Tim Geithner
July 11, 2008

FEDERAL RESERVE BANK
OF NEW YORK

OFFICE MEMORANDUM

DATE July 11, 2008

TO Tim Geithner

SUBJECT Managing a Loss of Confidence in a

FROM Brickler, Brodows, McCurdy, Schuermann

Major Tri-party Repo Borrower

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Objectives

Drawing on the current arrangement for tri-party repo financing, here is a plan for Federal Reserve financing of a dealer's positions on a 24-hour basis. Currently, a dealer's positions are financed overnight by tri-party repo investors and during the day by its clearing bank. Should a dealer lose the confidence of its investors or clearing bank, their efforts to pull away form providing credit could be disastrous for the firm and also cast widespread doubt about the instrument as a nearly risk free, liquid overnight investment. In the event a firm faced this situation the Federal Reserve could step- in an provide overnight financing as it does now through the PDCF, and by replacing the credit provided by the clearing bank during the day.

The key elements are outlined in the second section of this note. Finally, we have estimated what it would mean for Lehman Brothers, as one example, if we were to apply our conservative haircuts to the full range of their tri-party collateral.

By allowing a dealer to provide a strong face to the market, this approach is intended to support market confidence in the dealer and, by continuing the smooth functioning of the market, in the tri-party repo instrument itself. This could be done on an announced or unannounced basis. Providing an unannounced financing back-stop to the firm would permit it to face the market in a business as usual manner, seeking funds at market rates and on terms comparable to other firms. Further, the Fed's provision of funds to the clearing

banks during the day would put them in the position to wire out any funds investors may request intra-day. In the midst of a stress situation the fast return of funds would again alleviate concerns about market functioning and further boost confidence in the tri-party instrument.

Providing the facility on an announced basis--that we are willing to do this against good collateral and with strong haircuts might cause the same sort of speculation about use--but it would underscore the Fed's intention to support the instruments. Investors would still need to make their credit judgments about counterparties but they would know that they will get their money back and will not get locked in if they decide to pull back.

Proposed Action

To prevent a loss of confidence in a large tri-party repo borrower from triggering a broader loss of confidence in the tri-party repo mechanism, the Federal Reserve should strongly encourage the tri-party repo agent bank to provide intraday financing to the bank and honor investor requests for withdrawals promptly. If the borrower fails to attract sufficient financing by the end of the day, the borrower could turn to the PDCF.

If the triparty repo agent bank cannot be convinced, the Federal Reserve could consider providing the dealer with intraday credit in order to avert a widespread loss of confidence in the triparty repo mechanism.

- FRBNY could enter into a "conditional" non-recourse loan with the clearing bank at the beginning of the day, collateralized by a cash claim on the dealer in question and the associated collateral. If the dealer survives the day, the clearing bank would be required to repay the loan before the end of the day (at zero percent interest). The loan would not appear on their balance sheet or on the Federal Reserve's. The dealer could turn to the PDCF for any residual funding needed for the following night.

- If the dealer does not survive the day, the clearing bank would have the option to extinguish the loan before the end of the day by transferring their

cash claim on the dealer and the associated collateral to FRBNY. (Legal analysis pending.)

- FRBNY would liquidate the dealer's collateral (potentially at a loss) in the event that the cash claim was not fulfilled. Collateral could be held in an off-balance sheet entity during the liquidation period.

Impact on Firm

To compute the financial impact, we make use of the firm's reported allocated repo collateral as per the firm's own MIS dated July 9, 2008. The total global collateral is $297.7bn, of which $1.5bn is Asia, $59.8bn Europe, and $236.5bn US. The US breakdown is summarized in Table 1 below, with totals by type indicated at the top. The firm had $173bn or 73% of its collateral in OMO eligible, another $39.5bn (17%) in PDCF eligible,[1] and a remaining $23.6bn (10%) in other collateral types.

[1] All munis are assumed to be PDCF eligible, though only investment grade are. We do not know precisely what proportion of the muni portfolio is investment grade, but are told that it is the vast majority. The category "other" was left out entirely; it makes up only $0.1bn and is thus not material.

Table 1: Lehman US repo collateral, as of July 9, 2008

Collateral Type	Exposure (bn)
OMO	**173.3**
PDCF	**39.5**
Other	**23.6**
Treasuries	62.0
Government Agency	28.4
Agency MBS	82.9
Asset Backs - Investment Grade	5.8
Asset Backs - Non-Investment Grade	1.5
Corporates - Investment Grade	10.4
Corporates - Non-Investment Grade	4.2
Money Markets	9.6
Muni	4.1
Other	0.1
Private Labels - Investment Grade	9.7
Private Labels - High Yield	2.0
Wholeloan Commercial	5.7
Wholeloan Residential	0.4
C1 - Investment Grade Convertibles	0.5
C2 - Non-Investment Grade Convertibles	0.8
Equities	8.5
Total	**$ 236.46**

We now go on to compute the haircut impact on this portfolio of collateral. This is presented in Table 2 where we repeat the collateral amounts and add haircut information for each asset type. Two haircuts are presented. First our proposed haircuts based on conservative volatility assumptions [a brief methodology description can be found at the end of this document], and second the average haircut actually charged by JPMC in the course of its tri-party clearing operations. The latter are meant to reflect typical current haircuts experienced by the firm.

Because the portfolio is 73% OMO eligible, the weighted average haircuts are modest: 1.055 (or 5.5%) using the conservative volatilities, and 1.023 (2.3%)

using the average JPMC haircuts.[2] If all collateral were to be pledged – including $23.6bn of heretofore non-PDCF eligible collateral – the firm would need to post $13.1bn in extra cash, using our proposed conservative haircuts, to realize the full value of its collateral. Using JPMC's average haircuts, that amount is just $5.4bn.

[2] The (non-weighted) average haircut of PDCF eligible collateral is about 1.079, or 7.9%.

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Table 2: Lehman US repo collateral, as of July 9, 2008, including haircut considerations

		Conservative	Average	Collateral Requirement (bn)	
Collateral Type	**Exposure ($bn)**	**Volatility**	**JPMC HC**	**Conservative**	**Avg**
Treasuries	62.0	1.015	1.01	$ 62.94	$ 62.63
Government Agency	28.4	1.02	1.01	$ 28.97	$ 28.69
Agency MBS	82.9	1.05	1.02	$ 87.07	$ 84.59
Asset Backs - Investment Grade	5.8	1.15	1.03	$ 6.66	$ 5.94
Asset Backs - Non-I-Grade	1.5	1.25	1.15	$ 1.82	$ 1.67
Corporates - Investment Grade	10.4	1.05	1.01	$ 10.87	$ 10.47
Corporates - Non-Investment Grade	4.2	1.10	1.05	$ 4.67	$ 4.46
Money Markets	9.6	1.05	1.01	$ 10.03	$ 9.65
Muni	4.1	1.10	1.05	$ 4.48	$ 4.28
Other	0.1	1.05	1.02	$ 0.08	$ 0.07
Private Labels - Investment Grade	9.7	1.15	1.05	$ 11.16	$ 10.19
Private Labels - High Yield	2.0	1.25	1.10	$ 2.55	$ 2.24
Wholeloan Commercial	5.7	1.15	1.08	$ 6.50	$ 6.10
Wholeloan Residential	0.4	1.15	1.08	$ 0.49	$ 0.46
C1 - Investment Grade Convertibles	0.5	1.15	1.08	$ 0.58	$ 0.54
C2 - Non-I-Grade Convertibles	0.8	1.20	1.12	$ 0.90	$ 0.84
Equities	8.5	1.15	1.08	$ 9.77	$ 9.18
Total	**$ 236.46**	**1.055**	1.023	**$ 249.54**	**$ 242.00**
cash equivalent				***$ 224.06***	***$ 231.04***
extra collateral				$ 13.08	$ 5.54

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Conservative Haircut Methodology

The principle behind the haircuts is a scaled dynamic volatility measure. For each of the major tri-party asset classes, we chose 2 risk factor time series, usually indices available on Bloomberg. One was the major or most representative index (say for municipals, the Merrill Muni Master), or a more adversely selected index (for munis, Merrill's Muni Misc 12-22 yrs series). The latter would likely be more appropriate since if and when an institution would pledge a security at the PDCF, it will probably be one of the less liquid securities for a given asset type or class.

Using daily returns from the indices, we compute a dynamic volatility using the RiskMetrics exponentially weighted moving average model. We then have a time series of daily volatilities. Some of the time series are quite long (10+yrs), others shorter (<2 yrs for some of the more esoteric series). We then take the 99th percentile from the time series of volatilities as a measure of an unusually large volatility. This may have occurred recently, eg. in March for some of the structured credit products, or in the more distant past, an example here being the fall of 1998 for the corporate credit master index. This daily volatility is then scaled to a monthly horizon via the square-root of t (here t=21 days) rule. The volatilities are then grouped into three initial haircut buckets: 2%, 5%, and 10%. Treasuries have a haircut of 1.5%, commensurate with the standard tri-party repo haircut. It seems reasonable to keep this haircut the same as Treasuries, though they may be volatile as well, are likely to improve in value during turbulent times ("good volatility").

Finally we make an adjustment based on the shape of the volatility distribution itself. Volatility is but one way of measuring risk. If the volatility itself is subject to sudden moves and jumps, which tends to happen in the more illiquid instruments, then this is an added risk. Thus, the more skewed the distribution of volatility, the more volatility surprises one may experience, the more risky the asset class.

Our final haircuts range from 2% (1.5% for Treasuries) to 25% (ABS speculative grade).