Futures & Derivatives LAW REPORT
The Journal on the Law of Investment & Risk Management Products

February 2006, Vol. 26 No. 2 © Legalworks

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Derivatives Debacles: Part 1 of 3 The Rogue Trader

By Justin Harlow, Brian Chao and Julie Greenberg*

Derivatives debacles are not a new phenomenon. Ever since the Great Tulip Crash of 1637 which resulted in massive losses on tulip contracts traded on the Amsterdam Exchange, trading disasters have rarely been out of the news. The list appears endless: Barings Bank, Daiwa Bank, Sumitomo, and more recently, Allied Irish Bank, National Australia Bank and China Aviation Oil.

So why do trading companies continue to experience such tumultuous meltdowns? In a word, volatility. Volatility creates the opportunity to make massive amounts of quick money, which in turn acts as a magnet for return-hungry investors. The same volatility that attracts investors also attracts traders, with one key difference. Investors experience the full brunt of their ups and downs, whereas traders do not repay legitimate losses.

These misaligned incentives can create an environment that fuels excessive risk-taking by traders. Without the proper compliance structure and associated control mechanisms, eventually a rogue trader will infiltrate the trading floor and create havoc. It's synonymous to operating a PC without virus protection. Unprotected, your PC may be safe for years, but left unchecked the threat of a crippling infection is always there.

With the introduction of the Sarbanes-Oxley Act, greater emphasis has been placed on the compliance role of the General Counsel's office. But what can the General Counsel's office do to prevent their company from becoming the next Barings, Allied Irish Bank (AIB) or National Australia Bank (NAB)? By investigating these defining derivatives debacles of our times it is possible to draw lessons on the policies, procedures, and systems necessary for sustained prudent management of derivative activities.

BARINGS

What happened?

Barings Bank, a storied British bank that provided financing for both the Louisiana Purchase and the British involvement in the Napoleonic wars, collapsed in 1995 under the weight of a $1.4 billion trading loss caused by "star" trader Nick Leeson. Leeson had catapulted from a back-office clerk to head futures trader after being transferred to Singapore from the London headquarters. Leeson started out trading on SIMEX, the Singapore futures exchange, primarily on behalf of banks and hedge funds. Before long he commenced proprietary trading whereby he aimed

[Continued on page 12]

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Letter from Editor

Sparks Fly Over ICE

On January 31, 2006, the staff of the Commodity Futures Trading Commission (Commission) issued a no-action letter to ICE Futures, the London-based subsidiary of U.S.-based Intercontinental Exchange, Inc. (ICE), permitting ICE Futures to make available in the United States its electronic trading and order matching system screen terminals for the trading of a West Texas Intermediate Light Sweet Crude Oil Futures Contract (WTI Contract) without being a designated contract market subject to Commission oversight.

The staff's letter was in response to ICE Futures notice to the staff of its intent to commence trading in the WTI Contract pursuant to the Commission's Statement of Policy (2000) regarding the listing of new futures and options contracts by foreign exchanges that are operating electronic trading devices in the United States and a 2003 (as subsequently amended) no-action letter to ICE Futures' predecessor, the International Petroleum Exchange Limited (IPE) that permitted simple notification to the Commission of new foreign futures contracts to be offered on its screen-trading system. However, in permitting trading of what appears to be a futures contract based on a U.S. commodity (West Texas crude), the Commission's staff cautioned that "the Commission will be evaluating the use of the no-action process in light of significant issues raised by the factual circumstances underlying the subject notice. The Commission's final determination may impact whether ICE Futures will be able to continue to rely on the Division's no-action letter in making its WTI contract available for trading through electronic trading devices in the U.S."

ICE Futures' WTI Contract competes directly with the New York Mercantile Exchange's (NYMEX) WTI Contract. Not surprisingly, NYMEX, a highly regulated exchange, strenuously objected to the Commission's staff permitting ICE Futures to operate in the United States as a market not regulated by the Commission (ICE Futures is regulated by the U.K.'s Financial Services Authority). In a letter to Commission Chairman Rueben Jeffery III, NYMEX cautioned the Commission that the previous no-action letters upon which the current relief is based were predicated on the IPE not envisioning significant U.S. trading volume. NYMEX stated that subsequent to the original no-action letter issued to IPE (ICE Futures' predecessor), IPE determined to shut down its trading floor in London and shift all trading to ICE's Atlanta-based system. Additionally, according to NYMEX, ICE is now intending to list the WTI Contract as a *foreign* contract even though its settlement price will be based on the NYMEX settlement price. Consequently, according to NYMEX, ICE Futures' WTI Contract will be permitted to be traded from within the United States without being subject to any federal oversight. The Commissioners (rather than the staff) have been requested by NYMEX to restudy the issue and determine whether the WTI Contract is a foreign contract or whether it is a U.S. contract requiring ICE Futures to become a designated contract market regulated by the Commission.

In a further objection, Senator Charles E. Schumer (New York) wrote to Chairman Jeffery to express his "grave concern" over the approval. Senator Schumer requested that the Commission rescind its staff's approval, raising the issue of a level playing field and warning that if ICE Futures is allowed to operate in this manner "we may be in danger of U.S. exchanges quickly establishing affiliates in other markets and moving their U.S. products overseas so as to exploit the regulatory gap created by the current status quo under CFTC regulatory practice."

The issue of foreign electronic exchanges creating futures contracts materially similar to those traded on U.S. regulated futures exchanges is deserving of intense study and an opportunity for public comment, including addressing the Commodity Exchange Act's mandate that the Commission consider anticompetitive issues in performing its role as the regulator of U.S. futures trading.

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Futures and Derivatives Law Report

Legalworks
395 Hudson Street, 3rd Floor
New York, NY 10014

One year subscription, 11 issues, $350
(ISSN: 1083-8562)

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A Decade of Repo Netting

*By Jeffrey F. Ingber**

The United States government securities industry often is said to be the largest and most liquid financial marketplace in the world. Repurchase and reverse repurchase agreement transactions involving government securities as collateral (repos) constitute a significant segment of this market. In fact, it is estimated that the total value of repos outstanding is about $5.5 trillion on any given business day among dealers alone.[1]

For over a decade, a large portion of non-tri-party United States repo activity has been cleared, netted, risk managed, and settled by the Fixed Income Clearing Corporation (FICC) and its predecessor, the Government Securities Clearing Corporation (GSCC). In its Government Securities Division (GSD), FICC compares, nets, guarantees, facilitates settlement of, and manages the risk arising from, all of the eligible transactions submitted to it by its members. The clearance, netting, and settlement process provided by FICC for repos is now integral to the functioning of the United States government repo marketplace. This article traces the history and development of FICC's repo services.

Overview of the Repo Market

Repos are a critical source of funding for the broker-dealer community; the means by which broker-dealers tap into the liquidity of "buy side" entities such as municipalities, mutual funds, and pension plans. More broadly, the repo market is used by financial entities for a variety of reasons, including as a safe and efficient means of investing and borrowing cash at a favorable rate, to finance the holding and investment in securities and other financial assets, to cover short sales, to make a spread on matched book trading, and to speculate on the direction of interest rates. The repo market is integrally related to the government securities buy-sell market because repos are the principal method by which securities dealers fund their acquisition of Treasury securities.

Repos by design are hybrid instruments that share some characteristics of both purchase-sales and collateralized borrowings. A repo, by its terms, involves two separate but related transactions; namely, an agreement that one party (the seller) will transfer securities in exchange for cash to a second party (the buyer), and a simultaneous agreement that the seller will repurchase the same or equivalent securities from the buyer for a specified price at a specified later date or on demand. Every repo is also a reverse repo; that is, a reverse repo is simply a repo viewed from the perspective of the buyer. With the exception of certain tax and accounting consequences,[2] repos are generally recognized as purchase and sale transactions, which is critical to their liquidity. [3]

The United States government securities repo market may be separated into three parts. The oldest and most fundamental one is the "delivery-versus-payment", or DVP, repo market. In a DVP repo, the seller and buyer, at the time of trade, basically agree to interact directly with each other in the transfer of securities and cash and in the performance of all other repo obligations. A second repo market, which developed in the 1980s, is the tri-party repo market. In a tri-party repo, a third-party custodian, typically a bank, acts on behalf of the buyer and seller and exercises independent control over the exchange of securities and funds between the two parties.[4] Finally, there is the "general financing collateral" or GCF repo®, which was introduced in 1998.[5] The GCF REPO service enables dealers which are netting members of the Government Securities Division of the FICC [6] to trade general collateral repos[7], based on rate, term, and underlying product, throughout the day without requiring intraday, trade-for-trade settlement on a DVP basis.

The Development of Repo Netting Services

GSCC began its comparison service for government securities buy-sell transactions in 1988, and its netting service for such transactions a year later.[8] Thereafter, GSCC had begun to consider the benefits of applying its automated comparison, netting, and risk management services to repos.

In 1990, with the basic netting engine now built, GSCC management started to analyze the possibility of applying its comparison, netting, and risk management processes to repos, to provide more widespread risk management and operational benefits.

There were various risks and inefficiencies in the government securities repo market at that time. First, repo transactions were confirmed on a non-automated basis by telephone or fax. Also, while the bulk of repo activity was done through the inter-dealer brokers, such brokered transactions were not transacted anonymously but, rather, were done on a "give-up" basis, exposing a dealer's trading strategies to competitors. Moreover, market participants faced the risk (which might not be sufficiently, if at all, covered by margin) that a counterparty would fail to pay back principal plus interest owed or fail to deliver back collateral. Furthermore, repos required settlement of their start and close legs on a trade-by-trade basis between myriad counterparties with whom a firm was dealing. This kept administrative and operational costs high.

In 1990, with the basic netting engine now built, GSCC management started to analyze the possibility of applying its comparison, netting, and risk management processes to repos, to provide more widespread risk management and operational benefits. Key to the feasibility of including repos in the net is that, from a clearing perspective, buys and sells generated by repos do not differ significantly from outright buys and sells.[9] In view of this, management realized that it could offer a service that would maintain track of and net out offsetting securities movements, whether arising from other repos or from non-repo trading involving the same CUSIP. In

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this manner, the netting process could eliminate the need to transfer the bulk of the underlying securities movements that would otherwise need to be made.

. . . GSCC had the potential to provide the repo market with efficiencies and risk protections akin to those that it had provided for buy-sell trades.

Initially, there was resistance by the industry to the GSCC proposal for providing services for repos. This was due primarily to the perception of larger market participants that GSCC's netting process would "level the playing field" to their disadvantage.[10] Among the factors that helped to overcome this resistance was the focus on the government securities marketplace brought about by the 1991 "Salomon Brothers scandal," wherein that firm admitted that it had violated United States Treasury auction rules by submitting fraudulent bids a year earlier. In the wake of the scandal, in January 1992, the Federal Reserve, SEC, and Treasury Department issued a *Joint Report on the Government Securities Market*.[11] Included among the report's findings was that GSCC had made the market "even more efficient", that GSCC's netting process "substantially reduces counterparty risk" for GSCC members and, notably, that "GSCC could benefit the repo market by offering a system that clearly defines which stage of a transaction is occurring, e.g., opening, closing, setting up a reverse repo or closing a reverse repo, and that automatically generates a comparison of the transaction."

In 1992, the GSCC Board agreed that GSCC had the potential to provide the repo market with efficiencies and risk protections akin to those that it had provided for buy-sell trades. By August 1992, GSCC had designed a repo netting proposal that would provide for the following benefits to the repo market:

1. Automated comparison of the start and close legs of a repo, including the capture of all of the key elements of the transaction. This would facilitate members' ability to monitor repos and maintain appropriate recordkeeping and audit trail information.[12]

2. Netting and settlement of underlying collateral movements so as to eliminate the need to transfer the majority of such movements, thus providing significant cost savings and alleviating operational burdens.

3. Pass-through of coupon interest, thus providing for coupon payment protection.[13]

4. Guarantee of settlement of repo transactions, with GSCC assuming the role of credit counterparty to each side (as it did for buy-sells).

5. Centralized and standardized daily margin and mark-to-market for each repo position.

6. Favorable accounting treatment through facilitating members' ability to offset among repos and reverse repos netted and guaranteed by GSCC.[14]

7. Net capital relief: The SEC's net capital rule requires a broker-dealer to deduct from its net worth certain repo agreement deficits when computing net capital. That rule also provides, however, that when computing the deductions, broker-dealers may net obligations due under repo agreements entered into with the same party; thus, having the clearing corporation as the common counterparty to repo dealers would provide substantial net capital relief.[15]

GSCC staff then sought guidance from the Repo Committee of the Public Securities Association[16] The PSA Repo Committee, which was chaired at that time by John Macfarlane, Managing Director and Treasurer of Salomon Brothers Inc., and Bill Molloy, Managing Director of Morgan Stanley & Co., established a working group to focus on the proposal, comprised of dealers and repo brokers. The Working Group, after meeting from September through December of 1992, wrote to GSCC management encouraging GSCC to provide a comparison service for repos "as expeditiously as possible", noting that comparison would have a number of benefits for the repo market, including helping counterparties detect errors and creating an audit trail.

The Working Group also asked for a more detailed "blueprint" for netting repo transactions, in order to reduce credit exposures and increase operating efficiencies. It noted that:

> Three general principles should govern the development of such blueprint: (1) implementation should be designed so as not to require costs of conversion which might exceed savings from futures operational efficiencies; (2) novation through GSCC should achieve counterparty netting for accounting purposes; and (3) netting should reduce the cost to GSCC members associated with daylight overdrafts.[17]

Launching Repo Comparison

In April 1993, GSCC established its own Repo Implementation Committee.[18] The Committee's initial focus was on the implementation of a comparison service for repos, designed to provide benefits such as: the elimination of physical confirms, more timely comparison of repo trade data, easier monitoring of the status of repos, ready ability to link and monitor the start and close legs of a repo, enhanced ability for identification and correction of errors, provision to members of various types of useful "trailer" information, easier recordkeeping, and easier access to audit trail information.

There followed over a year of business specification design and technological development. In January 1995, GSCC launched a Repo Comparison Pilot, with over 20 participants. Participating in that pilot helped firms detect the systems and operational changes needed to provide GSCC with accurate repo comparison data, as well as identify unforeseen problems.

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On May 12, 1995, GSCC went live with its repo comparison service, with 26 participants. Overnight and fixed-term Government repos were eligible. GSCC did not make (and still has not made) characteristics regarding rights of substitution a required match item because it felt that this would greatly hinder the comparison rate for repos.

Repo Netting Begins

Focus then turned to a repo netting service, implementation of which was scheduled for later in the year. GSCC struggled with the proper resolution of various key issues. One was whether GSCC should guarantee settlement of a forward-starting repo (i.e., a repo where the start leg is scheduled to settle one or more days after trade date)[19] prior to the actual start of the repo.[20]

One option was to net and fully guarantee the repo at the time of its comparison. The problem with this approach was an unacceptable degree of exposure to GSCC. It did not appear appropriate for GSCC to obligate itself to have to conduct two settlements when the underlying repo might never be initiated by the parties to it.

GSCC ultimately chose the middle ground of providing rate protection . . . during the period between trade execution and the start of the repo, based on the differential between the contract repo rate and the current rate for a repo of like term and underlying collateral.

Another alternative was to neither net nor guarantee the repo until settlement of the start leg actually takes place. Management rejected this approach because it left participants with no protection during the forward start period. GSCC ultimately chose the middle ground of providing rate protection (but not guaranteeing actual settlement of the start and close legs of a repo that had not in fact started) during the period between trade execution and the start of the repo, based on the differential between the contract repo rate and the current rate for a repo of like term and underlying collateral. This made sense because no securities have moved between the parties before the start date and there is, therefore, no risk other than interest rate risk.

Another major issue regarded guaranteeing settlement of repos of an extended length, where the daily financing mark to the parties, and the interest rate exposure to GSCC, could be quite large. In view of the risk involved, GSCC chose to limit the number of business days between submission date and settlement date for the close leg of an eligible repo to a half year.[21]

Finally, because of potential operational difficulties, GSCC ultimately chose to make open repos (repos with no fixed end date) ineligible. Other eligibility requirements established for netting included: the data on a repo must be submitted by repo netting members, such data must be compared, and the underlying securities must be Treasury or book-entry Agency securities.

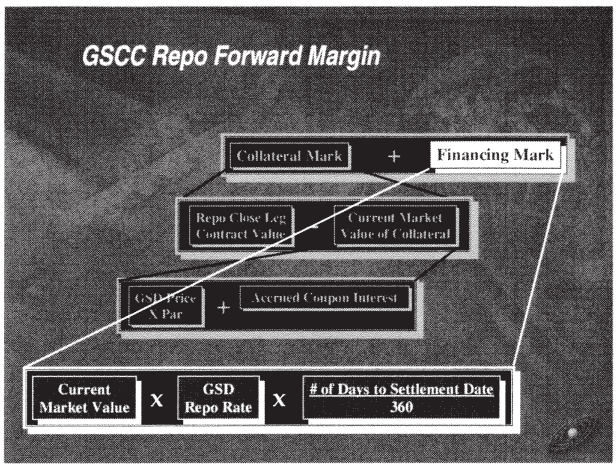
On November 17, 1995, the initial phase of the repo netting service, involving the netting and settlement of the close leg of overnight and term repos[22] (and the start leg of forward-settling repos) began, with 13 participants.[23] Repo transactions were netted with regular buy/sell activity and Treasury auction purchases in the same CUSIP to arrive at a single net position in each security.

As it did for cash transactions, when GSCC netted repos, it interposed itself between the two parties for settlement purposes (in fact, buy-sells and repos were netted together in one netting process). GSCC's guarantee for netted repos included the start leg of the repo if it occurred after trade date (most repos start on the day that they are executed, but GSCC and its members were not equipped to handle same-day start legs),[24] the return of repo collateral to the repo participant, the return of principal (the repo start amount) to the reverse participant, and payment of repo interest to the full term of the repo to the reverse participant. This guarantee also included coupon interest protection; meaning that, once the repo started, GSCC would automatically pass coupon from the reverse participant to the repo participant on coupon date.

Risk Management Considerations

GSCC had to significantly revise its risk protections to accommodate the greater risk arising from repo activity. Repos on average are much larger in size than buy-sells,[25] many are long term, and they carry a financing component that buy-sells do not.

With regard to its mark-to-market process for repos (also known as "forward margin"), in addition to applying a mark to the underlying securities on forward trades, GSCC began to use a new, separate financing mark, which took into account the potential financing cost GSCC would earn or incur if it had to finance the repo position of a failed participant between the date of failure and the settlement date for the close leg on a long-term repo.[26]



In determining the repo rate used in these calculations, GSCC decided that they would need to be tailored to each individual repo transaction.[27] First, GSCC would determine if the underlying collateral is general or special. For general collateral repos, GSCC would use the remaining term of the repo to determine the appropriate market repo rate. For special collateral repos, GSCC would determine the special repo rate by CUSIP and specific term of the special.

GSCC's mark-to-market process also changed fundamentally in that GSCC had previously collected debit marks (which could be satisfied by cash or eligible collateral) but held credit marks; moreover, it did not use credit marks to offset debit marks in other CUSIPs. It now shifted to offsetting credit marks against debit marks across CUSIPs (thus providing for cross-margining of the cash and repo markets) with full pass-through of collected marks. By starting to pay out credit marks, GSCC was required to convert the mark-to-market process into an all cash one.

GSCC also sought to provide its full guarantee without adversely affecting the economics of the repo. Thus, GSCC determined to pay interest on debit mark amounts collected and charge interest on credit margin amounts paid on a daily basis using an effective Federal funds rate.

With regard to Clearing Fund margin, GSCC added a new "repo volatility" component to guard against risk associated with guaranteeing the payment of repo interest to the term of the repo.[28] The need for the repo volatility aspect of the Clearing Fund arises from the liquidation process that GSCC would undergo should a member with an outstanding term repo fail.[29] Clearing Fund is designed to protect GSCC from the exposure presented by the fluctuations in the value of a net settlement position from the latest marking-to-market until liquidation. The repo volatility amount, which corresponds to the volatility of repo rates, is used to provide GSCC with protection from the portion of that fluctuation in value that represents interest exposure.[30]

GSCC's margining and re-pricing services provided a standardized approach for moving repo cash collateral with interest. They fundamentally changed the marketplace in that participants no longer needed to build margin (or a "haircut", typically two percent) into the original value of the repo, but rather price the repo at the current market value.

Balance Sheet Offset

The repo netting service was a major success, with participants and volumes growing consistently.[31] Critical to this success was the fortuitous adoption, in December 1994, by the FASB of Interpretation No. 41,[32] which permitted financial entities to offset on their financial statement repos and reverse repos when certain criteria are met, such as same counterparty, executed in accordance with a master netting agreement, have the same settlement date, involve securities that exist in book-entry form, and settle on an appropriate securities transfer system.

The "same counterparty" requirement was critical; that was where GSCC could provide great value. By becoming the common counterparty to each side of the repo upon novation, GSCC could maximize the ability of participants to take balance sheet offset. This role was crystallized in an opinion, dated May 30, 1995, of Price Waterhouse LLP in which it stated to GSCC that "members would be allowed to offset, for financial statement purposes, a short and long net settlement position…in a particular CUSIP comprised in whole or part of repo transactions against a long or short net settlement position with the same scheduled settlement date in another CUSIP comprised in whole or part of repo transactions."[33]

Expansion to Brokered Repos

The establishment of the repo netting system had "transformed" the Treasury repo market.[34] But there was more fundamental change to come. GSCC's next major effort was to provide netting and guaranteed settlement services for brokered repos (which were the majority of repos and were done on a give-up of identity basis), including automating start and close leg processing.

A critical issue in this regard was that, as noted earlier, most repos start on the day that they are executed, but GSCC and its members were not equipped to handle same-day start legs. GSCC's Repo Implementation Committee and its broker membership proposed a solution (which was supposed to be short-term one, but remains in effect to this day), that would have brokers assume responsibility for the movement of securities between dealers for same-day start leg settlement. Brokers and dealers would send transaction details to GSCC for comparison, netting, and guaranteed settlement of repo close legs.

With regard to repo start leg fails (i.e., by the close of the securities Fedwire, the repo dealer has failed to deliver the securities to the broker), a policy was established that the fail automatically is converted into "due to/due from" settlement obligation with GSCC. Before doing so, GSCC would make every attempt to contact dealers in the afternoon to confirm these fails.[35]

[T]he service turned a market that was entirely give-up into a largely anonymous, or blind, brokered one.

On August 5, 1996, inter-dealer broker netting members became eligible to participate in the repo netting process.[36] Starting on that date, brokers meeting GSCC's established financial and operational requirements began submitting repos to GSCC that were executed on a blind or principal basis, in lieu of give-up. Settlement of same-day start legs occurred directly between the broker and the repo and reverse dealers, while compared close legs and forward start legs were netted, guaranteed and settled through GSCC.

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The implementation of repo brokering services revolutionized that marketplace.[37] As GSCC guaranteed settlement of the repo close leg, it eliminated the dealer's counterparty risk. Thus, the service turned a market that was entirely give-up into a largely anonymous, or blind, brokered one. Encompassing more transactions into the net also dramatically reduced the number of total daily settlements for broker participants, as they now netted out of transactions brokered between two dealers, absent an error in trade data submission. This made their back-office settlement process much more cost efficient.

Using the brokers as counterparties was not without controversy. As one commentator stated:

> The Government Securities Clearing Corporation has opted to use brokers as counterparties …The controversial move introduces new risks because it allows relatively thinly-capitalized brokers to act temporarily as principals opposite big dealers such as Merrill Lynch or Salomon Brothers.[38]

One means by which GSCC limited this risk was the imposition of enhanced minimum capital requirements. At the time, the give-up repo brokers operated with minimal capital. GSCC changed that by requiring that each IDB netting member engaged in repo activity have and maintain a minimum of $10 million in excess net/liquid capital (an increase from the then-current $4.2 million net/liquid capital standard). Among other things, this helped to mitigate the risk of a broker failing between transaction execution and submission of data to GSCC.

Moreover, a scope-of-business limitation was imposed, in that each repo transaction submitted to GSCC by a broker was required to have an actual Netting System participant as the counterparty, and was required to be bound to a corresponding reverse repo transaction. This assured that the broker would net out of the settlement process.

From an operational perspective, the brokers already had in place the systems to submit data to, and receive output from, GSCC for repos; thus, brokers needed only to make minor changes to their regular buy-sell input and output specifications to accommodate repos and then test with GSCC.

However, additional operational requirements were imposed on the participating brokers:

1. each broker must establish a separate account, with a separate Fedwire address, at a clearing bank for use exclusively for repo start leg intra-day settlement, which account would be subject to review by GSCC,
2. each eligible repo transaction must be submitted to GSCC as soon as possible after execution and, in any event, no later than 15 minutes thereafter,
3. if the counterparty netting member indicates that an error has been made by the broker, the broker is obligated to promptly take steps to resolve the error or dispute, and
4. brokers would be involved in collateral substitutions on long-term repos.[39]

Moreover, GSCC required that data on all regular-way repos, forward-starting repos, and repos in which the start leg has failed were required to be submitted to GSCC. GSCC also asked its participants, for risk mitigation purposes, to submit all forward starting repos involving specific collateral to GSCC on trade date. Trades executed prior to auction were required to be submitted at par. Trades executed after the auction should be submitted to GSCC at execution price. On issue date, GSCC's forward margin process would automatically mark the repo to the current market value.

Finally, GSCC reserved the right, for risk management purposes, to compare the repo based on data submitted by one side.[40]

Subsequent Enhancements

Soon after implementation of the blind brokered repo service, there arose a concern on the part of certain dealers that, because of the potential for a lack of submission of data by a dealer or broker counterparty, a brokered repo will not be compared and, therefore, will not enter GSCC's netting process. This issue was of particular concern with regard to repos that start on the same day on which they are entered into and that close the next day because there is relatively little time available to correct errors or omissions. To address this concern, GSCC established a policy that it would effectively guarantee the settlement of the start and close legs of every netting-eligible blind brokered repo transaction that had been entered into in good faith by a member.[41]

Various enhancements were quickly made to the service. In October 1996, GSCC implemented a collateral substitution facility, allowing members to submit repo rights of substitution details on their comparison input and to process collateral substitutions online.[42] In November 1996, repo-to-maturity processing became available, providing services for repos with underlying collateral that matures on the repo close date. In January 1997, the repo netting service was enhanced to provide services for repos with underlying collateral that matures prior to the repo close date.[43]

These enhancements provided members with great flexibility when selecting collateral for repo transactions. All a participant had to do was substitute acceptable new collateral no later than the business date prior to the maturity date of the underlying collateral. Thus, a participant could substitute collateral as many times as it wanted over the term of the repo (subject to the terms of the repo) and substituted collateral could mature before the repo close date, as long as appropriate substitutions were made on a timely basis.

The benefits of the repo netting system were so great that European repo traders wanted the same benefits.[44] In 1998, GSCC began consideration of expanding its repo netting services to European sovereign debt repos. The ultimate goal was to provide its members that trade globally the ability to receive a combined balance sheet offset benefit for all of their repo activity. Soon after initiating this process, GSCC

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determined that such a European netting vehicle would more efficiently be established through a joint venture with Euroclear. By November of the following year, however, GSCC and Euroclear had determined that it would be most desirable to provide European netting services through a single vehicle, which would be the London Clearing House (LCH) and its RepoClear service.

Introduction of the GCF Repo® Service

On November 23, 1998, the General Collateral Financing (GCF) Repo® service (which was entirely independent of the DVP repo netting service) was introduced on an intra-bank basis (meaning that dealers using GSCC's settlement banks -- The Bank of New York and JP Morgan Chase Bank – could trade GCF REPOs only with other dealers using the same bank). This new service enabled dealers to execute general collateral repos, based on rate and term, throughout the day via eligible brokers. Standardized, generic CUSIPs are used to specify the acceptable type of underlying collateral. Brokers submit these repos to GSCC as soon as possible after trade execution and prior to a specified cutoff time. The clearing corporation guarantees the settlement of GCF REPOs upon receipt, and conducts an afternoon net after the close of the securities Fedwire exclusively for GCF REPO activity, establishing a single net receive or deliver position for dealer members in each generic CUSIP.

The new service enhanced members' ability to trade general collateral repos by removing collateral notification and allocation constraints and burdens. Also, because members settle on a net basis after the close of the securities Fedwire, they incur no Fedwire charges. Through netting and novation, GSCC becomes the legal counterparty to all GCF REPOs, thereby eliminating counterparty credit risk and providing maximum balance sheet offset. GCF REPO activity also effectively is common-margined with a member's DVP repo activity.[45]

The following June, the service moved to inter-bank mode, meaning that a participating dealer could trade GCF REPOs with any other participating dealer, including ones that cleared at the other different bank. Nonetheless, unlike the basic repo netting service, participation in the GCF REPO service was disappointing, and volumes were low.

Indeed, by 2000, GSCC began to consider whether to close the service. It was suggested by some market participants that once other products were made eligible, the service would grow. Ultimately, that is what happened. On January 24, 2000, Agency securities were made eligible for the GCF REPO service. On March 20, 2000, the first mortgage-backed securities (MBS) -- Fannie Mae & Freddie Mac fixed-rates -- were made eligible for the GCF REPO service.

With the introduction of these new products, particularly MBS securities (which were much more readily available to dealers for use to allocate for GCF REPO lending than Treasuries or Agencies), the service took off. By 2002, the growth and success of the GCF REPO service was evident, and GCF REPO had become "an integral securities financing alternative for Wall Street dealers."[46] This in turn had caused sizable intraday funds movements between the two clearing banks that in turn created potential payments system risk considerations and net debit cap pressures on the banks. The problem became so significant that the "question is whether there's a chance that this product will go away."[47] The clearing corporation resolved this issue, at least temporarily, in March of 2003 by returning the service to intra-bank status.

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[I]t becomes clear that the introduction of FICC's repo netting process, which represented a multi-year industry effort and consensus, fundamentally transformed the government securities financing marketplace.

Growth in volumes, and expansion of eligible products, has continued unabated. In April 7, 2003, Ginnie Mae MBS were made eligible for the GCF REPO service. On April 26, 2004, Ginnie Mae, Fannie Mae, and Freddie Mac Adjustable Rate MBS were made eligible for the GCF REPO service.[48] Most recently, on May 2, 2005 Treasury TIPS were made eligible for the service.

Looking back over the past decade, it becomes clear that the introduction of FICC's repo netting process, which represented a multi-year industry effort and consensus, fundamentally transformed the government securities financing marketplace. Dramatic operational efficiencies and cost reductions were achieved, particularly for the brokers. A blind brokered repo market came into existence, which allowed for greater market liquidity. Matched book repo dealers were given the benefit of greatly enhanced balance sheet offset, which enabled those dealers to grow their activity in a prudent manner with reduced expense. Most importantly, an enormous amount of risk was eliminated from this huge and significant marketplace.

The growth of the repo netting service has been striking. On average each business day during 2005, FICC processed $2.7 trillion in government securities activity, of which approximately $1.6 trillion was DVP repo activity[49], and $260 billion was GCF REPO activity. Further enhancements are planned, and the benefits that flow from the repo netting system will continue to help ensure the growth and liquidity of the repo market.

Notes

* Mr. Ingber is a Managing Director of The Depository Trust & Clearing Corporation (DTCC).

The author would like to thank the following persons for their assistance in preparing this article: Dave Buckmaster, Kate Connelly, Ken Garbade, Marc Golin, Eugene Ing, Rosalie Jenkins,

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John McPartland, Nikki Poulos, Dave Schroeder, Tiffany Simon, Rachel Tyler, Lori Santamorena, and Ed Watts.

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1 Table on Financing by U.S. Government Securities Dealers Reverse Repurchase and Repurchase Agreements, Average Daily Amount Outstanding (as of September 30, 2005) at Bondmarkets.com.

2 The Federal tax code treats a repo like a collateralized loan, which is critical because it means that the repo seller does not have to treat the sale as a taxable event, will retain its basis in the securities, and will be entitled to any special tax treatment the interest may receive. Frank Souder, Domestic Securities Lending, June 1996. For accounting purposes, a repo is "a transaction that is accounted for as a collateralized borrowing…" See FASB Interpretation No. 41, *Offsetting of Amounts Related to Certain Repurchase and Reverse Repurchase Agreement*.

3 See amicus curiae brief of The Bond Market Association in *Granite Partners, L.P. v. Bear, Stearns & Co. Inc.*, 17 F. Supp. 2d 275, 1998-2 Trade Cas. (CCH) P 72301, 41 Fed. R. Serv. 3d 1345, 36 U.C.C. Rep. Serv. 2d 1238 (S.D. N.Y. 1998).

4 After the repo is entered into, the custodian takes possession of the seller's securities and transfers cash to the seller. Similarly, it takes in the buyer's cash and confirms to it the receipt of the seller's securities. The custodian performs these functions in reverse at the end of the term of the transaction.

5 For an overview of the GCF REPO service, see Jeffrey F. Ingber, *Gets Confusing Fast: A Review of the GCF Repo Service*, The RMA Journal, May 2003"; Michael J. Fleming and Kenneth D. Garbade, *The Repurchase Agreement Refined: GCF Repo*, Federal Reserve Bank of New York Current Issues in Economics and Finance, vol. 9, number 6, June 2003.

6 FICC, a securities clearing agency registered with and regulated by the SEC, is the central clearing organization for the United States government securities and financing marketplaces.

FICC is a subsidiary of The Depository Trust & Clearing Corporation. FICC was created in December 2002 by the merger of the MBS Clearing Corporation into the Government Securities Clearing Corporation. FICC has two divisions—the GSD and the Mortgage-Backed Securities Division—each with its own separate set of rules and procedures. In this article, "FICC" refers only to the GSD.

7 The securities provided for a repo entered into to borrow money usually will be non-specific collateral, meaning that identification of collateral, within certain parameters, is at the option of seller. This is because the securities involved in the repo transaction are transferred to the buyer as collateral primarily to provide assurance that the seller will perform its obligation to return cash on the settlement date. This is known as a "general collateral" repo, as opposed to a "special collateral" repo, where the motivating factor for the transaction is to obtain a specific CUSIP.

8 Netting in its essence is math. For a member's activity in a particular CUSIP, all the buy activity par amounts that reflect the creation of a long obligation are added, then all sell activity par amounts that reflect the creation of a short obligation are added; the difference between these two totals is the member's net long or short position for the CUSIP. Once the net settlement position is established by GSCC, the identity of the underlying trade activity is lost for clearance and settlement purposes. GSCC nets on a multilateral basis, meaning that netting members are fungible and indistinguishable for netting purposes. The netting is done with a full guarantee of settlement for each net settlement position established. Once the trade enters the net, GSCC becomes, through "novation," the effective counterparty to each trading party for credit and settlement purposes. In other words, all of a member's obligations, such as to pay money and deliver or receive securities, that were established as the result of its trade with a counterparty member are terminated and replaced by similar obligations to and from GSCC.

9 A repo is more than a pair of buy-sells because, among other things, the lender of funds is entitled to interest at the agreed-upon repo rate, the borrower of funds is entitled to coupon payments on its collateral, and there may be substitutions of collateral during the life of a term repo.

10 "Ironically, one benefit of GSCC's netting process raises concerns, said some industry participants. Because GSCC will act as a counterparty for all repo trades netted, some larger firms worry that smaller, less-capitalized firms might be able to operate on a more level playing field because they would be seen as just as safe as the bigger players." Kenneth S. Levine, GSCC Plans to Compare and Net Repurchase Trades, Redemption Digest and Securities Industry Daily, August 23, 1994.

11 Joint Report on the Government Securities Market issued by Department of the Treasury, Securities and Exchange Commission and Board of Governors of the Federal Reserve System (January 1992).

12 Of particular note was that, at that time, for overnight repos settlement of the close leg often occurred before the counterparty had the opportunity to check the information contained in its confirmation (which it received only on the morning of settlement date). GSCC proposed to enable members to compare their repos on a same-day basis and, thus, be able to properly monitor overnight repo transactions and reconcile any incorrect information.

13 Prior to the failure of Drysdale Government Securities, in May 1982, it was common practice in the repo market to ignore the value of accrued interest in pricing repos using coupon-bearing securities. This practice enabled Drysdale to acquire a substantial amount of undervalued securities, despite its limited capital base. Drysdale used the securities it had reversed in to make short sales to a third party for an amount that included the accrued interest. Using the surplus cash generated, Drysdale was able to raise working capital and to make interest payments to its other repo counterparties. This strategy worked until May 17, 1982, when cumulative losses on Drysdale's interest rate bets caused it to be unable to pay the interest on securities it had borrowed. As a result of the weaknesses exposed by the Drysdale matter, full accrual pricing, in which accrued interest is included in full in the initial purchase and resale prices, was adopted as standard market practice. Stephen A. Lumpkin, Repurchase and Reverse Repurchase Agreements (Federal Reserve Bank of Richmond 1998)

14 In this regard, an important development occurred in March 1992 when the FASB issued an interpretation (No. 39 - Offsetting of Amounts Related to Certain Contracts) stating that fair market amounts recognized for forward and other conditional or exchange contracts executed with the same counterparty under a master netting agreement may be offset. By letter of December 16, 1993 from Michael Passarella of PriceWaterhouse to the author, who was General Counsel of GSCC at that time, GSCC received an opinion that "participants that enter into transactions in repurchase and reverse repurchase agreement for settlement on the same date utilizing the same underlying collateral and avail themselves of GSCC's multilateral netting service should treat certain offsetting repurchase and reverse repurchase transactions that are netted by GSCC in a manner analogous to the treatment of their offsetting buy and sell cash transactions that involve the same underlying collateral and are netted by GSCC…Therefor, for financial statement reasons, these participants would be able to satisfy all of the criteria specified in FASB Interpretation

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No. 39 and thus would be able to offset the asset and liability amounts that arise from such transactions."

15 By letter, dated March 13, 1996, from Michael A. Macchiaroli, SEC Associate Director, to the author, GSCC obtained no-action relief to the effect that a broker-dealer, for net capital computation purposes under paragraph (c)(2)(iv)(F) of Rule 15c3-1 (17 C.F.R. § 240.15c3-1(c)(2)(iv)(F)), could treat GSCC as its counterparty for repo transactions entered into GSCC's netting system. GSCC received further no-action relief regarding its repo netting service by SEC letter dated April 1, 1998, which stated that the Division of Market Regulation would not recommend that enforcement action be taken if, when computing net capital, GSCC members did not deduct from their net worth repo and reverse repo deficits (basically, a "repo deficit" is the difference between market value of the underlying securities and the contract price for repurchase of the securities, if that latter amount is less), if, outstanding one business day or less (a deficit would be outstanding for more than one business day only if a member failed to pay a morning funds settlement obligation to GSCC), arising from repo and reverse repo agreements that were netted and guaranteed by GSCC.

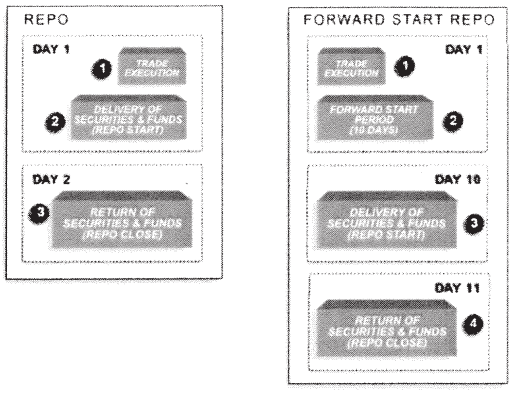
16 PSA. The PSA later became The Bond Market Association (TBMA) and the Repo Committee became the Funding Division of TBMA.

17 Letter of December 10, 1992 from John Macfarlane and Bill Molloy, Co-Chairmen of the Working Group, to Charles Moran, President of GSCC.

18 The Committee members were Mark Alexander (Merrill Lynch), Edward Almeida (Bear Stearns), Tom Costa (GSCC), Jack Huber (Lehman Brothers), Richard Kijewski (Fuji Securities), Gerard LaRocca (Salomon Brothers), James Malgieri (Morgan Stanley), Edward Mardovich (Tullett & Tokyo – Mr. Mardovich, who represented the brokers and was a valuable contributor to the Committee, subsequently moved to Euro Brokers Maxcor and died on 9/11), Daniel Minerva (Eastbridge Capital), Charles Moran (GSCC), Peter Murray (First Boston), William Santangelo (Chemical Securities), Howard Tucker (Garvin GuyButler), and Edward Watts (Goldman Sachs).

The following chart illustrates the difference between a regular repo and a forward-starting one:

19 The following chart illustrates the difference between a regular repo and a forward-starting one:



20 Many forward-start repos are general in nature. A significant problem at that time was market participants executing forward-starting general collateral (GC) repos but not submitting them for confirmation or comparison until right before commencement of the start leg, when collateral is assigned. GSCC sought to address this issue by establishing generic CUSIPs for forward-starting GC repos and encouraging their submission to the clearing corporation on the date of execution.

21 The term of an eligible repo initially was limited to 180 days, in order to evaluate GSCC's risk management measures. On September 23, 1996, it was extended to 360 days. On June 2, 1997, GSCC made eligible repos having settlement dates of up to two years after submission. In taking this action, GSCC was cognizant that the Bankruptcy Code's automatic stay exception for the liquidation of a "repurchase agreement" as defined by the Code, and for the setoff by a repo participant of a debt or claim arising in connection with such a defined "repurchase agreement," applies by its terms only to a repo transaction with a term of not more than one year. GSCC noted to its members that, "[i]n this regard, there is a comparable automatic stay exception in the Code for the liquidation of a repo transaction as a 'securities contract' (even if it has a term longer than one year) on which GSCC, as a clearing corporation, could rely in the exercise of its netting rights in respect of such transactions. The enforceability of GSCC's netting rights also are supplemented and made clear by the application of other federal legislation related to the netting of repo transactions entered into by financial institutions." GSCC Important Notice 42.97, dated May 28, 1997.

22 Open repos remain ineligible for FICC processing. Since open repos are not eligible for balance sheet offset, there has been little industry desire to make them netting-eligible.

23 Cantor Fitzgerald Securities, Deutsche Morgan Grenfell/C.J. Lawrence Inc., Dillon, Read & Co., Eastbridge Capital, Goldman Sachs & Co., HSBC Securities Inc., Lehman Brothers Inc., Merrill Lynch Government Securities Inc., Natwest Bank, NA, Oppenheimer & Co., Inc., Spear, Leeds Kellogg, LP, UBS Securities Inc., and Zion First National Bank were the initial participants. Repo transactions worth over $6 billion went into the net on the first day.

24 "Sal Ricca, the new President of the clearing corporation, explained…that GSCC is not fully linked interactively to our participants so we must enhance our systems before we can offer netting for the start leg." GSCC Seeks to Open Repo Netting Door to Brokers, Securities Industry Daily, May 24, 1996.

25 The average size of a buy/sell transaction at the time was roughly $9 million, while the average repo size was $38 million.

26 Please see www.ficc.com for detailed and more current information on the margining process for repos.

27 GSCC obtained repo rates daily from multiple sources, primarily through broker screens.

28 Every netting member is required to maintain deposits in a Clearing Fund account. Each member's required Clearing Fund deposit is calculated daily to ensure that enough funds are on hand to cover the risks associated with that member's activities and the potential for the member to default on its settlement obligations (such as a member might not pay a funds-only settlement amount due to GSCC or not deliver or take delivery of securities that comprise a net settlement position) causing a loss for the clearing corporation.

29 If the member is the funds borrower and has defaulted on its obligation to repurchase the underlying securities and pay interest at the end of the repo term, GSCC would immediately replace that party with another entity, by selling the same securities and reversing them in (for the same remaining term as the original repo transaction). GSCC would thus have the opportunity to earn interest income; however, this amount may be less than the interest payment that will have to be made to the funds lender on scheduled settlement date. Conversely, if the member is the funds lender and has defaulted on its obligation to redeliver the underlying securities at the end of the repo term, GSCC would immediately replace that party with another entity,

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by buying the same securities and then putting them out on repo (for the same remaining term as the original repo transaction). GSCC would thus incur interest expense, which may be greater than the interest payment to be received from the funds borrower at the end of the repo.

30 The formula provided that the gross amount of margin would be calculated by multiplying the system value of the repo position by the repo volatility factor (expressed in basis points), and then by a fraction, the numerator of which is the number of days to the scheduled settlement date of the close leg and the denominator of which is 360. The repo volatility factor for general collateral repos (defined as all repos other than special repos) was set at 50 basis points. For special repos (defined as any repo with a system rate that is more than 100 basis points less than the system rate for general collateral repos), a distinction would be made between those expected to come off special on a certain date (i.e., the upcoming issue date) and all others. The factor for specials expected to come off special would be the same as the factor for GC repos, while the factor for all other specials would be equal to the spread between the system rate for the repo and the system rate for GC repos (but in no event less than 50 basis points). Repo volatility amounts on long and short net positions are allowed to offset each other.

31 Not that there weren't issues. For example, the SEC filing made by GSCC for authority to implement the repo netting service was challenged by Delta Government Options Corporation, a competitor clearing corporation at that time, based on the assertion that the proposed repo netting system would not afford participants adequate financial protections. (Delta also asserted that GSCC participants would not be able to avail themselves of the offset relief provided by FIN 41.) The SEC ultimately rejected these objections. See SEC Release No. 34-36491, 60 S.E.C. Docket 1814, 1995 WL 704170 (November 17, 1995); File No. SR-GSCC-95-02, Order Approving a Proposed Rule Change Relating to Netting Services for the Non-Same-Day-Settling Aspects of Next-Day and Term Repurchase and Reverse Repurchase Transactions.

32 Offsetting of Amounts Related to Certain Repurchase and Reverse Repurchase Agreement (FIN 41).

33 In June 1996, the FASB issued Financial Accounting Standards Statement No. 125 (FAS 125), which provides accounting and reporting standards for transfers and the servicing of financial assets and extinguishment of liabilities, and established new criteria for determining whether a transfer of financial assets in exchange for cash or other consideration should be accounted for as a sale or as a pledge of collateral in a secured borrowing. After questions had been raised by members regarding the impact of FAS 125 on repo netting members' relationship with GSCC and, particularly, whether a right of substitution that is included in the underlying agreement continues to exist after novation, GSCC made a rule filing in 1997 (1997-3) in which it amended its rules to explicitly provide that: (i) GSCC will recognize that a right of substitution exists with regard to a repo if either the parties submit matching data indicating such right or GSCC, in its sole discretion, determines that the parties intended that such a right exist, (ii) if the parties to a repo enter into it with a right of substitution, that right continues once the repo is netted by GSCC, and GSCC will facilitate the parties' ability to conduct such a substitution or termination, and (iii) a right of substitution continues once the repo is netted by GSCC. This made clear that, if a GSCC repo netting participant has provided for a right of substitution in the underlying repo agreement, there is no need for that participant to seek to enter into an additional agreement with GSCC regarding right of substitution.

34 Rupert Bruce, Build a Repo Net and They Will Come, Bloomberg Magazine, May 1999.

35 Broker fails were a major issue in the post-9/11 processing environment. A "broker fail" arises when the dealer party to a brokered repo that is borrowing money and, thus, is obligated to deliver securities to the broker (for redelivery to the dealer party that lent the money), fails to do so on trade date. Normally, at the end of trade date, if such a fail has occurred, GSCC assumes responsibility from the broker for receipt and redelivery of the underlying securities; however, GSCC only does so after the fail has been verified with all participants. Such verification was impossible on and immediately after September 11; thus, GSCC determined that settlement and reconciliation of these fails should occur through GSCC in a centralized and protected manner rather than bilaterally through dealers and brokers. To eliminate the risk that dealer members might otherwise have directly with brokers, GSCC assumed settlement responsibility for all blind broker start leg fails as reported to GSCC by its two clearing banks; 2171 blind broker fails were assumed, valued at more than $96 billion. (It was subsequently discovered that information regarding the broker fails assumed on the 11th was incomplete. Many fails were missing, some fails were one-sided, other fails were inaccurate, and certain fails had already settled but continued to be reported as fails. GSCC worked closely with the brokers and their dealer counterparties to perform the extensive reconciliation of the data on all broker fails.)

36 Eight brokers (Exco RMJ Securities, Liberty Brokerage, Garban, Tullett & Tokyo Securities, C.F. Kross, GFI Group, Prebon Securities, and Euro Brokers Maxcor) and 26 dealers participated. On the launch date, more than $5 billion were processed. By week's end, over $31 billion in repo activity was processed.

37 "The establishment of a repo netting system by GSCC has transformed the United States Treasury repo market." Rupert Bruce, Build a Repo Net and They Will Come, Bloomberg Magazine, May 1999.

38 Jack Willoughby, Repo brokers given new power to act as counterparties, Investment Dealers' Digest, August 12, 1996.

39 The repo dealer initiating the substitution contacts the broker and provides it with all relevant information regarding the substitution. The broker then contacts the reverse dealer to arrange for the substitution, providing it with all pertinent information. The broker also provides GSCC with the terms of the substitution. GSCC, acting as an "honest" third party, holds the collateral received from one dealer until it can be passed through against payment. Once GSCC has the collateral from both parties, the substitution will be made, with GSCC automatically reversing any previous mark-to-market and Clearing Fund amounts calculated for the old collateral.

40 This right proved fortuitous on 9/11, when, in order to facilitate an orderly settlement process and mitigate the potential for the enormous systemic risk associated with thousands of unmatched trades, on the evening of the 11th, GSCC made the decision to create and administratively compare 2178 broker trades valued at over $71 billion based on the presumption that the dealer counterparty submission was accurate. In taking this action, GSCC moved a massive reconciliation effort that would have been conducted between its dealer and broker members into one central location within GSCC.

41 See letter dated February 14, 1997 from the author to each repo netting participant. In a letter dated July 18, 1997 the author wrote again to each repo netting participant to make clear that GSCC's guarantee would hold even if the broker executed the transaction with one dealer counterparty but did not, by the end of the day, have a matching, offsetting transaction with another dealer netting member. In 2000, real-time trade matching for

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government securities transactions was introduced. After that, GSCC changed its policy to guarantee a repo transaction upon its comparison.

42 Initially, participants were asked to not submit repos with right of substitution. With the new facility, participants could specify rights of substitution, providing an automated audit trail for those rights, using a new screen input facility (rather than via telephone or fax). GSCC places itself in the middle of all substitutions, with all collateral deliveries (of both old and replacement collateral) being due to/due from GSCC. GSCC also keeps track of the final money for each repo throughout its life, regardless of the number of substitutions.

43 All repos submitted with collateral maturing prior to repo close date must have a right of substitution. Further, participants must substitute new collateral in replacement of the maturing collateral no later than the business date prior to the maturity date of the underlying collateral.

44 "For United States investment bankers who trade in the European government securities-repurchase agreement market, work in recent years has been frustrating. They've toiled as hard as their New York counterparts, but haven't been able to match the latter's profitability. What their peers have but they don't is a multilateral repo netting system that serves as counterparty to all of the repo transactions of participating firms." Build a Repo Net and They Will Come, Rupert Bruce Bloomberg Magazine, May 1999.

45 The GCF REPO service was introduced in spite of objections from the Chicago Board of Trade and the Chicago Mercantile Exchange, who argued that GCF REPOs are futures contracts subject to the Commodity Exchange Act. In response, GSCC provided a legal analysis in support of the conclusions that forward-starting GCF REPOs (as well as all repos and when-issued buy/sells) are forward contracts and not futures contracts and that, even if GCF REPOs involving government securities are deemed to be futures contracts, since they are transactions in government securities and are not conducted on a board of trade, they are exempt from regulation by the Commodity Exchange Act.

46 Shane Kite, More Money, More Woes for GCF Repos, Securities Industry News, December 9, 2002.

47 Allen B. Clark, SVP of broker-dealer services at JPMorgan Chase Bank, Securities Industry News, December 9, 2002

48 In 2005, Treasuries accounted for only about 28% of all GCF REPO activity. The most actively traded generic product for GCF REPO purposes was Fannie Mae/Freddie Mac MBS, which accounted for over 46% of all GCF REPO trades.

49 Repo transactions involving Treasury Notes accounted for the largest share of GSD Repo activity, representing over 72% of the total volume. This arbitrage strategy allowed Leeson to buy the cheaper Nikkei contract and simultaneously sell the more expensive contract, reversing the trade when the price differences diminished. The strategy (also known as "switching") was deemed low-risk as the SIMEX and Osaka contracts tended to move together.

[Continued from page 1]

to exploit supposed low-risk arbitrage oppurtunities in the Nikkei index between the SIMEX and the Osaka exchanges. This arbitrage strategy allowed Leeson to buy the cheaper Nikkei contract and simultaneously sell the more expensive contract, reversing the trade when the price differences diminished. The strategy (also known as "switching") was deemed low-risk as the SIMEX and Osaka contracts tended to move together.

In an attempt to bolster profits from switching activities, Leeson needed to enhance the price differential between the executed Osaka and SIMEX Nikkei 225 contracts. He achieved this by engaging in a practice common on many exchanges known as "cross-trading". A cross-trade is a trade executed on an exchange by a sole member who is both the buyer and seller. This was permitted on SIMEX if the buy and sell orders were from two different customer accounts executed at the same market contract price. Leeson executed cross-trades between 88888 (a secret account originally established to hide trading errors) and three Barings switching accounts. Barings was therefore both the buyer and seller and the trades were illegal. Upon executing the trades Leeson used his back-office influence to change the prices on the deals in order to show large gains in the reported switching accounts at the expense of significant losses in account 88888. The cross-trades boosted Barings reported profits to five times plan in 1994 with Leeson receiving a significant bonus. However, significant losses had been recorded in account 88888 that Leeson had to eventually recover.

In an attempt to recover losses recorded in account 88888, Leeson ramped up his speculative activity by gambling on increases in the Nikkei 225 futures contract. He also speculated with options by selling straddles on the Nikkei index. Selling straddles involves the sale of both a put option and call option. In times of stable markets the seller profits as the moneyness of the options is less than the collected premiums. However, in times of high volatility, the options become valuable and the buyer becomes increasingly likely to exercise the option. Consequently, in order for Leeson to recover his losses, it was necessary for the Nikkei to increase in value and the market to remain steady, an unlikely combination.

In January 1995, an earthquake hit Japan causing the Nikkei to plummet and crush the value of Leeson's position. He attempted to recoup this loss by betting on a rebound of the Nikkei, purchasing March and June Nikkei 225 futures. Days after the earthquake, Barings' London futures team gave a presentation on Leeson's perfectly matched book, long in Osaka and short the same amount in SIMEX. It was revealed less than a month later that the secret account was in fact long 55,339 Nikkei contracts for delivery the next month, hardly resembling a hedged book. Those contracts alone represented a loss of nearly half a billion dollars. Further, Leeson also concealed $20 billion of Japanese government bonds and Euroyen contracts and 70,892 Nikkei put and call option contracts in account 88888. Leeson went on the run.

Shortly after fleeing Singapore, Leeson was arrested in Frankfurt en route to London. Despite his protestations, he was extradited to Singapore to stand trial. He was sentenced to six and a half years in Singapore's Changi prison. While in prison, he contracted colon cancer, which he survived, but he was divorced by his wife. Leeson was released from prison early in July 1999 for good behavior. In 2005, Leeson accepted the position of commercial manager for Galway United football club in western Ireland where he is responsible for delivering on financial initiatives for the club.

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How did he get away with it?

The trading disaster of Barings and Nick Leeson highlights the potential for impropriety that exists in the absence of proper monitoring and compliance. The first fundamental error committed by senior management was to commence trading in products and markets that they did not understand. Nothing demonstrates this fundamental lack of understanding more than their agreement to fulfill the massive margin requirements demanded by Leeson. In January and February 1995, Barings Tokyo and London transferred $835m to Barings Singapore to enable Leeson to meet margin requirements on SIMEX. This was a huge amount of margin to support a portfolio that was supposedly low-risk and making money. Further, Leeson cited the need to post margin on behalf of Barings' clients as a justification for the cash injection even though it was against SIMEX rules for a broker to post its own money as margin on behalf of clients.

The second error made by Barings senior management was the belief that because the agreed upon strategy was low-risk there was no need to closely monitor Leeson. During 1994, Barings employed risk controllers in their London, Tokyo, and Hong Kong offices, but not in Singapore. Accordingly, the bank allowed Leeson to retain his back-office duties even as he became the head futures trader in an attempt to control costs. Controlling costs meant not controlling Leeson. As head of the back-office, Leeson removed account 88888 from the daily market activity reports completely and only used the data contained in the account to calculate SIMEX margins that he needed to pay to perpetuate the fraud. With account 88888 activities hidden, Leeson not only speculated wildly on Nikkei futures but traded products such as Nikkei options, Japanese government bonds and Euroyen contracts that he had no authority to trade in the first place.

Despite the apparent lack of supervision in Barings Singapore one would expect Leeson's superiors to keep a close eye on activities. However, there was confusion over reporting lines with Leeson supposedly reporting to Barings London for proprietary trading and Barings Tokyo for customer trading. Both left it to the other party to supervise Leeson. Without an independent back-office or any other form of meaningful supervision, Leeson was free to speculate at will.

ALLIED IRISH BANK

What happened?

In 2002, AIB announced that it had accumulated losses of $691 million following four plus years of fraudulent trading. John Rusnak, a proprietary foreign exchange trader working from the Baltimore operation (Rusnak operated for AllFirst Bank a subsidiary of AIB), had indicated to supervisors that his trading strategy would be largely based on options arbitrage, taking advantage of implied volatility variances. In fact, Rusnak primarily made directional trades, betting the yen would appreciate against the dollar.

Rusnak incurred heavy losses in 1997 when the Asian market turned downwards against his unhedged long positions in yen futures. By the end of the year, his losses were approaching $30 million. Instead of reporting his actual position, he began to falsify trades in an attempt to hide his losses while he tried to turn around his fortunes. To conceal his actual portfolio value, he entered bogus, apparently offsetting options trades into the processing system. For example, Rusnak would enter a deep in-the-money call option supposedly purchased from a Tokyo bank to buy yen at a given strike in the future. Simultaneously he would sell a put option to the same Tokyo bank with identical contract details except the put option would expire on the day that the contract was written. The call option would remain on the balance sheet and cover prior losses (due to the moneyness of the option) while further leveraging Rusnak's exposure to the yen. The short put option would expire at close and disappear from the balance sheet. When the call option approached expiry, Rusnak would enter into another contract to roll the position forward (while simultaneously entering into a short put option that again expired on the day it was written).

In 1999, with losses at $41.5m, Rusnak turned to prime brokerages as a vehicle for his scam. The use of prime brokerages allowed Rusnak to scale up his trading activity while effectively bypassing Allfirst's back office. The prime brokerage accounts provided net settlements whereby individual transactions would be rolled into a single forward transaction which significantly reduced the ability of Allfirst's back office to police his trading activity. He also used historical rate rollover contracts to extend the realization of his losses in hope that he would claw back his losses. By the end of 2000, Rusnak had lost $300m. As a final attempt to recoup losses he gambled on his resurrection one last time by selling massive amounts of options. Selling options results in large amounts of cash in the form of premiums being received instantaneously in exchange for potential future obligations. Rusnak needed a lot of cash so he sold deep in-the-money options that were almost certain to result in future exercise and a vast outflow of funds. When the yen depreciated further, the options he sold resulted in further losses of over $300m resulting in total losses of $691m.

The fallout from the scandal included the dismissal of seven executives responsible for his oversight, a 16% drop in share price, and a 7 ½ year jail sentence for Rusnak.

How did he get away with it?

Rusnak took advantage of the lax control environment and outdated systems to embark on a bogus trading strategy that would cover his losing bets on the yen. First, he created false documents to create the illusion that the bogus trades were confirmed by external counterparties (saved in the "fake docs" folder of his PC). Rusnak was able to convince the back office staff to accept confirmations from him rather than obtaining them independently from the counterparty. Later, Rusnak would convince the back office that the option trades did not require confirmation at all given that the premiums netted to zero and there was no risk.

Even if the back office staff were fooled by the documentary evidence, a simple understanding of derivatives theory should

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have alerted them to the bogus nature of the transactions. First, it is implausible that two offsetting options with identical characteristics except expiry date could command the same option premium. The extended time to expiration is a key valuation component of an option price as it provides more time for the option to get in-the-money. The back office failed to notice that identical premiums were being paid on dissimilar options. This lapse was key to Rusnak's scheme of deception as exercising offsetting options with the same premiums with the same counterparty was the only way that premiums would have netted out, removing the need for back office to execute a cash transfer that would have alerted the counterparty. Secondly, the options expiring on the day they were written were allowed to expire unexercised. These options were deep in-the-money and there is no way a rational counterparty would have failed to exercise the option.

In various accounts of the Allied Irish Bank (AIB) debacle, much is made of the failure of risk measures, such as the value-at-risk (VaR) model, to detect the excessive risks taken by Rusnak. A VaR system is used to calculate portfolio risk and VaR limits are often placed on trader activities to constrain excessive risk-taking. The problem at AIB was not necessarily the VaR system itself, but rather the bogus trades that were input into the VaR system. In addition, Rusnak was able to avoid the stop-loss limit placed on his portfolio, which would have caused a cessation of trading, by manipulating the currency exchange rates used to value his portfolio. He was able to do so because he had control of the Reuters data feed used to obtain currency rates and he then manipulated the spreadsheet before passing those rates on to the risk department.

NATIONAL AUSTRALIA BANK

What happened?

The National Australia Bank (NAB) debacle has much in common with the AIB rogue trader incident. Interestingly, senior executives at NAB reviewed the Ludwig Report on the AIB disaster and seemed to be sure that they had the correct policies, procedures, and systems in place to avoid such an incident. However, on January 24, 2004, NAB announced that rogue trading within the company by four foreign exchange traders between September 2001 and January 2004 had resulted in trading losses of approximately A$360m.

Rogue trading by the four foreign exchange traders began sometime around October 2001 when they started to conceal legitimate losses (and profits). In order to present the illusion of a low-risk strategy (in line with the formal strategy of low levels of proprietary trading) the NAB traders engaged in the pursuit of earnings smoothing. The traders would enter legitimate trades into the trade capture system (Horizon) but change the transaction rates in order to create fictitious profits and losses that had a dampening effect on earnings volatility.

The ease with which earnings were manipulated emboldened the traders and when the 2003 financial year-end (30th September) approached and profits were short of targets they decided to expand their scheme of deception. Starting on October 1, 2003, not only did they manipulate transaction rates, but they entered entirely fictitious one-sided internal spot trades into Horizon. Unlike conventional internal transactions, where the two sides of the deal entered offset one another, these one-sided transactions showed a positive profit for the overall portfolio. Again the transaction rates associated with these transactions were off-market and when the books were marked and daily gains calculated they produced fictitious profits. The false transactions overstated the value of the portfolio by A$42m which translated into a yearly book profit just above the budget for the year of A$37m.

From October 2003 onward, when the labor intensive burden of falsifying spot transactions became too much for the traders, they started to falsify option contracts. Between October and December 2003, the traders continued to exceed their VaR limits as they attempted to claw back the profits they previously overstated to achieve their bonus targets. Further, and similar to the activities in the AIB case, the traders began to sell huge amounts of in-the-money options in an attempt to resurrect their fortunes. Mounting exposures, coupled with a plummeting US dollar increased the overstatement of the portfolio to A$92m. On 13th January, NAB announced losses of A$180m attributable to rogue trading and, by January 27, 2004, after revaluation of the portfolio, this number had climbed to A$360m.

How did they get away with it?

Interestingly, unlike the Barings and AIB crises, the National Australia Bank debacle did not identify a "lone wolf" as the perpetrator. Nevertheless collusive deception coupled with a corporate culture of "profit is king" and atrocious systems created an environment ripe for a rogue trading incident. Increased competition in NAB's traditional businesses had squeezed profit margins and alternative revenue streams had to be established. NAB turned to foreign exchange trading as a way to enhance their earnings base. Like so many prior derivatives debacles, the failure of risk management policies, procedures, and systems to keep pace with front office expansion would prove disastrous.

Amazingly, all three methods of profit manipulation discussed above relied almost exclusively on one oversight in the profit-booking and deal validation process. Profit-booking commenced with a systems run at 8AM with the daily gains calculated using the dealing rates and transactions entered into the Horizon system at that time. The trades entered into Horizon were not validated by the back office until a systems run at 9AM. Consequently, the traders were able to enter incorrect transaction details for profit-booking purposes prior to 8AM and then subsequently correct or remove the trades between 8AM and 9AM so that the back office would sign-off on the validity of the trades entered into the system.

The trade capture system was not the only system within NAB that had serious shortcomings. The risk measurement system was also fundamentally flawed as it could not accurately capture the risk on traded options (it could not handle the volatility smile exhibited by options offered at different strike prices). Rather than address the model shortcomings, the VaR on traded options and associated policy violations were simply

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removed from the daily risk report: out of sight, out of mind. In October 2003, NAB upgraded to the Infinity risk management system after finally obtaining budget approval. Although Infinity dealt with the volatility restrictions in the legacy model, little attention was paid to the new VaR numbers as the traders protested strongly that the numbers were unreliable. Without confidence in the VaR system, it would have been advisable to restrict options trading or prohibit it altogether.

In addition to the systems weaknesses, it appears that the trading policies and procedures were also inadequate. Even though the bogus transactions were removed prior to the risk numbers being calculated, the traders continually blew through their VaR limits. When such VaR exceptions were flagged it was blamed on the shortcomings of the VaR model and the resulting violations were never vetted and approved by risk control personnel. Further, the trading of certain derivative types held in the portfolio was in breach of trading policy given that the relevant Product Usage Authorities document had not been approved by the market risk group.

LESSONS LEARNED

The cases of Barings, AIB, and NAB clearly illustrate the dangers posed by rogue traders. We have seen that rogue trading arises in profit-driven environments where risk management is forced to take a back seat.

Further, it appears that despite the increased sophistication of trading procedures and systems the threat remains. Can we learn any lessons from these debacles? Are there common breakdowns that can be addressed in order to prevent these events occurring in the future? Here we discuss some of the key lessons learned from these cases and discuss how addressing these weaknesses can substantially reduce the risk of a rogue trader wreaking havoc on the trading floor.

1. Senior management must understand the trading strategy

Before trading commences it is critical that senior management and the control functions (middle and back office) understand the trading strategy and ensure that the risks and returns are consistent with the desires of key stakeholders. As we have seen in all of the cases discussed here, problems started when competition in traditional businesses reduced profit margins provoking an intensification of derivatives trading. However, senior management never caught up with the program. Rather than perform their due diligence and fully understand the risks in the newly adopted strategy, they buried their head in the sand and prayed that profits would roll in. It is impossible to detect when the trading portfolio diverges from the chosen strategy if you don't understand the authorized strategy in the first place.

2. The trading policy should be consistent with the trading strategy

The trading strategy should determine the risk-return profile of trading activity. It should clearly outline the products to be traded, the markets in which trading activity is permitted and the level of trading and amount of risk tolerated. Once the trading strategy has been authorized, the trading policy establishes the rules of the game to ensure that trading abuses are clearly defined. Without a clearly defined trading policy, control functions do not know what they are policing and cannot highlight trading breaches. Further, trading policy needs to change as trading strategy changes. In all three cases examined above it is abundantly clear that strategy came first, with policy and policing never really keeping apace.

3. Control functions must have the authority, the ability, and the incentive to enforce the policy

Devising a well-written cohesive trading policy consistent with the desired trading strategy is a start, but the control functions must police trading activity to ensure traders abide by policy guidelines; e.g. only trading authorized products and respecting risk limits. In the case of Barings, there was no control function. In the AIB debacle, the control function was present but they were easily influenced and frequently bullied by Rusnak. In the NAB case, the back office function was seriously undermined by fatal flaws in the trade capture system and the approval of risk limit violations by front office personnel.

Further, it is imperative that the control functions have the skills necessary to detect policy abuses. In trading organizations, the best talent often tends to gravitate to the front office as personnel are attracted by earning potential. This can leave a knowledge gap in control function areas. An effective control function must be sufficiently staffed with talented personnel that understand the trading strategy and the objectives of the trading policy.

It is unclear in the cases discussed here whether there was collaboration between the traders and the control functions. Nevertheless, such collaboration is often much more prevalent in situations when the control functions have a vested financial interest in portfolio performance. Ensuring that financial rewards for control functions are not dominated by trading gains and losses is often a critical step in devising effective incentive mechanisms for middle and back office staff.

4. Systems and personnel investments must keep pace with trading activity

In the Barings, AIB, and NAB debacles it is painfully clear that investment in systems and personnel did not increase with the ramp up in trading activity. In the case of NAB, the traders should never have been allowed to trade options whose risk could not be accurately captured in the risk management system. In the case of AIB, why was a 26 year-old with 18 months experience in charge of monitoring foreign-exchange trading? Barings Singapore failed to employ separate back office staff in an attempt to contain costs. In all these instances, the ability of the control functions to effectively perform their duties was constrained because the companies were focused solely on profits and neglected or ignored the cost side of the equation.

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5. Clear reporting lines need to be established

Establishing clear reporting lines is essential. Traders with clear reporting lines will be more accountable for their actions. In the case of Barings, ambiguity in reporting lines between Singapore and the London and Tokyo offices meant that senior management failed to monitor Leeson or question his actions.

6. Take external evidence seriously

Even if the trading floor is rotten to the core and everybody is party to the fraud, external evidence can still save the day. When substantial losses are recorded, all exchanges and the majority of counterparties involved in OTC trading request margin to guarantee contract performance. In the Barings case, the request for $835m in cash to support margining on a low-risk strategy that was making money should have set the alarm bells ringing.

WHAT CAN THE GENERAL COUNSEL'S OFFICE DO?

With the introduction of the Sarbanes-Oxley Act of 2002, compliance has become an increasingly important component of the General Counsel's day-to-day activities. Alongside other compliance functions such as middle and back offices, internal audit, and external audit, the General Counsel's office is becoming increasingly responsible for ensuring that the company operates in a controlled manner adhering to authorized trading policies and procedures. We have outlined the lessons learned from the Barings, AIB, and NAB debacles, but what should the General Counsel's office do to prevent their company becoming the next derivatives debacle?

1. Ensure traders know right from wrong

Some of the worst trading violations were performed by traders who didn't know that what they were doing was illegal. It should be the General Counsel's responsibility to ensure that everybody knows the law and what is legal and illegal; or, at the least, what is ethical and unethical.

2. Get to know the business

It is imperative that the General Counsel's office understands the products being traded. A better understanding of the trading strategy will translate into a better understanding of results. Take time to speak with the Chief Risk Officer (CRO) or his equivalent and ask him to explain the trading strategies, where the profits and losses come from and where the risk lies in the portfolio. Chances are that if he can't explain this clearly, he doesn't understand the strategy. After speaking with the CRO, speak with the head traders: their stories should be comparable. Finally, check key profitability and risk reports to ensure that the strategy is being followed.

3. Get familiar with the trading floor culture

Rogue trading incidents are prevalent in companies where traders dominate and are allowed to run wild. Staff appraisals are often a good place to gain a sense of the trading floor culture. Check appraisals for complaints from the middle and back office functions that their recommendations are never listened to. Exit interviews can be even more valuable given the potential for a more candid assessment. Finally, check staff turnover records. Rapid turnover in the middle and back offices can not only indicate detrimental frictions, but also a perpetual knowledge gap in key control function areas.

4. Facilitate information sharing between compliance functions

Rogue traders often leave a trail of evidence, but information gaps between departments prevent the cumulative extent of the problems from coming to the surface. The General Counsel can close these gaps by facilitating information sharing between various groups. Effective information sharing will, however, only restrict rogue trading activity if all of the information is collected in the first place. Information sharing at Barings would not have prevented Leeson's activities as ambiguous reporting lines meant management superiors failed to monitor activities and the back office functions were nonexistent.

5. Check key reports to ensure control functions are working properly

The General Counsel must rely on the middle office, back office, and audit functions to perform regular tests of the policies, procedures, and systems. The General Counsel is not expected to get knee-deep in the trading systems to ensure that they are operating appropriately and producing accurate answers. However, close examination of standard reports can provide a valuable insight into the workings of the control environment. Persistent risk limit violations with no evidence of action taken to address the situation are indicative of a lax control environment. System error reports also suggest the inability of systems to keep pace with trading activity. Also, the same items appearing time and again on audit reports suggest that the control function is failing to adapt to business requirements.

6. Consider insurance

If all else fails, consider buying insurance. SVB Holdings, a subsidiary of Lloyds of London, offers insurance against rogue trading incidents providing up to $500m in coverage. Premiums are expensive, but given the magnitude of losses experienced at Barings, AIB, and NAB it could be the most prudent investment that your company makes.

Notes

* Justin Harlow is a Senior Manager within the Legal Support Services group of Risk Capital (jharlow@riskcapital.com). Brian Chao (bchao@riskcapital.com) and Julie Greenberg jgreenberg@riskcapital.com) are both Consultants at Risk Capital.

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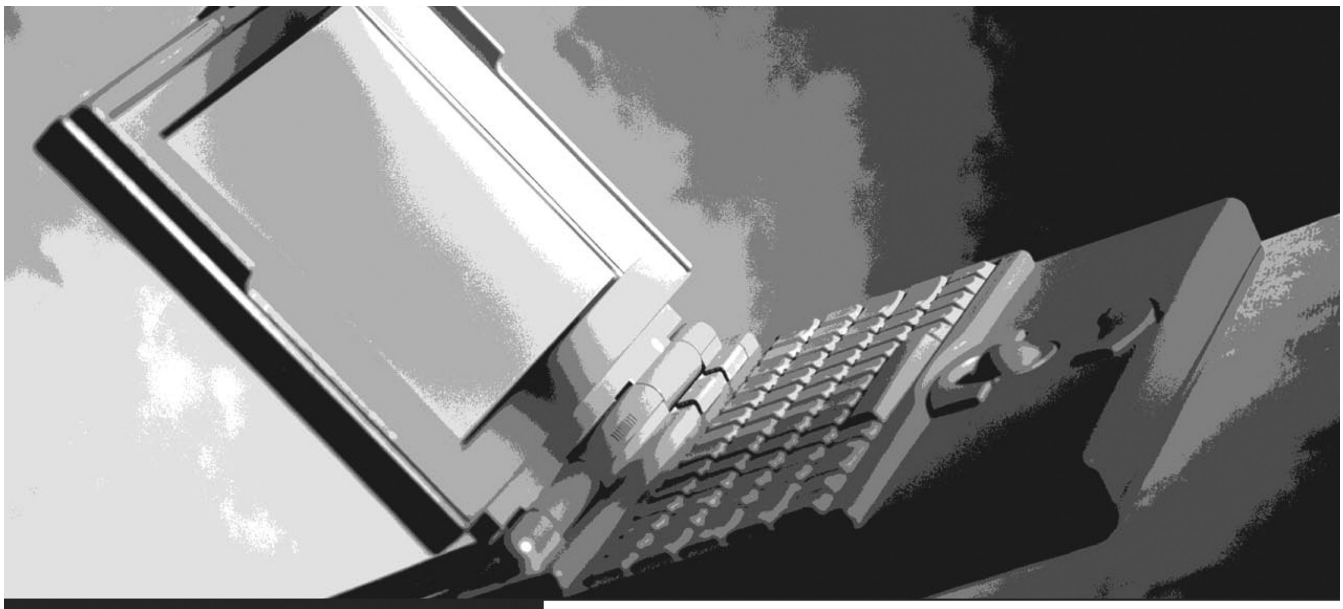

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