



WP/09/42

# IMF Working Paper

---

## Deleveraging after Lehman—Evidence from Reduced Rehypothecation

*Manmohan Singh and James Aitken*



## IMF Working Paper

Monetary and Capital Markets Department

### Devleveraging after Lehman—Evidence from Reduced Rehypothecation

Prepared by Manmohan Singh and James Aitken<sup>1</sup>

Authorized for distribution by Udaibir S. Das

March 2009

#### Abstract

**This Working Paper should not be reported as representing the views of the IMF.**

The views expressed in this Working Paper are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

Rehypothecation is the practice that allows collateral posted by, say, a hedge fund to their prime broker to be used again as collateral by that prime broker for its own funding. In the United Kingdom, such use of a customer's assets by a prime broker can be for an unlimited amount of the customer's assets. And moreover, there are no customer protection rules (such as in the United States under the Securities Act of 1933). The paper shows evidence that, following Lehman's bankruptcy, the extent of rehypothecation has declined substantially, in part because investment firms fear losing collateral if their prime broker becomes insolvent. While less rehypothecation reduces counterparty risk in the system, it also reduces market liquidity.

JEL Classification Numbers: G21; G28; F33; K22; G18; G15

Keywords: Rehypothecation; Lehman's bankruptcy; Counterparty risk; Liquidity risk

Author's E-Mail Address: [msingh@imf.org](mailto:msingh@imf.org); [james.aitken@ubs.com](mailto:james.aitken@ubs.com)

---

<sup>1</sup> Manmohan Singh is a Senior Economist with the International Monetary Fund and James Aitken is an Executive Director with UBS. The authors wish to thank Darrell Duffie, Kimberly Summe, Paul Mills, Herve Ferhani, Mahmood Pradhan, and Peter Stella for their comments. The views expressed are our own and not of the IMF or UBS. We are responsible for any errors or misinterpretations.

## Contents

Page

I. Introduction .....	3
II. Rehypothecation in the United States and the United Kingdom.....	3
III. Rehypothecation After Lehman’s Bankruptcy .....	5
IV. Conclusion .....	7
References.....	11
Tables	
1. Collateral Received that can be Pledged is Decreasing .....	6
2. Securities Lending by Major Custodians.....	6
Appendix	
1. Securities Exchange Act’s Rule 15c3–3 .....	9

## I. INTRODUCTION

Rehypothecation means that the collateral posted by a prime brokerage client (e.g., hedge fund) to their prime broker can be used as collateral also by the prime broker for its own purposes.<sup>2</sup> Every Customer Account Agreement or Prime Brokerage Agreement with a prime brokerage client will include a blanket consent to this practice unless stated otherwise. Market sources suggest that rehypothecation of assets has historically been a cheaper way of financing the prime business than turning to the repo market.<sup>3</sup> In Section II we describe the differences between rehypothecation rules in the United States and in the United Kingdom. In the United Kingdom and Europe, such use of a customer's or hedge fund's assets by a prime broker can be for an unlimited amount of the customer's pledged assets. However, there are no customer protection rules such as those offered under the Securities Act of 1933 in the United States. In Section III, we show evidence that, following Lehman's bankruptcy, rehypothecation is becoming much more limited. While this may reduce counterparty risk, it can in turn aggravate global liquidity risk. In the concluding section, we highlight the need to discuss reduced rehypothecation as it is likely to continue.

## II. REHYPOTHECATION IN THE UNITED STATES AND THE UNITED KINGDOM

A defined set of customer protection rules for rehypothecated assets exists in the United States, but not in the United Kingdom. This difference meant that when Lehman Brothers International (Europe) filed for insolvency, there was no statutory protection available to those customers as the United Kingdom insolvency regime is not specific to entity type. In the United States, however, the Securities Investor Protection Act (SIPA) of 1970 provides for certain procedures that will apply in the event of the insolvency of a broker-dealer. Hence, the customers of Lehman Brothers Inc. (U.S.) could potentially be treated more advantageously than the U.K. customers of Lehman Brothers International (Europe) in terms of the timing and identification of the return of rehypothecated assets. The customer protection rule is designed to work in conjunction with the Federal bankruptcy scheme for broker-dealers created by SIPA.

---

<sup>2</sup> According to IMF WP 08/258, rehypothecation was acknowledged to be positive for the global financial system, prior to Lehman.

<sup>3</sup> Empirical work to test this hypothesis has been absent or very limited, but may be very relevant if rehypothecation loses ground in the near future. Repos have a cost that can be higher if there is failed delivery; rehypothecation is a legal assignment and thus is/was costless (until Lehman's bankruptcy especially in United Kingdom).

In the United Kingdom, rehypothecation can be for an unlimited amount of the customer's assets and there are no customer protection rules such as Rule 15c3-3 in the United States.<sup>4</sup> (see Appendix 1). Rule 15c3-3 prevents a broker-dealer from using its customers securities to finance its proprietary activities. Under Rule 15c3-3, the broker-dealer may use/rehypothecate an amount up to 140 percent of the customer's debit balance (i.e. borrowing from the broker-dealer).<sup>5</sup>

Created by SIPA, the Securities Investor Protection Corporation (SIPC) is an important part of the overall system of investor protection in the United States. SIPC's focus is very specific: restoring funds to investors with assets in the hands of bankrupt and otherwise financially troubled brokerage firms (e.g., Lehman). Since 1970, SIPC has accumulated almost \$2 billion from its members' assessments that can be used by investors to recover assets during insolvency.

A key reason why hedge funds may have previously opted for funding in Europe is that leverage is not capped as in the United States via the 140 percent rule under Rule 15c3-3. Leverage levels at many U.K. hedge funds, banks and financial affiliates have been higher, as both United Kingdom (and continental Europe) do not have a parallel to SIPA.<sup>6</sup> Thus, prime brokers and banks would rehypothecate their client's assets along with their own proprietary assets as collateral for funding from the global financial system. However, since the U.K.'s bankruptcy law does not make a distinction between banks and broker-dealers and does not provide the associated protection from broker-dealers (like SIPA in the United States), hedge fund assets remain frozen in the United Kingdom, whereas thanks to SIPA, this is not the case in the United States. Disentangling hedge fund assets from the broker-dealer/banks' proprietary assets that have been rehypothecated together, will remain an onerous task in the United Kingdom.

Rehypothecation is allowed only on margin securities in the United States. Fully-paid securities, which are the securities for which a customer has actually made full payment, are generally held in the cash account and are not permitted to be rehypothecated. Excess margin securities, which are that portion of a customer's margin securities having a market value that

---

<sup>4</sup> A customer includes any person from whom or on whose behalf a broker-dealer holds securities or cash unless specifically excluded. A customer excludes counterparties to repo and stock lending agreements.

<sup>5</sup> Assume a customer has \$500 in pledged securities and a debit balance of \$200, resulting in net equity of \$300. The broker-dealer can rehypothecate up to \$280 of the customer's assets (140 percent x \$200).

<sup>6</sup> Market sources indicate that there is asymmetry within continental Europe on rehypothecation rules; however, there is no equivalent to U.S. Sec 15c3-3.

exceeds 140 percent of the customer's debit balance to the broker-dealer, are also not permitted to be rehypothecated. Margin securities, which are customer securities held in a margin account and for which the customer has not made full payment, are not subject to the possession and control requirement, so a broker-dealer can use these securities in its own business—including rehypothecation—subject to certain limitations.

### III. REHYPOTHECATION AFTER LEHMAN'S BANKRUPTCY

Based on recent 10Q reports, rehypothecation is declining rapidly. After Lehman's bankruptcy, prime brokers have been demanding more cash collateral in place of securities (unless they are highly liquid securities). Liquidator PriceWaterhouseCoopers (PWC) confirmed in October 2008 that certain assets provided to Lehman Brothers International Europe (LBIE) were rehypothecated and no longer held for the client on a segregated basis and as a result the client may no longer have a proprietary interest in the assets.<sup>7</sup> As such, investors of LBIE fell within the general body of unsecured creditors. Hedge funds often use their securities for their own repo trades and financing of their own positions, and are increasingly seeking to ensure that assets that have not been pledged as collateral are kept in segregated client accounts, so that prime brokers have absolutely no claim over the assets in them. Segregated accounts, broadly speaking, includes sweeping non-collateral assets into custody accounts, restricting rehypothecation rights, using multiple prime-brokers, and applying for client money protection as under U.K. FSA's Client Money Rules.<sup>8</sup>

Some investors have now taken precautionary measures against the practice by taking term loans from large banks and sweeping assets which are not being used as collateral by the prime brokers. The (former) investment banks are now showing a trend away from rehypothecation (Table 1). We measure this from their 10Q and 10K filings by subtracting the collateral that was pledged from the collateral received. *The latest data show that since end-2007 the decline in rehypothecation (i.e., total collateral received that can be pledged) by the largest four broker-dealers was \$1.774 trillion.*

---

<sup>7</sup> There was a case in London in the High Court on September 22, 2008 where the High Court refused to grant the petitioning hedge fund the return of its assets—despite the fact that their agreement indicated that Lehman could not use its assets for rehypothecation. In the United Kingdom, it is title transfer (unlike the United States, where the client retains ownership but the broker would have a security interest).

<sup>8</sup> Some of the astute fund managers in the United Kingdom are already doing so. Brevan Howard's Annual Investment Manager Review states: "We limit the rights of prime brokers to rehypothecate our securities. We move our cash balances away from our prime brokers to segregated custody accounts at third parties."

**Table 1. Collateral Received that can be Pledged is Decreasing**

	Nov 2005	Nov 2006	Nov 2007	May 2008	Aug 2008	Nov 2008
Lehman	528	621	798	518		
Morgan Stanley	798	942	948	953	877	294
Goldman Sachs	629	746	891	869	832	579
Merrill Lynch	538	634	855	865	676	327
JPMorgan <sup>9</sup>						

Source: 10Q and 10K reports; For Merrill Lynch the column dates are December, June and September instead of November, May, and August.

Furthermore, reduced rehypothecation is being accompanied by reduced securities lending. The decline (in absolute dollar terms) in the amount of collateral thus flowing from the securities lending operations of the major custodians from end-2007 to end-September 2008 is about \$737 billion, which could have been pledged and possibly repledged (Aitken, 2009). The decline in collateral if measured from March 2008 (the peak) is about \$814 billion (See Table 2).<sup>10</sup>

**Table 2. Securities Lending by Major Custodians  
(billions of dollars)**

	Dec 31, 2007	March 31, 2008	June 30, 2008	Dec 31, 2008
Bank of NY	\$619	\$637	\$567	\$341
State Street	\$558	\$591	\$550	\$325
JPMorgan	\$385	\$411	\$362	\$169
Total	\$1,562	\$1,639	\$1,479	\$825

Source: 10Q and 10K reports

<sup>9</sup> JPMorgan's recent 10Q and 10K reports show an increase in 'collateral received that can be pledged' due to the combined reporting of Bear Stearns and the perception of 'being close to Fed' bank. It is difficult to disentangle these and other issues that contributed to a growth in this area for JPMorgan.

<sup>10</sup> Rehypothecation, legally is distinct from repos which includes collateral received from dealer repo counterparties, among other uses; however, their economic impact is the same for global liquidity purposes.



The above are the three major custodians and not the entire financial system; the reduction, due to the aversion to rehypothecation and reduced securities lending globally, is likely to be much higher as the number of investors who are banning the lending of securities by their custodians continues to grow.

Overall, good collateral is increasingly getting scarce in the present credit crisis (Duffie and Zhu, 2009). Since December 2007, the recent 10Qs of the large four (former) investment banks show a reduction of almost \$1.8 trillion in ‘collateral received that can be pledged’ i.e., a sharp decline in rehypothecated collateral. Also, between the major three global custodian banks there has been a decline of about \$750 billion since December 2007 in collateral flowing in the global financial system. This decline stems from their own counterparty risk, mandate constraints from their clients, and the deleveraging that is taking place. This reduced liquidity of over \$2.5 trillion in the United States banking system alone, adds to the cost of funding in the financial system.

Before Lehman, high grade collateral was encouraged to be pledged, repledged and rehypothecated. If collateral could not be rehypothecated, though, the entire financial system would be put at risk as this was the basis of so much activity in the system (Segoviano and Singh, 2008). Post-Lehman, reduced rehypothecation results in higher funding costs for financial institutions that have until recently been able to use their client money/collateral. Thus, one may argue that reduced rehypothecation is a positive development especially if jurisdictions like the United Kingdom do not have swift bankruptcy resolution (or a SIPC type institution like in the United States). *It is likely that, in the near future, hedge funds will have to pay increased fees for services of the prime broker if their collateral is now allowed to be rehypothecated.*

While the use of collateral mitigates counterparty risk, it can aggravate funding liquidity risk because counterparties have to provide additional collateral at short notice if conditions change.<sup>11</sup> During the recent turmoil, shortages of high-quality collateral emerged prompting special operations by central banks.

#### IV. CONCLUSION

Having access to high quality collateral did not always guarantee that troubled institutions could maintain access to wholesale funding, as evidenced in the case of Bear Stearns. However, presently major financial institutions worldwide have either increased or created

---

<sup>11</sup> The more widely collateralization is used, the more significant this risk becomes, especially as market prices movements in hedged portfolios result in changes in the size of counterparty credit exposures.

sizable liquidity buffers of high-grade collateral, and cash. This is a rational response in the aftermath of Bear Stearns, Lehman and AIG.

Following the collapse of Lehman, hedge funds have become more cognizant of the way the client money and asset regime operates in the United Kingdom. For some, the United Kingdom provides a platform for higher leveraging (and deleveraging) not available in the United States.<sup>12</sup> For others—especially those affected adversely by the Lehman bankruptcy—if jurisdictions like the United Kingdom do not provide for swift bankruptcy resolution (or a SIPC type institution like in the United States) they will limit rehypothecation. The trend so far from Table 1 is an overall aversion to rehypothecation.

Does reduced rehypothecation encourage secured lending (e.g., repo market)? Adrian and Shin (2009) show a declining trend in primary dealer repo activity (adjusted for M2) that is contributing towards the credit crunch.<sup>13</sup> In the present financial crisis, overnight inter-bank banks (e.g., fed funds) rates have dropped with liquidity injections, so repo rates and rebate rates approach zero, which means that failure to return collateral has a small penalty (at least until the new delivery failure penalties are approved and kick in). Thus, there was an increasing number of delivery failures in the repo market last fall, and such failures are still continuing, albeit to a somewhat lesser extent. This further disrupts the supply of collateral, because collateral can then be hoarded at trivial penalties. The resulting deleveraging is leading to dislocations in the cash bond market (e.g., negative basis).

From a policy perspective, the recent trend depicted in the two tables above is likely to continue. In the aftermath of Lehman, banking clients such as hedge funds in the United Kingdom are demanding “segregated accounts” (Sidley Austin, 2008).<sup>14</sup> Looking forward, this may result either in the prime business changing in favor of tri-party repo-financing and/or assigned custody, or in a move to a U.S. brokerage. In general, if the financial crisis deepens, there will be an increasing tendency for those providing collateral to counterparties to ask for it to be segregated from the counterparty’s assets and to place limits on its further use.

---

<sup>12</sup> Reduced rehypothecation leads to deleveraging (via the proprietary trading desks of the broker-dealer) that results in further aversion to rehypothecation.

<sup>13</sup> Bridgewater, Daily Observations, February 13, highlighting that many foreign central banks are not keen on lending U.S. Treasuries in the repo market.

<sup>14</sup> <http://www.sidley.com>

## APPENDIX I. SECURITIES EXCHANGE ACT'S RULE 15C3-3

In essence, Rule 15c3-3 of the Securities Exchange Act of 1934 prevents a broker-dealer from using its customers' securities to finance its proprietary activities. The rule has three principal requirements:

- A broker-dealer must maintain possession or control of certain customer securities (all fully paid securities and excess margin customer securities i.e., securities in a customer's margin account that exceed 140 percent of the margin debit in their account.)
- As to customer cash, a broker-dealer must deposit the cash or "qualified securities" of like value in a special account known as the "reserve account". In other words, the broker-dealer is required to segregate all customer cash or money obtained from the use of customer property that has not been used to finance transactions of other customers.
- As to customer securities that are not required to be in the broker's control (e.g., those securities posted as required collateral that can be pledged as collateral to third parties), the broker-dealer is subject to limits on the amount it can borrow against such securities.

The customer protection rule is designed to work in conjunction with the Federal bankruptcy scheme for broker-dealers created by SIPA.

### A. Customer

"Customer" includes any person from whom or on whose behalf a broker-dealer holds securities or cash unless specifically excluded.

Customer excludes:

- Subordinated lenders to the broker-dealer;
- Other brokers or dealers and municipal securities dealers or government securities broker-dealers; and
- Counterparties to repo and stock lending agreements.

A U.S. bank is generally a customer, even if it is affiliated with the broker-dealer. A non-broker-dealer affiliate of the broker-dealer, even a subsidiary, can be a customer.

## B. Control Requirement

The broker-dealer must obtain and maintain physical possession or control of all customer fully-paid and excess margin securities. A good control location is a U.S. bank. Outside the United States, securities can be held at a non-U.S. bank, broker or dealer, depository or clearing agency designated by the SEC. In addition, the SEC has permitted service firms affiliated with a foreign investment company that performs various services for the fund to serve as foreign control locations. Control means that the securities are located in an account in the name of the broker-dealer at a clearing corporation, depository or bank, free of any lien.

## C. Types of Securities

The customer protection rule divides securities held or purchased by a broker-dealer into four categories:

- **“Fully-paid securities”**, which are generally held in the cash account into which a customer has actually made full payment;
- **“Excess margin securities”**, which are that portion of a customer’s margin securities having a market value that exceeds 140 percent of the customer’s debit balance to the broker-dealer;
- **“Margin securities”**, which are customer securities held in a margin, or any other Regulation T account for which a customer has not made full payment. Margin securities are not subject to the possession and control requirement, so a broker-dealer can use these securities in its own business, subject to certain limitations; and
- **Non-customer securities** (proprietary positions, for example).

Fully paid securities and “excess margin securities” cannot be rehypothecated (they have to be “controlled”). A broker-dealer has the right to rehypothecate customer (margin) securities when the customer pledges those securities to the broker-dealer to support a margin debit. Under Rule 15c3-3, the broker-dealer may use an amount up to 140 percent of the customer’s debit balance.

**REFERENCES**

Adrian, Tobias and Shin, Hyun Song, Money, Liquidity, and Monetary Policy, Federal Reserve Bank of New York, January, 2009

Aitken, James, 2009, The Plumbing, UBS presentation, January 28, 2009.

Duffie, Darrell and Zhu, Haoxiang, "Does a Central Clearing Counterparty Reduce Counterparty Risk," forthcoming.

Segoviano, Miguel and Manmohan Singh, 2008, Counterparty Risk in OTC Derivatives, IMF Working Paper 08/258.

Sidley Austin LLP, Hedge Funds and the U.K. Prime Brokers in the Post-Lehman Environment (December 2, 2008)