Role of Pledged Collateral in Liquidity Metrics and Monetary Policy

Bank of England Conference


Manmohan Singh
Senior Economist, International Monetary Fund

“Views expressed in this presentation are those of the author and do not necessarily represent those of the IMF or IMF policy.”
Recent coverage of this research

- **Reserve Bank of Australia (RBA):**
  
  “but it is also interesting to think about the equivalent concept of the other side of the balance sheet, what might be collateral multipliers. That is how many times do assets get recycled in the system, particularly in terms of generating funding. **Collateral multipliers don’t appear in standard textbooks.** (Feb 2012 speech, Guy Debelle, now deputy governor/RBA)

- **There are now several Working Groups (FSB etc.), on the best metric for collateral reuse**, including work on “**Data Gaps**”

- **CGFS: interim report on repo markets:**
  
  “consistent with studies that have shown that the number of intermediary balance sheets connecting the end suppliers of cash/collateral has reduced in recent years” –December, 2016
Pledged collateral received by U.S. banks

![Graph showing pledged collateral received by U.S. banks from 2007 to 2016 for various banks including Bear Stearns, Lehman, Morgan Stanley, Goldman Sachs, Merrill/BoA, JP Morgan, and Citigroup. The y-axis represents Billions US$, and the x-axis represents years from 2007 to 2016.]
Pledged collateral received by European banks (and Nomura)
Hedge Funds largely finance their positions in two ways.

- **First**, they can either pledge collateral for reuse to their **prime broker** in lieu of **cash borrowing** from the PB (via rehypothecation).
  - In the U.S., SEC’s Rule 15c3a and Regulation T generally limits PB’s use of rehypothecated collateral from a client. Non US jurisdictions such as UK via English Law do not have any limits.

- **Second**, HFs also fund their positions via **repo(s)** with dealers who may or may not be their PBs.

- HF collateral “**to the street**” from PB and repo was about **$1.7 trill** (2007) and down to about **$1.3 trill** after Lehman’s demise. Most recently with AUM growing sizably, HF collateral to street **about $2.0 trillion**, end-2016.
Securities Lending—a primary source of collateral to markets; not rebounding (yet)

Securities Lending, 2007-2015

<table>
<thead>
<tr>
<th>Collateral Received from Pension Funds, Insurers, Official Accounts etc</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Securities Lending vs. Cash Collateral</td>
<td>1209</td>
<td>935</td>
<td>875</td>
<td>818</td>
<td>687</td>
<td>620</td>
<td>669</td>
<td>701</td>
<td>644</td>
</tr>
<tr>
<td>Securities Lending vs. Non-Cash Collateral</td>
<td>486</td>
<td>251</td>
<td>270</td>
<td>301</td>
<td>370</td>
<td>378</td>
<td>338</td>
<td>425</td>
<td>454</td>
</tr>
<tr>
<td>Total Securities Lending</td>
<td>1,695</td>
<td>1,178</td>
<td>1,146</td>
<td>1,119</td>
<td>1,058</td>
<td>998</td>
<td>1,008</td>
<td>1,137</td>
<td>1,098</td>
</tr>
</tbody>
</table>

Source: RMA
Not all collateral flows are down—snapshot from the prime-brokerage market

Figure 2.1 Equity long/short hedge fund position (i.e., delta bias)
## OTC Derivatives Market—extent of under-collateralization (after netting)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GRAND TOTAL</strong></td>
<td>35,281</td>
<td>25,314</td>
<td>21,542</td>
<td>24,673</td>
<td>21,296</td>
<td>19,518</td>
<td>27,285</td>
<td>25,392</td>
<td>24,740</td>
<td>20,245</td>
<td>18,825</td>
<td>17,438</td>
<td>20,880</td>
<td>15,313</td>
<td>14,498</td>
<td>20,701</td>
</tr>
<tr>
<td>A. Foreign exchange contracts</td>
<td>4,084</td>
<td>2,470</td>
<td>2,070</td>
<td>2,524</td>
<td>2,336</td>
<td>2,555</td>
<td>2,217</td>
<td>2,304</td>
<td>2,427</td>
<td>2,284</td>
<td>1,724</td>
<td>2,944</td>
<td>2,359</td>
<td>2,579</td>
<td>3,063</td>
<td></td>
</tr>
<tr>
<td>B. Interest rate contracts</td>
<td>20,087</td>
<td>15,478</td>
<td>14,020</td>
<td>17,533</td>
<td>14,746</td>
<td>13,244</td>
<td>20,001</td>
<td>19,113</td>
<td>18,833</td>
<td>15,238</td>
<td>14,020</td>
<td>13,461</td>
<td>15,608</td>
<td>11,062</td>
<td>10,148</td>
<td>15,096</td>
</tr>
<tr>
<td>C. Equity-linked contracts</td>
<td>1,112</td>
<td>879</td>
<td>708</td>
<td>706</td>
<td>648</td>
<td>708</td>
<td>679</td>
<td>645</td>
<td>605</td>
<td>692</td>
<td>700</td>
<td>678</td>
<td>615</td>
<td>606</td>
<td>495</td>
<td>515</td>
</tr>
<tr>
<td>D. Commodity contracts</td>
<td>955</td>
<td>682</td>
<td>545</td>
<td>457</td>
<td>526</td>
<td>471</td>
<td>487</td>
<td>390</td>
<td>358</td>
<td>394</td>
<td>264</td>
<td>269</td>
<td>317</td>
<td>237</td>
<td>297</td>
<td>202</td>
</tr>
<tr>
<td>E. Credit default swaps</td>
<td>5,116</td>
<td>2,987</td>
<td>1,801</td>
<td>1,666</td>
<td>1,351</td>
<td>1,345</td>
<td>1,586</td>
<td>1,187</td>
<td>848</td>
<td>725</td>
<td>653</td>
<td>635</td>
<td>593</td>
<td>453</td>
<td>421</td>
<td>347</td>
</tr>
<tr>
<td>F. Unallocated</td>
<td>3,927</td>
<td>2,817</td>
<td>2,398</td>
<td>1,788</td>
<td>1,543</td>
<td>1,414</td>
<td>1,977</td>
<td>1,840</td>
<td>1,792</td>
<td>779</td>
<td>724</td>
<td>671</td>
<td>803</td>
<td>596</td>
<td>558</td>
<td>1,473</td>
</tr>
</tbody>
</table>

**GROSS CREDIT EXPOSURE**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5,005</td>
<td>3,744</td>
<td>3,521</td>
<td>3,578</td>
<td>3,480</td>
<td>2,971</td>
<td>3,912</td>
<td>3,668</td>
<td>3,626</td>
<td>3,784</td>
<td>3,033</td>
<td>2,826</td>
<td>3,358</td>
<td>2,870</td>
<td>2,853</td>
<td>3,692</td>
</tr>
</tbody>
</table>

*Gross market values have been calculated as the sum of the total gross positive market value of contracts and the absolute value of the gross negative market value of contracts with non-reporting counterparties. Gross credit exposure is after taking into account legally enforceable bilateral netting agreements.*
An example of repeated use of collateral (that leads to “collateral chains”)
## Snapshot of pledged collateral market (and reuse)

**TABLE 1** Sources of pledged collateral, volume of market and velocity (2007; 2010–15).

<table>
<thead>
<tr>
<th>Year</th>
<th>Hedge funds</th>
<th>Securities lending</th>
<th>Total</th>
<th>Volume of secured operations</th>
<th>Reuse rate (or velocity)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>1.7</td>
<td>1.7</td>
<td>3.4</td>
<td>10.0</td>
<td>3.0</td>
</tr>
<tr>
<td>2010</td>
<td>1.3</td>
<td>1.1</td>
<td>2.4</td>
<td>5.8</td>
<td>2.4</td>
</tr>
<tr>
<td>2011</td>
<td>1.3</td>
<td>1.05</td>
<td>2.35</td>
<td>6.1</td>
<td>2.5</td>
</tr>
<tr>
<td>2012</td>
<td>1.8</td>
<td>1.0</td>
<td>2.8</td>
<td>6.0</td>
<td>2.2</td>
</tr>
<tr>
<td>2013</td>
<td>1.85</td>
<td>1.0</td>
<td>2.85</td>
<td>5.8</td>
<td>2.0</td>
</tr>
<tr>
<td>2014</td>
<td>1.9</td>
<td>1.1</td>
<td>3.0</td>
<td>5.8</td>
<td>1.9</td>
</tr>
<tr>
<td>2015</td>
<td>2.0</td>
<td>1.1</td>
<td>3.1</td>
<td>5.6</td>
<td>1.8</td>
</tr>
</tbody>
</table>

The wedge between “source collateral” and “reuse rate” suggests balance sheet space constraints.
Data gaps, or can regulators do more with what they have already?

- Consistent desire by regulators for more data, more transparency to understand nonbanks or nonbank/bank nexus.

- Off balance sheet activities such as nonbank’s pledged collateral with banks can be a significant source of bank’s funding in global financial centers.

- During distress periods, the type of nonbank/bank funding agreements can amplify and dislocate several key markets (e.g., repo, securities lending and derivative markets).

- See emphasis on Flow of Funds by FSB but this measure (even in the U.S.) is not complete to understand nonbank/global banks interface.
M2 (and beyond) issues:

- To date, regulatory efforts have focused on fortifying the equity base \((e_i)\) of the banking system and limiting the banking system’s leverage \((\lambda_i)\) through leverage caps.

- Non-bank funding to banks was assumed to be “sticky” and mainly in the form of household deposits.

- Regulatory efforts have ignored the sizable volumes of bank funding from non-banks. Since the money holdings of asset managers (pension, insurers, MMFs etc) are ultimately the claims of households, it follows that households ultimately fund banks through both M2 and non-M2 instruments.

- While households’ direct holdings of M2 instruments reflect their own investment decisions, their indirect holdings of non-M2 instruments are not a reflection of their direct investment choices, but the portfolio choice of their fiduciary asset managers.
Figure 1 is a snapshot of “z” or the nonbank/bank nexus explained in the analytical framework. The dealer bank depicted above are active in the cross-border collateral intermediation. So “zi” is important for dealer bank “i”. The ultimate borrowers also borrow directly from commercial banks; however they are not shown in this figure as their interaction with nonbanks is minimal; hence “zi” is negligible.
M2 and pledged collateral...although not all M2 is used in the financial markets
Credit supply to the end-users is provided either by equity $e_i$, of the banking system (including leverage $\lambda_i$) and non-bank funding; “$z_i$” is important to understand.
Re-defining $Z_i$ or, nonbank funding
---highlights the funding from the asset management complex, in addition to the household savings

$Z_i$ can be expressed as $Z_h + Z_k$, where,

$Z_h$ is the fraction of M2 funding that bank$_i$ receives from households, and $Z_k$ is the fraction of non-M2 funding that bank$_i$ receives from nonbanks

\[
\sum_{i=1}^{n} y_i = \sum_{i=1}^{n} e_i z_i (\lambda_i - 1) + \sum_{i=1}^{n} e_i
\]
The bank deposit market is sizable in the U.S.—in fact the top 4 bank holding companies (Wells Fargo, Citibank, JPMorgan and Bank of America) hold about $3.9 trillion in deposits as per FDIC’s June 2015; relative to $1.9 trillion as of June 2008.

The top 50 bank holding companies hold $7.5 trillion as of June 2015, relative to $4 trillion as of June 2008.

Had QE not happened then deposits would have grown roughly in line with economy's growth and/or household wealth (i.e., low single digit growth rates)
<table>
<thead>
<tr>
<th>Terms</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>Bank deposits at the central bank (D excludes banknotes, vault cash)</td>
</tr>
<tr>
<td>C1</td>
<td>Good collateral in all states of nature; can be converted to D at no haircut</td>
</tr>
<tr>
<td>C2</td>
<td>Collateral that under normal market conditions is “good”, else loses value</td>
</tr>
<tr>
<td>C1 held by banks</td>
<td>Only banks can convert C1 to D overnight. Nonbanks cannot change C1 to D</td>
</tr>
<tr>
<td>Ultimate liquidity</td>
<td>D plus C1 held by banks (Chapter 4 shows C1 may contribute more to financial lubrication than D)</td>
</tr>
</tbody>
</table>
The current global Monetary Policy

- Central banks via QE are trying to rejuvenate the credit creation engine.

- However there is “discomfort with collateral chains”. Restricting collateral re-use is a tight money policy that seems to be at odds with the current policies of key monetary authorities (see handout).

- Demand for Safe Assets:

  \[ \text{Demand} = \text{Supply} \times \text{re-use rate} \]

  Right hand side is “effective supply” in the market.

- Central Banks are now providing balance sheet space (ad hoc manner)
  - RRP of the Fed (reverse-repo programs w/ MMFs, and central banks);
  - CCPs direct deposits at Fed—these can be very large numbers!
The “old plumbing” ..... in blue area
“One might also worry that money market rates might not move together as rates rise, meaning that, for example, a disconnect might emerge between secured and unsecured rates, or between overnight and term instruments.”

“Either situation could result in impaired transmission of monetary policy into broad financial conditions.”
Policy rate (Fed Funds) and repo rates (GCF)

- Treasury GCF Repo Weighted Average Rate
- Fed Funds Rate
- Fed RRP Facility Rate
- IOER
When both private and public balance sheets do the plumbing

- Money
- Collateral

Fed's RRP

Dealer banks

- Money
- Collateral

Hedge Funds

REPOS/PRIME BROKERAGE

- Collateral
- Money

GSEs (e.g., Fannie, Freddie)

Asset Managers, pension funds, insurers, SWFs, official sector etc (via custodians)

SECURITIES LENDING

- Collateral
- Money/Collateral
Lean central bank balance sheets reduce bank deposits (i.e., excess reserves) and increase private “balance sheet space”

<table>
<thead>
<tr>
<th>Federal Reserve</th>
<th>Nonbanks</th>
<th>Banks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td><strong>Assets</strong></td>
<td><strong>Assets</strong></td>
</tr>
<tr>
<td>Asset Sales</td>
<td>Assets from Fed</td>
<td>Deposits at Fed</td>
</tr>
<tr>
<td>Bank Deposits</td>
<td>Deposits at Banks</td>
<td>Nonbank Deposits</td>
</tr>
<tr>
<td>Liabilities</td>
<td>Liabilities</td>
<td>Liabilities</td>
</tr>
</tbody>
</table>

- Asset Sales reduce bank deposits (i.e., excess reserves).
- Increase private “balance sheet space”.