

Tri-Party Repo Infrastructure Reform

A White Paper Prepared by
The Federal Reserve Bank of New York

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White Paper:

Tri-Party Repo Infrastructure Reforms

Federal Reserve Bank of New York

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Executive Summary

The Federal Reserve Bank of New York (FRBNY) has issued this white paper to discuss policy concerns regarding weaknesses in the infrastructure of the tri-party repo market as well as to seek comment on industry recommendations to address these concerns. The FRBNY asked the Payments Risk Committee (PRC)—a private-sector group of senior U.S. bank officials that is sponsored by the FRBNY—to form a task force to address the weaknesses that became visible over the course of the financial crisis. The PRC responded by creating the Tri-Party Repo Infrastructure Reform Task Force in 2009. The task force is now publishing its recommendations.

A key focus of the recommendations is to reduce reliance by market participants on intraday credit provided by tri-party repo agents. Other complementary recommendations are designed to foster improvements to credit and liquidity risk management practices of market participants, enhance market transparency, and decrease the likelihood and mitigate the negative effect of default by a large cash borrower.

Feedback received on this white paper from a broad range of stakeholders is intended to help FRBNY staff and others with regulatory and supervisory responsibilities to assess the recommendations and identify additional or alternative measures that should be considered.

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Appendix I: Detailed Example of a Tri-Party Repo

Appendix II: Final Report of the Tri-Party Repo Infrastructure Reform Task Force

In conjunction with the release of this white paper, the FRBNY has launched a web page devoted to tri-party repo infrastructure reform, where you will find a direct link to submit comments as well as answers to Frequently Asked Questions.

We invite you to visit it at <http://www.newyorkfed.org/banking/tpr_infr_reform.html>.

I. Introduction

As conditions in credit markets deteriorated in 2008 and 2009, weaknesses were revealed in the infrastructure supporting tri-party repurchase agreements (repos). These weaknesses had the potential to amplify instability in the financial system. To avert a collapse in confidence in the tri-party repo market, the Federal Reserve took extraordinary actions—for example, the central bank established the Primary Dealer Credit Facility (PDCF) and the Term Securities Lending Facility (TSLF) to help primary dealers meet their funding needs and provide liquidity to other market participants.¹ Although these measures were largely effective in stabilizing the tri-party repo market, they were temporary, and both facilities have since expired. Concerns about the infrastructure persist, however, and must be addressed to increase the resiliency of this critical market to future stresses.

Analysis conducted by the Federal Reserve Bank of New York (FRBNY), which is broadly consistent with observations by market participants and by other policymakers, points to three significant policy concerns associated with the design of the tri-party repo market infrastructure that left the market vulnerable to a severe disruption: (1) the market's reliance on large amounts of intraday credit made available to cash borrowers by the clearing banks that provide the operational infrastructure for these transactions, (2) the risk management practices of cash lenders and clearing banks—practices that were, with the benefit of hindsight, clearly inadequate and vulnerable to procyclical pressures, and (3) a lack of effective plans by market participants for managing the tri-party collateral of a large securities dealer in default without creating potentially destabilizing effects on the broader financial system.

In 2009, the FRBNY asked the Payments Risk Committee (PRC) to form a task force to address these FRBNY policy concerns.² The resulting Tri-Party Repo Infrastructure Reform Task Force brought

¹ See <http://www.federalreserve.gov/monetarypolicy/bst_lendingprimary.htm> for information on the PDCF and TSLF.

² The PRC is a private-sector group of senior U.S. bank officials sponsored by the FRBNY. For information on the committee and the press release announcing the formation of the task force, see <<http://www.ny.frb.org/prc>>.

together market participants to design and recommend enhancements to the tri-party infrastructure. Task force members represent the most active broker-dealers and the most active segments of cash lenders in the tri-party market as well as clearing banks and relevant industry groups. The task force met regularly to discuss potential changes to the infrastructure, defined broadly as the set of policies, procedures, and systems supporting the tri-party repo market. Members have concluded their work, and their final recommendations have been published (see Appendix II).

Although the task force was asked to focus on infrastructure weaknesses, it is clear that dealers were made vulnerable to runs on their tri-party repo financing by additional factors, such as maturity mismatches on their books, their degree of leverage, and assumptions about the durability of secured financing that proved too optimistic. Although these factors are technically beyond the scope of the task force's work, they are central to a stable tri-party repo market and it was necessary to consider them alongside the infrastructure concerns. Ultimately, infrastructure reforms in the tri-party repo market should complement broader, ongoing efforts to increase the resiliency of dealers to strained market conditions.

The FRBNY has two main objectives in publishing this white paper. First, it seeks to illuminate the policy concerns that led to the formation of the task force. Second, it invites feedback on the task force recommendations from the broad range of stakeholders in the tri-party repo market. Comments are requested on the anticipated impact of the recommendations, implementation challenges, and additional steps that could be taken to strengthen the resiliency of the infrastructure supporting this market. Responses to the questions posed in Section VI of this paper will inform implementation and contribute to the analysis of future actions to strengthen this critical market, for consideration by policymakers.

Section II of this paper defines repo market terms and describes the current market structure and its primary benefits. In Section III, we discuss the areas of concern with respect to the current design

of the tri-party repo infrastructure. Section IV introduces the task force. Section V presents some initial views on what the task force recommendations accomplish and do not accomplish as well as anticipates potential implementation challenges. We conclude in Section VI with the aforementioned questions designed to elicit feedback on the recommendations.

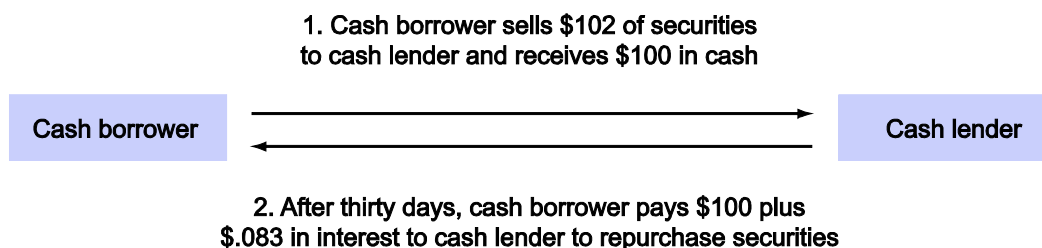
II. Repo Market Definitions and Market Overview

A repo is a sale of securities coupled with an agreement to repurchase the securities at a specified price on a later date.³ It is economically similar to a secured loan. The cash lender loans cash to a borrower and receives the borrower's securities as collateral. The proceeds of the initial securities sale can be thought of as the principal amount of the loan, and the excess paid by the cash borrower to repurchase the securities corresponds to the interest paid on the loan, also known as the repo rate. The difference between the amount of cash loaned and the value of the collateral posted is called the "haircut" or "margin," and it functions as a buffer for the lender against short-term variations in the value of the collateral. Figure 1 illustrates a simple bilateral repo transaction.

Figure 1

A Bilateral Repo Transaction

\$100 Repo at 1% Repo Rate and 2% Haircut for Thirty Days



³ For a discussion, see <<http://www.newyorkfed.org/research/epr/06v12n1/0605garb.html>>.

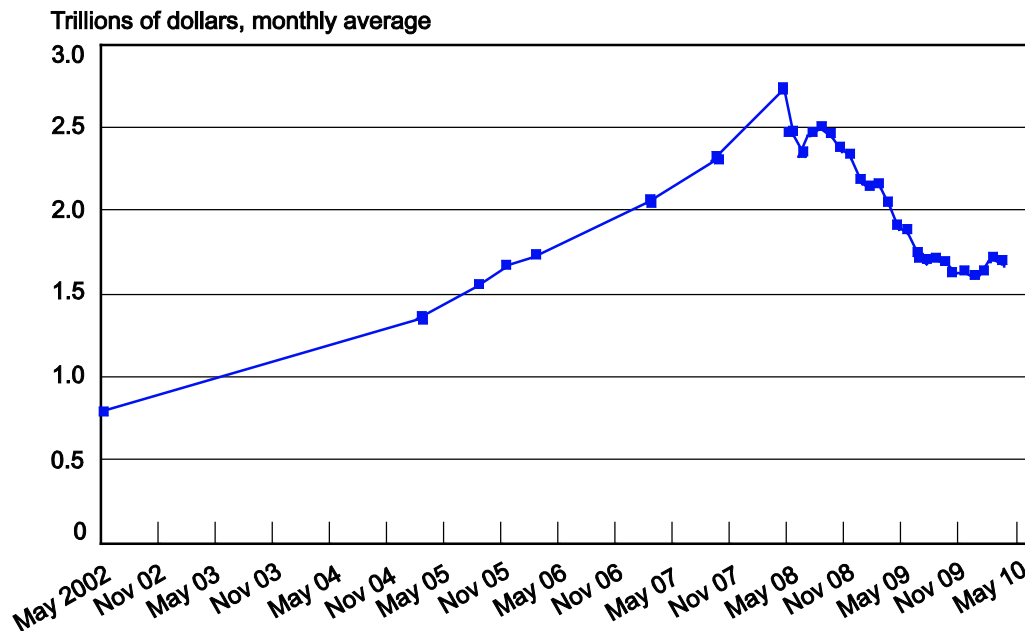
Tri-party repo transactions are similar to bilateral repo transactions, but a third party, the tri-party agent, participates in the transaction along with the cash borrower and the cash lender or investor. Cash lenders—primarily money market mutual funds, custodial banks investing cash collateral on behalf of their securities lending clients, and other asset managers—have funds that they are willing to lend against collateral. Cash borrowers, typically fixed-income securities broker-dealers, seek to finance securities that can be used as collateral. Cash lenders use tri-party repos as investments that offer liquidity maximization, principal protection, and a small positive return, while cash borrowers rely on them as a major source of short-term funding. The tri-party agent facilitates transactions by providing operational services, such as custody of securities, settlement of cash and securities, valuation of collateral, and optimization tools to allocate collateral efficiently. In the U.S. market, government securities clearing banks serve as tri-party agents; in addition to providing operational services, the agents extend large amounts of intraday credit to dealers to enable them to meet delivery obligations on securities financed in tri-party repos. The role of the clearing bank is explained in more detail in the “Current Practices and Infrastructure” discussion.

Tri-party repos are the most prevalent form of repo contract in the United States. Broker-dealers obtain a significant portion of financing for their own and their clients’ securities inventories through the market. During first-quarter 2010, the value of securities financed by tri-party repos averaged \$1.7 trillion.⁴ The size of the market has declined notably since the peak of about \$2.8 trillion in early 2008. Figure 2 shows the growth of tri-party repo transactions over the past eight years.

⁴ Federal Reserve Bank of New York calculations, based on data from The Bank of New York Mellon and JPMorgan Chase.

Figure 2
Growth of Tri-Party Repo Market

Aggregate Value of Market



Sources: The Bank of New York Mellon; JPMorgan Chase.

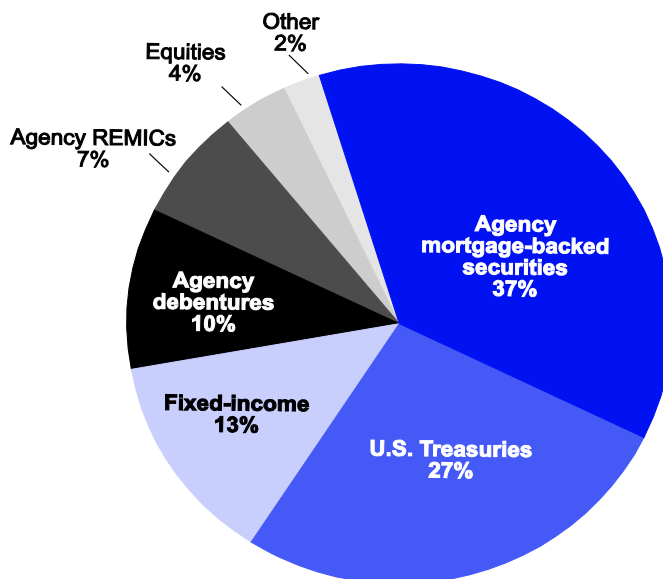
Notes: Limited data were provided by clearing banks prior to April 2008. The figure reflects the data provided, indicated by the markers, and the smoothed trend line between them.

Activity in the tri-party repo market is highly concentrated: the top ten cash borrowers account for approximately 85 percent of the value of tri-party repo securities being financed, and the top ten cash investors provide about 65 percent of the funds invested.⁵ The largest individual borrowers routinely finance more than \$100 billion in securities through these transactions. At the peak of market activity, the largest dealer positions exceeded \$400 billion. While the value of the largest portfolios has declined, it remains significant, at more than \$200 billion. The largest cash investors individually provide more than \$100 billion in tri-party repo financing daily.

⁵ Here, “investor” refers to a single firm. A single firm can include the securities lending division of a bank as well as the asset management division. Similarly, a money market mutual fund complex, considered a single investor here, may represent many separate funds under a single management umbrella.

The collateral used to secure tri-party repos consists largely of U.S. Treasuries and agency mortgage-backed securities and debentures.⁶ As of first-quarter 2010, this type of collateral represented slightly more than 80 percent of all collateral in the tri-party market. Other assets financed through tri-party repos include fixed-income securities and equities on deposit at the Depository Trust & Clearing Corporation (DTCC) as well as whole loans (currently less than 1 percent of assets financed).⁷ These asset types are primarily, but not exclusively, investment-grade securities. Some are materially less liquid than traditional government and agency securities. At the market’s peak in early 2008, this type of collateral made up nearly 30 percent of the total.⁸ Figure 3 presents the breakdown of tri-party repo market collateral at March 31, 2010.

Figure 3
Breakdown of U.S. Tri-Party Repo Market Collateral
 2010:Q1



Sources: The Bank of New York Mellon; JPMorgan Chase.
 Note: REMICs are real estate mortgage investment conduits.

⁶ “Agency” here refers to securities issued by Fannie Mae, Federal Home Loan Mortgage Corporation (FHLMC) securities, and securities guaranteed by the Government National Mortgage Association (Ginnie Mae).

⁷ DTCC fixed-income assets include corporate bonds, asset-backed securities, money market instruments, private-label collateralized mortgage obligations, and municipal bonds. For more information, see <<http://www.dtcc.com/about/business/>>.

⁸ Since the start of the financial crisis, the value of non-Treasury, non-agency collateral financed in the tri-party repo market has declined by more than \$600 billion, as dealers deleveraged their balance sheets and investors became less willing to accept nontraditional, less liquid collateral to secure their tri-party investments.

Current Practices and Infrastructure

According to current operational practices, a cash lender and a cash borrower arrange their tri-party repo transactions bilaterally in the morning, agreeing on the tenor of the repo, the amount of cash provided, the value of the collateral provided, and the repo rate, among other parameters. The actual securities used as collateral are assigned later by the tri-party agent (or, in some cases, by the cash borrower), such that they meet the schedule of acceptable collateral specified by the cash lender. After the terms of the transaction are agreed upon, the dealer notifies its clearing bank. In some cases, only the very basic terms of the repo are communicated. (A typical repo “day” is illustrated in Figure 4, on page 11. A detailed example of a tri-party repo transaction, related processes, and risk ramifications can be found in Appendix I.)

Late in the day, the clearing bank, adhering to the terms of the transaction provided by the borrower, settles the repos by simultaneously transferring collateral and cash between the borrower’s and lender’s cash and securities accounts at the clearing bank. In other words, securities are moved from the borrower’s securities account to the lender’s securities account and the corresponding cash amounts are transferred from the lender’s cash account to the borrower’s cash account; this process “locks” the borrower’s securities in the lender’s account. A dealer allocates specific securities to each transaction using its clearing bank’s or its own collateral optimization engine, as constrained by the schedule of acceptable collateral. Overnight, the lender holds the collateral, which exceeds the value of the cash loan by the value of the haircut, to offset the risk that the borrower will not be able to return the appropriate amount of cash the following day.

Prior to 8:30 a.m. each day, the clearing bank extends credit to each dealer and returns the securities that were pledged as collateral so that the dealer can deliver any securities that are sold to

buyers.⁹ This process of returning the collateral to the dealer is referred to as “unwinding” the repo, and it generally applies to all repo transactions, even those term transactions not maturing that day. The unwinding each morning creates an overdraft in the dealer’s cash account at its clearing bank when the clearing bank returns the repo collateral to the dealer and returns the cash borrowed by the dealer to the lender’s demand deposit account. Once their cash is returned through the unwinding, the majority of cash lenders elect to leave the cash in uncollateralized demand deposit accounts at the clearing banks, because most of this cash is typically reinvested at the end of the day.

Throughout the business day, broker-dealers buy and sell securities for their own and their client-owned positions. These securities are delivered into and out of the dealer’s securities account at its clearing bank.¹⁰ Concurrently, the dealer’s cash account at the clearing bank is adjusted for the offsetting cash transactions. Because dealers typically do not have sufficient cash balances at their clearing bank to pay for their securities purchases during the day, the clearing bank extends intraday credit to the dealer and takes a lien on the dealer’s security as collateral.

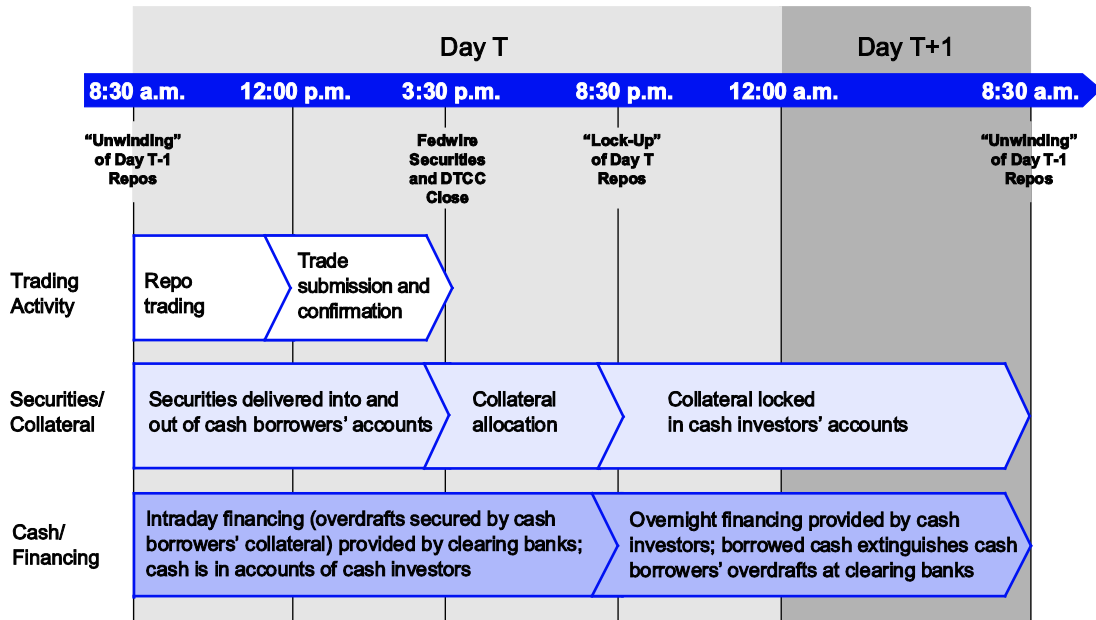
The intraday overdraft, which remains in place between the morning unwinding and the end-of-day lock-up, or “rewinding,” imposes on the clearing bank a credit exposure to the dealer that is collateralized by the securities in the dealer’s account. Dealers use the cash they receive from lenders at the end of the day to extinguish these overdrafts.

⁹ Deliveries can be made by book-entry if both the buyer and seller have securities accounts at the same clearing bank, or made via Fedwire to a custodial account at another depository institution.

¹⁰ Broker-dealers do not have access to central bank credit and are not direct participants in Fedwire. As a result, they rely on clearing banks—which have such access—to provide both the credit and operational infrastructure required to support their securities clearing and settlement activities.

Figure 4

Key Elements of Current Daily Repo Process



Note: Timeframes are approximate.

Benefits of Tri-Party Repos

Compared with other types of repurchase agreements, tri-party repos offer a number of advantages that have contributed to their growing use over the years. First, tri-party repo transactions settle via book-entries at a clearing bank, whereas "deliver-out" repos settle by transferring government securities from a cash borrower to a cash lender, and then returning them the next day, over the Federal Reserve's Fedwire Securities Service or the Fixed Income Clearing Corporation. The settlement of tri-party repo transactions internally on the books of a borrower's clearing bank reduces counterparties' transaction costs and operational burdens (such as the need for cash investors to maintain a processing infrastructure), which become significant when many small-denomination securities are used to collateralize the repos. Second, tri-party repo services give borrowers greater flexibility in allocating collateral. Each lender specifies the general types of securities that are acceptable repo collateral. The

clearing bank must then allocate a dealer's available securities; it accomplishes this by optimizing the allocations to the many cash lenders that a dealer has lined up. Third, settlement of new tri-party repo transactions (as well as the recreation of term repos) occurs late in the afternoon, after the close of Fedwire Securities. Late-afternoon settlement gives dealers a better chance of obtaining repo financing for securities that were delivered to them during the afternoon. Investors benefit as well, from a greater opportunity to find a short-term investment for surplus cash that becomes available late in the day.

III. How Tri-Party Repo Infrastructure Arrangements Propagate Systemic Risk

As the financial condition of dealers deteriorated and collateral valuations became uncertain, weaknesses in the policies, procedures, and systems supporting the tri-party repo market were exposed. Given the magnitude of the exposures generated and the vital importance of this market to dealer funding, a breakdown in the tri-party market had the potential to destabilize the financial system. On March 17, 2008, in the wake of the Bear Stearns collapse, the Federal Reserve Board took the extraordinary action of creating the Primary Dealer Credit Facility relying on emergency lending authorities under section 13(3) of the Federal Reserve Act.¹¹ The PDCF permitted broker-dealers, which do not have access to the Federal Reserve's discount window, to obtain short-term collateralized loans through this temporary lending facility.¹² The PDCF was intended to preserve market stability by providing emergency liquidity when financing was no longer available from cash lenders and other private sources.

¹¹ The PDCF was created under section 13(3) of the Federal Reserve Act, which requires that the Federal Reserve Board make a finding of "unusual and exigent" circumstances. For additional analysis of the market stress that led to the facility's creation, see <http://www.newyorkfed.org/research/current_issues/ci15-4.html>.

¹² Concerns about the lack of access by money market mutual funds to emergency liquidity motivated the creation of two other Federal Reserve programs, the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility and the Money Market Investor Funding Facility. Information on all the Federal Reserve's liquidity facilities is available at <<http://www.federalreserve.gov/monetarypolicy/bst.htm>>. The Federal Reserve provides loans to depository institutions through the discount window. For more information, see <<http://www.frbdiscountwindow.org>>.

While market conditions have improved—and, as a result, the PDCF was allowed to expire—concerns about the existing infrastructure arrangements remain. The three fundamental areas of concern are the reliance of broker-dealers on intraday credit from tri-party clearing banks, risk management practices that are vulnerable to procyclical pressures, and the lack of effective and transparent methods to manage the liquidation of a defaulted broker-dealer’s collateral.

Market dependence on intraday credit. The market’s dependence on a substantial amount of intraday credit supplied by the clearing banks to facilitate the clearing and settlement of securities creates the potential for two important destabilizing outcomes. First, the daily hand-off of credit extensions between overnight cash lenders and clearing banks creates an incentive for each to reduce its exposure quickly by pulling away from a potentially troubled dealer before the other one does. Indeed, as dealers came under severe stress, clearing banks reconsidered their longstanding practice of routinely extending intraday credit, as they recognized the potential risk it posed to them. In the event of an intraday default, a clearing bank would have to take the dealer’s entire portfolio onto its balance sheet. This could affect the financial health of the clearing bank because its intraday exposures are large relative to its capital. At the same time, a sudden withdrawal of intraday credit would have significant ramifications. If the dealer did not find an alternative source of funding for its securities, a sudden withdrawal would trigger a default. As a result, cash investors would be faced with the dual challenge of trying to liquidate collateral without incurring losses while also addressing their own liquidity needs. To avoid credit losses and liquidity pressures, they could withdraw funding more broadly—potentially jeopardizing the ability of the remaining dealers to finance their securities. Generally speaking, the expectation of liquidity perpetuated by the daily unwinding of repos may lead cash lenders to underestimate their credit and liquidity risks, which could leave gaps in their contingency plans for responding to an actual dealer default.

Second, another longstanding concern—rooted in the clearing bank practice of extending large amounts of intraday credit to dealers—involves the loss of confidence in a clearing bank. A loss of confidence could disrupt funding to a large segment of the dealer community if investors became concerned about the safety of holding their cash deposits at the clearing bank (resulting from the daily unwinding of repos).¹³

Risk management practices. Risk management practices may have exacerbated the pressure on dealers during the credit crisis. During normal times, competitive dynamics and an abundance of market liquidity led investors and clearing banks to adopt liberal policies on collateral eligibility, the size and concentration of portfolios, and haircuts. During times of financial stress, the desire by investors and clearing banks to protect themselves can lead to sudden withdrawals of credit or sharp increases in margins and haircuts.

Lack of effective and transparent plans to support orderly liquidation of a defaulted dealer's collateral. When they were faced with the prospect of counterparty default, it became apparent that neither clearing banks nor lenders were well prepared to conduct an orderly liquidation of a large dealer's tri-party repo collateral. Either group would face challenges with respect to operational arrangements, sources of liquidity during a (potentially lengthy) liquidation period, and the impact of distressed asset prices on their own balance sheets. The lenders and clearing banks both believed that, in the event of an imminent dealer default, each could withdraw credit before the other. Under existing practices, a clearing bank would have a lien on the securities backing the intraday extension of credit if a borrower failed during the day. Lenders, however, would have to liquidate the collateral if the failure occurred at night. Without transparent procedures and increased clarity concerning the rules that would apply to all market participants during such an event, the failure of one cash borrower could lead to a

¹³ The industry effort to create what became known as “New Bank” to replace a troubled clearing bank was intended to address this problem. New Bank was not fully implemented, however. Work was suspended in 2008 in anticipation of the need for more fundamental infrastructure reforms.

loss of confidence in the market itself. This, in turn, could lead investors to withdraw their repo funding en masse or clearing banks to discontinue all provision of intraday credit, thus affecting tri-party borrowers more broadly.

Furthermore, an uncoordinated liquidation of potentially hundreds of billions of dollars in collateral could create “fire-sale” conditions as collateral is sold into a stressed environment. Investors could realize significant losses during the liquidation, while much lower asset prices observed during the fire-sale conditions could further tighten liquidity pressure on the remaining, otherwise healthy, dealers.

IV. The Tri-Party Repo Infrastructure Reform Task Force

The PRC, at the request of the FRBNY, formed a task force to address the FRBNY policy concerns described above. Members of the Tri-Party Repo Infrastructure Reform Task Force represent major tri-party repo market participants and service providers as well as relevant industry groups. Market participants represent the most active broker-dealers and the most active segments of cash lenders in the tri-party repo market.

Recognizing that it would not be practical for all market participants and stakeholders to contribute directly to the process, the task force took measures to make its work transparent and to encourage inclusiveness. In December 2009, task force members published an interim report on their work and highlighted draft recommendations.¹⁴ To engage a broader range of market participants in the dialogue, the task force hosted a workshop in February 2010 to present its ideas. Work concluded on May 17, 2010, with publication of the final task force recommendations (Appendix II). To enable other stakeholders not participating in the task force to provide input, the FRBNY is seeking comments on this analysis and the task force’s final recommendations.

¹⁴ See <http://www.ny.frb.org/prc/report_091222.pdf> for the full interim report.

The key element of the task force recommendations is to reduce reliance by market participants on intraday credit provided by tri-party repo agents. Other complementary recommendations are designed to foster improvements to credit and liquidity risk management practices of market participants, enhance market transparency, and decrease the likelihood and mitigate the negative effect of default by a large cash borrower.

V. The FRBNY's Comments on the Task Force Recommendations

The FRBNY commends the Tri-Party Repo Infrastructure Reform Task Force for its efforts to address the policy concerns relating to current market practices and infrastructure.

These recommendations, when implemented, should help reduce the potential for problems at one firm to spill over to others, clarify the credit and liquidity risks borne by market participants, and better equip market participants with the tools to manage these risks appropriately. Specifically, the recommendations—by reducing the amount of intraday credit provided by clearing banks and eliminating the wholesale daily unwinding of all tri-party repo trades—should minimize two important channels through which a problem at one firm could affect others. First, a clearing bank's exposure to its own clients should be reduced to a manageable level. Second, the tri-party repo market should be more resilient to concerns about the financial well-being of a clearing bank, because cash investors will have secured exposures to their counterparties instead of unsecured exposures to a clearing bank during the day.

The proposed elimination of the practice of unwinding all tri-party repos each morning will also highlight the credit and liquidity risks borne by cash investors—making it clear that an investor's ability to withdraw funding and receive cash from a troubled borrower is linked to that borrower's ability to secure another source of funding. The complementary recommendations to create increased

transparency regarding the size and composition of borrower portfolios will better equip cash investors to understand the conditions they would face in a liquidation.

However, the task force recommendations do not address all areas of concern in the tri-party repo market. For example, the steps proposed to increase cash investors' preparedness for the sudden failure of a large dealer do not directly address concerns that such failure could prompt the simultaneous liquidation of large amounts of assets and create fire-sale conditions. The task force report discusses several alternatives that were considered but ultimately failed to gain broad support. While fire-sale concerns are not unique to this market, it should be noted that the significant value of assets financed by individual dealers and the short-term liquidity needs of tri-party repo cash lenders make this issue particularly relevant to the tri-party repo market. Regulators and market participants will need to continue to explore options to assess the level of risk this poses to financial stability and to seek appropriate solutions to mitigate this risk.

In addition, the recommendations will not materially alter the propensity of cash investors to run from a troubled dealer—in fact, they may withdraw funding from a troubled counterparty sooner because of increased awareness of the risk of having to accept collateral in lieu of cash in the event of default. As a result, dealers will need to recognize and accommodate this lack of durability of secured financing in their liquidity contingency planning and regulators will want to ensure that dealers' plans take these vulnerabilities into consideration. This is likely to increase dealer funding costs—particularly for assets that are not highly liquid.

The task force recommendations are ambitious and will require a focused and sustained effort by market participants and clearing banks to achieve their objectives. To eliminate reliance on intraday credit, clearing banks will need to develop systems to support robust collateral substitution, and other market participants will need to make fundamental changes to their business practices and process flows.

It is expected that the heads of the most active firms in the tri-party repo market will make a formal commitment to implement needed enhancements to tri-party repo infrastructure in a timely manner, including those initiatives described in the task force report. Additionally, the FRBNY will engage the primary regulators of clearing banks and major market participants to incorporate the enhancements into rules and supervisory plans, as appropriate.

In conclusion, the tri-party repo market and short-term funding markets will continue to evolve as broader regulatory reforms take shape, and enhancements to infrastructure—such as those proposed by the task force—are implemented. Because it is not possible to anticipate the full impact of these combined forces, it will be imperative to monitor the evolution of the tri-party repo and other short-term funding markets closely. The FRBNY intends to take additional actions, as necessary, to promote the safety and soundness of the market participants under its direct supervision and, working closely with other regulatory and supervisory authorities, to support the stability and resilience of financial markets more broadly.

VI. Questions for Comment

The FRBNY invites comment on all aspects of the proposed recommendations of the Tri-Party Repo Infrastructure Reform Task Force, as well as on the policy concerns described in this paper. The questions below are designed to encourage meaningful discussion and thoughtful analysis of the issues and to help us assess the task force recommendations. Responses to the questions will inform the next steps toward the implementation of specific enhancements and will contribute to the analysis of future actions considered by the FRBNY. Comments received will be made public on our website.

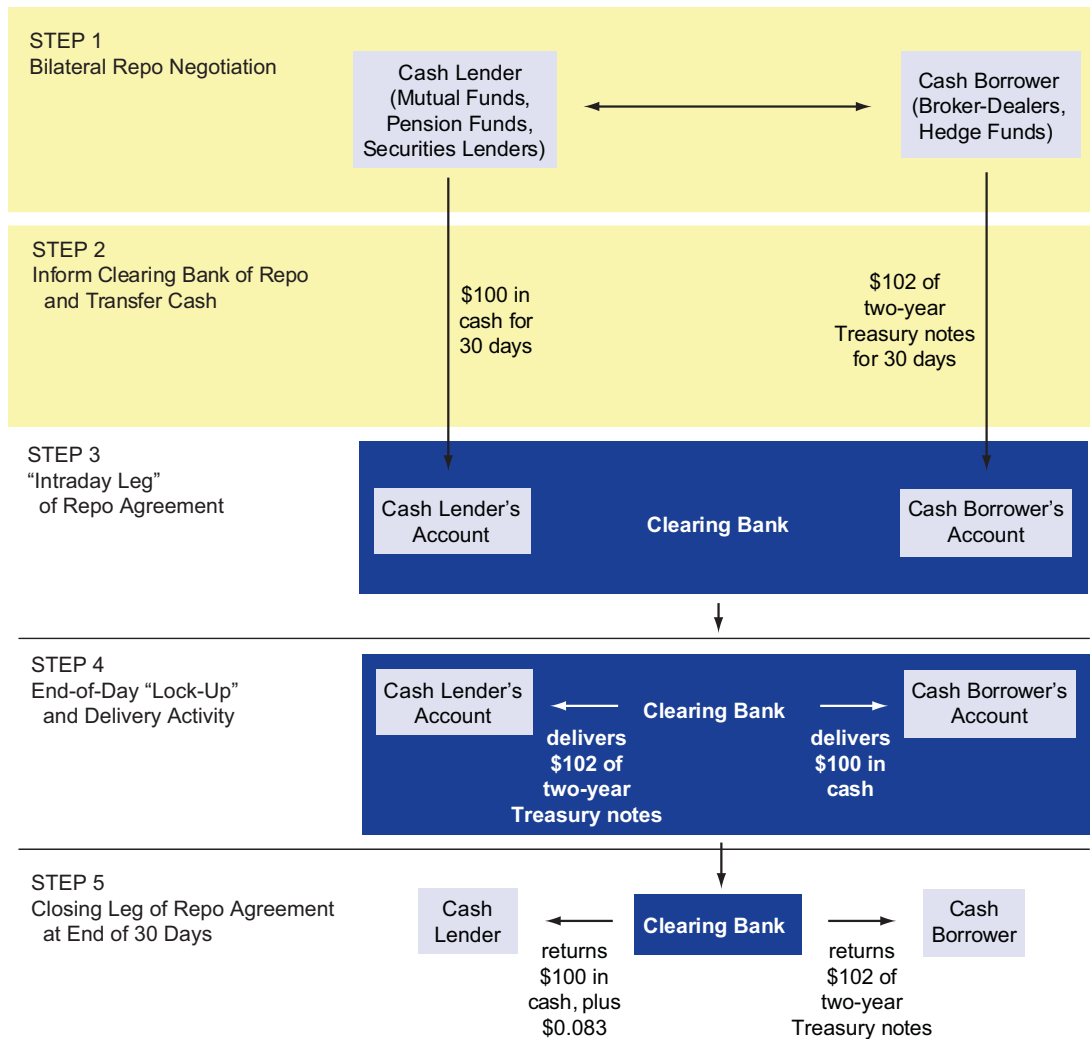
Please e-mail all responses by June 16, 2010 to: TPR.Reform@ny.frb.org.

1. Have the sources of systemic risk in the tri-party repo market been identified correctly? What additional vulnerabilities or material risks should be considered in evaluating the need for reforms in this critical market?
2. Are the recommendations proposed by the task force appropriate and adequate to address the policy concerns articulated in this paper?
 - a) Please comment on specific recommendations that you think are most likely to be effective.
 - b) Please comment on specific recommendations that you believe will not be effective.
 - c) Please comment on specific recommendations that you believe may have unintended consequences.
 - d) Are there additional specific measures within the general approach proposed in the task force report that should be considered?
3. Are the task force recommendations, including targets for reduction of intraday credit extension by clearing banks, achievable in the timeframes outlined? What barriers or challenges to implementation do you anticipate?
4. What business impact do you anticipate from the recommendations? For example, what impact would you expect this series of reforms to have on the structure, volumes, collateral, or other parameters of the tri-party repo market?
5. Considering a dealer default scenario, what additional measures should be considered to address concerns regarding potential liquidity pressures on cash lenders and surviving dealers, and the potential for fire-sale conditions?
6. What measures could be taken to reduce the likelihood of cash lenders running from a troubled dealer?
 - a) Are there ways to increase a lender's ability to effectively deal with a scenario in which it must accept collateral in lieu of cash following a dealer default?
7. What other approaches to assessing and mitigating systemic risk in tri-party repo business arrangements should the Federal Reserve or industry leaders consider?
 - a) For example, would implementation of a central counterparty be desirable in this market? If so, what specific features of a central counterparty would be most desirable, and why?

Appendix I

Detailed Example of a Tri-Party Repo

Detailed Example of a Tri-Party Repo



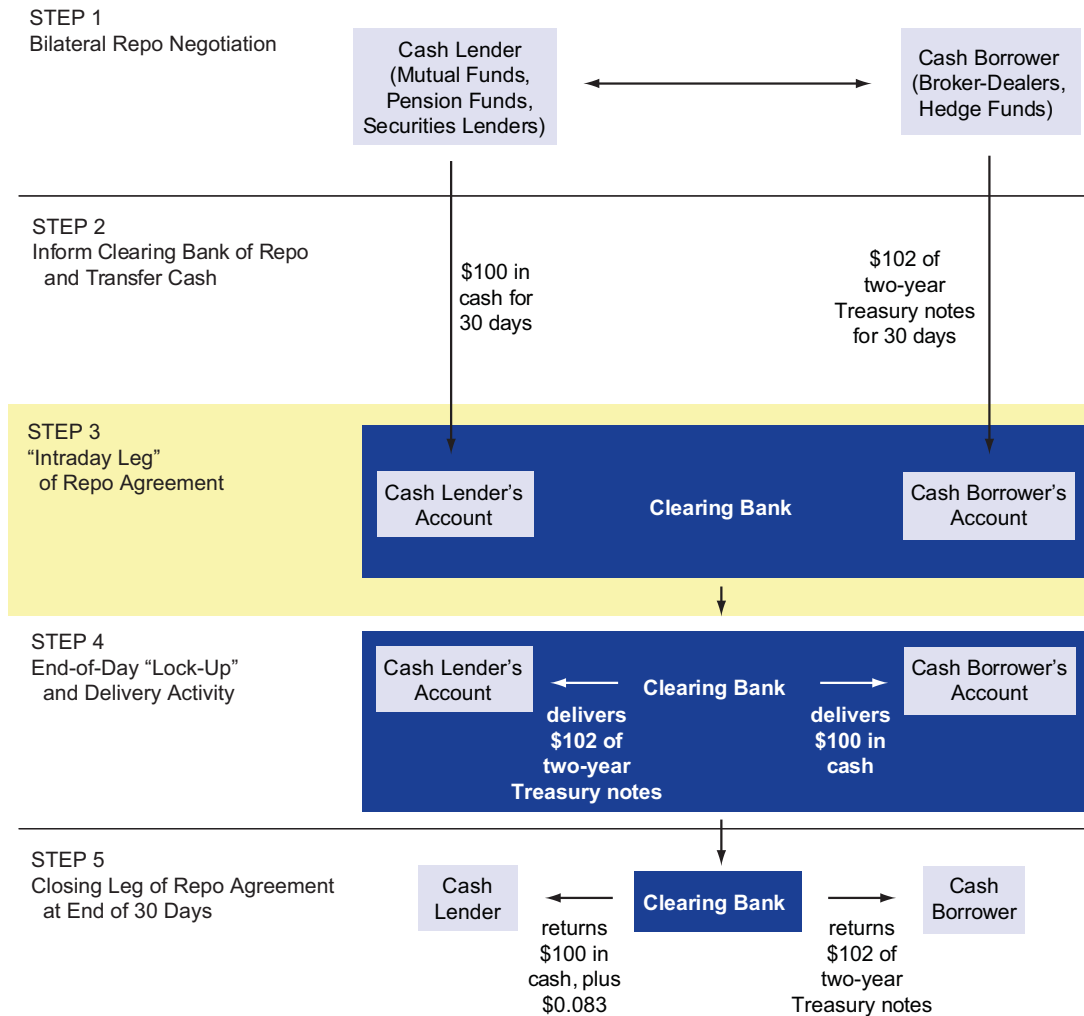
STEP 1 Bilateral Repo Negotiation

- Cash borrower, seeking short-term funding to finance portions of its inventory, negotiates with cash lenders, creating a repo collateralized by borrower's securities.
- Both parties agree on repo terms:
 - a) amount to be lent: \$100
 - b) margin (haircut on collateral): 2% (= \$2)
 - a) + b) = value of collateral provided: (\$100 + \$2)
 - c) repo term commitment: 30 days
 - d) repo rate (cost of borrowing cash): 1%
 - e) acceptable collateral: two-year Treasury notes

STEP 2 Inform Clearing Bank of Repo and Transfer Cash

- Cash borrower informs its clearing bank of repo.
- Cash lender sends loan amount to cash borrower's clearing bank.
- Cash borrower authorizes allocation of collateral from clearing bank account.

Detailed Example of a Tri-Party Repo



STEP 3 "Intraday Leg" of Repo Agreement

- **Daily "Unwinding"**: At 8:30 a.m., all repos, regardless of maturity, are "unwound" by clearing banks to provide intraday credit to cash borrowers.
- Credit allows cash borrowers to settle buy-sell transactions throughout day.

- **Intraday Credit Calculation**: Amount of allowable credit is discretionary, but generally based on a daily calculation:

Cash Lender's Account¹

\$100 in cash

Cash Borrower's Account¹

\$102 in two-year Treasury notes

\$0 cash balance

3% clearing bank margin

Allowable Intraday Credit

Cash Borrower Total Collateral + Cash Borrower

Total Cash Balance - Clearing Bank Margin:

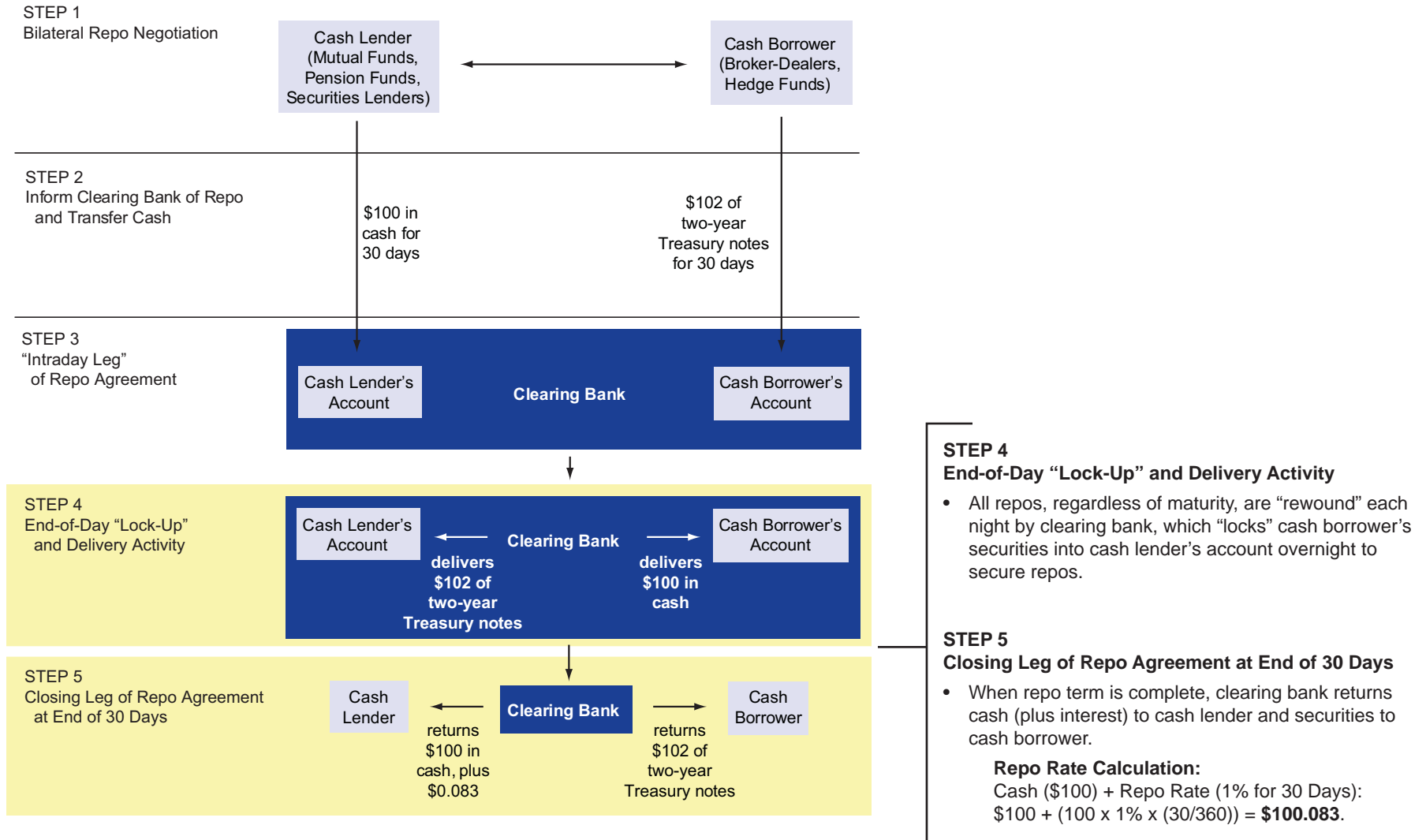
$\$102 + \$0 - (\$102 \times 3\%) = \mathbf{\$98.94}$.

- **Intraday Risks**

- **Clearing Bank** has secured exposure to cash borrower for intraday credit extended.
- **Cash Lender** has unsecured exposure to clearing bank for cash left in its account at bank.
- **Cash Borrower** is vulnerable to change in discretionary amount of intraday received and to disruption to trading/settlement if clearing bank fails.

¹ For simplicity, we assume that participants have only one repo and no other balances at clearing bank.

Detailed Example of a Tri-Party Repo



Appendix II

Tri-Party Repo Infrastructure Reform Task Force Report

Task Force on Tri-Party Repo Infrastructure

Payments Risk Committee

Report

May 17, 2010

The Task Force on Tri-Party Repo Infrastructure was formed in September 2009 under the auspices of the Payments Risk Committee, a private sector body sponsored by the Federal Reserve Bank of New York. The Task Force membership includes representatives from multiple types of market participants that participate in the tri-party repo market, as well as relevant industry associations. Federal Reserve and SEC staff participated in meetings of the Task Force as observers and technical advisors.

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Section 1: Introduction and Summary

In the fall of 2009, to address the systemic risk that had become evident during the financial crisis, the Federal Reserve asked market participants to review and make recommendations regarding opportunities for improvement to the tri-party repo infrastructure.

The Task Force on Tri-Party Repo Infrastructure was formed and this Report contains its findings and recommendations. The Report and the work underlying it have been developed through the joint effort of a large number of market participants, representing multiple types of financial institutions that participate in the tri-party repo market. The work of the Task Force was the subject of a workshop in February 2010 attended by representatives from more than 100 different organizations.

Federal Reserve and SEC staff attended Task Force meetings and provided clarification of relevant policy concerns and positions. However, it is important to make clear that the conclusions of the Task Force are its own. No endorsement of its conclusions has been sought or received from any regulatory authority. The Task Force is aware of and supports the Federal Reserve's simultaneous issuance of a White Paper that provides its perspective on the issues covered in the Task Force Report and requests public comment.

It is important to emphasize that the tri-party repo market and the markets for the underlying collateral are dynamic. Task Force members are committed to ongoing industry assessment of the issues addressed in this Report.

Description of Tri-Party Repo Market

The tri-party repo market is large and important, but not very well understood. It represents a significant part of the overall U.S. repo market, in which market participants obtain financing against collateral and their counterparties invest cash secured by that collateral. Large U.S. securities firms and bank securities affiliates finance a large portion of their fixed income securities inventories, as well as some equity securities, via the tri-party repo market. This market also provides a variety of types of investors with the ability to manage cash balances by investing in a secured product. The "tri-party" label refers to repo transactions that settle entirely on the books of one of two "Clearing Banks" in the U.S. market: Bank of New York Mellon (BNYM) and JP Morgan Chase (JPMC). The Clearing Bank is thus a third party involved in the repo transaction between a "Dealer" (party, not necessarily a Broker-Dealer, borrowing cash against securities collateral) and a "Cash Investor" (party lending cash against securities collateral).¹

The attractiveness of the tri-party repo market is driven by the treatment of repurchase transactions in bankruptcy, the use of securities as collateral (including daily margining and haircuts), and the custodian services of the Clearing Banks which provide protections that do not exist for bilateral repo investors or unsecured creditors. As a result, the U.S. repo market contributes significantly to the liquidity and efficiency of the U.S. Treasury and Agency (including Agency MBS) securities markets, which collectively make up approximately 75% of the total collateral in the U.S. repo market. The importance of the U.S. repo market is underscored by the fact that it is the market in which the Federal Reserve operationally implements U.S. monetary policy.

The tri-party repo structure developed in the mid 1980s in response to the desire by Cash Investors to have collateral held by a third-party agent. The tri-party market continued to grow as the Clearing Banks invested in infrastructure advancements that allowed Dealers and Cash Investors to optimize their use of the platform. At peak levels in 2008, over \$2.8 trillion in securities were being financed through the U.S. tri-party repo market. The U.S. repo market in general and the tri-party repo market in particular have provided important benefits (e.g. flexibility and reduced funding costs due to credit protections and operational efficiencies) to the financial system

¹ For clarity and consistency, this Report uses the capitalized terms "Clearing Bank", "Dealer", and "Cash Investor" throughout the Report to refer to these three parties to a tri-party repo transaction.

and have helped to reduce the cost of borrowing for the U.S. Treasury, thereby lowering debt-service costs borne by taxpayers.²

At several points during the financial crisis of 2007-2009, the tri-party repo market took on particular importance in relation to the failures and near-failures of Countrywide Securities, Bear Stearns, and Lehman Brothers. The potential for the tri-party repo market to cease functioning, with impacts to securities firms, money market mutual funds, major banks involved in payment and settlements globally, and even to the liquidity of the U.S. Treasury and Agency securities, has been cited by policy makers as a key concern behind aggressive interventions to contain the financial crisis.

Summary of Recommendations

Based on its analysis, the Task Force identified the following areas where improvements are needed:

- Operational Arrangements – Largely to obtain operational efficiencies, current arrangements – including the “daily unwind” of all transactions regardless of term – require massive amounts of intraday credit to be provided by the two Clearing Banks. The lack of clear understanding concerning the ultimate allocation of credit and liquidity risks among repo market participants weakened incentives to manage and constrain those risks.
- Dealer Liquidity Risk Management – Some Dealers did not properly anticipate the potential for secured financing to be unavailable, even for high quality collateral. Some Dealers became excessively reliant on short-term repo financing, especially in regard to collateral types that were or became illiquid and subject to valuation uncertainty, contributing to greater leverage in the system.
- Margining Practices – Market participants in many cases did not anticipate the extent to which market conditions could worsen and did not set margins accordingly, leading to pro-cyclical increases in those margins when conditions did worsen during the crisis. Most Cash Investors did not anticipate the potential for losses as collateral prices declined.
- Contingency Planning – In many cases, Cash Investors were unprepared to cope with the consequences of a Dealer default, in particular the potential need to manage and liquidate collateral securing a defaulted repo position. In some cases, Cash Investors financed assets that they would not normally hold outright.
- Transparency – There was insufficient transparency with respect to many aspects of the tri-party market, including its aggregate size and composition, the extent of concentrations, and typical levels of margin. This contributed to the build-up of exposures and the lack of prior concerted action to address the issues identified in this Report.

The detailed recommendations contained in the main body of the Report address all of these areas.

Operational Arrangements

First and foremost, the Task Force has focused on the specific actions needed to fundamentally strengthen the operational arrangements at the heart of the tri-party repo market. These actions are necessary to reduce the market’s reliance on intraday credit provided by the Clearing Banks and clarify the credit and liquidity risks borne by market participants. Substantial effort has been undertaken to identify the precise steps necessary and the key dependencies involved. Tangible steps have been taken and intraday exposures are lower than at the outset of the Task Force’s work. The percentage of tri-party repo trades unwound on a daily basis decreased an average of

² Benefits of the tri-party repo market are discussed in the FRBNY White Paper on the Tri-Party Repo Infrastructure Reform Task Force.

10% from September 2009 to March 2010.³

The Task Force believes that the objective should be the “practical elimination” of intraday credit provided by the Clearing Banks, defined by the Task Force as a point beyond which the residual amounts of intraday credit extensions are both small and can be governed by transparent bilateral arrangements, known in advance to participants. The key operational advancement needed to achieve this objective is “auto-substitution”, which will allow for the automated substitution of securities collateral supporting a tri-party repo transaction, while that transaction remains in place. Both Clearing Banks have committed to implement this functionality by February 2011. The Task Force believes achievement of the “practical elimination” objective can and should be achieved within six months following the implementation of “auto-substitution”, implying a target date of mid-year 2011.

Alongside this effort to radically reduce the amount of intraday credit provided by Clearing Banks, the Task Force believes it is critical to reinforce that Cash Investors are “at risk” if their repo counterparty defaults. Clarity in this respect helps to ensure strong incentives to mitigate risks and to undertake appropriate contingency planning.

Dealer Liquidity Risk Management

Tri-party repo activity must be an essential focus for liquidity risk management. Dealers should not assume that secured financing is inherently stable. Since Cash Investors are “at risk” if the Dealer defaults, Dealers should realize that some Cash Investors may reduce and/or eliminate funding as the credit quality of the Dealer deteriorates, despite the existence of collateral. As such, Dealers should account for the loss of secured funding within their liquidity risk management plans and liquidity stress tests. Dealer liquidity buffers should be sized accordingly. Had such an approach been in place consistently across the industry during the crisis, it is much more likely that illiquid collateral would have been matched by a corresponding liquidity buffer, limiting the potential systemic impact of the loss of that financing.

In addition, Dealers should lengthen and stagger the maturity profile of their financing, seek to combine short-term and long-term financing with the same counterparty and should continue exploring alternative mechanisms that may be able to achieve more durable financing of certain types of securities. The Task Force supports the increased emphasis on liquidity risk management by supervisors and regulators.

These recommendations on liquidity risk management echo those of many other reports and papers analyzing aspects of the financial crisis. The Task Force believes that the recommendations in this area have particular relevance for tri-party repo transactions.

Margining Practices

Margining practices must be broadly strengthened in the wake of the crisis. The Report outlines a number of margining best practices but stops short of recommending one specific approach. Market participants should undertake statistical analysis and stress testing of collateral price movements that allows them to assess the potential for losses at different levels of margins and to make decisions based on their appetite and capacity to absorb losses. Cash Investors should seek information that allows them to assess the potential concentration of repo counterparties with respect to a particular type of security; where such information is not forthcoming, they should use aggregate market information and/or make conservative inferences.

Margin pro-cyclicality refers to the process by which margin levels are reduced in good times and increased in bad times. Pro-cyclicality cannot be fully eliminated, since quantitative measures used to guide margin levels fluctuate over time. Nevertheless, improvements can be made. The approach to margining should be understood across market participants. Margin agreements should avoid precipitous and unanticipated increases in margins. Margins should be set in accordance with regulatory liquidity risk management and margin risk management standards. The regular publication of margin levels in the tri-party repo market and qualitative surveys of credit

³ Figures are based on aggregates provided by the Clearing Banks.

terms, as proposed in a recent BIS report on margin requirements and haircuts, can aid market participants in setting appropriate margin levels.

Contingency Planning

Cash Investors should develop “liquidation plans” for the management and liquidation of repo collateral in the event of a Dealer default. These plans should cover both practical aspects such as custodial arrangements, as well as stress tests of potential losses due to collateral price movements and stress tests of possible liquidity needs. Exploration of additional liquidity tools and mechanisms by Cash Investors should also be considered. Cash Investors should regularly review their liquidation plans with their senior management and boards as appropriate depending on the nature of the organization.

Cash Investors should be able to demonstrate that potential stress scenarios on their single largest repo counterparty will not lead to destabilizing losses, even when associated collateral valuations are subjected to reasonably severe stress tests.

Additionally, DTCC and/or other interested providers should explore the development of a “collateral liquidation manager” service that would be made available to a broad range of market participants on a voluntary basis, as well as tools that will legally support offsetting of secured exposures related to the defaulting party.

Impediments to the rapid initiation of liquidation plans by Cash Investors would increase uncertainty and systemic risk. Therefore, the Task Force believes that SIPC (Securities Investor Protection Corporation) should agree not to impose a stay on repo counterparties exercising their contractual remedies. This is consistent with the approach that SIPC has taken in prior Dealer defaults.

Transparency

The tri-party repo market requires greater transparency. The Task Force has worked closely with the Federal Reserve to develop a template for regular publication of key information provided by the Clearing Banks. A pilot version of this template with actual data as of April 2010 is included on the following page and is discussed in the Report. This shows the aggregate size of the tri-party market, broken down by asset category, with associated measures of Dealer concentration. The second table reports on margin haircut levels reported by the Clearing Banks for each asset category. Measures of Dealer concentration are also included on an anonymous basis.

Transparency of collateral valuation is an essential component of secured funding. Collateral that is prone to illiquidity and significant uncertainties in valuation adds to systemic risk when funded in the overnight repo market. Market participants should evaluate the prudence of funding this type of collateral in the short term repo markets.

The Task Force will establish a working group of valuation specialists across tri-party repo market participants to evaluate collateral pricing methodologies and make recommendations for improvements, including the feasibility of same day pricing.

Table 1
Tri-party Repo Statistics as of April 9, 2010
See Annex 3 for Explanatory Notes

Composition and Concentration of Tri-Party Repo Collateral

Asset Group	Collateral Value (\$ billions)	Share of Total	Concentration by Top 3 Dealers
ABS (Investment and non-investment grade)	41.7	2.4%	45%
Agency CMOs	112.7	6.6%	46%
Agency Debentures (including strips)	179.5	10.5%	33%
Agency MBS	584.9	34.2%	45%
CMOs Private Label Investment grade	25.2	1.5%	48%
CMOs Private Label Non investment grade	18.9	1.1%	47%
Corporates Investment grade	79.6	4.7%	39%
Corporates Non investment grade	34.7	2.0%	54%
Equities	73.3	4.3%	59%
Money Markets	27.4	1.6%	74%
US Treasuries excluding strips	474.4	27.7%	39%
US Treasury Strips	38.7	2.3%	46%
Other	19.5	1.1%	
Total	1,710.5	100%	38%

Distribution of Investor Haircuts in Tri-Party Repo

Asset Group	Collateral Value (\$ billions)	Haircuts		
		10th Percentile	Median	90th Percentile
ABS (IG and non-IG)	41.7	0%	5%	8%
Agency CMOs	112.7	2%	3%	5%
Agency Debentures (including strips)	179.5	2%	2%	5%
Agency MBS	584.9	2%	2%	4%
CMOs Private Label Investment grade	25.2	2%	5%	7%
CMOs Private Label Non investment grade	18.9	0%	8%	8%
Corporates Investment grade	79.6	2%	5%	8%
Corporates Non investment grade	34.7	5%	8%	15%
Equities	73.3	5%	8%	20%
Money Markets	27.4	2%	3%	5%
US Treasuries excluding strips	474.4	2%	2%	2%
US Treasury Strips	38.7	2%	2%	2%
Other	19.5			
Total	1,710.5			

Assessment of Recommendation Impact

The recommendations summarized above and detailed in the Report are ambitious, far-reaching, and will substantially mitigate the systemic risk potential associated with the tri-party repo market.

- Through the “practical elimination” of intraday credit extended by the Clearing Banks, any potential threat to the solvency of either Clearing Bank due to this exposure, however remote, is likewise removed. This alone is a substantial mitigation of systemic risk.
- By clarifying the responsibility for credit and liquidity risks among tri-party repo participants, incentives for robust risk management are strengthened.
 - Good incentives work best when situated within a highly transparent environment with well articulated expectations and frequent opportunities for effective benchmarking by authorities with the power to compel changes in behavior.
 - The Task Force recommendations in the areas of contingency planning, margin practices and valuation, and transparency are meant to provide these additional “support mechanisms” for strong risk management practices.
- The Task Force’s recommendations to bring greater transparency to the tri-party repo market via regular reporting of volumes, margin levels, and relative concentrations by asset category and across Dealers will substantially enhance the ability for supervisors and market participants to assess trends and call attention to emerging issues before they become systemic in nature.
- The implementation by Dealers of stronger liquidity risk management practices, as recommended by numerous other reports and supervisory reviews, has a number of important benefits in regard to tri-party repo transactions, and must proceed hand-in-hand with the other recommendations to reduce the systemic risk potential.
 - For example, feedback between forced sales and asset price declines and the loss or change in the terms of short-dated repo financing can be mitigated either by an extension in the maturity of that financing or by sizing liquidity buffers to absorb the loss of repo financing on less liquid collateral.
 - In the extreme case where markets are under severe stress, there is a potential for a sudden pullback in repo availability to become a self-fulfilling solvency event as the impacted Dealer is forced to sell large amounts of illiquid assets under extreme time pressure. This potential is again mitigated if the pullback in repo financing can be met via sale of high-quality assets from the Dealer’s liquidity buffer.
 - This stronger approach to liquidity risk management implies that in cases where a Dealer’s default is preceded by a period of deterioration, there should be greater scope to reduce the size of the repo book in advance of default and therefore the amount of collateral that Cash Investors would need to liquidate at the point of default.
- The Task Force believes that the combination of measures it is recommending will reduce the scope for Dealers to use the tri-party repo market as a mechanism to finance excessive levels of illiquid collateral.

In spite of these substantial improvements, the Task Force believes it is important to be clear about what its recommendations will not do.

- These recommendations will not make tri-party repo financing “stable” in the face of events that give rise to concerns with counterparty credit standing.
 - Discussions within the Task Force emphasized repeatedly that some Cash Investors focus principally on Dealer credit quality. Anytime a Dealer’s financial condition is visibly weakened, tri-party repo financing may be subject to withdrawal.

- At the height of the financial crisis, contagion concerns affected counterparty risk assessments by many market participants.
- However, the Task Force believes that some Cash Investors will become more comfortable in relying on tri-party collateral as a credit risk mitigant due to risk-based margining and improved transparency. This will improve the stability of this financing.
- Implementation of the Task Force’s recommendations will not eliminate the possibility of the sale of large amounts of repo collateral due to a Dealer default. However, the Task Force recommendations may change the manner in which a stress scenario involving Dealers would evolve.
 - Improvements in transparency and in risk management practices by all participants, as well as ongoing enhancements to the regulatory framework, should improve the resiliency of a Dealer to a withdrawal of repo financing following a weakening in its financial condition.
 - There will also be much greater clarity regarding the status of exposures on an intraday basis and importantly who will bear the exposures in the event of a default.
- The Task Force considered and rejected recommending the mandatory use by all Cash Investors of a single liquidation agent in such circumstances to effect a coordinated liquidation.
 - Cash Investors represented on the Task Force were concerned that such an approach would result in sub-optimal outcomes relative to allowing Cash Investors flexibility in choosing how to manage this situation. They believed that a mandatory approach would result in less value for their constituents.
 - Task Force discussions focused on the importance of access to funding as the critical pre-requisite to avoid fire sale impacts.⁴ Centralizing the liquidation problem does not address the underlying problem of where such funding would come from. The Task Force did not believe it was appropriate to assume that a Federal Reserve or other official liquidity facility would be made available to a centralized liquidation agent and the premise of the “fire sale” concern is precisely that private market funding is not available.
 - The Task Force believes that a better balance will be achieved by recommending that Cash Investors plan in advance for a Dealer default and manage their exposures to individual Dealers in light of the potential impact of such a default on their overall portfolio liquidity.

Additional Concepts and Topics

The Task Force discussed several concepts that have been put forward as possible ideas that could be considered in the future.

- These include the following concepts.
 - A Liquidity Stabilization Utility (LSU) that would function as a bank with the explicit purpose of providing liquidity against collateral to Cash Investors after a Dealer default.
 - Cash Investors obtaining committed lines of credit.
 - A central counterparty facility that would substitute its credit standing for that of individual Dealers in the tri-party market.
 - An Emergency Bank that a troubled Dealer could transfer its repo portfolio to, possibly supplemented by an additional guarantee fund.
- Task Force discussions highlighted a number of challenges with each of these concepts and accordingly the Task Force is not endorsing any of these concepts.

⁴ See Brunnermeier and Pedersen, “Market Liquidity and Funding Liquidity”, *Review of Financial Studies* 2009, Vol. 22, No. 6, pp. 2201–2238, for an economic analysis of this linkage.

- As noted earlier, the Task Force is aware and highly supportive of the Federal Reserve's plan to simultaneously issue a White Paper that requests further comment on these and any other issues raised by the Task Force's Report and recommendations.

Conclusion

The following Sections of the Report spell out the specific recommendations individually and then address the issues and recommendations in each area of the Task Force's work. The Task Force is convinced that these recommendations can and should be implemented and that they will collectively make a material difference in the extent of systemic risk potential associated with the tri-party repo market infrastructure. The Task Force greatly appreciates the time and efforts of all who contributed to its discussions.

Section 2: Summary List of Task Force Recommendations

Operational Arrangements – The Task Force Recommendations set out the milestones for the industry action plan developed and agreed by the Task Force to eliminate to the greatest extent possible Clearing Bank extensions of intraday credit by enhancing operational arrangements in the tri-party repo market. Recommendations are addressed to all tri-party repo market participants unless specified.

- | | |
|--|--------------|
| 1. Implement operational enhancements to achieve the “practical elimination” of intraday credit by the Clearing Banks, where “practical elimination” is defined as a point beyond which the residual amounts of intraday credit extensions are both small and can be governed by transparent bilateral arrangements, known in advance to participants ⁵ . | 30 Jun 2011 |
| 1A. Clearing Banks to provide project plans in relation to their implementation of robust automated collateral substitution (“auto-substitution”) capability. | 15 July 2010 |
| 1B. Eliminate remaining sources of ambiguity or inaccuracy in tri-party repo booking procedures and trade communications to the Clearing Banks, including information related to the term of the transaction. | 31 Aug 2010 |
| 1C. Agree to standardized intraday settlement time(s) for maturing repo trades (e.g., Morning Settlement, End of Day Settlement), that will be implemented following pre-requisite enhancements (e.g., auto-substitution). | 31 Aug 2010 |
| 1D. Agree solution(s) for three-way, real-time, point of trade confirmations for tri-party repo transactions, inclusive of discussions with third-party vendors. | 15 Oct 2010 |
| 1E. Clearing Banks to complete development of software to support auto-substitution capability and confirm timelines for full implementation. | 15 Feb 2011 |
| 1F. Dealers and Cash Investors to confirm that internal processes related to all aspects of tri-party repo are prepared for the operational enhancements recommended in this Report. | 15 Feb 2011 |
| 1G. Implement market-wide, three-way, real-time, point of trade confirmation solution(s) which memorializes legally binding repo transactions entered into between Cash Investors and Dealers. | 15 Apr 2011 |
| 2. Dealers and Cash Investors to undertake regular due diligence reviews of Clearing Banks that cover, at a minimum, operational and contractual conformity, adherence to collateral allocation rules, and collateral pricing methodologies. | Ongoing |
-

⁵ Market participants should target the reduction in intraday credit to be less than 10% of a Dealer’s notional tri-party book (representing the estimated portion of a Dealer’s book that reaches final maturity and is not rolled on a given day).

Dealer Liquidity Risk Management – The Task Force Recommendations support other assessments of the financial crisis in emphasizing the importance of stronger liquidity risk management.

- | | |
|---|-------------|
| 3. Dealers need to incorporate lessons from the financial crisis experience related to tri-party repo in making appropriate improvements to liquidity risk management and planning. | Ongoing |
| 4. Dealers <u>should not</u> assume that short-term tri-party repo financing with all of their counterparties throughout all market conditions is inherently stable. | Ongoing |
| 5. Dealers and Clearing Banks to assess and clarify terms for the potential availability of secured intraday credit facilities (both discretionary and committed) to mitigate the liquidity risks associated with maturing repo trades. | 15 Nov 2010 |
-

Margining Practices – The Task Force Recommendations support a broad strengthening of margining practices, based on the principles that margins should be risk-based, should not be pro-cyclical, and should be based on objective/transparent criteria.

- | | |
|---|---------|
| 6. Cash Investors, Dealers, and Clearing Banks to determine appropriate collateral margins in line with the principles set out in Section 6 of this Report, taking note of monthly Tri-Party Repo Statistics to be published on the Federal Reserve Bank of New York website. | Ongoing |
| 7. Clearing Banks to continue to share information on intraday margin methodologies and processes with respective Dealers. | Ongoing |
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Contingency Planning – The Task Force Recommendations support improving the preparedness of Cash Investors and the tri-party repo market to cope with a Dealer default.

- | | |
|---|-------------|
| 8. Cash Investors to undertake regular stress tests of tri-party repo counterparty exposures that consider a default of the largest repo counterparty together with potential changes in the market value of the underlying collateral. | Ongoing |
| 9. Cash Investors to put in place and regularly review contingency plans for a Dealer default that cover, at a minimum, a process for effectively managing collateral, including a plan to manage liquidity and risk exposure during the liquidation process. | 15 Jan 2011 |
| 10. Relevant industry associations in conjunction with their constituents are encouraged to publish comprehensive Best Practice guidance for Cash Investors. | 30 Sep 2010 |
| 11. DTCC and its affiliates to work with other market participants to maximize the potential for offsetting of positions in the event of a Dealer default; DTCC and/or other interested parties can provide a viable collateral liquidation management service for those Cash Investors wishing to delegate these activities. | 30 Nov 2010 |
| 12. All market participants to continue exploring additional concepts that have the potential to add to the stability and resilience of tri-party repo financing and/or reduce the potential for collateral “fire sales” in the event of a Dealer default. | Ongoing |
-

Transparency – The Task Force Recommendations are intended to increase transparency with respect to the size, composition, and concentration of the tri-party repo market, the range of margins applied, and the valuation methodologies applied to the underlying repo collateral.

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| 13. Initiate monthly publication, via the Federal Reserve, of aggregate statistics on tri-party repo collateral and Cash Investor margin levels, with disclosure by asset class, based on information provided by the Clearing Banks. (See Table 1 for a pilot version.) | 30 Jul 2010 |
| 14. The Task Force will establish a working group of valuation specialists across tri-party repo market participants to evaluate collateral pricing methods and make recommendations for improvements, including the feasibility of same-day pricing. | 15 Oct 2010 |
| 15. Cash Investors to regularly validate tri-party collateral for pricing, appropriateness, and classification. Dealers to regularly compare collateral marks on their own books and records with vendor prices provided by the Clearing Banks. | Ongoing |
| 16. Dealers to inform Cash Investors and Clearing Banks in cases where the Dealer’s marks are materially below the vendor prices provided by the Clearing Bank. | Ongoing |
-

Section 3: Background

The accompanying White Paper issued by the Federal Reserve provides additional detail on the history and mechanics of the tri-party repo market. Accordingly, the Task Force is not replicating that material here. In this section we simply review some of the main points necessary as a starting point for further analysis.

Tri-party repo grew from its origin as a funding instrument for U.S. Treasuries to include nearly all securities held by Dealers. The growth of the tri-party repo market mirrored the growth of Dealer balance sheets. The market evolved from a strictly overnight market to include significant term trading.

At peak levels in 2008, over US\$ 2.8 trillion in securities were being financed through tri-party repo transactions, many with very short maturities, and involving the daily transfer of nearly the full amount of associated cash and securities on the accounts of one or the other of the two tri-party “Clearing Banks”: Bank of New York Mellon (BNY) and JPMorgan Chase (JPM).

Individual Dealers (repo sellers / borrowers) routinely financed more than US\$ 100 bn in securities via the tri-party mechanism. The largest single firm exposure peaked at more than US\$ 400 bn. Tri-party repo arrangements were at the center of the liquidity pressures faced by securities firms at the height of the financial crisis, especially as the pricing transparency and liquidity of some forms of tri-party collateral deteriorated at the same time that counterparty credit concerns were escalating.

Cash Investors in the tri-party market include money market mutual funds (2a-7 funds), securities lending agents (typically major custodian banks), and other institutional investors or fund managers (including commercial banks and corporate treasurers) who seek to invest cash short-term. The repo trades can be overnight trades, term trades with some fixed future maturity date, or open trades which remain in place until one or the other parties elects not to renew the trade.

At its heart, the tri-party repo market matches a large demand on the part of Cash Investors for safe, flexible, short-term investments with the desire for banks and securities dealers to finance their securities inventories on a more efficient and reliable basis than they can borrow on an unsecured basis. The treatment of repurchase transactions in bankruptcy, the use of securities as collateral (including daily margining and haircuts), and the custodian services of the Clearing Banks provide protections to repo Cash Investors that do not exist for unsecured creditors.

This mechanism for financing Dealer securities inventories grew during the last decade to become a substantial portion of total Dealer balance sheet liabilities. For reference, the daily volume of tri-party transactions is a multiple of the entire financial commercial paper market. Dealers collectively believed that this method of financing would be more stable than unsecured financing in the event of market or firm-specific stress events given the protections described above, in particular the fact that the repo Cash Investor is collateralized.

Currently, the bulk of the entire secured exposure passes from the Cash Investors to the Clearing Banks intraday to provide operational efficiency. The bulk of tri-party repo transactions currently are “unwound” vs. cash on the Clearing Banks’ books each day (normally around 8 am), with new allocations effected on the books of the Clearing Banks beginning in the afternoon. As a result, the amount of secured credit and market risk exposure borne by the two Clearing Banks in the normal course of business today is extreme and there is uniform support from all tri-party repo market participants on the importance of reducing this intraday exposure as the top priority from a systemic risk perspective.

Section 4: Operational Arrangements

The Task Force workstream covering operational arrangements focused first on identifying the processes that must be enhanced to enable large reductions in intraday credit extensions by the Clearing Banks without hindering the trading and financing functionality associated with the current platform.⁶ Three core processes were identified.

- **Trade Booking Process:** Some market participants do not submit complete trade information to the Clearing Banks on a timely basis after trade execution. Booking and submission flaws are two reasons Clearing Banks return collateral to Dealers and cash to Cash Investors every day, even when the repo has a maturity date beyond one day.
- **Trade Confirmation:** There is no industry-wide formalized two-way (Dealers and Cash Investors) or three-way (adding Clearing Bank) trade confirmation practice at the time of trade execution. Cash Investors and Dealers generally confirm their trades bilaterally. The timely reporting of trade information to Clearing Banks gives them more information for better risk management.
- **Intraday Collateral Management:** In most tri-party repo trades the Clearing Bank returns collateral to the Dealer and cash to the Cash Investor every day, even for term repo transactions. This practice is called the “unwind.” The purpose of the “unwind” is operational in that it gives Dealers access to the collateral for daily settlement activity. The result is that most of the secured exposure is transferred from the Cash Investors to the Clearing Banks until collateral is returned to the Cash Investor later in the business day, resulting in excessive, albeit secured, intraday exposures for the two Clearing Banks.

The Task Force concluded that enhancements in these areas, in particular the development of robust automated intraday collateral substitution (“auto substitution”) capability, together with implementation of new standardized settlement times for maturing repo trades, should enable very substantial reductions in intraday exposures without loss of functionality. Accordingly, the Task Force has developed and agreed on an ambitious industry action plan to achieve this objective. This action plan culminates in the “practical elimination” of intraday exposure by the middle of next year.

Recommendation 1. Implement operational enhancements to achieve the “practical elimination” of intraday credit by the Clearing Banks, where “practical elimination” is defined as a point beyond which the residual amounts of intraday credit extensions are both small and can be governed by transparent bilateral arrangements, known in advance to participants⁷. (30 Jun 2011)

The use of the “practical elimination” standard as defined in this Recommendation reflects the desire to measure progress tangibly and quantitatively, while also recognizing that zero intraday secured financing is not a realistic target in this timeframe.

⁶ Clearing Banks have employed two tactical solutions to reduce intraday exposures since December 2009:

- By eliminating the unwind of selected term repos, participating Dealers keep specific term loans fully collateralized and perform a minimal level of substitution in coordination with the Clearing Banks,
- By delaying the morning unwind process, Dealers reduce delivery obligations and can then re-allocate trades to eliminate intraday exposure.

Participation has been broad-based and has achieved an approximate \$150 billion reduction in the daily unwind at the two Clearing Banks. Market participants are committed to implementing tactical solutions until the strategic solution is implemented. Term trades represent 10%-40% of the entire market. Going forward, market participants can reduce intraday exposure by replacing overnight maturing trades with term maturing trades and by segregating overnight maturing trades from open maturities.

⁷ Market participants should target the reduction in intraday credit to be less than 10% of a Dealer’s notional tri-party book (representing the estimated portion of a Dealer’s book that reaches final maturity and is not rolled on a given day).

The action plan consists of additional intermediate milestones that the Task Force believes are necessary to achieve success with respect to the overall objective. These are as follows.

Trade Booking Process

An important pre-requisite for more ambitious changes is to first ensure as high a level of accuracy as possible in the recording and communication of all relevant trade details.

Recommendation 1B. Eliminate remaining sources of ambiguity or inaccuracy in tri-party repo booking procedures and trade communications to the Clearing Banks, including information related to the term of the transaction. (31 Aug 2010)

Trade Confirmation

A three-way confirmation process will improve the quality and timeliness of trade information received by the Clearing Banks. Errors will be caught and resolved earlier in the day. Since most trades are executed early in the morning, Clearing Banks will have the essential funding information necessary to make an informed decision about extension of intraday credit to individual Dealers. The Task Force supports the use of open architecture and standard messaging protocols in regard to possible trade confirmation solution(s).

Recommendation 1D. Agree solution(s) for three-way, real-time, point of trade confirmations for tri-party repo transactions, inclusive of discussions with third-party vendors. (15 Oct 2010)

Recommendation 1G. Implement market-wide, three-way, real-time, point of trade confirmation solution(s) which memorializes legally binding repo transactions entered into between Cash Investors and Dealers. (15 April 2011)

It is essential that all repo participants agree that tri-party repo trades are legally binding agreements which are memorialized at the point of confirmation. See Annex 1 for the 'Minimum Parameters Required for Trade Matching' developed by the Task Force.

Intraday Collateral Management

There are two primary elements to the operational improvements needed in intraday collateral management. First, the Clearing Banks will need to develop and provide robust auto-substitution capability that allows Dealers to access and settle trades involving collateral being financed with tri-party repo without unwinding the underlying tri-party repo transaction. The second change in intraday collateral management needed is to establish agreed 24 hour settlement cycles that keep investors collateralized and borrowers funded throughout that period, since this will by definition reduce the need for routine intraday credit extensions by the Clearing Banks. In sum, the model that this will support has the following aspects for each major participant.

Dealers

- Preserves liquidity by allowing ready access to encumbered collateral
- Reduces credit dependency on the Clearing Banks as credit exposure is kept with Cash Investors
- Minimal impact to current trading practices as process becomes fully automated and highly efficient

Cash Investors

- Greatly reduces unsecured depositor risk to the Clearing Banks
- Ensures appropriate margined collateralization with eligible securities and cash throughout the day

Clearing Banks

- Greatly reduces the outsized intraday credit extension to Dealers resulting from the daily unwind
- Allows for greater clarity in credit lines and credit relationships with Dealers

Key milestones in relation to the Clearing Bank implementation of auto-substitution are as follows.

Recommendation 1A. Clearing Banks to provide project plans in relation to their implementation of robust automated collateral substitution (“auto-substitution”) capability. (15 Jul 2010)

Recommendation 1E. Clearing Banks to complete development of software to support auto-substitution capability and confirm timelines for full implementation. (15 Feb 2011)

The second change in intraday collateral management that is needed is to establish agreed settlement times that keep Cash Investors collateralized and borrowers funded throughout the period, since this will by definition reduce the need for routine intraday credit extensions by the Clearing Banks.

Recommendation 1C. Agree to standardized intraday settlement time(s) for maturing repo trades (e.g., Morning Settlement, End of Day Settlement), that will be implemented following pre-requisite enhancements (e.g., auto-substitution). (31 Aug 2010)

Although the new standardized settlement times will not be implemented right away, it is important to reach agreement on them within the next few months in order to plan other elements around them. In this context, it is also critical to recognize the agreement by the Legal Subcommittee regarding confirmation (via the three-way, point of trade confirmation) of the legally binding repo transactions entered into between Dealers and Cash Investors at the point of trade, as this will create a more solid foundation within which the industry will operate. Market participants should ensure that legal documentation is appropriately supportive of this obligation.

The following points summarize the current thinking in regard to potential standardized settlement times, taking into account the work done by the Task Force’s legal workstream, as summarized in Annex 2 of the Report. These concepts will be discussed further and vetted across the industry prior to final decisions by the Task Force.

- Market participants should weigh the merits of developing a standard settlement for maturing transactions during the afternoon, unless the two counterparties otherwise agree to a morning settlement.
 - The benefits of a twice-daily settlement period for final maturity of transactions are significant; it would provide additional opportunities to reduce intraday credit extensions by the Clearing Banks, it would allow additional time for Cash Investors to provide final allocation account information to the Dealers and Clearing Banks, and it would keep Cash Investors fully secured through the 24 hour cycle.
 - These benefits need to be balanced with the challenges of introducing a second settlement period, including operational complexity during a compressed end of day timeframe, as well as the inability of Cash Investors to take possession and/or liquidate collateral late in the day.
- As agreed by the Legal Subcommittee, all trades entered into between a Cash Investor and a Dealer, including block trades, represent legally binding commitments to provide financing from Cash Investor to Dealer which is memorialized via the three-way confirmation. Otherwise, this solution will not effectively mitigate intraday exposure. (See Annex 2).
- It is incumbent upon Cash Investors to deliver sub-account trade information as early as possible during the day to transfer the risk of Dealer default to the appropriate specific entity(s) providing financing to the Dealer.

- Cash Investors and Dealers should seek to execute and confirm repos prior to 10 a.m. Note that later-day trades should still be able to be settled; however if both parties agree to a transaction in the morning it should be communicated through the confirmation process immediately so the Clearing Bank has an appropriate assessment of daily financing activity.

Readiness for Change

The operational changes discussed here will require a large amount of coordination and cooperation to achieve, especially in the rapid timeframe envisioned. Clearing Banks have a major role to play in laying out their plans and working closely with their customers. Cash Investors and Dealers also need to work constructively and aggressively to be sure they are ready for these changes.

Recommendation 1F. Dealers and Cash Investors to confirm that internal processes related to all aspects of tri-party repo are prepared for the operational enhancements recommended in this Report. (15 Feb 2011)

The Task Force has identified the following areas for market participants to consider as they prepare for these changes in operational arrangements.

- Extensive operational and technology changes are required of all parties to support a significant increase in the lock-up of collateral from the current model.
- Substitutions, accounting (including the calculation and payment of interest), collateral valuation methodologies, and related processes need to be adapted to the new model.
- Cash Investors and Dealers require real-time information of the composition of collateral securing a term trade at any point during the day.
- Defining collateral substitution process for interbank GCF Repo collateral pledged to term trades.
- Efficiently targeting intraday securities and cash substitutions to minimize Cash Investors' unsecured depositor exposure to the Clearing Banks
- A transparent process for managing fails will need to be developed pending agreement on new standardized settlement times.

Impact

When collectively implemented, the new operational arrangements will drastically reduce the need for intraday credit from the Clearing Banks. Estimates from Clearing Banks are an immediate 10-40% reduction in intraday credit to Dealers from tactical solutions already underway, with reductions targeted at 90% or more when the strategic solutions are in place.

Ongoing Due Diligence

In addition to the action plan developed to support improvements in operational arrangements, the Task Force supports both Dealers and Cash Investors reviewing the operational practices of the Clearing Banks on a regular basis. This should include monitoring collateral allocations to ensure that collateral has been properly allocated and checking the price of the allocated collateral.

Recommendation 2. Dealers and Cash Investors to undertake regular due diligence reviews of Clearing Banks that cover, at a minimum, operational and contractual conformity, adherence to collateral allocation rules, and collateral pricing methodologies. (Ongoing)

Section 5: Dealer Liquidity Risk Management

Dealer liquidity contingency plans and liquidity risk management practices pre-crisis had evolved predominantly during stable environments and in many cases were predicated on short-term secured funding being more stable during times of stress than unsecured funding. These approaches to liquidity risk management did not sufficiently appreciate the sensitivity of many Cash Investors to counterparty concerns even in the presence of high-quality collateral, the potential for a broad pullback in tri-party repo financing, and the loss of price transparency and liquidity for certain collateral types.

Dealers have taken these lessons to heart and have been applying them to their liquidity risk management practices. The supervisory and regulatory community has also made liquidity risk a priority issue and have been driving further improvements through proposed regulatory changes and heightened supervisory review. Among the areas of emphasis that have been highlighted in Task Force discussions are the following.

- Improving liquidity risk measurement and reporting capabilities, with respect to both granularity and frequency and the capture of instruments with contingent liquidity implications.
- Undertaking more systematic and detailed liquidity risk stress tests and using the results to help size more robust liquidity buffers.
- Making greater use of term funding where available. Staggering maturities and combining short-term and long-term funding with the same counterparty to modify incentives to withdraw short-term funding.
- More robust governance and increased senior management focus.

Liquidity risk management was not intended to be a primary focus of the Task Force, but is a crucial aspect for the analysis of how future stress scenarios could evolve and therefore for the assessment of systemic risk in relation to tri-party repo activity. In terms of Recommendations, the Task Force supports the broad emphasis on strengthening liquidity risk management practices and wishes to highlight the need for Dealers to ensure that the liquidity risk management aspects of tri-party repo activities receive priority attention.

Recommendation 3. Dealers need to incorporate lessons from the financial crisis experience related to tri-party repo in making appropriate improvements to liquidity risk management and planning. (Ongoing)

In the context of the tri-party repo market, the “lesson learned” that stands out the most is the over-reliance on short-term secured funding and its presumed stability. Discussions in the Task Force emphasized repeatedly that many Cash Investors focus primarily if not almost exclusively on counterparty concerns and that they will withdraw secured funding on the same or very similar timeframes as they would withdraw unsecured funding.

Recommendation 4. Dealers should not assume that short-term tri-party repo financing with all of their counterparties throughout all market conditions is inherently stable. (Ongoing)

Intraday Credit

A particular aspect of liquidity risk in the tri-party market going forward will be the treatment of maturing repos. If a Dealer is unable to roll over repo financing or otherwise finance the maturing assets, the Clearing Bank may choose not to allow the repo to mature, meaning the Cash Investor will retain the risk. Dealers will naturally be eager to prevent events from reaching this point, especially if it is not reflective of a broader deterioration in the Dealer’s condition.

Dealers therefore have a strong interest in clarifying the terms under which Clearing Banks would be willing to provide intraday secured financing, either on a discretionary basis or possibly on a committed basis. Clearing Banks have an interest in understanding the assumptions Dealers are making with respect to potential requests for Clearing Bank credit in a stress event. Bilateral discussions to explore these topics and address the range of terms involved (e.g., amount, drawdown conditions, maturity, fees, expiration, collateral eligibility, margin levels) will be beneficial in providing clarity to both Dealers and Clearing Banks ahead of future stress events.

Recommendation 5. Dealers and Clearing Banks to assess and clarify terms for the potential availability of secured intraday credit facilities (both discretionary and committed) to mitigate the liquidity risks associated with maturing repo trades. (15 Nov 2010)

Section 6: Margining Practices

Recent market events have highlighted several issues related to margining practices. These issues include:

- **Margin Levels:** Margin levels in certain asset classes were insufficient to cover the close-out/liquidation risk of the securities held as collateral.
- **Valuations:** Market participants did not sufficiently anticipate the potential for some types of repo collateral to lose price transparency and liquidity for extended periods of time.
- **Margining Process between Dealer and Clearing Bank:** The Clearing Bank unwind and margining process was not well understood by all Dealers and Cash Investors

Due to the issues highlighted above, some Cash Investors were becoming more exposed to counterparty credit risk at the same time that counterparty credit concerns were escalating. As a result, behavior started to trend closer to the behavior of unsecured credit investors, resulting in Cash Investors exiting the repo market or drastically changing their collateral requirements. Given the heavy reliance on the repo market for financing, this pull back in funding and the meaningful increases in margin requirements in a deteriorating market contributed to systemic risk concerns.

To address these issues, the Task Force initiated a workstream on margining practices, which has developed a set of principles for firms to use in setting margins. The Task Force believes that if Cash Investors and Clearing Banks fully incorporate these principles into their margin processes, the result will be more robust, less pro-cyclical, and more transparent and predictable margins. In turn, this will contribute to the stability of the repo market in future times of market stress.

It is important to note that the Task Force is not endorsing standardization of margining methodologies or of margin levels across the market. The Task Force believes the margining process is a risk management tool, and each institution should be afforded the flexibility to manage their risk in accordance with their own risk management policies, principles, and processes.

Principles to Consider For Margin Requirements

Risk Based

As volatility increased throughout 2008, market participants recognized that the liquidation value of the collateral received might not be sufficient to recover 100% of the repo financing in the event of a Dealer default. The Task Force believes that this uncertainty can lead to instability as Cash Investors are more likely to exit the repo market or exclude broad asset types in order to avoid unsecured exposure in a deteriorating market.

In hindsight we believe that this uncertainty was largely driven by an underestimation of how quickly a healthy market can transition into a stressed market in which a Dealer's credit quality and asset liquidity becomes a concern.

There is broad agreement within the Task Force that Clearing Banks and Cash Investors should set margin requirements considering the potential price decline of the securities held as collateral during a period of market stress and volatility while assuming a strong correlation with a Dealer's failure to perform. This risk based analysis should also consider:

- **Portfolio concentration risks:** A portfolio of diverse assets may perform better than a highly concentrated portfolio. In other words, an increase in portfolio concentrations will correspond to an increase in security-specific, idiosyncratic gap risk.

- **Liquidation horizon:** A conservative liquidation time horizon should be assumed to support an orderly liquidation of collateral and to account for potential delays in liquidating a portfolio. These delays can be driven by potential stay periods (e.g. SIPC Stay) or by asset concentrations (e.g. a security holding may exceed the daily traded volume, and therefore multiple days may be required for the market to absorb the position), or possibly other factors.
- **Implied & historical asset volatility:** When calculating counterparty risk exposure, market participants should complement a historical volatility analysis with the implied volatility in the markets. This is important since history is not always a good proxy for the future.
- **Stress testing:** In cases of stable markets where implied volatility is low and historical volatility assumptions have decayed, an overlay of market stress testing to determine margin levels is critical to ensure that a low volatility environment does not lead to pro-cyclical behavior.

It is important to note that although the Task Force encourages all market participants to fully analyze all risks inherent in the tri-party repo market, it is not intended to be a risk-free market. Market participants should have flexibility to scale their margining levels up or down in exchange for incremental yield based upon their individual risk appetite. The key is for market participants to size their appetite for unsecured credit risk and then set assumptions and margins accordingly⁸.

Granularity

In order to properly quantify the liquidation risk, the margin analysis should be conducted at least at a level granular enough to distinguish the risk between the various asset classes, credit ratings, durations, etc. As an example, it may not be sufficient to look at the historical price volatility of Corporate Bonds. The Corporate Bond asset class is very broad and includes sub-asset classes that may have different risk and liquidity profiles.

By enabling margin levels to be set at a more granular level Clearing Banks/Cash Investors will be in a better position to understand/assess the risk of collateral that they hold, as well as ensure that the margin properly covers their liquidation risk.

Periodic Review

It is important to review the methodologies and assumptions that are used in the calculation on a periodic basis in order to recalibrate the haircuts. Although the initial haircuts have already assumed a stressed scenario, the recalibration will be required if changes in market conditions prove that various assumptions were too aggressive or too conservative.

Reliable 3rd Party Valuations

Collateralizing tri-party repo trades with assets that have reliable 3rd party valuations is an integral part of any risk based margining process. This is discussed further in Section 8 below.

Practicality

As a counterbalance to the principles above, any margining proposal should consider the practicality of the calculation/implementation. Simply put, a robust risk-based algorithm that analyzes stress levels and volatility at the cusip level may be ideal from a risk management approach, but the practical requirements of building this infrastructure and rolling out this approach to all market participants is beyond what market-wide infrastructure can currently manage. For most Cash Investors, the Task Force believes that setting margin levels by asset class provides an appropriate balance, allowing credit ratings and maturities to be taken into account, with sufficient granularity to ensure sufficient risk differentiation but also ensuring that the number of collateral types associated with margin levels is manageable. In addition, the repo market will need to balance any new risk based approaches with the potential cost of implementation as well as the operational difficulties associated with day-to-

⁸ As discussed in Section 5, some Cash Investors assign more weight to the Dealer credit quality, independently of the collateral pledged, so risk-based margining may not prevent Cash Investors from exiting tri-party repos with a deteriorating Dealer.

day management. However, the principles outlined here should be followed by all market participants, regardless of the risk management tools and the specific approach they use to implement them. This may mean that some securities are not appropriate for certain Cash Investors. This will be driven, at least in part, by the Cash Investors' ability to analyze the risk of the specific asset class given their internal risk systems.

Avoid Pro-Cyclical Behavior

As risk was perceived to be lower and spreads tightened throughout the last credit cycle a common trend was to see reductions in the amount of collateral that was provided in the repo market. At the time, the market accepted this practice based upon the prevailing stable market.

As the markets deteriorated in 2008 and 2009 market participants changed margin rule sets by excluding certain asset types and increasing margin levels in order to offset the perceived higher collateral liquidation risk due to the increase in price volatility. At the extreme, some participants pulled out of the repo market because they became uncomfortable with the unsecured credit risk resulting from insufficient margin. This pro-cyclical behavior incited risk-taking in periods of stability and it constrained liquidity at the worst possible time. In some cases, this also resulted in particular concern as some Dealers relied on Clearing Banks to finance collateral no longer accepted by Cash Investors while alternative financing was sought.

In general, the Task Force believes the margining process should avoid pro-cyclical behavior whereby Clearing Banks and Cash Investors change their rule sets in a sudden and capricious way in times of stress, leaving Dealers with little financing options for illiquid collateral. As a more risk-focused and stress-based haircut approach is incorporated we believe this pro-cyclical behavior will be reduced because of the higher margin levels that will be applied ex ante and regularly adjusted throughout the market cycle. This should reduce dramatic or unexpected calls for additional collateral. Furthermore, this through-the-cycle margin will provide sufficient protection such that increases in volatility or reductions in liquidity and price transparency will not have the same significant impact on repo funding or margin arrangements.

Objective & Transparent Methodology

Misunderstandings related to the tri-party margining process between Dealers and Clearing Banks was another driver of instability in the recent market crisis. While both Clearing Banks and Cash Investors had discretion to increase their margin, there was no framework to disclose or explain the margin methodology or underlying drivers and assumptions.

In contrast, the Task Force believes that an objective, well defined, and transparent methodology that reduces unexpected increases or decreases in margin requirements should contribute to the elimination of this uncertainty. Furthermore, we believe a more transparent approach will reduce the need for unanticipated and poorly understood margin calls. A key feature of this approach will be disclosure that explains the drivers and rationale of the calculation, as well as its underlying assumptions and mechanics (e.g., how are credit risk, interest rate risk, liquidity, concentration risks, etc. accounted for?).

Additionally, any changes to the methodology should be communicated to all parties, and should be phased into the margining process with reasonable notice time. Although the ability to increase haircuts is a key component to risk management, the phasing-in of changes to the margining process should not materially impact the various parties' credit exposure analysis as the agreed upon through-the-cycle haircuts have already assumed a stress based cushion. Additionally, this phased-in approach will give Dealers sufficient time to prepare for increased haircuts or to otherwise manage their inventory if posting the incremental margin is uneconomic. As a result, we believe this process will reduce the possibility that changes in repo margining will have a destabilizing impact on the market.

Determining Appropriate Margins

Because of the complexities of the margining process, the Task Force is not making detailed technical Recommendations on margin approaches. Instead, the Task Force has articulated the principles just described and

recommends that market participants adopt these principles within their own risk management approaches. In addition, the Task Force recommends that market participants review the regular publication of tri-party repo margin levels that will become available as the result of the Task Force's Recommendations in Section 8 of the Report. These should serve as a benchmark for assessing margin levels but are not a substitute for undertaking one's own analysis. Information on the relative concentration of Dealers in different asset categories may be informative with respect to the potential for larger liquidity effects on pricing in the event of a liquidation and therefore might be particularly useful in the margin context.

Recommendation 6. Cash Investors, Dealers, and Clearing Banks to determine appropriate collateral margins in line with the principles set out in Section 6 of this Report, taking note of monthly Tri-Party Repo Statistics to be published on the Federal Reserve Bank of New York website. (Ongoing)

Although this Recommendation is addressed to both Clearing Banks and Cash Investors, it is important to note that the implementation considerations are different. Therefore, it should not be expected that the specific margining methodologies/processes would be the same between Clearing Banks and Cash Investors.

Margining Process between Dealer and Clearing Bank

The Clearing Bank unwind and margining process was not well understood by all Dealers. As highlighted above, the Task Force does not propose a precise margining methodology to be used by all Clearing Banks. Instead we recommend that Clearing Banks / Dealers work together to improve transparency and reduce subjectivity in the daily margining process.

Recommendation 7. Clearing Banks to continue to share information on intraday margin methodologies and processes with respective Dealers. (Ongoing)

Section 7: Contingency Planning

The focus of this part of the Task Force's efforts has been on improving preparedness to cope effectively with the default of a Dealer firm. Given the Recommendations on operational arrangements and the envisioned reductions in Clearing Bank provision of intraday credit, it follows that Cash Investors should have even stronger incentives to engage in effective contingency planning for such events.

A critical starting point for such contingency planning is the assessment of potential impacts from such a default event. This type of stress analysis should consider the default of the Cash Investor's single largest repo counterparty (as measured by exposure), a standard that has long been applied to participants in systemically important payment and settlement arrangements. In addition, it should consider the impact of that Dealer's default on the price of the collateral that would need to be liquidated, the length of time the Cash Investor believes would be available for such liquidation, and any other factors that might impact the proceeds from collateral liquidation. The results of the stress analysis should factor into the risk assessment and risk appetite of Cash Investors as well as their collateral concentration limits and margin setting processes. These results should be discussed with senior management and boards as appropriate depending on the nature of the organization.

Recommendation 8. Cash Investors to undertake regular stress tests of tri-party repo counterparty exposures that consider a default of the largest repo counterparty together with potential changes in the market value of the underlying collateral. (Ongoing)

After a Dealer default, Cash Investors have the right to seize and liquidate the collateral and should have appropriate processes and procedures to handle collateral management and liquidation. In the event that the collateral liquidation proceeds are insufficient to offset the entire amount of the Cash Investor's claim, the Cash Investor retains an unsecured claim against the Dealer for the amount not satisfied. Thoughtful management of the collateral can minimize the impact to an individual Cash Investor and to the market as a whole.

Cash Investors should be prepared for a borrower default by having policies, procedures, and systems in place to be able to facilitate the delivery of collateral. This plan could include instructing the Clearing Bank that holds the collateral on behalf of the Cash Investor prior to the default to transfer the collateral to a segregated collateral account at the Clearing Bank. The Cash Investor, either directly or with the assistance of an agent, must be able to price the collateral in order to assign a price to their defaulted repo position held by the Cash Investor (e.g., market value of defaulted repo position is dependent upon the market value of the collateral it expects to receive upon liquidation).

Cash Investors should have a cohesive strategy and resources to support the orderly liquidation of a defaulted Dealer's tri-party repo collateral. Depending upon market conditions, immediate liquidation may not be the best option for some Cash Investors. The defaulted repo position could be an illiquid holding and the Cash Investor may need liquidity before the repo collateral is liquidated. Each Cash Investor should have an overall liquidity plan which takes into account the possibility of a Dealer default. Some Cash Investors may choose to manage the sale of collateral directly while others may elect to use a delegated liquidation agent. Cash investors should establish, monitor, and test these procedures to ensure that agents are able to accept the delivery of collateral at any time.

Recommendation 9. Cash Investors to put in place and regularly review contingency plans for a Dealer default that cover, at a minimum, a process for effectively managing collateral, including a plan to manage liquidity and risk exposure during the liquidation process. (15 Jan 2011)

Building on the work of Task Force, to which it has contributed substantially, the Investment Company Institute is developing a more comprehensive set of Best Practice guidance for the Cash Investor community, with a particular focus on money market mutual funds. The Task Force strongly supports this initiative.

Recommendation 10. Relevant industry associations in conjunction with their constituents are encouraged to publish comprehensive Best Practice guidance for Cash Investors. (30 Sep 2010)

Mitigating liquidity impact of Dealer default

There are several possible ways to reduce the liquidity impact of a failing Dealer on Cash Investors, in addition to the obvious approach of reducing the size of repo exposures in the first place.

Pre-arranging secured liquidity facilities

Cash Investors may choose to enter into a committed liquidity facility that would allow them to obtain temporary liquidity secured by high-quality unencumbered securities that they own. Many Cash Investors own sufficient high-quality, short-dated securities that could collateralize the funding under such a facility. The facility would reduce the need to engage in a “fire sale” of collateral that could depress securities prices. Cash investors would need to gauge how large a credit facility might be needed to cover their liquidity needs. This must be reassessed regularly. The potential use of such facilities by regulated Cash Investors should be discussed with those regulators.

Netting/offset of Dealer positions through DTCC (The Depository Trust & Clearing Corporation)

Offsetting positions that Cash Investors hold relative to a defaulted Dealer and those that the Dealer held with its other clients reduces the number of positions that need to be liquidated. The more potential offsets that can be identified, the less potential liquidation needs to occur

In the event of a Dealer default, Clearing Banks and DTCC should review all FICC (Fixed Income Clearing Corporation), NSCC (National Securities Clearing Corporation), and DTC (The Depository Trust Company) sell positions in order to identify tri-party repo collateral that can be used to satisfy the defaulted Dealer’s short positions through a netting/set-off process, which could result in less collateral to be liquidated in the open market. Procedures need to be in place to control this flow. DTCC has existing infrastructure in place with Clearing Banks that could potentially be leveraged to accommodate this process. DTCC did a preliminary sample analysis of three large tri-party repo portfolios based on data received from each of the Clearing Banks. The analysis focused on U.S. Treasury and U.S. Agency debt collateral. Netting opportunities ranged from 9% to 18%.

Recommendation 11. DTCC and its affiliates to work with other market participants to maximize the potential for offsetting of positions in the event of a Dealer default; DTCC and/or other interested parties can provide a viable collateral liquidation management service for those Cash Investors wishing to delegate these activities. (30 Nov 2010)

Additional Concepts

Liquidity Stabilization Utility

This is a more far-reaching concept as mentioned in Section 1 of the Report. The idea would be to establish an ongoing bank entity, the Liquidity Stabilization Utility (LSU), which would exist for the primary purpose of providing liquidity to Cash Investors. The LSU could provide Cash Investors a collateralized loan transaction secured by high quality short term assets owned by the Cash Investors. Cash Investors could then dispose of the repo collateral received from the defaulted Dealer in an orderly manner.

As a bank, the LSU could in principle raise cash to fund the loans to the Cash Investors by pledging the high quality assets to the Federal Reserve discount window. The objective would be to eliminate as far as possible the risk of loss to the LSU or the Federal Reserve by having the relevant Cash Investors contractually obligated to bear the

first loss of any shortfalls due to the prices obtained in the ultimate liquidation. Capital would be built up in the LSU over time through fees, allowing it to play a greater role in providing liquidity as it grows.

As noted in Section 1, the LSU raises a number of issues, including its ultimate reliance on Federal Reserve liquidity, and therefore the Task Force is not including a recommendation regarding the LSU.

Central Counterparty

Another far-reaching concept is the notion of a central counterparty or “CCP” for tri-party repo transactions. At the heart of the CCP idea is the concept of mutualization of any losses above the margins charged by the CCP. These are expected to be higher than those charged in bilateral transactions. The mutualization could occur across the Dealer community, or across some combination of Dealers and Cash Investors, and would not necessarily imply any change in infrastructure relative to that maintained by the two Clearing Banks. Because the CCP stands in as the counterparty facing Cash Investors in its tri-party transactions, in principle it could finance the liquidation of collateral associated with a defaulted Dealer simply by undertaking new tri-party transactions. As long as the credit quality of the CCP itself was not in question, this approach would therefore have potential to address concerns both with respect to the “fire sale” liquidation of collateral and with respect to the stability of tri-party financing. The costs and complexity of the issues involved, however, especially prior to the operational enhancements needed to eliminate the need for intraday credit, lead the Task Force to avoid making a specific recommendation regarding a central counterparty.

<p>Recommendation 12. All market participants to continue exploring additional concepts that have the potential to add to the stability and resilience of tri-party repo financing and/or reduce the potential for collateral “fire sales” in the event of a Dealer default. (Ongoing)</p>

Section 8: Transparency

The tri-party repo market has historically seen only limited disclosures regarding the aggregate size of the market, collateral types, and margin levels. This lack of transparency contributes to market uncertainty during times of stress and also may have contributed to under-estimates of the extent of pro-cyclicality inherent in pre-crisis margin levels and in the systemic risk potential of the tri-party repo market overall.

Recommendation 13. Initiate monthly publication, via the Federal Reserve, of aggregate statistics on tri-party repo collateral and Cash Investor margin levels, with disclosure by asset class, based on information provided by the Clearing Banks. (See Table 1 for a pilot version.) (30 Jul 2010)

The pilot version of the report does not yet include term information, however the plan is to provide this once it is available and reviewed by the Task Force.

Collateral Valuation

As highlighted in the discussion of margining practices, margins will only be effective to the extent they are being applied in conjunction with an accurate price for the securities held as collateral. If inaccurate prices are being supplied by third party vendors the Clearing Bank/Cash Investor may be exposed to a situation where the market value of collateral is insufficient to cover the repo notional. This could potentially result in unsecured counterparty credit exposure resulting from 'collateral valuation risk'.

In order to minimize the collateral valuation risk the Task Force believes the valuation process requires robust, reliable and independent pricing sources. Managing collateral valuation risk requires that participants understand the nature and type of sources that are being used together with associated methodologies, in particular where model-based prices are being used, as well as the assumptions and input sources associated with those models. There may also be some collateral types where collective efforts by Dealers could further enhance the transparency of valuation. For example, in some markets, third party services have enabled anonymous compilation of marks applied and thereby provided additional useful information on the range and central tendency of such marks.

Given the loss of liquidity and the increase in valuation uncertainty that some collateral types experienced during the crisis, there may also be benefit in exploring whether additional information on the range and nature of valuations could be useful in measuring the extent of valuation uncertainty. Cash Investors would also benefit from understanding as rapidly as possible when and where valuation uncertainty is increasing.

Lastly, in the current environment, there are many asset classes for which the vendors provide pricing as of the *previous day's* close of business. In a volatile market, this stale pricing can misstate the current value of the assets. As a result, there is a need to evaluate the possibility of providing same day pricing valuations across a wider range of assets included within the tri-party repo market.

For all these reasons, the Task Force believes that it is desirable to establish a focused working group of valuation specialists to look at these and other issues and to make recommendations.

Recommendation 14. The Task Force will establish a working group of valuation specialists across tri-party repo market participants to evaluate collateral pricing methods and make recommendations for improvements, including the feasibility of same-day pricing. (15 Oct 2010)

On a regular basis, both Dealers and Cash Investors should be comparing or testing valuations provided by Clearing Banks. Cash Investors should test the vendor prices provided by the Clearing Bank to determine if the level of over-collateralization is appropriate. Running independent pricing analysis can help Cash Investors identify

potential issues and correct them. Cash Investors should be able to price the collateral they receive and should validate their prices with Clearing Banks and Dealers. This supports validating the prices used by Clearing Banks and increases price transparency across the tri-party repo market. Dealers should likewise include a comparison of valuations as part of their regular interactions with Clearing Banks. This could include establishing bilateral tolerance levels that trigger greater review or discussion between the Dealer and the Clearing Bank.

Recommendation 15. Cash Investors to regularly validate tri-party collateral for pricing, appropriateness, and classification. Dealers to regularly compare collateral marks on their own books and records with vendor prices provided by the Clearing Banks. (Ongoing)

A special case arises when the Dealer's marks for a given security are materially below the prices provided by the Clearing Banks, which obtain them from third party vendors. In such cases, Dealers should highlight the variations to Cash Investors and Clearing Banks to ensure that repo transactions are not financing securities at levels that would imply a material shortfall of margin, assuming the Dealer's valuation is the correct one.

Recommendation 16. Dealers to inform Cash Investors and Clearing Banks in cases where the Dealer's marks are materially below the vendor prices provided by the Clearing Bank. (Ongoing)

Section 9: Assessment

As discussed in Section 1 of this Report, the recent credit crisis highlighted material weaknesses in the U.S. tri-party repo market that exposed the global financial markets to systemic risk. These weaknesses can be grouped into the following categories:

- Operational Arrangements: The daily unwind process resulted in the two Clearing Banks extending up to \$2.8 trillion dollars in intraday funding. This also resulted in uncertainty as to where the credit exposure resided throughout the day.
- Dealer Liquidity Risk Management: Examples include Dealers' reliance on very short-dated repo financing, as well as Dealers' reliance on uncommitted funding to support the daily unwind process.
- Margining Practices: Pro-cyclical margining practices resulted in a loss of liquidity for Dealers in a stressed market.
- Contingency Planning: Insufficient preparation for market participants to cope with a Dealer default.
- Transparency: The market generally lacked transparency in terms of market depth and risk.

In aggregate, the proposals that are detailed in this Report will drastically reduce, although not eliminate, many of these risks. The following paragraphs will summarize, through specific examples, where this risk is reduced.

The practical elimination of the daily unwinds for non-maturing trades will reduce the intraday credit by the Clearing Banks to less than 10%⁹. At its peak, this would have resulted in a \$2.5 trillion reduction in Clearing Banks' credit risk. Furthermore, by potentially re-setting the market standard for unwinding maturing trades until later in the day, the Clearing Banks' remaining credit risk will be further reduced to an afternoon window period in a given day with regards to the unwind process for maturing trades¹⁰.

In order to improve Cash Investors' capacity to manage a Dealer default, the Recommendations in this Report (1) encourage a more risk based, non pro-cyclical margining process that will improve the expected recovery rate in a default scenario, and (2) provide an industry netting mechanism and support an optional liquidation agent. These enhancements will improve the resiliency of the product as participants will have greater access to a fully functional operational process for collateral liquidation.

From a Dealer's perspective, although the amount of intraday funding required from the Clearing Banks is limited, a transition from uncommitted funding facilities to committed funding facilities would greatly reduce a Dealer's liquidity risk. Additionally, by the market moving to a risk-based, non pro-cyclical margining process the Dealers will be less likely to see a massive withdrawal of funding as they enter a stressed environment.

Lastly, the industry is undertaking an effort to improve market transparency. This transparency will come in various forms: (1) the industry's first monthly publication which details the overall size and depth of the U.S. tri-party repo market, (2) Tri-Party Repo Best Practices guidance for Cash Investors which will educate all market participants as to the risks of the product and the best practices to manage these risks, (3) a three-way, real-time trade confirmation process, and (4) practical elimination of the daily unwind process which will ensure clarity on intraday exposures. This will substantially enhance the ability for supervisors and market participants to assess trends and call attention to emerging issues before they become systemic in nature.

⁹ The 10 % represents the estimated portion of a Dealer's book that matures or receives initial funding on a given day.

¹⁰ Clearing Banks may additionally provide some intraday credit related to cash substitutions prior to trade maturity. We do not expect these amounts to be material.

It is important to note that the Task Force was not mandated to opine on the liquidity risk management practices of the various Dealers. Although the Report has touched briefly on some general best practices on this topic, it also seems clear that upcoming regulatory changes (e.g. Basel III, etc) will further reduce, although not eliminate, the probability of a Dealer default by increasing capital and liquidity standards generally. The standards proposed in relation to liquidity are particularly relevant as they are likely to mean that lower-quality collateral funded via short-dated repo must be matched by liquid assets within the firm's liquidity buffer.

The benefits of these modifications are illustrated by the following simplified transaction examples that compare (1) the current tri-party framework, and (2) the framework after implementation of all proposals:

Example #1: Business As Usual Scenario - Repo Trade Is Extended¹¹

- Assumptions
 - Dealer has a single, \$1.0bn repo maturing today
 - Dealer and Cash Investor agree to enter into a new \$1.0bn repo prior to the morning deadline
 - The collateral allocation is static (e.g. no collateral substitutions are required)
- Current Market Process
 - The Clearing Bank is not notified of the new trade details
 - The Clearing Bank extends a \$1.0bn intraday loan to the Dealer as part of the daily unwind process
 - The Clearing Bank credits a \$1.0bn deposit into the Cash Investor's account
 - The Dealer is reliant on a discretionary line of credit from the Clearing Bank to manage the operational flows on this trade
 - At the end of the day: the Clearing Bank reallocates the collateral to the Cash Investor; withdraws the cash deposit from the Cash Investor's account, and closes out the intraday loan to the Dealer
 - Cash Investor's credit risk is transferred between secured Dealer risk and unsecured Clearing Bank deposit risk. The timing of this risk transfer is unknown to Cash Investor throughout the day
- Post Task Force Implementation
 - The Dealer, Cash Investor, and Clearing Bank confirm the details of the new trade via the three-way, real time confirmation process
 - The trade is no longer subject to the daily unwind
 - The Clearing Bank will not need to extend any credit to the Dealer in the context of this example
 - The Cash Investor has repo exposure to the Dealer all day

Example #2: Business As Usual Scenario – Repo Trade Matures

- Assumptions
 - Dealer has a single, \$1.0bn repo maturing today
 - The Dealer and Cash Investor are unable to agree on a new repo trade
 - The collateral allocation is static (e.g. no collateral substitutions are required)
 - In the Post Implementation Task Force scenario, the original trade will be subject to the End of Day Settlement time discussed in Section 4 of the Report.
- Current Market Process
 - In the morning, the Clearing Bank extends a \$1.0bn intraday loan to the Dealer as part of the daily unwind process
 - The Clearing Bank credits a \$1.0bn deposit into the Cash Investor's account

¹¹ With the exception of the confirmation process, a non-maturing term trade will have similar mechanics

- The Dealer is reliant on a discretionary line of credit from the Clearing Bank to manage the operation flows on this trade
- Cash Investor withdraws this cash in the morning leaving the Clearing Bank with sole exposure to the Dealer
- At the end of the day, the Dealer repays the \$1.0bn to the Clearing Bank to close out the intraday loan
- Post Task Force Implementation
 - *At the end of the business day and subject to the terms of the committed funding line in place between the Dealer and the Clearing Bank¹², the Clearing Bank extends a \$1.0bn loan to the Dealer, and credits \$1.0bn of cash into the Cash Investors account*
 - From the Dealer's perspective, the intraday loan is committed subject to the terms of the agreement
 - The Cash Investor withdraws its cash at the end of the day
 - The Dealer will repay the intraday loan prior to the end of the day

Example #3: Dealer Stress Scenario (\$1.0bn repo trade does not mature due to Dealer default)

- Assumptions
 - Dealer has a single, \$1.0bn repo maturing today
 - In the Post Implementation Task Force scenario, Dealer is unable to meet the terms of its committed intraday funding facility from the Clearing Bank (e.g. unable to post the necessary collateral), and the Dealer is unable to repay the principal amount due
- Current Market Process
 - Due to the stress in the market, there is general uncertainty as to how the unwind process will work:
 - The Clearing Bank may or may not unwind this trade
 - The Dealer does not have any clarity as to whether the trade will unwind
 - The Cash Investor does not know if/how the maturing trade will be unwound
 - If the trade is not unwound and the Dealer defaults, there is uncertainty regarding the liquidation process
- Post Task Force Implementation
 - At the end of the day, the Clearing Bank makes a margin call to the Dealer; Dealer is unable to meet the call
 - Per the terms of the committed funding facility the Clearing Bank will not unwind the maturing trade (i.e. no credit will be extended to the Dealer, collateral will remain in the Cash Investors account). As a result, the Cash Investor will retain its risk to the Dealer
 - At the end of the day, if the Dealer has not repaid the principal due, the collateral liquidation process will begin
 - The industry netting process would pair off trades to reduce the inventory that will be delivered to the Cash Investors
 - If elected, the remaining collateral after netting will be transferred to the third party liquidation agent who will act on behalf of the Cash Investor
 - In general, the Cash Investor will be better prepared to manage this scenario due to their improved contingency planning

¹² Terms may include maximum funding capacity, collateral eligibility, defined haircuts, etc

Section 10: Next Steps

Upon the publication of this Report the Task Force's *original* mandate will be completed. However, in order to maintain the current momentum through to execution, the Task Force proposes to take ownership of the implementation phase from a collective industry perspective. This proposal is intended to combine the benefits of continuity with the flexibility to evolve the Task Force and the individuals that are participating. The Task Force also recognizes that other groupings may in time be seen as more natural points of governance for certain issues discussed in this Report. Nevertheless, the Task Force believes the greater concern in the short run must be to maintain momentum and drive the operational improvements needed in the tri-party repo infrastructure.

Accordingly, the focus of the Task Force's next phase will consist of: (1) the execution of its Recommendations, in particular the industry action plan to improve tri-party repo operational arrangements, and (2) analyzing and adapting these Recommendations based upon potential regulatory developments and responses to the Federal Reserve's White Paper. The Task Force will maintain a working group focused primarily on operational infrastructure improvements and will establish a second working group on valuation issues as outlined in the Recommendations. The Task Force will also continue to seek input from market participants not directly represented on the Task Force.

The Task Force wishes to thank all market participants and staff at official agencies who provided input or otherwise contributed to this Report. A full listing of the Task Force members and those who contributed to its work streams is included as Annex 4 of the Report.

Section 11: Annexes

Annex 1 - Minimum Parameters Required for Trade Matching

A minimum number of parameters must agree in order for a booked trade to be matched.

These parameters have been listed and defined below. There are certain economic terms of a repo trade, such as the actual benchmark used, which may not have been defined in the initial booking, but which are not required for a successful match. All fields listed below must be populated, at least with default values. No fields can be blank unless otherwise noted below.

1. Buyer legal entity. The Buyer's legal name. For the initial morning trades, prior to beneficial owner sub-account allocations being ready, the Buyer's legal name may belong to the top account owner, the investment advisor, or another affiliated entity representing the eventual beneficial owner(s). In the afternoon, once allocations are available, this field would be populated with beneficial owner's legal name.
2. Seller legal entity. The Seller's legal entity name.
3. Transaction type. (Repo, B/P, [other]) The default would be Repo.
4. Trade date. (MM/DD/YYYY) The date the trade's terms are agreed.
5. Settlement/start date. (MM/DD/YYYY) The date on which the Buyer's cash begins funding the Seller's inventory.
6. Currency. (CCY) This will default to USD.
7. Principal. The size of the repo financing, listed in the units of CCY.
8. Rate type. (fixed or floating)
9. Rate. (NNNN bps) If "Rate type" is fixed, the fixed rate is entered. If the "Rate type" is floating, the applicable spread to the benchmark would be included. The benchmark would be included in a subsequent communication.
10. Maturity date. (MM/DD/YYYY) The date when a trade matures, whether it is an overnight trade or a term trade longer than overnight. Open trades will have a standard representation TBD in this field.
11. Collateral type identification. The Seller and Buyer will input the same identifier to represent the collateral agreed to under the trade. The Clearing Bank will need to be able to recognize, at the very least at a high level, what this collateral basket is (e.g., Treasuries, common equities, etc.) in order to do allocations. Note: this may require a standard collateral classification across all market participants, as well as more standard collateral schedules.
12. Block trade identification. This field is necessary to be populated by the Matching Service in order for subsequent allocations to beneficial owner sub-accounts can cancel and replace the original early morning top account trades. This will only be used for trades that have afternoon allocations.
13. Initial/Revised Breakdown. (Will become final breakdown if no subsequent submission received at "end of day" - to be defined)
14. Morning/Afternoon settlement. (If convention is adopted by industry)
15. Rolled Trade. (Y/N)

Annex 2 - Summary of Work of the Legal Subcommittee of the Task Force on Tri-Party Repo Infrastructure

Overview

Under the leadership of the Federal Reserve Bank of New York, the Legal Subcommittee of the Tri-Party Repo Task Force included legal representatives from Cash Investors (asset managers/repo Buyers, Dealers (repo Sellers), and Clearing Banks. The work of the Legal Subcommittee focused on trying to provide legal solutions to the following two challenges in the tri-party repo market:

1. Confirming the legal certainty regarding repo commitments made early in the day between various funds and/or joint account(s) and their Dealer counterparties (on a principal to principal basis) while maintaining flexibility to change allocations to specific principals after the overall commitment is established; and
2. Eliminating the daily unwind of cash and collateral currently performed by the Clearing Banks in respect of term repurchase transactions and, to the greatest extent possible, eliminating the daily unwind of cash and collateral performed by the Clearing Banks in respect of all other repurchase transactions.

The proposal of the Legal Subcommittee is described below, in broad terms. This proposal is intended to cover all types of repurchase transactions, including transactions which involve joint trading accounts as well as transactions involving government and non-government securities, with the understanding that there will no longer be daily unwinds for term repurchase transactions. In addition, the Legal Subcommittee thought it was important to note that each time a Cash Investor and a Dealer enter into a new repurchase transaction (even if that transaction is between the same Cash Investor and Dealer and for the same Purchase Price as the transaction entered into on the prior day), such subsequent transaction is legally a new transaction. The use of capitalized terms refers to common definitions in master repurchase agreements.

Note that as discussed in Section 4 Operational Arrangements, these proposals on new standardized settlement times have not yet been agreed or finalized. The below is an outline of how a Morning Settlement and or End of Day Settlement could work.

Operational Assumptions

This summary assumes that the Clearing Banks would be able to support two operational changes to current practice:

1. Dealers would be able to substitute collateral in Cash Investors' account throughout the Business Day in compliance with applicable margin requirements; and
2. There will be a three party confirmation system through which Cash Investors, Dealers and Clearing Banks will have complete information regarding what has been agreed to between Cash Investors and Dealers early in the trading day and through which repurchase transactions may be allocated among Cash Investors and the allocations adjusted at agreed upon intervals during the Business Day. Such confirmation system shall be referred to herein as the "Three Party Confirmation".

Lifecycle of an Overnight Repurchase Transaction

- As a general rule, subject to the provisions below, the maturity of an overnight repurchase transaction agreed to on any Business Day will occur at the end of the day on the following Business Day.
- Alternatively, and as an exception to the general rule described above, Cash Investor and Dealer may, at the time such parties agree to enter into such repurchase transaction, agree to a "morning settlement" in respect of all or any portion of the repurchase transaction agreed to on such Business Day, whereby such repurchase transaction (or portion thereof subject to morning settlement) shall mature on the morning of the following Business Day. If only a portion of the repurchase transaction agreed to on such Business Day is subject to morning settlement, the parties will treat such portion as a separate transaction with its own Three Party Confirmation, and the balance will mature at the end of the day on the following Business Day.

Allocation of Transactions

- On any Business Day that Cash Investor and Dealer agree to enter into a repurchase transaction, Cash Investor or Cash Investor's agent, along with Dealer and Clearing Bank, shall confirm in the morning the legally-binding agreement entered into with Dealer, with a provisional notice (the "Initial Notice"), which shall take the form of the Three Party Confirmation, and which shall indicate the specific principal(s) or joint account(s) that are expected to participate in such repurchase transaction. If more than one principal or joint account will participate in a repurchase transaction, the Initial Notice will indicate the portion of the Purchase Price to be paid by each principal or joint account specified in the Initial Notice.
- In respect of any repurchase transaction evidenced by an Initial Notice, Cash Investor or Cash Investor's Agent may subsequently adjust the identity of the principal(s) or joint account(s) and their respective allocations (but not the aggregate principal amount) of the Purchase Price specified in the Initial Notice by providing Dealer and Clearing Bank with a revised notice delivered no later than the end of the day on the date of the Initial Notice (the "Final Notice"); it being understood that (i) Cash Investor may provide one or more revised notices on such date, but only the latest revised notice relating to such repurchase transaction and confirmed by Cash Investor, Dealer and Clearing Bank shall be deemed to be the Final Notice, (ii) if Cash Investor does not provide any such revised notice to Dealer, the Initial Notice shall be deemed to be the Final Notice, and (iii) any revised notices, including the Final Notice, shall take the form of the Three Party Confirmation.
- Promptly upon Dealer's declaration of a Cash Investor Event of Default, and in any event before noon New York City Time on the next Business Day, Cash Investor(s) agree to inform Dealer and Clearing Bank of (i) each Cash Investor responsible for the Event of Default (each a "Defaulting Cash Investor"), and (ii) each Defaulting Cash Investor's share of the Purchase Price of the account Transactions specified in the Final Notice. Only such Defaulting Cash Investor's allocated share of the Purchase Price for such Transaction shall be deemed subject to such Cash Investor Event of Default.

Daily Maintenance of Transactions

- If, on any Business Day following the date a Final Notice was provided in respect of a repurchase transaction between Cash Investor and Dealer, Cash Investor and Dealer agree to a subsequent repurchase transaction, and Cash Investor, Dealer and Clearing Bank have confirmed such transaction via an Initial Notice, subject to any morning settlement agreed to either on the trade date or as described in the following paragraph, Clearing Bank will unwind¹³ only the portion of the repurchase transaction entered into on the previous Business Day that exceeds the Purchase Price specified on the current Business Day's Final Notice at the end of the day on the current Business Day.
- On any Business Day following the date a Final Notice was provided in respect of a repurchase transaction between Cash Investor and Dealer, Cash Investor and Dealer may agree to a "morning settlement" in respect of all or any portion of the repurchase transaction agreed to on the previous Business Day, whereby (upon notice of the mutually agreed morning settlement to Clearing Bank) such repurchase transaction (or portion thereof subject to morning settlement) shall mature on the morning of the current Business Day. Subject to the preceding paragraph, any repurchase transaction (or portion thereof) not subject to morning settlement will mature at the end of the day on the current Business Day. For the avoidance of doubt, the morning settlement option may be agreed to by Cash Investor and Dealer both at the time of entering into a repurchase transaction and on the morning of the following Business Day.

If, on any Business Day following the date a Final Notice was provided in respect of a repurchase transaction between Cash Investor and Dealer, Cash Investor and Dealer do not agree to a subsequent repurchase transaction, unless the transaction is subject to morning settlement, Clearing Bank will unwind the repurchase transaction entered into on the previous Business Day at the end of the day on the current Business Day.

¹³ Nothing contained in this summary is intended to create any obligation on behalf of Clearing Bank to extend credit to the Seller in order to support any unwind upon the maturity of a repurchase transaction contemplated herein.

Annex 3 - Explanatory notes to the table on investor haircuts and the table on collateral composition

1. The tables are based on the market value including and margin percentages applied in tri-party repurchase transactions in the U.S. The summary statistics are being provided to market participants in the interest of creating greater transparency on the size and nature of the U.S. tri-party repo market. Each investor should make risk-based decisions appropriate for his or her own institution with proper consideration for the credit quality of the parties to a transaction.
2. The figures in the table are derived from the entire population of securities allocated in tri-party repurchase transactions for which Bank of New York Mellon (BNYM) and JP Morgan Chase (JPMC) serve as agents. These transactions are executed on their U.S.-based tri-party platforms.
 - a. Because the data set comprises the entire population of tri-party repos, the figures shown are all-inclusive and are not estimates that are obtained by drawing a sample.
 - b. Readers should be aware that while this data reflects all U.S. tri-party repo, it does not account for any bilateral repo trades, and thus does not reflect the entire U.S. repo market.
3. The data set was obtained for a single date, specifically the close of business on 4/9/2010. This date, the seventh business day of the month, was selected because it is judged to be a typical business date. Days such as the first or last business day of the month, or a mortgage-backed securities settlement day, could introduce distortions into the data.
 - a. It is proposed that these tables be published monthly as of the seventh business day of each month unless such date is deemed by the FRBNY or the two Clearing Banks to be an atypical business day in which case an alternate date will be selected.
4. The data consists of the market values applied by BNYM and JPMC using their standard processes and third party vendor sources. The figures shown in the first table are based on the haircuts (also called margins) applied to the value of the securities used as collateral, expressed as a percent of the valuation given to the securities. The collateral values used for calculating the totals are the value of collateral (including accrued interest) before the haircut.
 - a. For each asset group, a median value and a range of haircuts are shown.
 - b. Concentration data is shown for the three largest Dealer holdings both by asset group and for the entire population of tri-party repo. For the entire population, the dollar value of the top three largest Dealer portfolios was summed and divided by the total dollar value of all tri-party Dealer portfolios.
5. The data set comprises 5,419 individual repurchase agreements (“deals”). It is common practice to use a combination of securities from two or more asset groups to serve as the collateral for a single repurchase agreement. Securities taken from each asset group may have a different haircut applied to them. For example, a mix of Treasury securities, agency debentures, and agency MBS could collateralize a single repurchase agreement. The respective haircuts could be 2 percent, 2.5 percent, and 3 percent. In this example, the single repurchase agreement would yield these three data points. As a result, in the haircut table, the number of data points (or collateral allocations) is 7,774 which is greater than the number (5,419) of repurchase agreements.

6. Definition of asset groups

Asset group	Definition
Asset-Backed Securities (Investment Grade and Non-Investment Grade)	Securities that are secured by cash flows of a discrete pool of receivables or other financial assets, further divided by the following, if the 1% threshold* is met: <ul style="list-style-type: none"> • ABS Investment grade securities and • ABS Non-Investment grade securities.
Agency CMO (Collateralized Mortgage Obligations)	REMIC and CMO securities issued by GSEs supporting the housing market – FNMA, FMAC, and GNMA.
Agency MBS (Mortgage-Backed Securities)	MBSs issued by Government Sponsored Enterprises (GSEs) that support the housing market – FNMA, FMAC, and GNMA.
Agency Debentures and Agency Strips	Debt securities issued by federal agencies or GSEs. These agencies and GSEs are: FNMA, FMAC, GNMA, FHLB, TVA, SLMA, REFCO, FICO, USPS, FFCB, FMHA, FAMC, FCFAC, and FLBB, further divided by the following, if the 1% threshold is met: <ul style="list-style-type: none"> • Agency Debentures excluding Strips and • Agency Strips.
Private Label Collateralized Mortgage Obligations (CMOs), (Investment Grade and Non-Investment Grade.	CMOs issued by corporations or private institutions, further divided by the following, if the 1% threshold is met: <ul style="list-style-type: none"> • CMOs Private Label Investment grade and • CMOs Private Label Non-Investment grade.
Corporate Securities (Investment Grade and Non-Investment Grade)	Unsecured debt securities issued and guaranteed by a corporation, further divided by the following, if the 1% threshold is met: <ul style="list-style-type: none"> • Corporate Investment grade and • Corporate Non-Investment grade.
Equities	Common and Preferred Stock, ETFs, ADRs, UITs, Mutual Funds, Warrants & Rights, and Convertible Bonds.
Money Market	CP, CDs, BAs, and Bank Notes.
US Treasuries excluding Strips and US Treasury Strips	Bills, bonds, and notes issued by the U.S. Treasury, including TIPS, further divided by: <ul style="list-style-type: none"> • US Treasuries excluding Strips and • US Treasury Strips.

* Please see explanatory note 7 for additional detail regarding the 1% threshold.

7. A materiality threshold of 1 percent of total market value of securities allocated in tri-party repo is applied for inclusion of an asset group in the haircut tables. For the tables based on March 9 data, the threshold for inclusion of an asset group is \$17 billion, or one percent of \$1.7 trillion. The sum of collateral value of the asset groups not shown within the “Other” category is \$19.49 billion, a little more than 1 percent of total collateral value. As the total collateral value in tri-party repo agreements rises or falls over time, the threshold value will change accordingly. This may result in the inclusion of more or fewer asset groups in the monthly reports.

- a. Although the Task Force members requested that haircut data be broken out by Investment Grade and Non-Investment Grade for the following asset classes: ABS, CMO Private Label securities and Corporate Securities, this breakout is only displayed if the 1% threshold is met. If this threshold is not met, the Investment Grade portion is combined with the Non-Investment Grade portion for the purposes of displaying haircut data. Similarly, while Task Force members also requested that Agency Strips be broken out from Agency Debentures, this detail is only displayed for haircut data if it meets the 1% threshold.
 - b. Additional asset groups that do not meet the 1% threshold and therefore do not appear in the current haircut table are: Collateralized Debt Obligations, International Securities, Municipal Securities, Trust Receipts, and Whole Loans. Municipal Securities is the largest of the asset groups that do not appear.
8. Both sides of the tri-party repo market are characterized by at least moderate levels of concentration.
- a. On the cash borrowing side, the broker-dealers that are most active in the market engage in a substantial number of repo contracts. As a result, several of the data points have the same broker-dealer as the counterparty. This pattern is true for the entire data set as well as for a particular asset group.
 - b. On the cash lending side, entities that are most active in the market also engage in a substantial number of repo contracts, and as a result, several of the data points have the same financial institution or legal entity as the counterparty. In the case of money market mutual funds, this pattern is described in their semi-annual reports. In the reports, a Money Market Mutual Fund (MMMF) lists its entire portfolio holdings, including repurchase agreements. A large MMMF may be engaged in as many as 50 repurchase agreements on a given day.
 - c. Concentration on both sides of the market also yields some repetition in the data set for a specific counterparty pair (for example, Barclays Capital as cash borrower, and Fidelity Cash Reserves as cash lender). The repetitions occur not only in the data set as a whole, but also for specific asset groups (for example, equities). In effect, there are fewer independent observations than the number of collateral allocations, which each yields one data point.

The repetition of counterparty pairs in the data is an additional reason to establish a threshold such as one percent of total collateral value before including an asset group in the table.

Annex 4 - Tri-party Repo Infrastructure Reform Task Force and Workstream Participants

Tri-Party Repo Task Force Members			
Role	Member	Alternate	Firm
Task Force Chairman	Darryll Hendricks		<i>UBS Investment Bank</i>
PRC Oversight	Don Monks		<i>BNY Mellon</i>
Clearing Banks	Art Certosimo	James Malgieri	<i>BNY Mellon</i>
	David Weisbrod	Sandie O'Connor Kelly Mathieson	<i>JPMorgan Chase</i>
Dealers	Dick Seitz		<i>Bank of America</i>
	David Lohuis	John Feraca	<i>Barclays Capital</i>
	Barrie Ringelheim	Thomas Mellina	<i>Citigroup Global Markets Inc</i>
	Paul Scheufele		<i>Credit Suisse</i>
	Tom Devine	Joe Rice	<i>Deutsche Bank</i>
	Robin Vince	Michael Kurlander	<i>Goldman Sachs</i>
	Craig Delany		<i>JP Morgan Chase</i>
	Tom Wipf	Ed Corral	<i>Morgan Stanley</i>
Colin Parry		<i>UBS Investment Bank</i>	
Investors	Robert Dolecki		<i>Fannie Mae</i>
	Debbie Cunningham		<i>Federated Investors</i>
	Norm Lind		<i>Fidelity</i>
	Laurie Brignac		<i>Invesco</i>
	Sean Dillon		<i>State Street</i>
Hedge Funds	Dan Dufresne		<i>Citadel Investment Group</i>
Utilities	Murray Pozmanter	Gary Chan	<i>DTCC</i>
Industry Groups	Brian Reid		<i>ICI</i>
	Rob Toomey		<i>SIFMA</i>
	Carl Kennedy		<i>Managed Funds Association</i>
Secretariat	Emily Gu		<i>UBS Investment Bank</i>
	Michele Braun		<i>FRBNY Payments Policy</i>
	Joanna Wisniecka		<i>FRBNY Payments Policy</i>
	Kirsten Harlow		<i>FRBNY Payments Policy</i>
Technical Advisors			
Federal Reserve Board of Govs.	Matt Eichner		<i>Research & Statistics</i>
	Jeff Stehm		<i>Rsv Bk Ops & Payment Sys.</i>
FRBNY	Lucinda Brickler		<i>Payments Policy</i>
	Larry Radecki		<i>Payments Policy</i>
	Brian Begalle		<i>Bank Supervision</i>
	Michael Alix		<i>Credit Risk</i>
	Chris Burke		<i>Markets Group</i>
	Antoine Martin		<i>Research</i>
	Michael Schussler		<i>Legal</i>
SEC	Mike Macchiaroli		<i>Trading & Markets</i>
	Richard Bookstaber		<i>Risk, Policy & Fin. Innovation</i>
	Daniele Marchesani		<i>Investment Management</i>

Operational Workstream			
Member	Firm	Member	Firm
Ed Corral (Lead)	<i>Morgan Stanley</i>	Sean McWeeney	<i>Goldman Sachs</i>
Michael Kurlander (Lead)	<i>Goldman Sachs</i>	Karl Mocharko	<i>Federated Investors</i>
Gary Chan	<i>DTCC</i>	Al Morabito	<i>Federated Investors</i>
Ricardo S. Chiavenato	<i>JP Morgan Chase</i>	John Morik	<i>BNY Mellon</i>
Dan Dufresne	<i>Citadel Investment Group</i>	Jeff Petro	<i>Federated Investors</i>
Enrico Giardina	<i>Morgan Stanley</i>	Murray Pozmanter	<i>DTCC</i>
Emily Gu	<i>UBS Investment Bank</i>	Mark Robinson	<i>BNY Mellon</i>
Elke Jakubowski	<i>DTCC</i>	Paul Scheufele	<i>Credit Suisse</i>
Peter Kelly	<i>DTCC</i>	Michael Schroeder	<i>BNY Mellon</i>
Mike Limeri	<i>Morgan Stanley</i>	Mark D Trivedi	<i>JP Morgan Chase</i>
James Malgieri	<i>BNY Mellon</i>	James White	<i>Goldman Sachs</i>
Kelly Mathieson	<i>JP Morgan Chase</i>	John Morik	<i>BNY Mellon</i>

Tactical Reductions in Intraday Exposure Workstream			
Member	Firm	Member	Firm
Paul Scheufele (Lead)	<i>Credit Suisse</i>	Sharon Lester	<i>Invesco</i>
Michael Albanese	<i>JP Morgan Chase</i>	Larry Mahler	<i>Credit Suisse</i>
Jim Beckenhaupt	<i>Barclays</i>	James Malgieri	<i>BNY Mellon</i>
Tony Blasi	<i>Credit Suisse</i>	Kelly Mathieson	<i>JP Morgan Chase</i>
Laurie Brignac	<i>Invesco</i>	Shirley McCoy	<i>JP Morgan Chase</i>
John Butler	<i>UBS Investment Bank</i>	Sean McWeeney	<i>Goldman Sachs</i>
Francesco Cafagna	<i>Goldman Sachs</i>	Karl Mocharko	<i>Federated Investors</i>
Gary Chan	<i>DTCC</i>	John Morik	<i>BNY Mellon</i>
Ricardo Chiavenato	<i>JP Morgan Chase</i>	Sandie O'Connor	<i>JP Morgan Chase</i>
Edward Corral	<i>Morgan Stanley</i>	John Palchynsky	<i>Barclays</i>
Craig Delany	<i>JP Morgan Chase</i>	Jeff Petro	<i>Federated Investors</i>
Sean Dillon	<i>State Street</i>	Murray Pozmanter	<i>DTCC</i>
Linda Felchak	<i>Invesco</i>	Christian Rasmussen	<i>UBS Investment Bank</i>
John Feraca	<i>Barclays</i>	Paul Ritchie	<i>UBS Investment Bank</i>
Daniel Fleming	<i>Barclays</i>	Jeffrey Scott	<i>UBS Investment Bank</i>
Kevin Gaffney	<i>Fidelity</i>	Dick Seitz	<i>Bank of America</i>
Emily Gu	<i>UBS Investment Bank</i>	Brian Smith	<i>Invesco</i>
Jacqueline Hakimzadeh	<i>Invesco</i>	Douglas Sorin	<i>UBS Investment Bank</i>
James Hraska	<i>Barclays</i>	Brian Swann	<i>Goldman Sachs</i>
Joseph e Johnston	<i>Bank of America</i>	Brandy Talge	<i>Invesco</i>
Craig Jones	<i>Barclays</i>	Mark Trivedi	<i>JP Morgan Chase</i>
Michael Kurlander	<i>Goldman Sachs</i>	Gilbert Vinluan	<i>Bank of America</i>

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Legal Workstream			
Member	Firm	Member	Firm
Michael Schussler (Lead)	FRBNY	Michael Kurlander	Goldman Sachs
Ted Amley	Morgan Stanley	Joseph Lallande	Invesco Aim
Jeff Aronson	JP Morgan Chase	Moses Lin	GSAM
Peter Bonanno	Goldman Sachs	Karl Mocharko	Federated Investors
Mary Breslin	Deutsche Bank	Jennifer Maloni	Bank of America
Gary Buki	BNY Mellon	Karrie McMillan	ICI
Deena C. Ethridge	State Street	Kevin Meagher	Fidelity
Alexander Gordon	GSAM	Frank J Nasta	JP Morgan Chase Asset Management
Shannon Hales	Citibank	James Panella	Morgan Stanley
Jane Heinrichs	ICI	Anastasia Sheffler-Wood	Invesco/Stradley Ronon
Debra Hong	Invesco/Stradley Ronon	Robert Toomey	SIFMA
Gail Inaba	JP Morgan Chase	Kathleen Tripp	JP Morgan Mutual Fund
Bruce Ismael	Deutsche Bank	Andrew Waskow	Goldman Sachs
Stephen Keen	Federated Investors/Reed Smith	Keith Weller	UBS Global Asset Management
Jason Ketchen	Fidelity	Todd Zerega	Federated Investors/Reed Smith

Margining Workstream			
Member	Firm	Member	Firm
Seth Kammerman (Lead)	Goldman Sachs	Sue Hill	Federated Investors
Stephen Brennan	BNY Mellon	Sanja Hukovic	UBS Investment Bank
Laurie Brignac	Invesco	Joseph Johnston	Bank of America
Kevin Caffrey	BNY Mellon	Stephen Keen	Federated Investors/Reed Smith
Ricardo Chiavenato	JPMorgan Chase	David Lamb	JPMorgan Chase
Richard Coffin	Barclays Capital	Matt Leisen	Goldman Sachs
Michael Curran	UBS Investment Bank	Lawrence Radecki	FRBNY
Craig Delany	JPMorgan Chase	Mike Reiffsteck	Bank of America
Tom Devine	Deutsche Bank	Mark Robinson	BNY Mellon
Keith Donohue	BNY Mellon	Jeffrey Scott	UBS Investment Bank
Dan Dufresne	Citadel Investment Group	Guido Storemer	UBS Investment Bank
John Feraca	Barclays Capital	Mark Trivedi	JPMorgan Chase
Eric Graham	Fidelity	Joanna Wisniecka	FRBNY
Kirsten Harlow	FRBNY		

Liquidation Workstream			
Member	Firm	Member	Firm
Murray Pozmanter (Lead)	DTCC	Elke Jakubowski	DTCC
David Weisbrod (Lead)	JPMorgan Chase	Peter Kelly	DTCC
Gary Chan	DTCC		

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