involvement of multiple dealer legal entities for transactional booking purposes, and in some cases reliance on multiple prime brokers. In this respect, although prime brokerage arrangements are designed to consolidate reporting and credit exposure, in fact in many cases the exposure is distributed to numerous transactional entities and prime brokers.

For purposes of this document, prime brokerage refers to a common arrangement for facilitating the execution, clearance and settlement of transactions entered into by active market participants, typically hedge funds. In a prime brokerage relationship, a customer may execute transactions with different executing dealers and have those transactions cleared by single or multiple prime brokers. Prime brokerage permits the customer to use the prime broker as a clearing facility for all of the customer's transactions, wherever executed, as well as a central custodian for the customer's positions and collateral.

The prime brokerage relationship with a hedge fund is often only part of the overall relationship with the fund or family of funds. The totality of the relationship with the fund may include numerous additional transactional and advisory involvements outside of the prime brokerage activity. The competitive pressure to secure relationships with hedge funds, including newly established funds, may lead, if not prudently managed, to an erosion of the credit standards and protections applied to this new business. It is essential that institutions on both sides of these arrangements fully understand and consider the terms that govern such credit relationships from a credit, risk and funding/treasury perspective.

Prime brokerage arrangements are documented with a variety of industry standard master agreements. Historically, in connection with equity prime brokerage arrangements, participants relied on a combination of a customer margin agreement and regulatory pronouncements, including disaffirmance rights on the part of the prime broker. As fixed income and derivative transactions have increasingly become

the subject of prime brokerage arrangements, participants must also rely on industry standard master trading agreements for these products. This has resulted in the following two additional concerns.

The diversification of these relationships to a broader product mix results in a series of documents that may themselves have different key commercial terms. Differences in terms, including events of default and cure periods, create anomalies between and among these transactions. This is further exacerbated in instances in which the transactions have been entered into in consideration of each other. These concerns also arise in direct trading with clients. Participants in the prime brokerage market should examine the analyses and policies developed with respect to derivatives documentation and netting generally, as many of these analyses and policies will be applicable to prime brokerage relationships.

Today's prime brokerage arrangements may have their roots in historic "give-up" agreements that have been used for decades in the futures and cash securities markets to document tri-party transactions involving an executing broker, a clearing broker and a customer. These agreements allow clients to effect transactions with multiple executing brokers, dealers or futures commission merchants, who then "give up" or transfer the transactions to one or more prime brokers for clearing and settlement. The purpose of these arrangements is both to permit clients to enhance liquidity by diversifying their "source of supply" to prevent market awareness of sizeable position-taking, and to maximize pricing and execution of these positions. These arrangements have generally been effective in accomplishing client goals without undue disputes or uncertainty because the transactions involved are relatively simple and standardized from a settlement perspective due to the spot nature of cash securities and the exchange margin and settlement rules in the case of listed derivatives.

In the early 1990s, a similar practice developed in the foreign exchange markets, under which a prime brokerage client would execute spot transactions with an executing dealer who would "give up" the transactions to a prime broker. This resulted in separate transactions between the executing dealer and the prime broker on the one hand, and equal and opposite transactions between the prime broker and the prime brokerage client on the other. This practice, as it extended to forward and option transactions involving foreign exchange, could introduce an element of market and credit risk to the executing dealer, which in theory is mitigated by the often



greater credit quality of the prime broker as compared to that of its client. However, executing dealers can address these risks by adopting internal controls and negotiating appropriate give-up agreements so that, at the time a trade is executed, the dealer should expect that the prime broker is legally obligated to accept it because the trade is within the parameters specified by the prime broker. If it uses this approach, the executing dealer should avoid or minimize a period of uncertainty as to whether or not the counterparty to the transaction will be the prime broker or the client. The allocation of these risks is typically subject to a detailed negotiation that sometimes involves compromises between the parties with respect to different periods of time in the transaction life cycle. Nonetheless, foreign exchange prime brokerage is now a widespread practice, which industry groups, including the Financial Markets Lawyers Group, have sought to standardize by means of a standardized give-up agreement. This agreement does, however, leave several risk allocation decisions to be elected and, accordingly, negotiated on a case-by-case basis.

More recently, prime brokers have sought to extend this service to other derivative transactions, specifically credit default swaps and, to a somewhat lesser extent, interest rate, currency and equity swap transactions. These transactions are often far less standardized than foreign exchange transactions and the uncertainty and risk of non-acceptance described above can be correspondingly more acute if not managed appropriately by the parties. The marketplace continues to struggle with successful reconciliation of these issues, and ISDA has launched a project to standardize give-up agreements across the range of derivative products. Certainly, as give-up arrangements involve increasingly complex products, prime brokers also need to consider issues that arise in relation to internal trading restrictions on specific underlying securities and issuers, and potentially to emerging responsibilities with respect to the scope and character of client trading activity.

An approach that has been successfully implemented by a number of large institutions and may be gaining widespread acceptance involves the upfront agreement between the executing dealer and the prime broker on all material credit terms under which transactions will be accepted by the prime broker. These terms often include permissible transaction types, trading and settlement limits and trade acceptance procedures. Under this approach, the executing dealer and the prime broker are each responsible for monitoring their own compliance with agreed-to terms. The executing dealer, by ensuring that all transactions it executes are

allowable and that it follows all agreed-to procedures, should expect that the transactions will be binding upon the prime broker. The internal control procedures incorporated into this approach meaningfully define the expectations of the executing dealer and prime broker and should be encouraged and strengthened. Although this approach has been implemented by some, other institutions do not have the operational capability to monitor and track transactions executed pursuant to prime brokerage arrangements. These institutions should consider developing or purchasing operational tools to monitor and control this aspect of their trading activity. In addition, as with all dealers and prime brokers, institutions should understand the applicable contractual terms and standards that govern the relationship between the executing dealer and the prime broker.

*9. Recommendation (Category I & II)*

The volume of prime brokerage business continues to grow substantially. While properly executed prime brokerage activities have the potential to reduce overall systemic risk, they are also subject to a variety of legal, operational, credit and other risk challenges. To mitigate those issues, CRMPG II recommends that significant industry participants intensify industry-sponsored efforts to define the important relationships among hedge funds and other customers, executing dealers and prime brokers across all product areas and business lines. In addition, each participant in the prime brokerage market, whether executing dealer, client or prime broker, should on an ongoing basis maintain a full and clear understanding of the risks (e.g., credit, market, contractual and operational) that it incurs in this market, its internal controls and its contractual relationships, taking into account the credit, market and operational factors that can arise in these three-way arrangements. As a component of this Recommendation, prime brokers should ascribe a high priority to actively monitoring the credit quality of each of their counterparties, including conducting regular due diligence calls and/or meetings.

Participants should consider the development of cross-product prime brokerage and netting agreements that would comprehensively address credit, commercial and risk issues. Such agreements could incorporate by reference each underlying master trading agreement that may have been entered into, and serve to harmonize disparate credit and other material commercial terms such as events of default, cure periods and close-out procedures.

As derivative prime brokerage products develop further, market participants should continue to work with industry groups to standardize terms and agreements that govern give-up arrangements. Participants need to ensure that they have the operational capability to monitor and track transactions executed pursuant to those arrangements. The magnitude of current and prospective prime brokerage trading volume is such that systems and processes must be automated further through solutions like straight through processing.

## ***F. Conclusion***

The comprehensive nature of the CRMPG I recommendations leads us to conclude that they remain highly relevant six years after the publication of the document. In the case of the majority of recommendations, industry participants have broadly accepted and implemented the recommendations. However, this is not universally the case, and CRMPG II recommends that each financial institution revisit the extent to which its current practices are consistent with the original recommendations, in order to identify deficiencies and develop remediation plans where necessary. Further, due to changes that have occurred in the markets since 1999, it is the Policy Group's view that market participants need to continue to enhance their processes and analytical tools and otherwise strengthen risk management practices, in order to maintain pace with a business environment that is increasing in complexity. In the Policy Group's view, such continued enhancements in the understanding and management of risk by market participants will play an important role in reducing systemic risk and enhancing the efficiency of the market.