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Managing Counterparty Risk in an Unstable Financial System

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Commonfund Institute houses the education and research activities of Commonfund and provides the entire community of long-term investors with investment information and professional development programs. Commonfund Institute is dedicated to the advancement of investment knowledge and the promotion of best practices in financial management. In addition to teaming with NACUBO to produce the NCSE, Commonfund Institute provides a wide variety of resources, including conferences, seminars and roundtables on topics such as endowments and treasury management; proprietary and third-party research and publications, including the Higher Education Price Index (HEPI); and events such as the annual Commonfund Forum and Commonfund Endowment Institute.

Managing Counterparty Risk in an Unstable Financial System

The recent flow of headlines excoriating bankers and financiers for malfeasance, fraud, and collusion has been almost biblical in proportion. Counterparties that appeared creditworthy based on financial statements and ratings have revealed that they are impaired either due to computer errors, control failures, malfeasance, or potential regulatory liabilities. In sequential scandals, financial institutions disclosed that they had dramatically violated principles of business conduct required by shareholders, creditors, clients, and the regulatory and legal codes. Justifiably, investors wonder if the current financial system is any safer than it proved to be in the Credit Crisis.

In the span of 12 months, the public has been hopefully witness to and not victims of the following cases:

- The near implosion of the Knight Capital Group on an accidental $440 million trading loss. The market maker's trading program ran amok over the course of 45 minutes on the morning of August 1, 2012, creating the losses and causing the New York Stock Exchange to suspend Knight from its job as a "designated market maker." The firm would have gone bankrupt had it not been able to sell a majority of itself to a rival. At best, this was an unintentional programming malfunction, but it was a stupendous error that potentially exposed its clients to losses and necessitated a rescue of the firm on August 6th.
- Peregrine Financial Group's CEO, Russell Wasendorf Sr., defrauded clients of as much as $215 million and spent client money on his offices, to dress up Peregrine's capital base, and to pay fees and fines. In his suicide note, Wasendorf indicated that he had been orchestrating a fraud for twenty years by falsifying bank statements sent to regulators using Photoshop, Excel, scanners and laser printers. Wasendorf's estate is now facing criminal charges from customers claiming the CEO and his son illegally commingled firm and client money. The U.S. Commodity Futures Trading Commission (CFTC) reviewed operations at Peregrine Financial Group Inc. at least twice since 2006 without detecting the fraud that led to the collapse of the futures broker and the $215 million shortfall in client funds.
- Attorneys general in at least five U.S. states are conducting investigations into Barclays PLC, Royal Bank of Scotland Group, UBS AG, Lloyds Banking Group, and Deutschebank due to alleged manipulation of the London interbank offer rate (LIBOR), adding to probes by U.S. and U.K. authorities. A former Barclays COO said former CEO Bob Diamond flat-out told him that the Bank of England had instructed the bank to manipulate LIBOR. Head of the Bank of England, Mervyn King, has told a parliamentary panel that neither he nor the UK Financial Services Authority had any responsibility to police LIBOR. The potential regulatory and civil claims could be in the billions of dollars, undermining Barclays' creditworthiness.

- JP Morgan Chase Chief Executive Officer Jamie Dimon said its chief investment office has had $5.8 billion in losses on the credit derivative trades so far, and that figure may climb by $1.7 billion in a worst-case scenario. While the size of the loss is manageable, Dimon has indicated that the causes were failures in risk measurement, risk reporting, escalation, and pricing of positions. According to the Wall Street Journal, Irvin Goldman, the risk manager supposedly responsible for overseeing the trades, had little risk-management experience before taking the chief risk officer post at the Chief Investment Office. He spent most of his career as a trader, starting at Salomon Brothers in the 1980s. He oversaw interest-rate product sales and trading at Credit Suisse First Boston and in 2003 joined Cantor Fitzgerald, where he was president of its debt capital markets and asset management divisions. Mr. Goldman ultimately left Cantor in October 2007 after his unit piled on trading losses during the previous summer. Worse still, he is also the brother-in-law of another top J.P. Morgan executive, Barry Zubrow. Mr. Goldman has now been fired.
- The collapse of MF Global Holdings Ltd. left an estimated $1.6 billion gap in customer funds despite being under U.S. regulations requiring the segregation of customer assets. The CFTC, the regulator for both MF Global and Peregrine, has since approved rules that seek to improve protection of customer funds held by futures brokers, after the agency came under fire following the two firms' misappropriation of hundreds of millions of dollars in customer funds and then failure, all under the agency's oversight. The rules, approved by the CFTC, require futures merchants to strengthen their controls over the treatment and monitoring of funds held for customers.

To an extent, these cases are a microcosm of the type of seemingly random destabilizing shocks threatening investor confidence in the financial system as a whole. The Peregrine and MF Global cases show that using customer money may not be an anomaly even when prohibited by law. Additionally, these are only the cases that led to losses and were detected. Naturally, investors should wonder how exposed they are to brokerages and banks that purport to segregate clients' assets and can manufacture statements showing they are solvent. In addition, none of these unexpected losses help to increase investor confidence in markets when they also remember the events of the Credit Crisis where brokers had lent out client assets and were unable to find and return them in a timely fashion.

While a host of regulatory reforms have been undertaken to make the financial system safer since the Credit Crisis, and the reforms are aimed at making markets and institutions more transparent, less complex, and less leveraged, they do not appear to have yet made the financial system safer for investors. Most reforms are in the banking sector and impose higher costs to encourage banks to internalize the costs of certain risky activities. Basel III requirements for more and better-quality capital and liquidity buffers should enable institutions to better withstand the stress of unpredictable events. However, all regulations suffer from the Law of Unintended Consequences in that they cannot anticipate all the possible reactions to a new regulatory approach. Even now, banks are adjusting to the new regulatory costs in various ways, some of which may not have been intended. The new banking standards may encourage certain activities to move to the nonbank sector, where those standards do not apply. Alternatively, big banking groups with advantages of scale may be better able to absorb the costs of the regulations; as a result, they may become even more systemically important and prominent in certain markets, making these markets more concentrated.

Although the intentions of policymakers are clear and positive, the reforms have yet to result in a safer financial system, in part because, in some economies and regions, the intervention measures such as quantitative easing needed to deal with the prolonged crisis are delaying the creative destruction needed for the system to evolve and follow a safer path. These intervention measures are rightly aimed at preventing a collapse of the financial system and supporting the real economy, but they also provide time for the broken limbs of the damaged financial system to heal without being properly reset. A recent IMF paper[1] suggests that despite improvements along some dimensions and in some economies, the structure of financial intermediation remains largely unchanged. The IMF data suggests that national and global financial systems are still overly complex, banking assets are concentrated with strong domestic interbank linkages, and the too-big-to-fail issues are unresolved. The report highlights that innovative products are already being developed to circumvent some new regulations.

These same traits characterized the Credit Crisis, suggesting the financial system remains vulnerable and that investors in highly integrated economies are still susceptible to cascading counterparty failures and harmful cross-border spillovers.

As the earlier examples showed, regulators, auditors and internal controllers obviously have not prevented executives from misrepresenting information and misappropriating assets to perpetuate a myth of creditworthiness or sustain a lavish lifestyle, nor have regulators detected such malfeasance quickly. The clients who transacted with the above financial services firms as counterparties, safe kept their assets with

1 *The Reform Agenda: An Interim Report On Progress Toward a Safer Financial System*, The International Monetary Fund. October 1, 2012

them and relied on them as service providers were exposed to losses and not afforded any meaningful protection by various auditing and regulatory watchdogs. As a consequence, they have suffered unexpected losses and business disruptions or had their assets needlessly tied up in court. These are all examples of counterparty risk which is heightened by lack of improvement in the financial system.

An investor's decision as to how to execute its investment strategy dictates the level of counterparty risk management it must undertake.

Counterparty risk is the probability that a party to a transaction or contract will be unable, or unwilling to fulfill its contractual obligations. Counterparty risk increases when a firm's solvency is undermined either due to systemic risk, financial loss, negligence, potential regulatory or legal claims, or operational failures. Investors entrusting their capital to fund managers, or investing directly, face different forms of counterparty risk. *Custodial risk* is a sub set of counterparty risk and is the risk of loss due to the insolvency, negligence or fraudulent action of the custodian or of a sub-custodian.

The global markets operate through a series of interconnected contracts among counterparties in the market, ranging from global commercial and investment banks, to corporate end-users, small and large broker dealers, futures commission merchants (FCMs), private and public exchanges, asset managers, hedge fund managers, custodians, administrators, and individual investors. The smooth functioning of the global financial markets relies on each of these intermediaries and counterparties fulfilling its contractual obligations. In our interconnected global financial market, the only way not to take some form of counterparty risk is to not participate. For investors, this is not a realistic option. But when regulators and internal controls are ineffective, and external auditors are not truly independent, objective and sufficiently skeptical, *how can investors protect themselves from increasingly complex counterparty risks?*

The problem has numerous dimensions and can occur anywhere along the intermediary chain. In addition, the usage of derivatives, leverage, and the ability of brokers and custodians to rehypothecate client assets each bring a new dimension of complexity to the effective management of counterparty risk. The most significant counterparty risk arises under derivatives contracts between investors and their most common trading counterparties, typically investment banks, FCMs, and brokerages. For example, the most significant form of counterparty risk facing the typical fund manager and investor is non-payment or non-performance by a broker or investment bank under a swap agreement or other OTC derivatives contract. If the contract is in the money and the counterparty fails to pay at maturity, the fund and its investors will incur a loss. If the counterparty defaults before maturity, the fund may have to replace the swap with a new one with a new counterparty that may be more costly. In addition, under a typical swap, a fund is required to post collateral at the inception of the swap (this is called initial margin) and then periodically increase or decrease that collateral throughout the life of the swap as the swap value rises and falls (this is called variation margin). If an investment bank or a prime broker fails during the life of the swap, the fund also faces the risk of non-return of collateral exchanged under the swap agreement.

While an individual swap is a self-contained, potentially leveraged and collateralized transaction, a prime-brokerage agreement is a collateralized leverage trading *facility*. Trading under such agreements also requires collateral to be posted and exposes the fund and its investors to the non-return of collateral pledged to the counterparty, but the magnitude of potential loss is greater.

Lastly, funds rely on financial institutions for custodial services. The failure of a financial institution to fulfill its contractual obligations regarding the custody and safekeeping of securities is also major counterparty risk for funds and their investors.

Investors should have an explicit strategy to manage these risks when investing. This paper describes what we believe to be best practice counterparty risk management that should be undertaken by an investor acting directly and relying on counterparties for certain investment and custodial services or by an investor relying on an advisor to invest on their behalf and manage counterparty risk. Strategies for managing counterparty risk are also detailed.[2]

2 A case study of a foundation which sustained losses due to both counterparty risks and a custodial risk, but which subsequently won a suit to recover losses, is available upon request from Commonfund. The case study reviews the events and distills the key risk management lessons.

Hope is Not A Strategy:
Explicitly Address Counterparty Risk When Developing an Investment Strategy

An investor's decision as to how to execute its investment strategy dictates the level of counterparty risk management it must undertake. If investing via a fund manager in a commingled funds, investors must conduct due diligence on their managers, and the counterparty risks faced by their managers, and the managers' capability to manage their counterparty risk. If investing via a managed account, investors must approve where the assets are custodied and the counterparties authorized to transact with that managed account. This requires evaluation and monitoring of both counterparty and custodial risks as well as the counterparty risk management capability of the manager. If investing directly via brokers, FCMs, and on exchanges, the challenge is even greater in that investors must not only evaluate, but manage their counterparty and custodian risk directly themselves. These risks in this context include the safekeeping risks, settlement risk of securities and derivatives transactions, repurchase agreements, non-return of collateral risk, and excessive rehypothecation of securities.

Costs due to counterparty risk may take the form of replacement costs arising from non-return of custodied or rehypothecated assets, non-performance on a derivatives contract, the non-return of collateral due to counterparty default, or operational costs by forcing the fund manager or investors to find alternative counterparties. It also may expose an investor to market risk if a counterparty defaults on a hedge, leaving an investment exposed to market fluctuations.

In the context of a custodian, counterparty risk can manifest itself in various ways. The most obvious is *Solvency risk*. This is when the financial viability and stability of the custodian threatens its ability to support long term investment in its business and withstand operational losses, undermining its ability to provide the contracted custodial services. Factors to be considered when evaluating solvency risk include the size and quality of the balance sheet, the adequacy of regulatory capital, stability and diversity of earnings and the proportion of non-interest income. Credit ratings are also of some value but generally are a lagging indicator of solvency trends. The quality of internal controls, the external auditors and supervisory bodies that oversee and regulate the bank should also be considered.

Another risk relating to custodial services relates to Asset Safety. *Asset Safety risk* is the risk that, in the event of default by either the global custodian, or the domestic subcustodian, client securities and/or cash are treated as being part of the assets of the financial institution which has gone into default, and therefore available to its creditors, rather than belonging to clients. When evaluating asset safety risk, investors should evaluate the degree of customer asset segregation across the varying regulatory and legal codes in each market.

Asset Servicing risk is another risk in custodial activities. This is the risk that the client is exposed to a loss due to weaknesses in the global custodian's operational infrastructure. In evaluating exposure to this risk, the level of responsibility taken by the global custodian for information provision on asset servicing events such as corporate actions and proxy voting, whether the service or information provision is in-house or outsourced are all relevant. Additionally, the level of responsibility accepted by the global custodian for carrying out correctly all client instructions given within a deadline is relevant.

Of course there is also *Operational risk* embedded within custodial risk. This is the risk that deficiencies in information systems or internal controls, human failures, failure to comply with regulations or management errors will result in unexpected losses. Essentially, this is the risk of investor loss due to breakdowns or weaknesses in internal controls or procedures at the global custodian. Factors to be considered are the level of internal audit, the firm's culture of compliance, the rigor of the external audit, the history of regulatory violations, the extent of the global custody operations, and the degree of business continuity planning.

Best Practices in Counterparty Risk Management

In conducting due diligence on potential fund managers or when managing their assets in-house, an investor should look for or establish best-practice. We believe best-practice counterparty-risk management includes the following items:

- Timely, detailed and enforceable documentation
- A clear and conservative Counterparty risk policy
- Minimum Counterparty-acceptance and contracting standards
- Real time, market driven, Credit-quality monitoring
- Active Counterparty-exposure measurement and limits
- Frequent and timely Counterparty-risk reporting
- Predefined Counterparty-risk mitigation and hedging plans

Timely, Detailed and Enforceable Documentation

Although written documents per se may not be necessary to establish a contract, they are the best evidence of the terms of a contract and the best means of ensuring that parties agree on the specific terms of a transaction. Failure to document a transaction appropriately or expeditiously creates unnecessary counterparty risk.

Counterparty risk can be controlled with adequate staffing and strong practices, but funds often outsource the negotiation and documentation of key contracts to third-party law firms, with limited involvement from the funds' CFO or COO. More active participation by dedicated fund staff has several benefits. First, it can effectively reduce the time between the date of the trade and its codification in writing. Second, it permits the fund, as the most vested party in the contract, to address, upfront, issues that may seem distant or irrelevant at the time of negotiation, but could become material in the event of a dispute. Third, the process provides a forum for the fund and the counterparty to agree upon numerous issues in a non-litigious setting. Finally, it permits the discussion and codification of the legal nature of the relationship between the parties before problems arise.

Delays in documentation are surprisingly common. Lapses between the time a transaction is entered into and the execution of documents evidencing the transaction can give rise to the risk that one of the parties could walk away from the trade or dispute its terms. In much the same way, inaccurate or incomplete documents could lead to disagreements and litigation when parties misunderstand their obligations and, as a result, fail to perform as expected. Equally significant, funds can confront unexpected market and credit risk as a result of misunderstandings about how documents work, particularly in disrupted markets. Close-outs of transactions in which funds experience unanticipated market and credit losses during contractual grace and notice periods provide a good example of this risk. Lastly, in litigation, documents are frequently put under a microscope and any flaw is magnified and used as an excuse for non-performance.

Negotiating and maintaining signed agreements governing the terms of the transactions or relationship (for example, custodial agreements, securities lending agreements, investment management agreements, derivative contracts, account-opening documents, brokerage agreements, ISDA, collateral-support agreement and give-up agreements) is essential. Lawyers should review the terms of the agreements to make sure the fund's and investors' interests are protected. Critical issues to be considered include:

"Wrong Way" Risk

Fund managers and investors should be particularly alert to "wrong way" counterparty risk. This occurs when the likelihood of a counterparty default is correlated to the potential exposure. Imagine, for example, if a fund had, presciently, bought protection against a default by Lehman Brothers in 2006 but, less prescient, bought it from Bear Stearns. When the financial crisis hit, the value of the protection on Lehman increased as Lehman's default probability increased. However, so did that of Bear Stearns, and more rapidly. Bear Stearns actually defaulted before Lehman, so the CDS would have been worthless, even though it provided protection, since payment would have been owed by the bankrupt Bear Stearns. Obviously, the likelihood of both Bear Stearns and Lehman Brothers defaulting, two brokers with large ABS businesses and assets on their balance sheets, were correlated. The amount owed to the fund under the swap increased as Lehman Brothers' creditworthiness fell but the counterparty risk of Bear Steans rose faster. This is an example of wrong-way risk.

- **Rights of set-off**
  The parties to, and the terms of, each document greatly affect the scope of a fund's exposure to a financial institution's insolvency. The investors and the fund should evaluate whether the agreements adequately allow for losses to be set off against amounts owed as a result of different transactions. How will set-off amounts be valued and handled? Will there be universal set-off rights across all relationships and transactions between the parties? Will the rights be unilateral or asymmetrical? In the event that the fund and its counterparties have entered into a Master Netting Agreement, then the actual exposure on the default of a counterparty is not the loss on each individual securities contract but the net value of all contracts covered by the netting agreement. Without a netting agreement, the fund or investors in a managed account would receive recovery on each contract with a positive value while still owing the full market value of contracts with negative market values. With a netting agreement in place, contracts with a negative market value will be subtracted from the value of contracts with a positive market value where both are with the same counterparty, thus reducing the overall exposure. The specific forms of agreed set-off will depend greatly on the nature of the business with the financial institution. It is also extremely important to note that enforceability of set-off rights varies by jurisdiction.

- **Rights of cross-default**
  What constitutes a default? Is non-return of collateral an agreed event of default? How will default be determined objectively? Will one or both parties seek to have a portion of the relationship "ringfenced" so that a default by one entity for one transaction does not result in termination and unwinding of all contracts between the entities?

- **Termination provisions**
  Under what conditions can the contract be terminated? How much notice must be given if one party seeks to terminate the relationship and how soon must collateral be returned? Including mutual "adequate assurances" clauses and termination events based on shareholder equity, book value or rating downgrades in the ISDA schedule can provide early-warning signs and termination rights (under the Master Agreement) before an insolvency.

- **Segregation of assets**
  Requiring assets and collateral to be segregated (with a third-party custodian or, at least, on the broker's books) and/or registered in the fund's name (which is rare) rather than in "street" name (which is common) can provide additional protection.

These are key issues which have a direct bearing on a fund's or investor's ability to reduce its exposure to a single counterparty with deteriorating creditworthiness and should be addressed in agreements before any risks actually materialize.

Individual funds and investors will, of course, make different determinations regarding the provisions to be contained in their counterparty contracts and agreements depending on the nature of their business and risk appetite. An ex ante understanding of the options and implications of various negotiated provisions and establishing minimum acceptance standards will enable better management of counterparty risk.

Counterparty Risk Policy

One of the factors that should be considered in determining how willing an investor is to place its capital with a specific fund manager is the manager's ability to manage counterparty risks. An investor should review the manager's counterparty risk policy.

A detailed and conservative counterparty risk policy should specify the criteria by which the fund manager selects only highly creditworthy counterparties, calculates and tracks counterparty risk exposures, avoids concentrations of counterparty risk with individual counterparties and, where applicable, different regions of the world. Obviously, clearly documenting contracts, selecting high-quality counterparties and diversifying counterparties reduces the likelihood and magnitude of a failure by a single counterparty.

An investor should expect a fund manager to be able to decide whether to enter into a transaction with a specific counterparty knowing the loss that the fund would suffer were the counterparty to default (i.e. its potential counterparty exposure). That, in turn, depends on the magnitude of its exposure to the counterparty, the documentation governing that relationship, and the likelihood of default (that is, the counterparty's creditworthiness). The counterparty risk policy should define how such potential exposure is quantified and limited.

A manager's assessment of exposure to a particular counterparty should include analysis of the following elements:

- **Creditworthiness of the Counterparty**
  Evaluation of initial creditworthiness via analysis of financial statements of the counterparty. Then ongoing monitoring of counterparty credit quality via market driven indicators such as bond credit spreads, Credit Default Swap spreads, and equity price direction and volatility, rather than solely relying on agency ratings, helps detect counterparty credit deterioration early and avoidance of losses.

- **Operational Robustness of the Counterparty**
  Evaluation of the rigor of the counterparty's internal and regulatory compliance, operational sophistication and stability, risk management focus and discipline, and audit integrity. This evaluation should include initial face to face due diligence and evaluation of these capabilities to see if they meet minimally acceptable standards and then on-going annual updates, either written or face to face.

- **Calculation of current replacement cost**
  The amount the fund would lose if its counterparty was to become insolvent at the current time and the fund manager had to replace the contract in the market.

- **Estimation of potential future exposure (PFE)**
  The exposure a fund has to loss arising from a specific counterparty failing to meet its contractual obligations on an individual securities contract can vary over time. A stochastic estimate of the expected and potential exposure that could result if the counterparty defaults at some date in the future life of the contract is necessary to quantify the risk. Many credit risk systems can now calculate PFE. PFE is particularly applicable to derivatives transactions where exposure is reciprocal, potentially non-linear and likely to change substantially before the contract expires, such as swaps.

- **The probability of loss**
  When dealing with a large number of counterparties, the likelihood of a loss in the event of a default by a counterparty over a relevant time horizon can be usefully modeled and used to manage counterparty risk. Probability of loss is a function of the nature of the transaction itself, the counterparty's current credit quality, and the length of the transaction.
- **Risk mitigation and documentation**
  The extent to which initial and variation margin collateral, cross-netting provisions, cross-default and set-off provisions or credit enhancement, such as two way collateral posting, reduce the magnitude of the exposure to a counterparty is an important consideration in quantifying potential loss.

Inconsistent trade verification processes may be a practical consequence of the need to make real-time trading decisions, but funds should aspire to minimize these occurrences and investors should encourage such processes.

Counterparty Acceptance and Contracting Standards

Before a fund initiates a transaction with a proposed counterparty, it should review all available public information—including CDS spreads, credit-agency reports, and counterparty financials—before agreeing to trade. It is also important to segregate counterparties according to legal entities and evaluate their specific creditworthiness; trading or utilizing the services of a subsidiary of an A-rated bank may provide little to no financial protection in the event of a default.

Furthermore, it should be assumed in general that a benefit of trading with one legal entity cannot be netted against a loss to another legal entity or across contracts within the same firm unless appropriate documentation is in place. For example, if a company is owed $10 million by the European arm of a financial institution, and owes $10 million to the American subsidiary of the same counterparty, and the European entity defaults, it will still have an obligation to the American subsidiary that must be paid before receiving any recovered funds from the European entity.

Contracting standards refer to the types and forms of contracts that may be entered into with an appropriately initiated counterparty. For example, in most derivative contracts, a standard contract such as the International Swaps and Derivatives Association (ISDA) contract is used. Even standard contracts require customization, however. The Credit Support Annex (CSA) of the ISDA details the unilateral or bilateral collateral-posting requirements of the counterparties. It also typically contains provisions for material adverse changes (MAC) in the credit quality of the counterparties, perhaps calling for more collateral when credit ratings are downgraded or CDS spreads exceed a certain level. Finally, the CSA details rules for termination of contracts—for example, upon failure to supply collateral. ISDA Master Agreements should be established to guarantee netting across different legal entities of the same counterparty to reduce exposure.

Counterparty Credit Quality Monitoring

The credit quality of the counterparty should be continually monitored to anticipate and detect situations where the counterparty's credit quality might deteriorate. As the Lehman, MF Global and subsequent defaults have shown, reliance on agency ratings is insufficient. Credit monitoring must include daily evaluation of bond spreads, CDS spreads, and the direction and volatility of equity prices of bank and brokerage counterparties. Differentiation should be made between counterparties that are systemically important and have access to stable long-term funding and the ability to utilize the U.S. Federal Reserve, European Central Bank, Bank of Japan, Swiss National Bank or other government-supported discount-window and repo facilities for emergency funding in order to determine which counterparties are the most financially sound.

In cases where an entity is not rated or where market driven indicators of credit quality are unavailable, incurring counterparty exposure should be avoided. This need not mean that the entity cannot be transacted with. Spot, delivery versus payment, or well over collateralized transactions can still be considered as they are unlikely to result in significant counterparty exposure due to their nature.

Counterparty Exposure Measurement and Limits

The appropriate risk-measurement approach varies by fund. For a large fund trading over-the-counter derivatives with numerous financial intermediaries of varying credit quality, measuring current and potential exposure is appropriate. For a fund trading exclusively in standardized exchange-traded contracts where the exchange is the counterparty, and/or simply trading cash securities, counterparty-risk measurement is less of an issue as the exchange is typically highly creditworthy and collateral is exchanged daily. However, even in this case, knowing how much excess cash was deposited in the broker's accounts and the mark-to-market value of collateral posted to exchanges daily is appropriate. Confirming all movements of collateral, sweeping of any excess cash out of the account at the broker on a daily basis and verifying assets reported on account statements daily is recommended.

Counterparty limits may be set based on actual current exposure or potential future exposure depending on the derivative activities of the fund. Counterparty limits refer to the amount of counterparty risk that may be taken to approved counterparties with acceptably negotiated trading contracts. In most funds, counterparty limits are set on an aggregate basis by counterparty. For example, if a fund is unwilling to take more than $100 million in counterparty risk to any one bank with an A- rating, it may divide that limit among various trading activities within the fund, such as CDSs, equity swaps, futures trading, custodial exposure, and so on.

Counterparty authority refers to the ability of any individual trader or trading desk to enter into new transactions with a counterparty, considering the possible impact on current or future counterparty exposure. Best-practice funds use some measure of potential future exposure in setting their counterparty limits, although many focus only on current exposure. Some funds will also set portfolio concentration limits, for example, restricting an individual fund's counterparty exposure to a particular broker and enforcing a degree of risk diversification. In all cases, funds should have established exception policies to remedy situations where counterparty limits are inadvertently or deliberately breached.

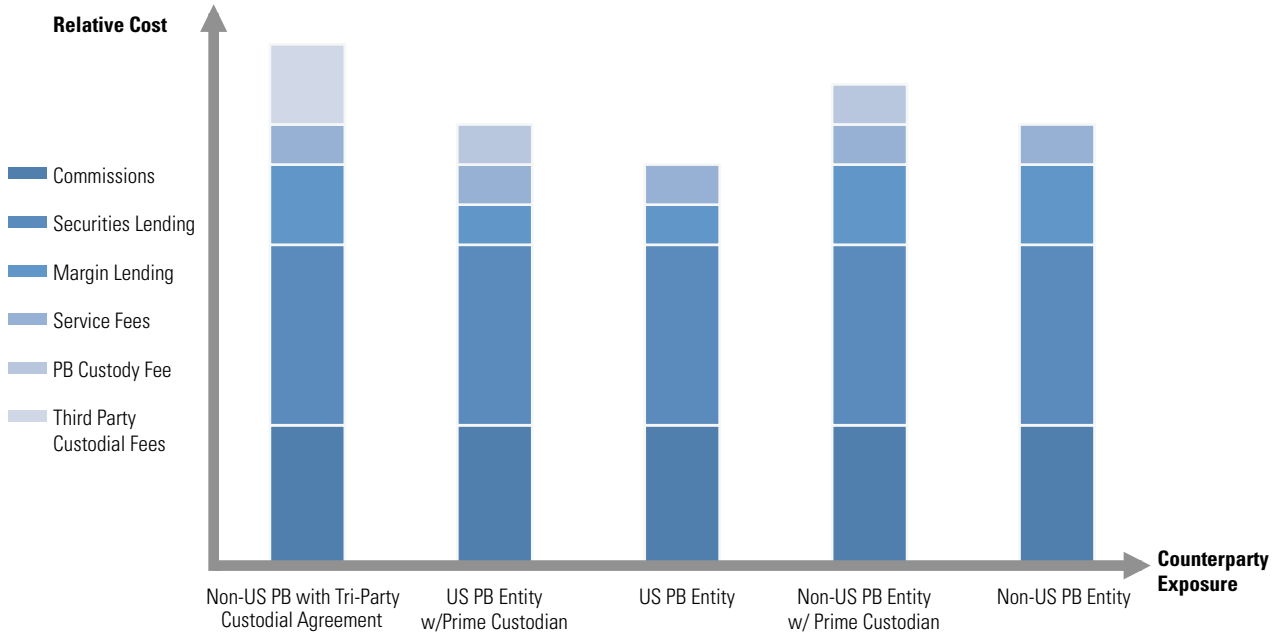
Transaction approval is a verification process to ensure that, before an individual transaction is executed, all of its requirements—counterparty initiation, contract negotiation, collateral provisions, collateral collection (if applicable), and compliance with limits—have been met. Some funds do not consistently follow such processes or due to time constraints, only apply them to their larger transactions, allowing significant slack in the process. These are a practical consequence of the need to make real-time trading decisions, but funds should aspire to minimize these occurrences and investors should encourage such processes.

Counterparty Risk Reporting

Counterparty-risk reporting should address counterparty risk across each fund managed by the fund manager, whether the counterparty risk is due to trading, collateral rehypothecation, or excess equity maintained at the counterparty. Aggregate mark-to-market, potential future exposures, and aggregate collateral posted (bilaterally) should be brought together in a comprehensive report showing counterparty exposure by non-netted legal entity and then legally nettable exposure. This ensures explicit assumptions about the enforceability of netting provisions are clear. Non-netted exposure would be the maximum potential exposure assuming nettability is not enforceable while netted exposures show the potential minimum exposure assuming all netting provisions are enforceable. Best-practice reporting highlights aggregate exposures against limits, limit violations, potentially correlated exposures, concentrations, and sensitivity of exposure to key market drivers.

Chart I

The costs of mitigating prime-brokerage counterparty exposure



For Illustration Only

Counterparty Risk Mitigation and Hedging

Fortunately, there are many strategies and institutional alternatives for funds to manage and mitigate their counterparty exposures and investors should evaluate their manager's counterparty risk management strategies. These are summarized in Chart I on the bottom of page 8. It illustrates that some strategies may incur no additional costs; some incur direct and indirect financial costs, while others incur both financial and operational costs. The financial costs are primarily driven by the fact that the solutions take fund assets out of the financial institution's control. The broker is consequently unable to rehypothecate the assets and is thus subject to a higher funding cost. Whether this cost is passed on to the client depends in large part on the client's sophistication and negotiating power. Operational costs from the various alternatives result primarily from the fund having to manage its excess collateral more actively, moving it to and from one institution or account to another as margin requirements dictate, rather than keeping it at the broker and allowing the broker to debit and credit the excess collateral account as claims on the fund change.

The alternatives also vary in their effectiveness at mitigating counterparty risk. To some extent, costs increase as counterparty risk diminishes but this is not true in every case or for every fund. Tri-party custodial arrangements are the most effective but also the most costly financially and operationally. U.S. regulatory rules provide greater certainty that a fund's assets will be segregated in the event of a broker defaulting and typically incur lower margin-lending fees, but not all securities or investment products can be accessed via U.S. broker platforms. Using a non-U.S. broker's legally separate and bankruptcy-remote custody vehicle can segregate assets if the broker defaults, but is potentially less effective at mitigating counterparty risk due to the fund's dependency on access to the broker's systems to move the collateral out of the vehicle. Using a non-U.S. vehicle typically incurs an additional fee and higher margin-lending costs.

The optimal choice will depend on the fund's specific priorities, risk tolerance, demand for leverage, and strategy.

Strategies for Managing Counterparty Risk

Investors executing an investment strategy directly or selecting an advisor to execute that strategy and manage counterparty risk for them must explicitly address their counterparty risk strategy. Elements of a counterparty risk strategy include:

- Counteparty Selection based on service stability and credit worthiness
- Diversification of Counterparty Risk
- Limits on Rehypothecation of investor assets
- Consideration of the Protections offered under Different National Regulatory Regimes
- Standards of Collateral management
- Usage of Bankruptcy Remote Custodians
- Tri-Party agreements
- Counterparty Risk Hedging options

Counterparty Selection

The first step in a counterparty risk strategy is to have controls concerning the selection of counterparties. When selecting counterparties, funds and investors should consider:

- The creditworthiness, reputation, experience and identity of the specific entity.
- The counterparty's ability to provide an appropriate level of service in light of the fund's business needs (including complexity of products and frequency of trading), such as:
  - Efficient and timely processing, reporting, clearing and settlement of transactions;
  - Financial capabilities necessary to support the fund's business;
  - Competent staff to service the fund's needs, including the support and reporting of information to prepare books and records; and
  - Terms and conditions for movements of margin and cash required by transactions.
- The regulatory environment in which the counterparty operates.
- The stability of terms on which the counterparty is willing to enter a transaction or to provide service to the fund (such as term-funding lock-ups for brokers).

Careful evaluation and selection of high-quality counterparties is one leg of an effective counterparty risk-management strategy.

Fund Exposures to Prime Brokers

Funds, through their business model and operations, take counterparty exposure to their prime brokers, which can result in losses in the event that the broker fails. As funds maintain cash and, in the case of leveraged funds like hedge funds, financed-security positions in their brokerage accounts and maintain additional fully paid-for securities in custody with their broker, a failure of the broker can result in loss of access to those assets. Approximately 80 percent of derivative trading and collateralization by funds and institutional managers occurs with less than 20 percent of the brokerage community. This concentration was clearly demonstrated in the failures of Bear Stearns and Lehman Brothers, which caused havoc in the Operations and Finance departments within funds as they scrambled to gather data on positions, collateral balances and reviewed the fine print of their ISDA and brokerage agreements to assess their potential exposures.

The defining features of the Prime Brokerage relationship (and the most important brokerage services) are:

Clearing and settlement - Clearing and settlement services enable transactions to be executed with multiple executing brokers, with centralizing clearing and settlement through a single prime broker.

Financing - Prime brokers typically also provide financing through margin loans, securities loans (for example, for short sales), repurchase agreements and OTC derivatives (via intermediation and embedded leverage).

Custody - For convenience in reporting, and to support access to financing, funds often place assets in the custody of a broker so that they can be quickly used as collateral to support financing if needed.

Utilizing brokerage services exposes the fund to counterparty and custodial risk if the broker becomes insolvent. Exposures are generally a function of the amount of its assets held, and available for rehypothecation[1], by the broker (actual exposure can exceed this amount), which grows commensurate with use of the brokerage's security financing services.

For example, to provide financing, the broker typically requires a security interest in *all* of the fund's assets that the broker holds; and in the case of some OTC derivatives and repurchase agreements, it will require the outright transfer of collateral. The degree to which a fund's assets can be caught in insolvency is commensurate with the amount of those funds held by the broker.

Prime brokers also typically demand the right to rehypothecate all assets, although some jurisdictions (including the U.S.) impose limits. Rehypothecation exacerbates the risk of insolvency by increasing the likelihood that the broker will have insufficient assets to satisfy customers' claims if it defaults. Funds also face the risk of trades not being properly executed or credited immediately preceding and during an insolvency due to the chaos created by a sudden insolvency.

The risks posed by a particular broker's insolvency will vary based on: (1) the terms of the brokerage documentation; (2) the broker's legal structure, including the applicable regulatory and insolvency regimes, and the involvement of unregulated affiliates; (3) where, how and in whose name assets are registered and held; (4) the extent to which rehypothecation is permissible and (5) the nature of the business conducted between the broker and the fund.

In August 2008, the Counterparty Risk Management Policy Group III (CRMPG III) noted, in a report entitled "Containing Systemic Risk: The Road to Reform", the ways in which funding-constrained brokers and investment banks can adversely affect counterparties when seeking to maximize their cash and near-cash securities. These effects include:

- Requesting that a client close out derivative transactions, especially those that are in-the-money to the client and thus require the return of high-quality collateral to the broker.
- Withdrawing funding lines to a fund to concentrate cash at the broker.
- Where the booking of trades consumes funding and balance sheet for the broker, requesting assignments or novations of trades held away from the broker and not assigning or novating trades to other brokers.

Collateral-management practices have always had to balance risk mitigation against portfolio liquidity and cost, and the sell-side community has historically led the way on the development of collateral-management expertise, capabilities, and systems to actively manage exposure and collateral. However, as a direct result of the collapse of Bear Stearns, Lehman Brothers, and MF Global, historical collateral management concepts, such as the rehypothecation of collateral to increase liquidity and reduce funding costs, have been re-evaluated by funds owing to the difficulties they experienced in recalling their collateral and securities during the crisis. To protect access to their collateral in the event of a failure by a broker, FCM, or investment bank, best practice fund managers are requiring collateral to be held under tri-party arrangements whereby collateral and securities are held by a highly creditworthy third-party custodian rather than at the broker.

1 Rehypothecation is the practice by banks and brokers of using, for their own purposes, assets that have been posted as collateral by their clients. Clients who permit rehypothecation of their collateral may be compensated either through a lower cost of borrowing or a rebate on fees. Rehypothecation includes the usage of client securities to allow other clients of the firm to short the securities. Stock lending and borrowing programs are an example of rehypothecation activities by banks but this can also extend to fixed income and other securities.

One important take-away from the fall of MF Global is the need to continually reassess a counterparty's creditworthiness while recognizing that investors will never have timely access to all the information necessary to ensure the ongoing creditworthiness of selected counterparties. Consequently, diversification of counterparty exposures is the essential second leg of an effective risk-management strategy.

Diversify Counterparty Risks

In the cases of MF Global, Bear Stearns, and Lehman Brothers, the market was deprived of key information as the firms spiraled downward. This information asymmetry, where clients will likely always have less-complete and less-timely information about a counterparty's creditworthiness than the counterparty itself, will persist. One primary means of mitigating this risk is to diversify counterparties. This lesson has now been taken to heart by investors and fund managers in the light of recent failures. It is very rare today to see even a small new fund launch without it at least having two prime-brokerage relationships in place first.

In addition, many funds and investors are also exploring other means of diversifying their risk. Many with sufficient scale are building proprietary clearing and settlement systems or outsourcing those services to niche (non-prime broker) providers, while others continue to explore alternative sources of funding. Repurchase agreements executed directly with "cash providers" (for example, large pension plans) in the market are a good example of an alternative funding source, which benefits funds through counterparty diversification, increased liquidity, lower financing rates, lower margins, the potential to escrow margin as well as providing potential access to government liquidity programs.

Limiting Rehypothecation

Another part of a counterparty risk strategy relates to the rehypothecation of a fund's assets, which involves the pledging of the assets without delivery of title. Under a traditional brokerage arrangement, when the client enters into an agreement with the broker, the latter generally takes security over *all* of the client's assets at the broker to secure the client's obligations under the agreement. The broker may then rehypothecate the securities in order to obtain a low-cost secured loan for itself. In instances in which the broker defaults on its loan and the rehypothecated assets are sold to satisfy the loan, the owner of the securities is without recourse other than to proceed against the broker.

In the U.S., the extent to which a broker can rehypothecate a client's assets is limited by the Securities Exchange Act of 1934 and subsequent amendments. A broker can rehypothecate assets up to the value of 140 percent of a client's liability to the broker. Further, brokers cannot use those assets to raise more money than they lend to their customers. This is different from the U.K., where there are no such statutory limits. Because rehypothecation is so profitable for brokers, some agreements allow for a U.S. client's assets to be transferred to the broker's U.K. subsidiary to circumvent these limits. Under U.K. law, when the broker exercises its right to rehypothecate an asset, the title to that asset transfers to the broker. Although U.S.-regulated brokers are more constrained than their European counterparts in the amount of assets they may rehypothecate, funds can still face problems in the event that their brokers file for bankruptcy.[3]

To reduce the risks involved, many funds now seek to prohibit or at least limit the rehypothecation of their collateral by amending their Credit Support Annex (CSA) or Broker Agreement. Since the Lehman collapse, the practice of seeking to impose limits in this way has become much more common, even in the U.K. where there are still no statutory limits. The 140 percent level is increasingly accepted as a commercially balanced amount to request even non-U.S. prime brokers to limit their rehypothecation. In addition, funds may require varying limits on the value of securities that may be rehypothecated across various asset classes. At the extreme, funds that do not need leverage may refuse to consent to rehypothecation altogether. Some funds try to restrict rehypothecation only to brokers that maintain a specified credit rating (although this would have had no effect in the Lehman Brothers case since Lehman maintained its credit rating right up until the collapse). All these options may result in higher funding charges from brokers.

An additional problem on both sides of the Atlantic in the wake of Lehman's and MF Global's bankruptcy is the lack of transparency regarding which assets had been rehypothecated. In addition to the risk of property being tied up in protracted bankruptcy proceedings, both the MF Global and the Lehman Brothers cases demonstrate the risk of (1) unintended exposure to an insolvent entity due to a creditworthy broker having lent out client assets to the insolvent entity—in essence, a form of counterparty risk as the insolvent broker may not return the borrowed assets—and (2) unclear priority of counterparty claim status in transactions such as derivative transactions with an insolvent entity. As a result, many clients, including funds, now request that their brokers increase their reporting on these activities. Some funds insist on daily reports on where their assets are being held and which have been lent out or rehypothecated.

3 In the case of LBIE (see following page), the safe and timely return of client assets was hindered because U.S. prime-brokerage clients lost their proprietary interests in the assets, and consequently lost money and asset protections under the U.K. Financial Services Authority's Client Assets Sourcebook (CASS).

Funds resist the claim that limits on a broker's ability to rehypothecate decreases the broker's interest margin and resist paying additional costs as a result. None the less, while limiting rehypothecation decreases counterparty risk, it may result in higher funding costs for the broker, which may translate into higher service fees for the fund.

Evaluate Differences in National Legal and Regulatory-Regimes

With non-U.S. prime brokers, there can be even more widespread disruptions for clients. In the specific case of Lehman Brothers International (Europe) (LBIE), the London-based Lehman Brothers subsidiary filed administration proceedings (British insolvency proceedings) on the same day that Lehman Brothers Holdings, Inc. filed for bankruptcy in the United States. Clients of LBIE were subject to protracted administration proceedings in London in order to recover assets held with LBIE. The British system treats rehypothecated assets as assets of the insolvency estate, which gives clients the status of unsecured creditors. Furthermore, even client assets held at LBIE which were not re-hypothecated were tied up in the administration process.

Pricewaterhouse Coopers UK, which acted as the Administrator for LBIE, cited confusion with records and complexity of transactions as reasons it has taken years for LBIE clients to receive their assets. Indeed, now 5 years after Lehman defaulted, many cases are still unresolved. For rehypothecated assets, the issues are even more unclear. The ultimate conclusion of this administration process could take many years and recoveries could be fractions of the original value. Many funds have sharply criticized the LBIE administration process for tying up client assets. The key lesson for investors is to not take UK exposure lightly and avoid it if possible.

Also, a financial institution's legal structure greatly affects the risk its insolvency poses to its customers. U.S. brokers have a statutory obligation to register as broker-dealers and to comply with US rules. Segregation of customer assets, rehypothecation, securities possession/control and minimum net equity are all regulated under the 1934 U.S. Securities Exchange Act. Customers of U.S. brokers holding assets in the U.S. may be protected by the Securities Investor Protection Act of 1979 (SIPA), which established the Securities Investor Protection Corporation (SIPC).

Generally, in a SIPC proceeding, customers of the insolvent party take priority over general unsecured creditors to recover from the pool of customer assets on a pro rata basis. A customer would be an unsecured creditor to the extent of any shortfall in the customer asset pool. Subject to certain restrictions, SIPC provides insurance to cover shortfalls up to half a million U.S. dollars per customer. Some brokers maintain additional insurance with the Customer Asset Protection Company (CAPCO) to cover excess shortfalls.

The regulatory protections afforded to U.S. brokers do not generally apply to their non-U.S. affiliates, to non-U.S. brokers or to assets held outside the United States. U.S. brokers commonly rely on such unregulated affiliates for margin lending or securities lending and/or to act as custodians in non-U.S. jurisdictions.

In such instances, the relevant jurisdiction's laws may provide less protection and impose fewer restrictions (many jurisdictions permit rehypothecation in full, for example) than would be the case in the United States.

Ideally, a fund or investor whose major concern is counterparty risk should choose counterparties that hold assets in the U.S., do not use unregulated affiliates and that have legal structures that subject them to the U.S. regulatory regime. Of course, counterparty risk is not the only consideration in choosing a broker. If there are business reasons for involving unregulated brokerage affiliates, a fund manager or investment client should conduct a cost-benefit analysis to ensure proper compensation for the additional risk.

As the LBIE example amply demonstrates, as an aspect of counterparty risk, investors need to give careful consideration to the regulatory framework that will be applied in the event of a dispute with, or the insolvency of, the counterparty. Here, the following issues come into play:

1. *Choice of law:* What legal regime will take precedence and govern in the event of a dispute with a counterparty?
2. *Choice of forum:* Where will such a dispute be adjudicated (in court or through arbitration?) and in what jurisdiction?
3. *Choice of regulation:* What regulations take precedence and govern the counterparty, particularly its related foreign entities?

Standards of Collateral Management: Sweeping of Excess Equity and Frequency of Collateral-Exchange

A straightforward way to mitigate a fund's exposure to a potential default by a financial institution is to maintain that exposure at the minimum level necessary to conduct successful investing. This entails maintaining excess value ("equity") in the broker's account sufficient to cover expected day-to-day changes in required margin but "sweeping up" any excess equity resulting from accumulated profits, dividends and interest payments on securities owned, or from the liquidation of positions and transferring it to a third party custodian daily.

The primary difficulty in determining the optimum excess value to maintain is the unpredictability of margin requirements. A fund does not want the operational burden of having to transfer cash into the account daily for small changes in margin as the late payment of margin is an event of default under most brokerage agreements and can give the broker legal grounds for terminating all agreements with the fund. This can result in a withdrawal of all funding and be highly disruptive to the fund's performance. However, a fund should not have unnecessary excess cash parked at a broker for simple convenience. A fund should seek to maintain some excess equity in the account which can be debited to pay margin calls quickly but no more.

In addition, the fund and its broker can agree on a minimum transfer amount such that immaterial changes in margin need not be paid immediately. Low initial unadjusted margin requirements and high thresholds for daily exposure adjusted variation margin in the CSA[4] can reduce exposure by minimizing unnecessary posting. This reduces the number of margin calls that must be paid immediately and enables the fund to periodically top up its excess with one significant transfer rather than numerous small daily transfers.

This sweeping of excess "equity" can and should be accelerated if a counterparty's creditworthiness deteriorates in order to minimize exposure. When excess equity is withdrawn from the brokerage account, it is typically deposited in an interest-bearing account at a more creditworthy custodian bank and reduces the fund's exposure to a potential counterparty default.

Bankruptcy-remote Custody Arrangements

As noted previously, investors were unable to recoup collateral assets that were caught up in the LBIE bankruptcy proceedings[5]. Consequently, funds began to demand that their remaining brokers provide options to shift any assets not being directly utilized to support margin indebtedness or cover short selling into a segregated and bankruptcy-remote account.

Financial institutions have responded with offerings which follow one of two basic models. In one approach, a special-purpose custody vehicle or trust is set-up as a distinct legal entity and excess assets can be moved out of brokerage accounts and into these custody vehicles. This model allows for funds to continue to monitor and manage both their broker and custody accounts through their existing service relationship and allows for an effective and easy exchange of data and reporting across the two accounts. The collateral remains with the broker and only excess assets are moved to the custody vehicle. The collateral and any excess assets remain within the same broker-dealer infrastructure, however, eliciting questions as to whether the collateral and assets are sufficiently remote to ensure rapid access by the fund in the event of the broker's bankruptcy. The broker's system and staff have to be available to effect the client's instructions to move assets.

A second model moves excess assets and collateral completely out of the broker-dealer entity and its infrastructure and into a third-party custodian. This arrangement is perceived as offering greater bankruptcy protection, but increases operational complexity through having to move assets across unrelated entities. But as the model has evolved and brokers and custodians have improved the interface between their respective systems, the operational complexity has reduced.

The use of a third-party custodian usually allows collateral to be traced more readily, thereby affording certain statutory protections in a number of jurisdictions in the event of a default. However, where a third-party custodian is used and the collateral is then rehypothecated, it is likely that such statutory protections will not apply and the outcome would be similar to that where the broker holds the collateral. Another drawback to this model is that while the broker keeps collateral with a third-party custodian, it may still have rehypothecation rights. Because the fund will typically not have been involved in negotiating the contract with the custodian, it will not be able to preclude rehypothecation and has no contractual right to require the custodian to return collateral in the event of insolvency of the broker, despite having a clear lien and segregated account.

Tri-Party Agreements

As a result of this remaining counterparty risk, many fund managers and institutional investors seek to negotiate agreements with the broker and a third-party custodian directly. This three-way contract ensures the fund's right to require the return of collateral as long as specific conditions are met, and to restrict the rehypothecation of any securities in the custody account. This model places both the excess assets and initial margin posted on derivatives transactions in a custody account at an independent custodian. If the fund, as the borrower, fails, the broker gets the collateral in the account. If the prime broker fails, its relationship with the fund remains and, together, they can execute an orderly unwinding of the business. Once settlement amounts are agreed, any shortfall

4 A CSA requires that when either party to a security contract owes the other during the life of the contract, collateral be posted. The two counterparties maintain an account with collateral consisting of cash and/or securities which mitigate the amount of loss incurred should either counterparty default on the net value of all the contracts under the netting agreement. When the difference between the net value of the contracts and the amount of collateral posted exceeds the margin requirements, additional collateral must be posted to make up the difference. This limits the exposure to the size of the market moves before additional posting is demanded, plus the size of the margin requirement.

5 Adding insult to injury was the fact that funds that had put on short positions by putting up cash to borrow stock from Lehman found themselves still required to return the stock to the bankrupt prime broker's estate, even though their own collateral at the broker had not been returned.

owed to the broker is deducted from the collateral held at the custodian and the fund receives the remaining collateral. Both broker and fund have a measure of protection from the collapse of the other.

Because securities in a third party custodian cannot typically be rehypothecated, prime brokers and custodians have required higher fees for agreeing to tri-party arrangements. The higher costs of such arrangement have made them less popular to date with small and mid-size funds that do not have the ability to absorb the costs nor the profit potential to bring brokers to the negotiating table.

Counterparty Risk Hedging

Finally, larger investors and funds may want to consider hedging counterparty exposures as part of their counterparty risk management strategy.

In a swap contract, assume a fund is long the receiving leg and short the paying leg. Because both legs can change in value, a swap contract can sometimes be an asset and at other times a liability depending on whether the fund is owed or owes money under the contract. When the swap is an asset and the investor (fund) is owed money, a default by the swap counterparty would result in a loss for the investor. When the swap is a liability, there is no counterparty exposure as no money is owed by the counterparty to the investors.

For example, consider a five-year S&P Index Swap with the fund being long the receiving leg. In a flat market, with low volatility, the swap will have nearly zero market value and thus zero replacement cost. Consequently, at inception there will be no counterparty exposure. However, the swap has a five-year maturity and market conditions can change before maturity. In an upwardly trending market with high volatility, the swap has the potential to be fairly valuable in the future, in which case the potential exposure is large and default by the counterparty could cause a substantial loss to the other party. The potential for the swap to become valuable as the market moves, the timing of those market moves, and the likelihood that the counterparty which owes money at that time defaults, all affect the value of the swap.

These factors are combined and quantified in a probability adjusted measurement of potential counterparty exposure called the "counterparty valuation adjustment."[6] This is the difference between the actual price of the contract and the price the contract would carry if the counterparty were risk-free. The difference between these two values is the price of default risk to the counterparty. The magnitude of this difference depends on the creditworthiness of the counterparty as expressed by its CDS spread, interest rates, and the volatility of the risk factors underlying the contract. When combined with an estimate of Potential Future Exposure and applied on an ongoing basis to a large portfolio of contracts where statistics and the laws of probability can be applied, the metrics can quantify the appropriate amounts to hedge.

If a fund and its investors are exposed to a counterparty with deteriorating credit quality, there are several options available to shape and hedge counterparty exposures. First, attempts may be made to close out some trading positions, move any excess cash with the counterparty, or initiate new trading positions that have the net effect of reducing the risk. Second, the fund may attempt to novate a contract or have it intermediated and given up to a more creditworthy broker—that is, to reassign the contract to a different counterparty for some consideration. Third, a fund may try to "collapse" a trade, if it finds it has identical and offsetting trades to two different counterparties. All of these options, however, typically require counterparty agreement.

In addition to these risk exposure shaping strategies, the exposure can be unilaterally hedged by obtaining default insurance for the expected loss to a defaulting counterparty. As a general statement, if a counterparty is a financial institution, a fund should be able to hedge its counterparty exposure. Buying a credit-default swap (CDS) is essentially buying the rights to a contingent payment triggered by a counterparty credit event and payable by another third-party, derivatives-trading counterparty.

Using a CDS to hedge counterparty exposure presents certain effectiveness challenges and incurs transaction costs but can be appropriate for institutional investors or funds. In most derivative trading situations, the actual exposure is variable, making it difficult to hedge 100 percent of the exposure at all times without frequent hedge adjustments and payment of bid/ask spreads. Second, in CDS markets, the payment-triggering event may not correspond exactly to a counterparty's default event. For example, when Takefuji , a Japanese consumer finance company, went into restructuring in 2010[7], CDS protection owners had to wait several days before the event was classified as a default event under CDSs. There was similar uncertainty as to whether holders of CDS on Greek sovereign bonds would be paid ultimately given the political dealings of the restructuring and attempts to restructure the debt without triggering the CDS. Third, as we learned in 2008, CDS protection can become extremely expensive when needed and CDS counterparties can be subject to their own performance risk, as Lehman Brothers' counterparties discovered.

6 Potential exposure is also referred to as "Potential Future Exposure (PFE)."

7 On September 28, 2010, Takefuji filed a petition for commencement of a corporate re-organization under the Japanese Corporate Reorganization Act, effectively putting itself into bankruptcy

Conclusion

Counterparties can fail with no warning and this risk has not decreased despite regulatory attempts to do so. Furthermore, audited financial statements, strong credit ratings, a history of regulatory compliance, and the presence of internal controls have not made counterparty credit risk more transparent or provided investors with timely warnings. In cases of malfeasance or breaches of fiduciary duty, regulations and internal controls have proven insufficient to protect investors from loss. Investors must take steps to protect themselves.

For investors investing directly, we believe the best practice counterparty risk management described in this paper is a prerequisite for reducing losses. For investors choosing to invest with managers in their commingled funds, evaluating those managers' abilities to manage counterparty risk is essential. Lastly, investors choosing managers but establishing separately managed accounts at those managers, must be able to manage the counterparty risk in those managed accounts themselves as the investor dictates the terms and quality of their counterparties directly.

Investors must take steps themselves to manage their counterparty exposures if investing directly and evaluate their managers counterparty risk management capabilities if investing via managers. In neither case is this a trivial exercise due to the complexity of counterparty relationships, the documentation governing them, and the systems needed to measure and track exposures. The concepts and operations are complex but, as the business headlines show, investors must understand and engage in counterparty risk management or fall victims to counterparty risk.

Investors and fund managers need to define their counterparty risk strategy alongside their investment strategy if they are to maximize returns. Investors and fund managers can greatly reduce their credit exposure to counterparties by negotiating contracts that anticipate the potential default of a counterparty and set out mechanisms that limit potential exposure. In negotiating such contracts, appreciation of the implications of the governing legal and regulatory regime is essential. In addition, limiting the extent to which a broker may rehypothecate a client's assets, negotiating netting, set-off and collateral provisions in ISDAs and Credit Support Annexes, setting minimum transfer amounts, and negotiating bankruptcy-remote custodial arrangements which ensure that excess assets and/or collateral posted is held in accounts maintained by a third party, and frequent sweeping of excess cash in the accounts, can all significantly reduce counterparty exposure. As negotiating contracts with high-quality counterparties alone cannot limit counterparty risk, diversification of counterparties and daily monitoring of market indicators of creditworthiness can further reduce the likelihood of a loss by alerting investors to deteriorating creditworthiness of a counterparty.

If investing directly or via a managed account, an investor must undertake these steps itself. If investing via a manager's comingled fund, an investor must assess the manager's counterparty exposures and counterparty risk management capabilities as part of its initial and ongoing due diligence. If investing via a Fund of Funds, counterparty risk management should be one of the value added services provided by the Fund of Fund manager.

Useful Concepts

Initial Margin: The percentage of the purchase price of securities (that can be purchased on margin) that the investor must pay for with its own cash or marginable securities. Also called the "initial margin requirement."

Maintenance Margin: In a typical collateral arrangement, the secured obligation is periodically marked-to-market, and the collateral is adjusted to reflect changes in value. The securing party posts additional collateral when the market value has risen, or removes collateral when it has fallen. This is necessary to maintain ownership of the asset. It is also referred to as the minimum amount of equity that must be maintained in a margin account. In the context of the NYSE and NASD, after an investor has bought securities on margin, the minimum required level of margin is 25 percent of the total market value of the securities in the margin account. Keep in mind that this level is a minimum, and many brokerages have higher maintenance requirements of 30-40 percent. Also referred to as "minimum maintenance" or "maintenance requirement."

Unilateral and Bilateral Collateral Requirements: An arrangement can be unilateral with just one party posting collateral. With two-sided obligations, such as a swap or foreign exchange forward, bilateral collateralization may be used. In that situation, both parties may post collateral for the value of their total obligation to the other. Alternatively, the net obligation may be collateralized—at any point in time, the party who is the net obligator posts collateral for the value of the net obligation.

Acceptable collateral: A secured party will usually prefer to receive highly rated collateral such as Treasuries or agencies. Collateral whose market value is volatile or negatively correlated with the value of the secured obligation is generally undesirable.

Frequency of margin calls: Because the value of an obligation and the value of posted collateral can change, a secured party typically wants to mark-to-market frequently, issuing a margin call to the securing party for additional collateral when needed.

Haircuts: In determining the amount of collateral that must be posted, haircuts are applied to the market value of various types of collateral. For example, if a one percent haircut is applied to Treasuries, then Treasuries are valued at 99 percent of their market value. A five percent haircut might be applied to certain corporate bonds, etc.

Threshold level: The level at which a counterparty may require collateral be posted, i.e. the value of an obligation above a certain threshold level which must be collateralized. For example, if a USD 1MM threshold applies to a USD 5MM obligation, only USD 4MM of the obligation will actually be collateralized.

Rehypothecation rights: The secured party may wish to have use of posted collateral—possibly lending it to another party or posting it as collateral for its own obligations to another party. Rehypothecation is not permitted in many jurisdictions.

Minimum Transfer Amounts: The smallest amount of currency value that is allowable for transfer as collateral. This is a lower threshold beneath which the cost to effect the transfer is greater than the counterparty risk mitigating benefits provided by topping up the collateral.

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David Belmont has firm-wide oversight and responsibility for all aspects of risk management. Prior to joining Commonfund in 2011, David was Global Head of Hedge Fund Credit for UBS Investment Bank where he led a global team of 45 risk managers and analysts responsible for the risk management of hedge fund and managed fund exposures in the Investment Bank globally. In addition, he was the Head of Risk Management for UBS Prime Services where he led a team of eight risk managers responsible for the market, credit and operational risk of the Prime Brokerage in the Americas. He was a member of the UBS Prime Brokerage Executive Committee, the Exchange Traded Derivatives Risk Committee, the Prime Services Risk Committee and Prime Services Risk Board. Prior to UBS, David spent 10 years in Asia, six of which were in Singapore with Temasek Holdings, Singapore's $100 billion sovereign wealth fund, most recently as its Chief Risk Officer from 2004- 2007. In addition, he was a Director with Anderson LLP and founded their Asia Financial and Commodity Risk Consulting practice in Singapore, managing a team of 17 professionals across Asia. He was also a Regional Risk Manager with Black River Asset Management, a multi-strategy hedge fund, and was a sovereign risk underwriter with Citicorp. David is a Chartered Financial Analyst and the author of the books Managing Hedge Fund Risk and Financing published by John Wiley and Sons (2011) and of Value Added Risk Management in Financial Institutions (John Wiley and Sons, 2004). He earned a B.A. from Bowdoin College cum laude and an M.B.A. and a M.S. from Yale University.

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