

Understanding the role of collateral in financial markets

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Views expressed are of the author only and not attributable to the IMF.

Summary of key messages:

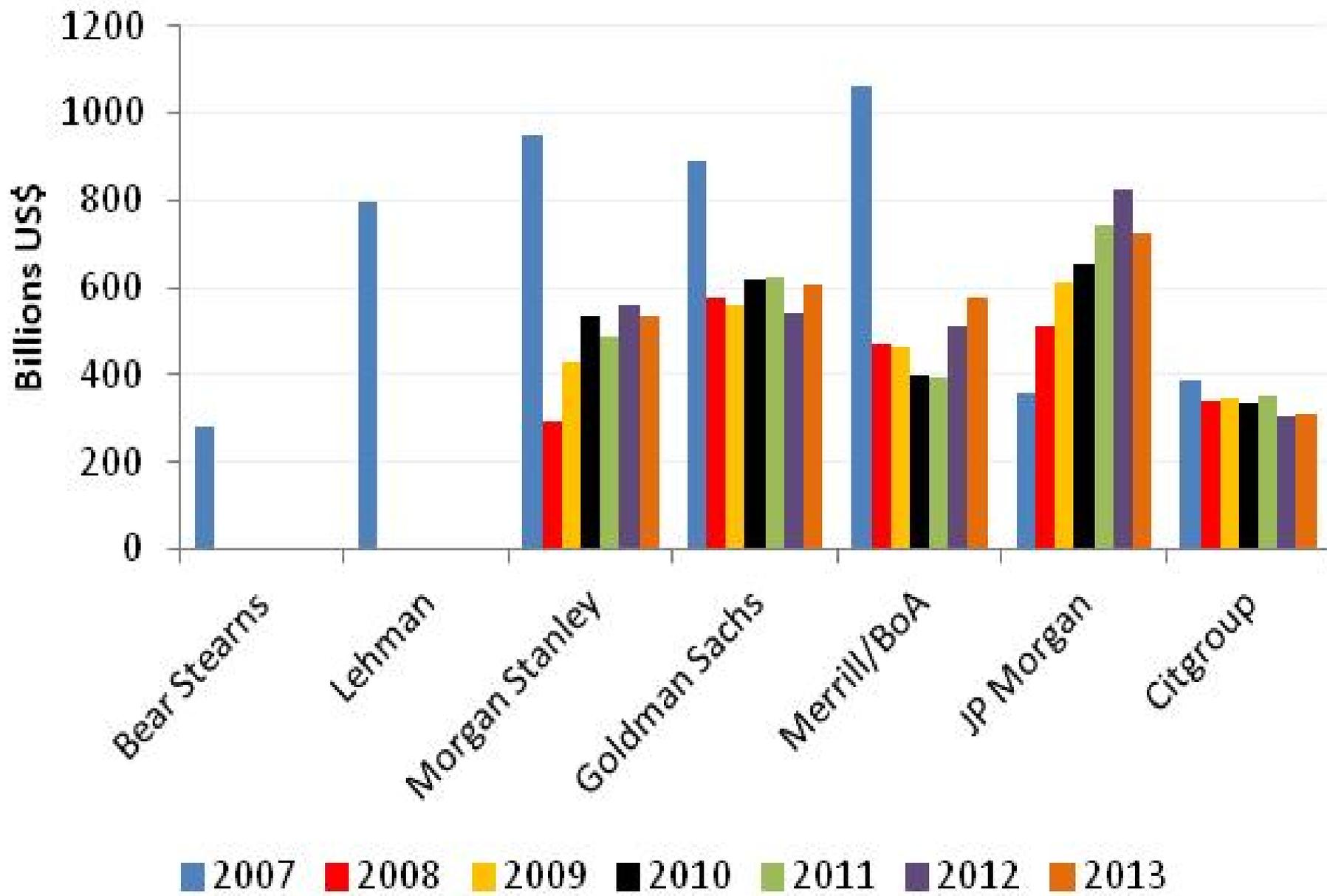
- Financial collateral metrics are **at par with money metrics** and an integral part of financial lubrication; collateral metrics complement what is discussed in textbooks on money metrics.
- Monetary Policy at ZLB (with QE) has **interfered with financial plumbing by silo-ing good collateral**; unwind of CB balance sheets opens a new chapter “collateral and monetary policy”
- Regulations (Basel/Dodd Frank Act etc) and QE are likely to lead to un-intended consequences.
 - OTC derivatives market and CCPs; break-down in this plumbing?
 - Shadow banking should not be a pejorative term; also uses capital
 - QE/regulations overlap in a “changing collateral space”
 - Safe assets: is there really a shortage? collateral re-use rate (velocity)

**Pledged Collateral for re-use does not appear on
Balance Sheet but only in footnotes—
thus, this is not picked up in Flow of Funds, or Call reports**

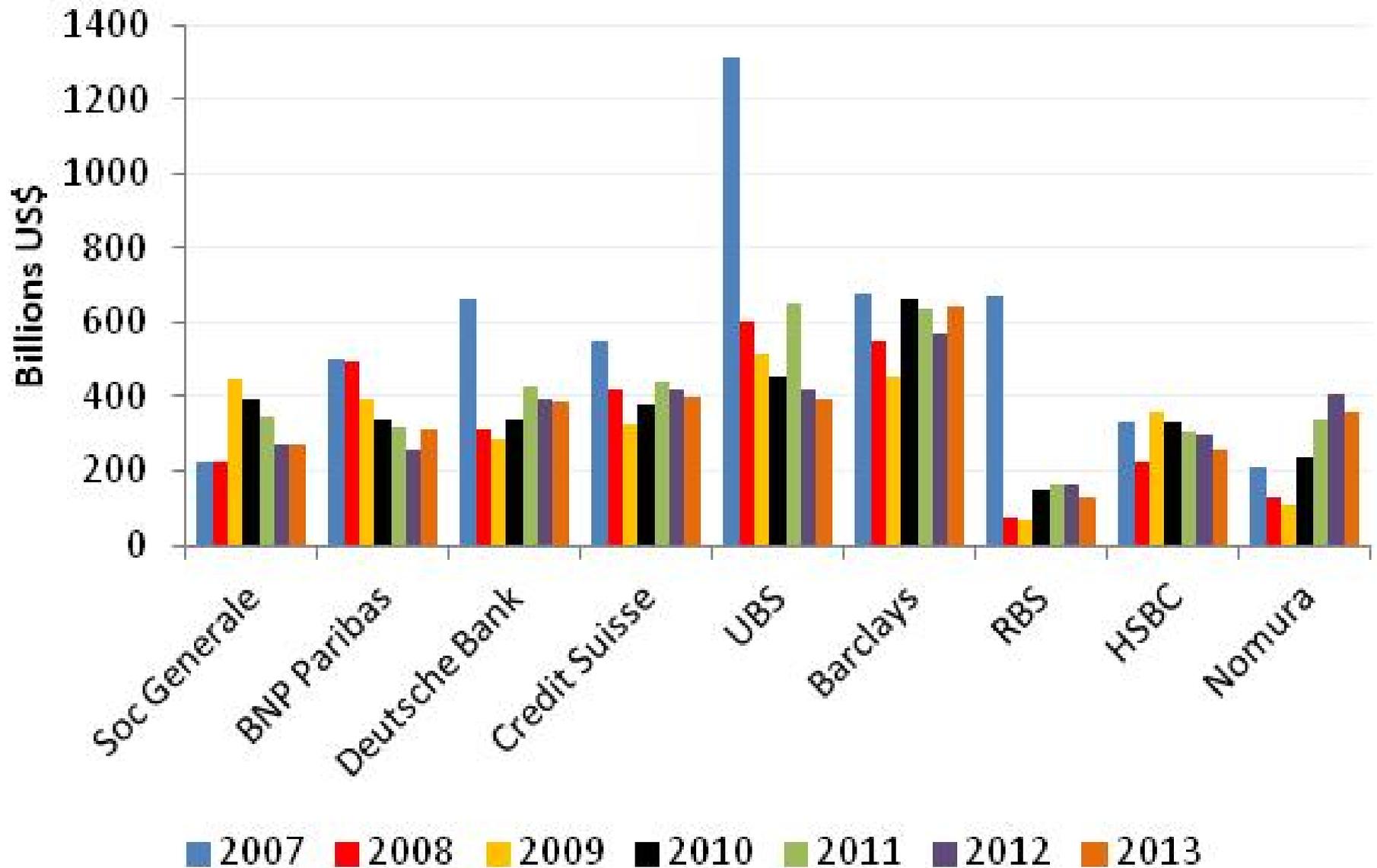
The typical language, in all large banks active in collateral funding appears as follows (from **Lehman's** last annual report below):

As of November 30, 2007, the fair value of securities received as collateral that were permitted to sell or re-pledged was approximately \$798 billion....(of which) the firm sold or re-pledged approximately \$725 billion as of November 30, 2007

Pledged Collateral—US banks



Pledged Collateral—European banks (plus Nomura)



Collateral from Hedge Funds—

biggest single source of pledged collateral to market

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 prime broker (via **rehypothecation**)
 - Note--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 **\$1.35 trill** in recent years. Most recently with AUM growing sizably, leverage rebounding.... collateral from HF to street **about \$ 1.85 trillion end-2013**

The “non-hedge fund” source of collateral— declining due to counterparty risk etc

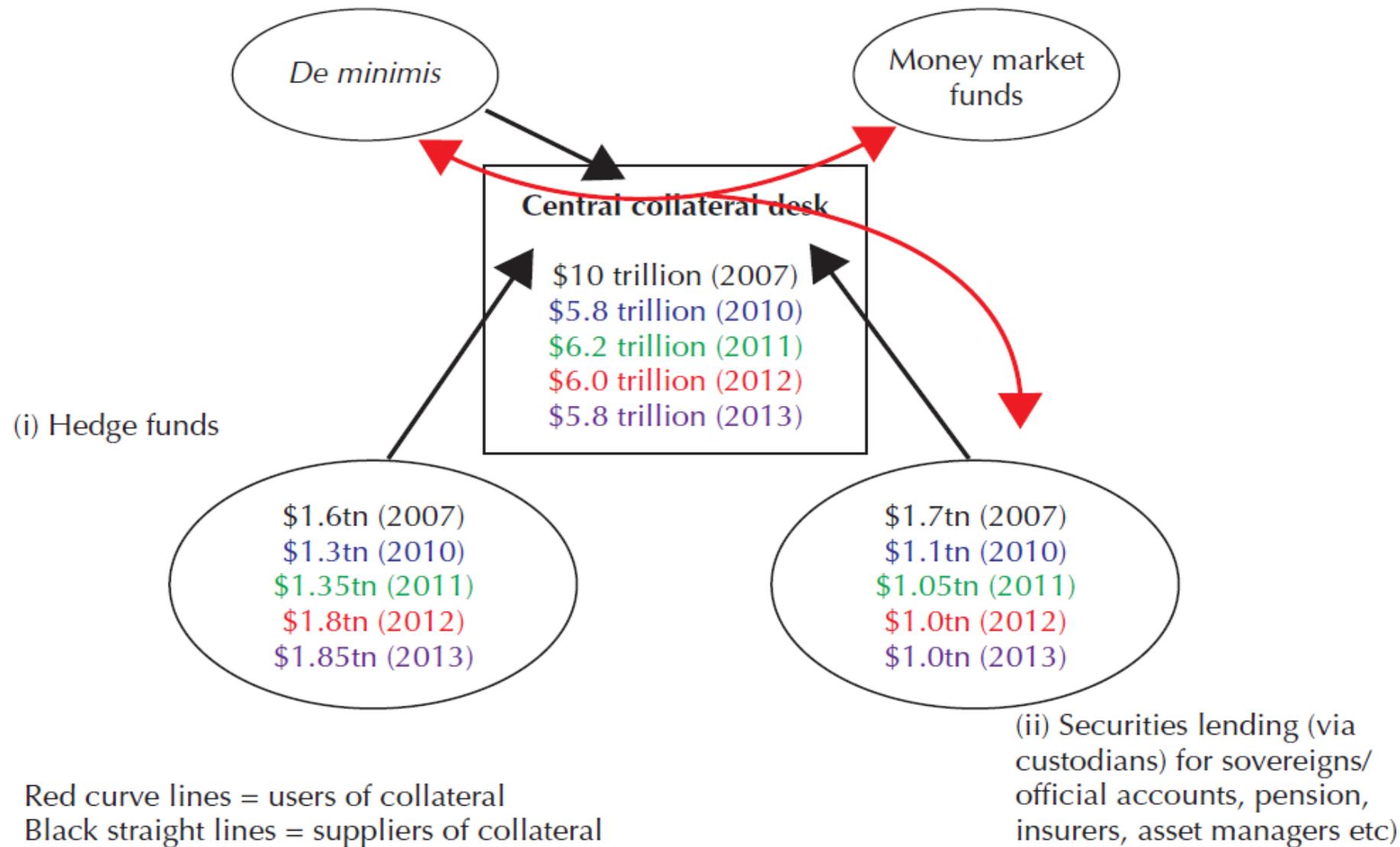
Table 1: Securities Lending, 2007-2013

Collateral Received from Pension Funds, Insurers, Official Accounts etc (US dollar, billions)							
	2007	2008	2009	2010	2011	2012	2013
Securities Lending vs. Cash Collateral	1209	935	875	818	687	620	669
Securities Lending vs. Non-Cash Collateral	486	251	270	301	370	378	338
Total Securities Lending	1,695	1,187	1,146	1,119	1,058	998	1,008

source: RMA

Figure 2.4 The sources and uses of collateral – summary (2007, 2010, 2011 and 2012)

(iii) Commercial banks



An example of repeated use of collateral (that leads to “collateral chains”)

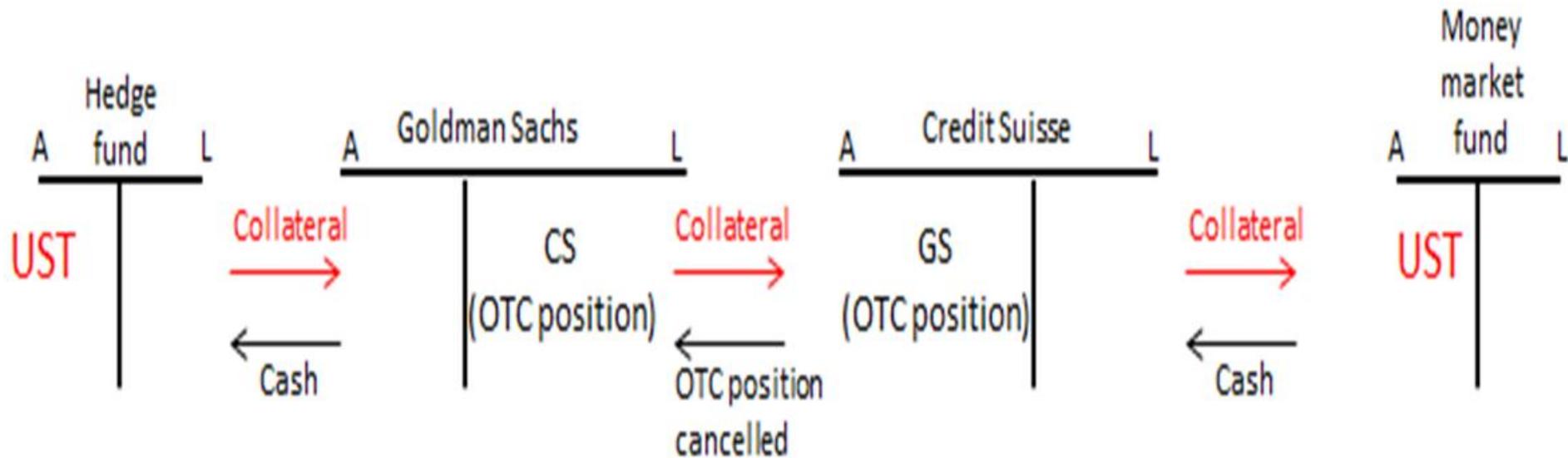


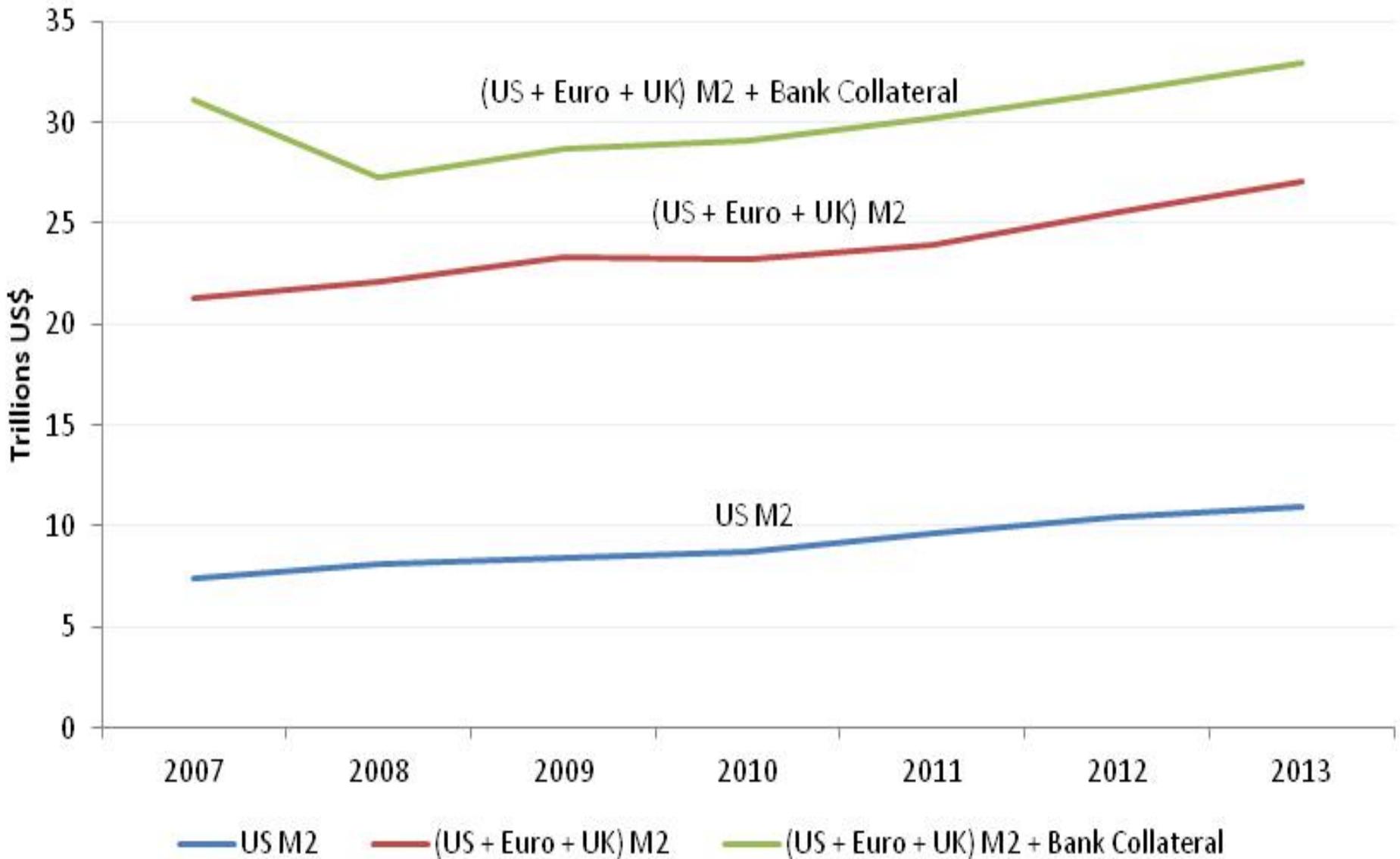
Table 2.3. Sources of Pledged Collateral, Volume of Market, and Velocity
(2007, 2010-2013)

(In trillions of U.S. dollars; velocity in units)

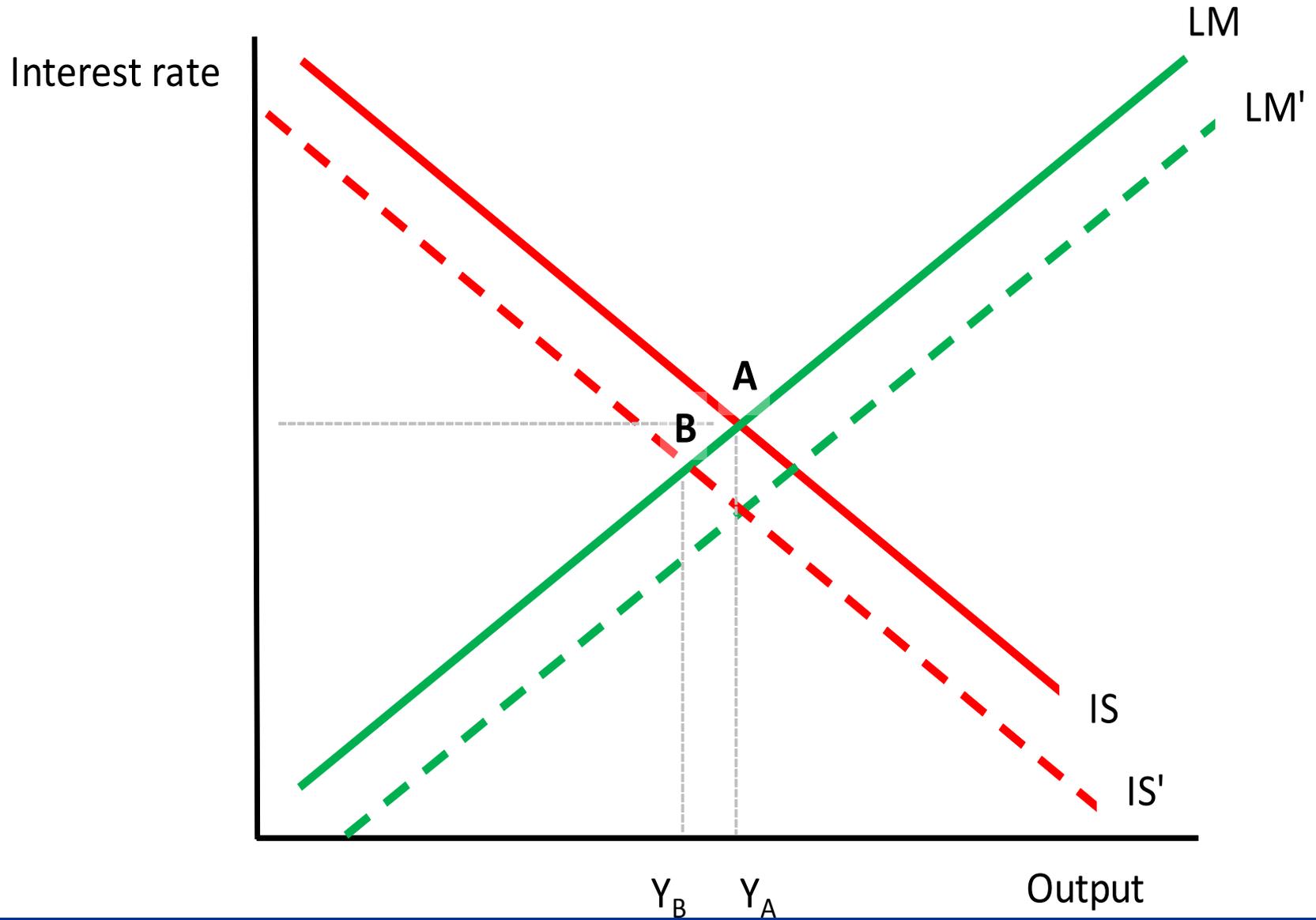
Year	Sources			Volume of secured operations	Velocity
	Hedge funds	Others	Total		
2007	1.7	1.7	3.4	10.0	3.0
2010	1.3	1.1	2.4	5.8	2.4
2011	1.3	1.05	2.35	6.1	2.5
2012	1.8	1.0	2.8	6.0	2.2
2013	1.85	1.0	2.85	5.8	2.0

Sources: Risk Management Association; also IMF Working Paper, Velocity of Pledged Collateral (Singh, 2011)

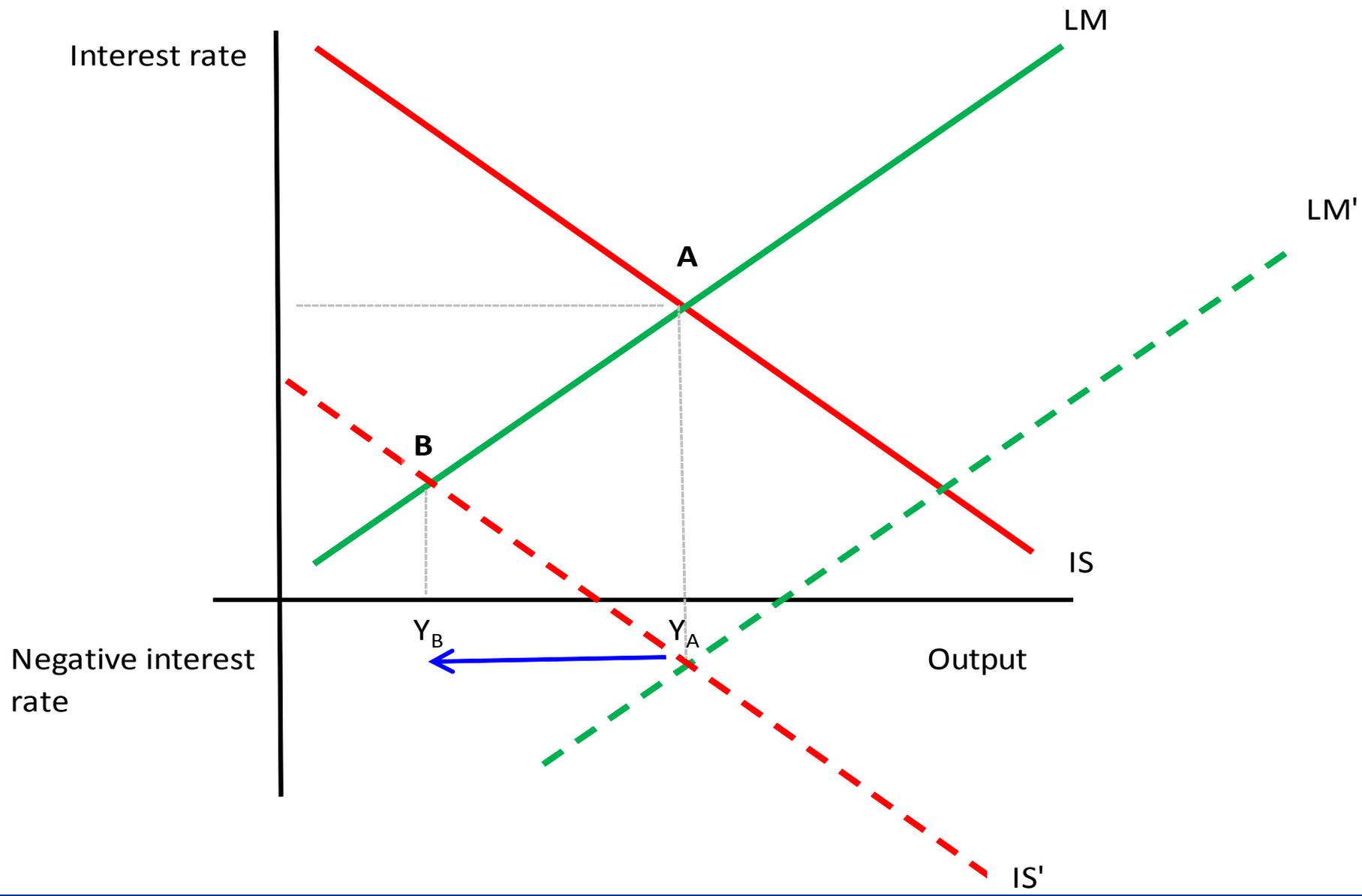
Overall Financial Lubrication— Money and Collateral.....some intuition



Collateral in IS/LM framework

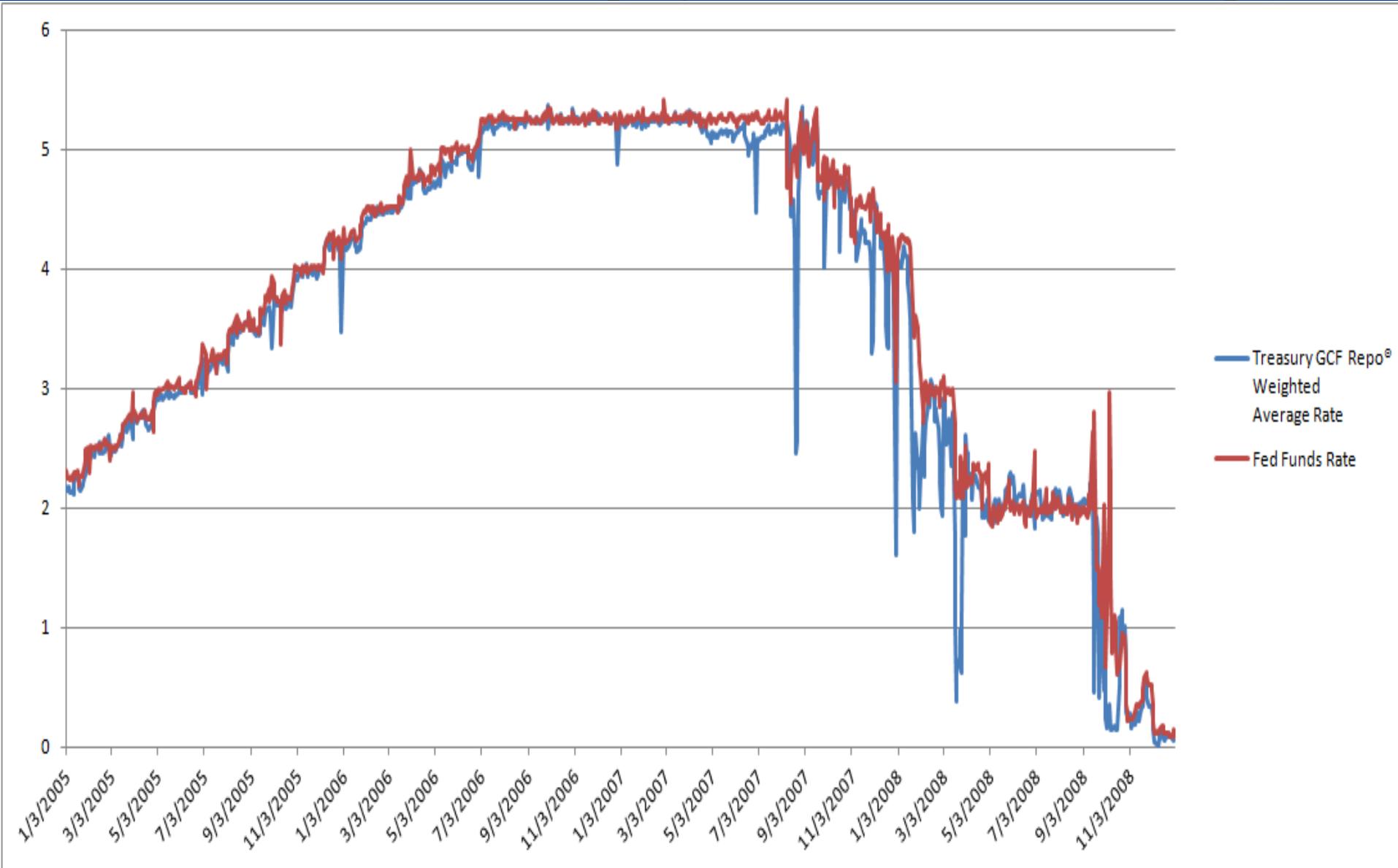


IS/LM and pledged collateral market crash; IS shifts “in” sizably; LM shifts “out” via QE etc

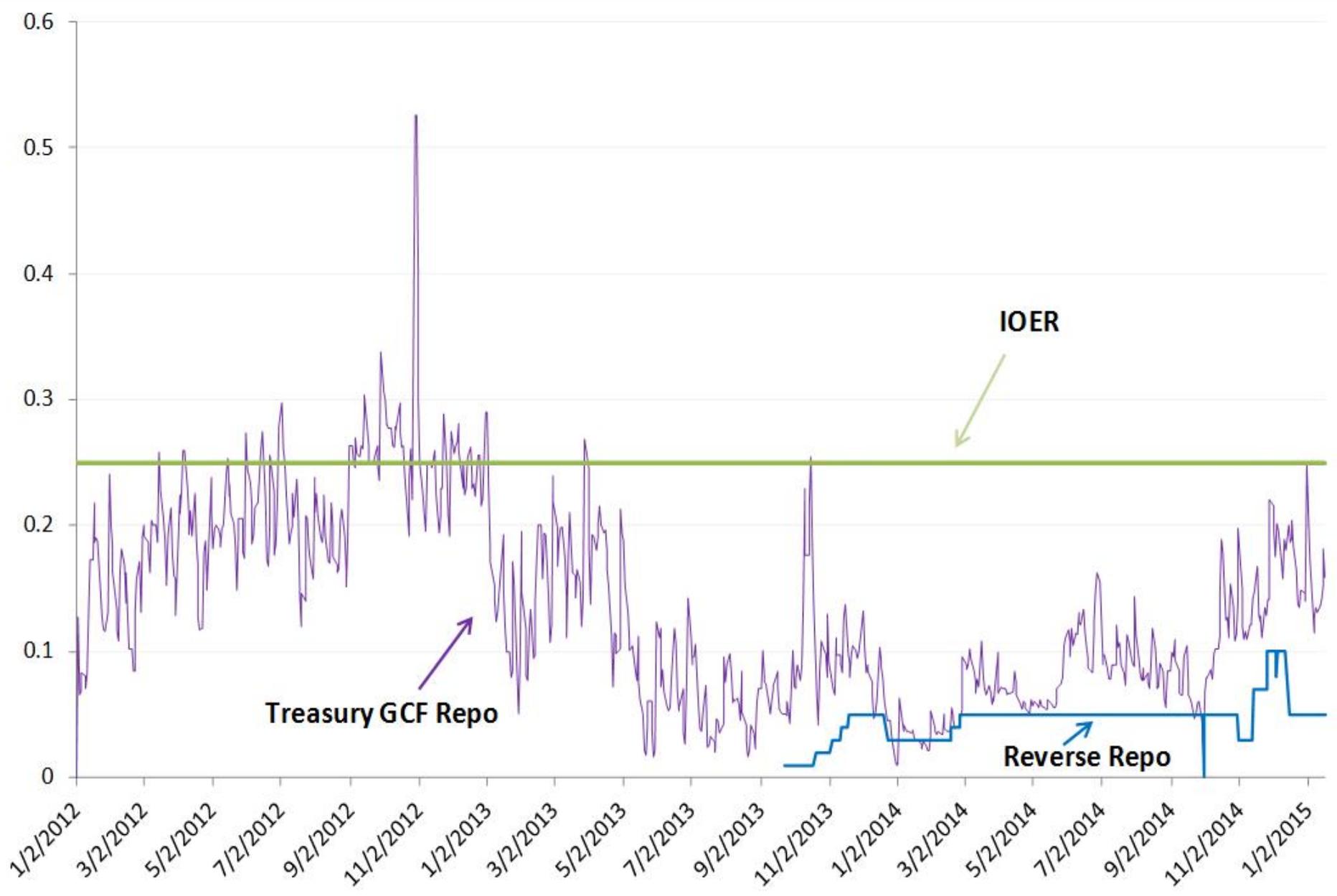


Pre-Lehman GC (general collateral)repo rate vs. Fed Funds rate

(GC repo rate is secured funding via collateral that is mostly liquid US Treasuries and/or MBS; the Triparty framework is used for GC repo)



IOER, GC repo, and Reverse Repo



Eurozone 'good collateral' rates and Eonia (their Fed Funds rate); since Sept '14, deposit rate at minus 20 bps

RepoFunds Rates vs. EONIA

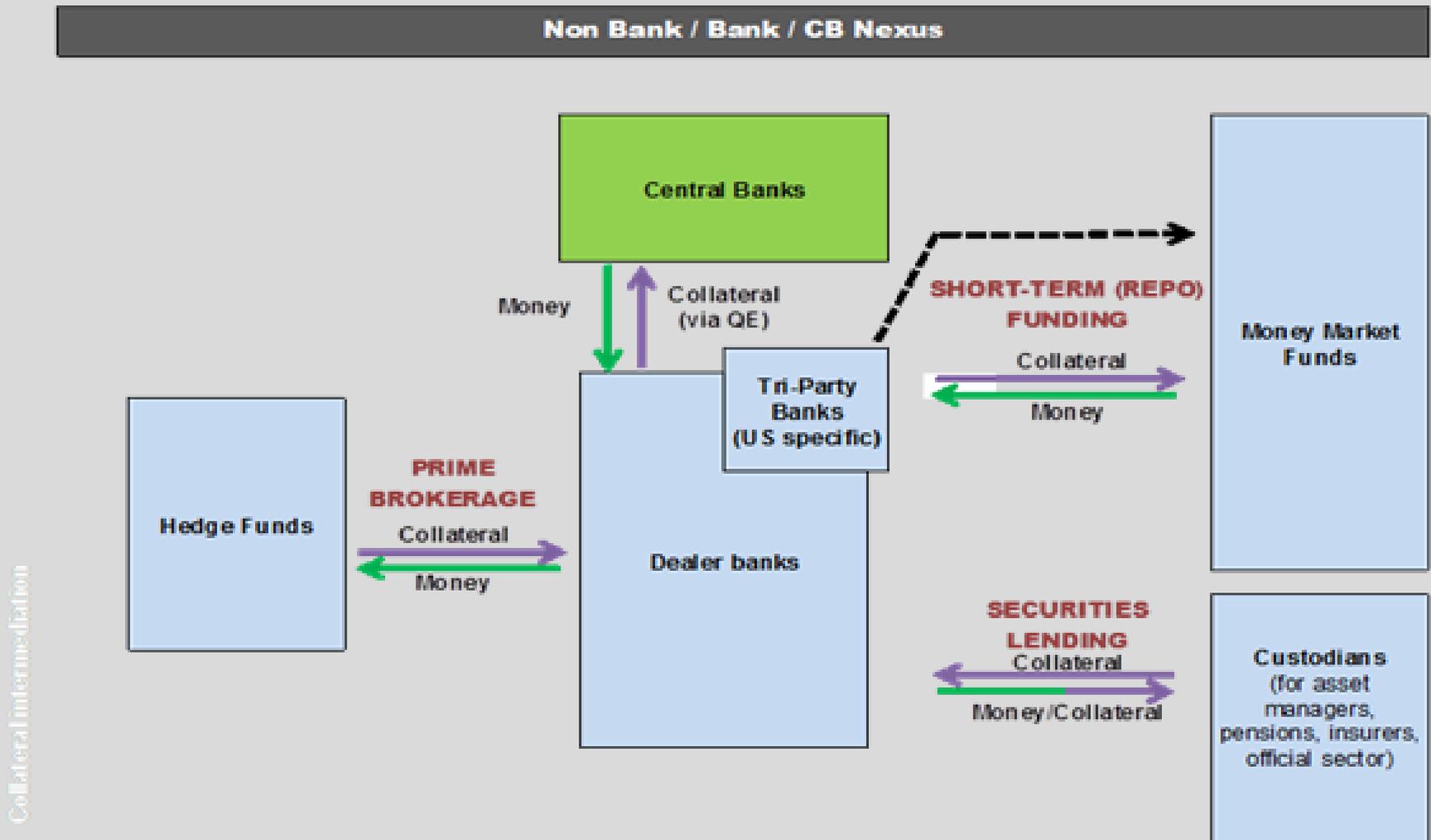


QE resulted in Fed printing and nonbanks selling UST and MBS to Fed.

- The bank deposit market is sizable—in fact the top 4 bank holding companies (Bank of America, Wells Fargo, Citibank and JPMorgan) hold about **\$3.8 trillion** in deposits as per FDIC's June 2014 data, relative to **\$1.9 trillion** as of June 2008.
- The top 50 bank holding companies (including foreign) hold **\$7 trillion** as of June 2014, relative to **\$4 trillion** as of June 2008.
- QE largely explains the growth in deposits (Carpenter et al 2013)
- Banks do not want these deposits, as Basel rules are implemented; **banks want “balance sheet space”**

The “old plumbing”in blue area

Figure 1: Collateral and Financial Plumbing



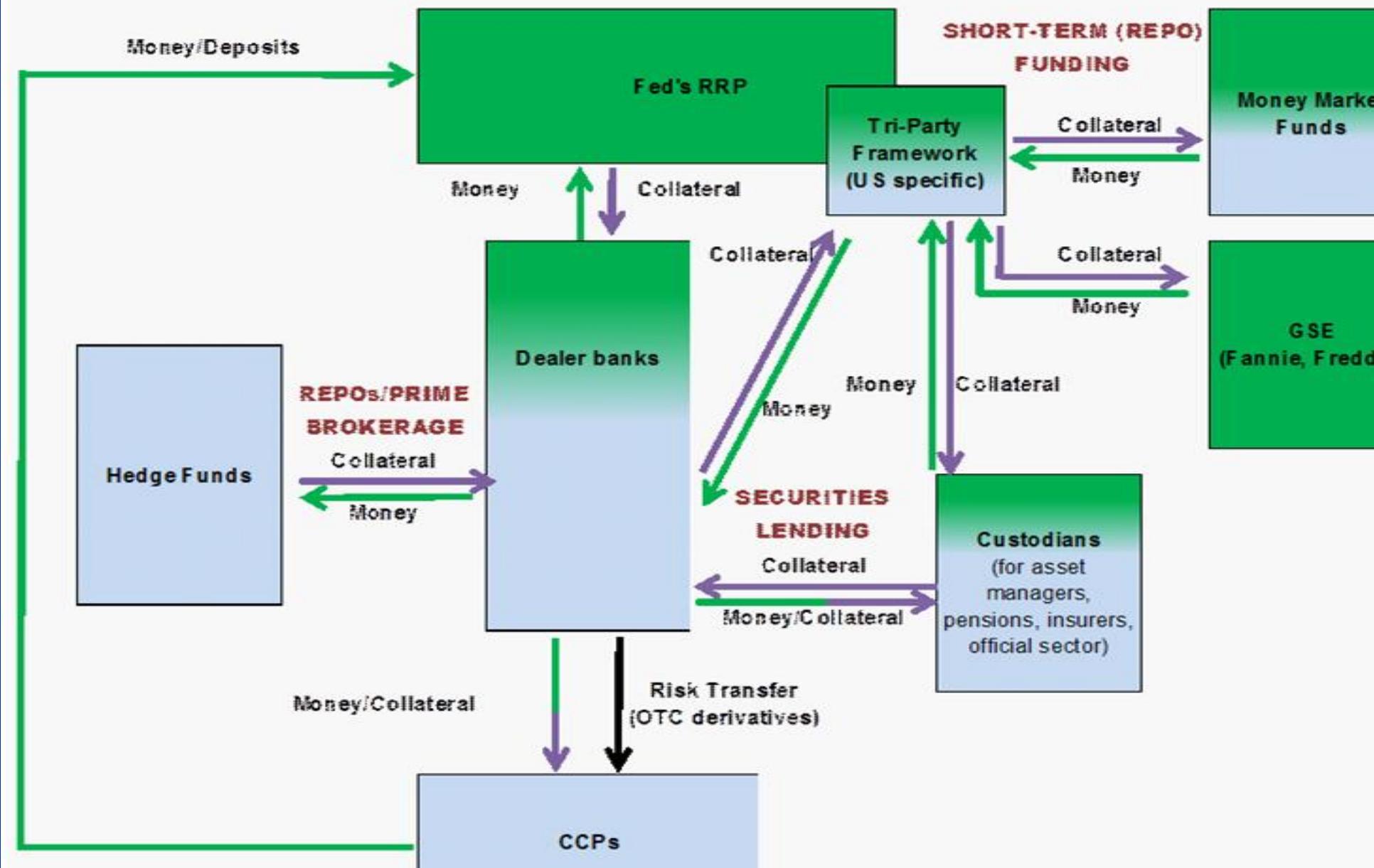
Collateral intermediation

The critical pieces of the plumbing are the repo markets and the bank deposit market.

- The U.S. bilateral repo market is a *market for collateral*: securities for possession and use, (incidentally against cash).
- The Tri-party repo (TPR) market in the U.S. is a *market for funding*: money for broker dealers/banks (incidentally collateralized by securities).

The new-plumbing:

RRP short-circuits the “nonbank/bank” plumbing



Accounting Drainage, especially RRP with nonbanks

1 a. Non-Banks Use of Reverse Repo Program (RRP) with Fed

Federal Reserve

Assets

Liabilities

Excess Reserves

↓ 100 Million

RRP (no rehypothecation)

↑ 100 Million

1 b. Banks Use of Reverse Repo Program (RRP) with Fed

Federal Reserve

Assets

Liabilities

Excess Reserves

↓ 100 Million

RRP (Rehypothecation capped--
only within Tri-Party)

↑ 100 Million

Excess reserves do not equal good collateral

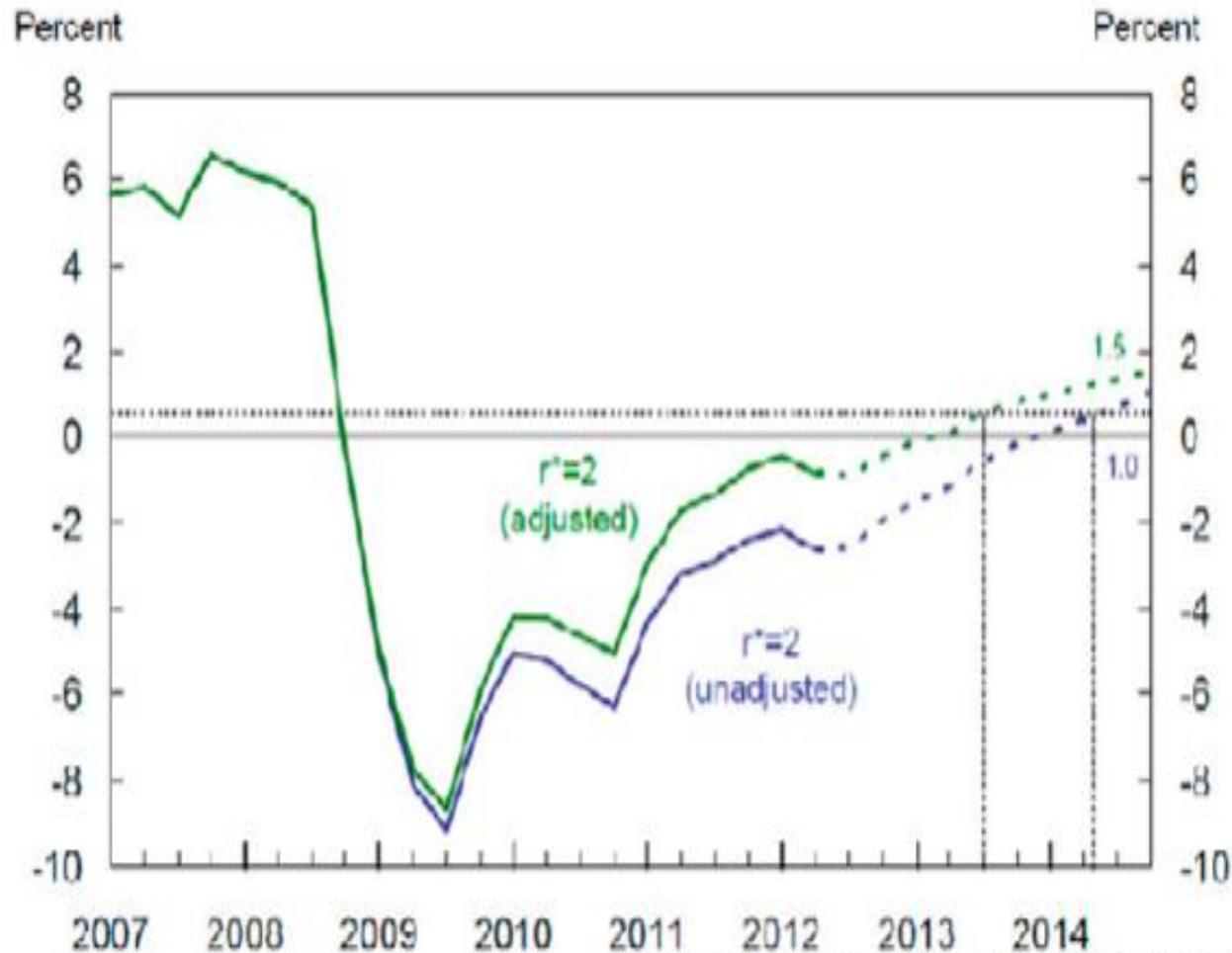
- However, collateral with **these nonbanks via reverse repos cannot be rehypothecated**, and thus will not contribute towards financial lubrication.
- Only **banks** are allowed to rehypothecate collateral received via reverse repos (e.g., term RRP, may increase collateral velocity)
 - if banks have balance sheet space
 - At present banks receive 25 bps via IOER; why bid at 5 or 10 bps, unless returns from “reuse” exceed 25bps, net of balance sheet costs, FDIC levy, etc.
- So roughly 3 trillion (change in) good collateral (that could be used by the financial system—banks and nonbanks) that is silo-ed on the Asset side, while roughly an equal amount is in “reserves” that is in banking domain only

Recent speech by NY Fed president Dudley, May 20, 2014, New York

“Also, with an exceptionally **large balance sheet** there will be considerable attention on the methods that the FOMC will likely use in order to exert control over the level of **short-term rates**”

[intuitively, from an **overall financial lubrication** angle (i.e., money+collateral), if collateral velocity has already been reduced from approx 3 to 2, there may be *less tightening* needed from monetary policy cycle.]

Figure 4. Real Interest Rates via Taylor Rule With/Without Fed's Balance Sheet Adjustment



Source: BLS, BEA, FRBNY Staff

Collateral Transformation and Financial Stability

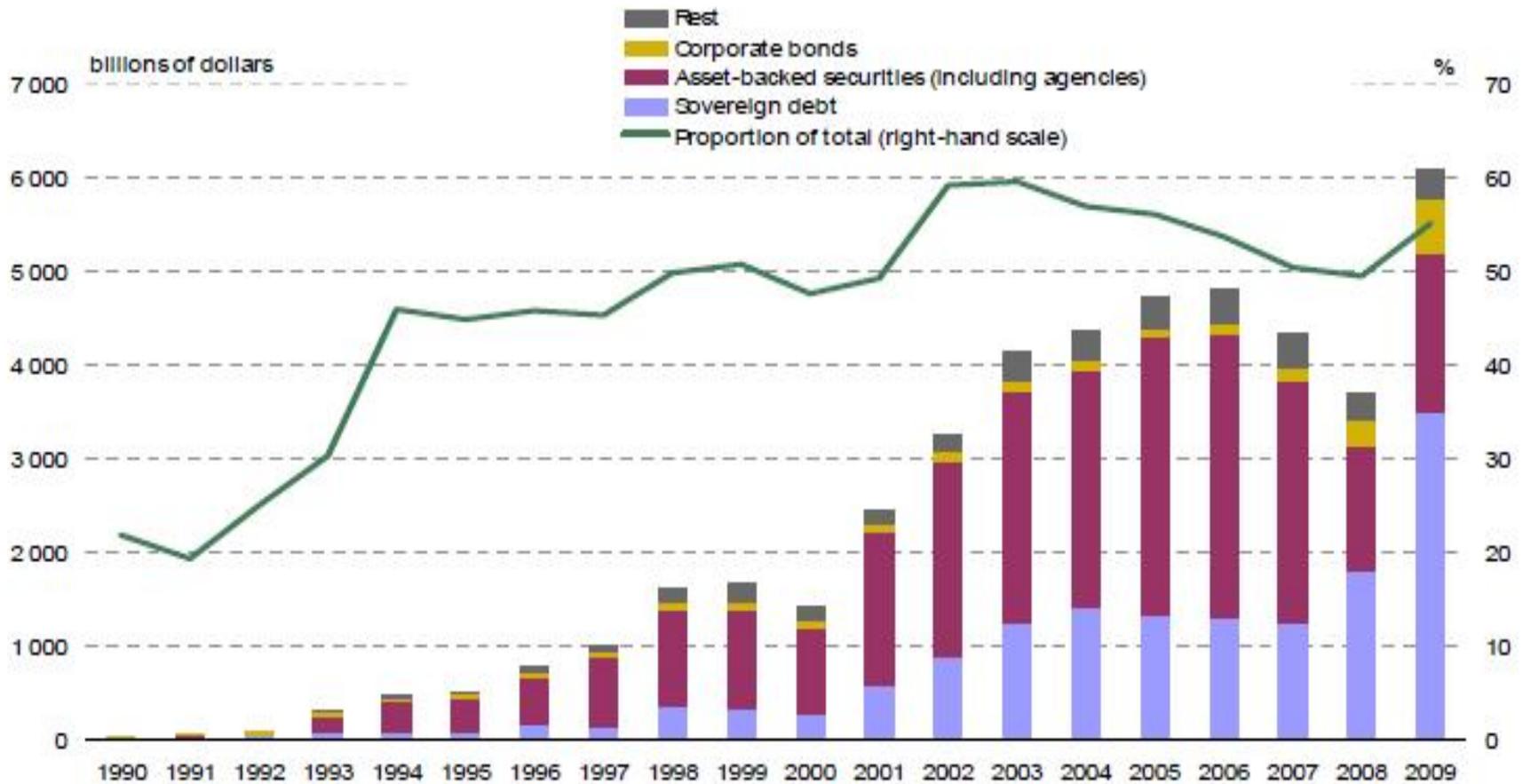
—should safe assets be produced as a public good? by whom? why?

- **Dealers are interested in collateral transformation.** In fact they may be the only actor in the financial space to bridge the likely demand/supply gap. However transforming a BB to AA/AAA may be constrained due to Basel III
- The final definition of leverage/LCR ratios will matter, especially if ratios “pick up” all off-balance sheet pledged collateral transactions.
- The *re-use* of collateral is fundamental to bridging the gap between demand and supply. *Academia has so far ignored this aspect in their models*. Fed’s RRP is another example of supplying safe assets. Similar angle for Reserve Bank of Australia’s facility.

$$\text{Demand}_{\text{collateral}} = \text{Supply}_{\text{collateral}} * \text{re-use factor}$$

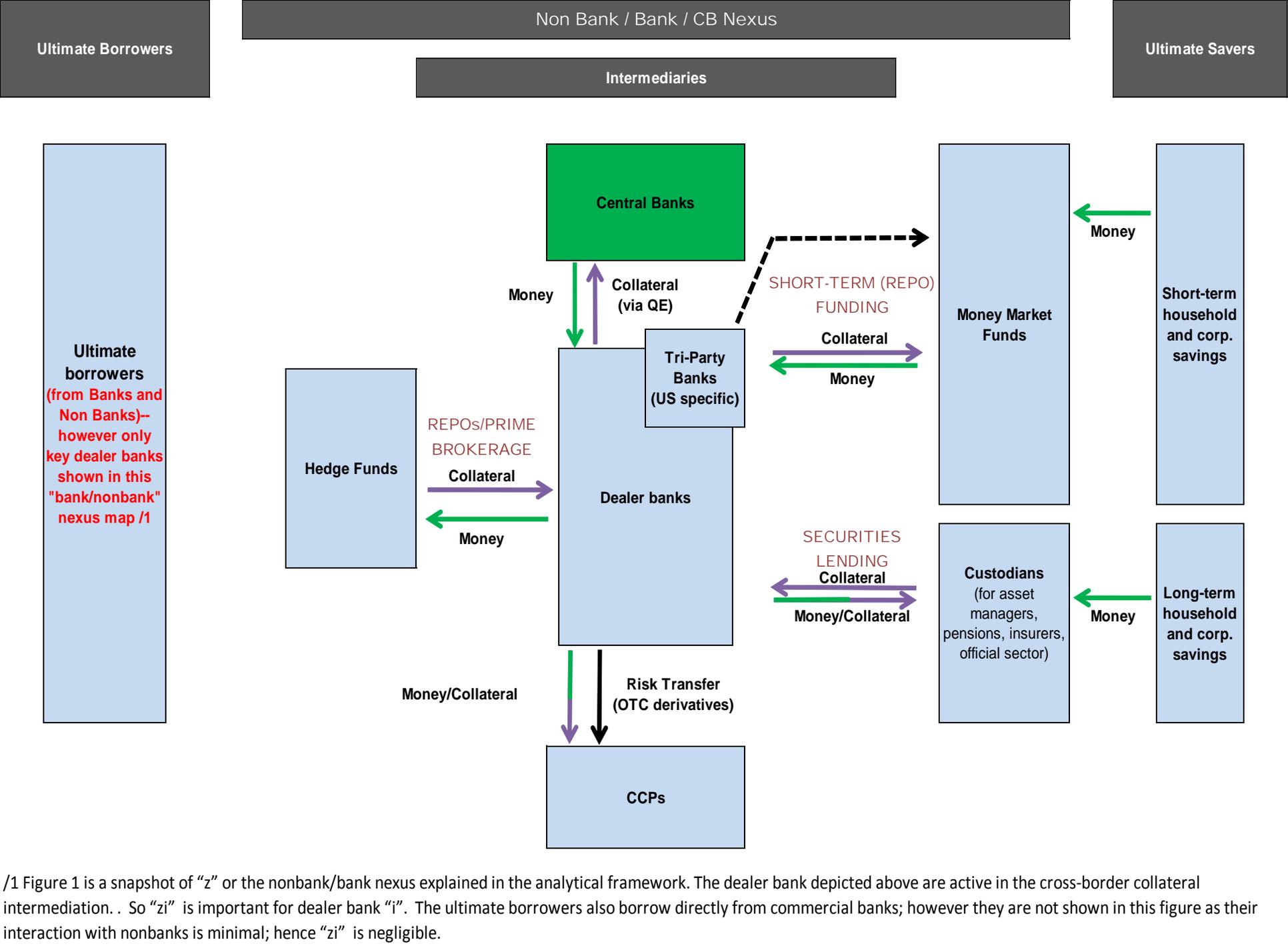
Large part of AAA issuance was private sector securitization (i.e., “burgundy” area)

World issue of AAA fixed-income



Regulatory focus—so far...

- To date, regulatory efforts have focused on fortifying the **equity base** (e_i) of the banking system and limiting the banking system's leverage (λ_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 not focused on **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.

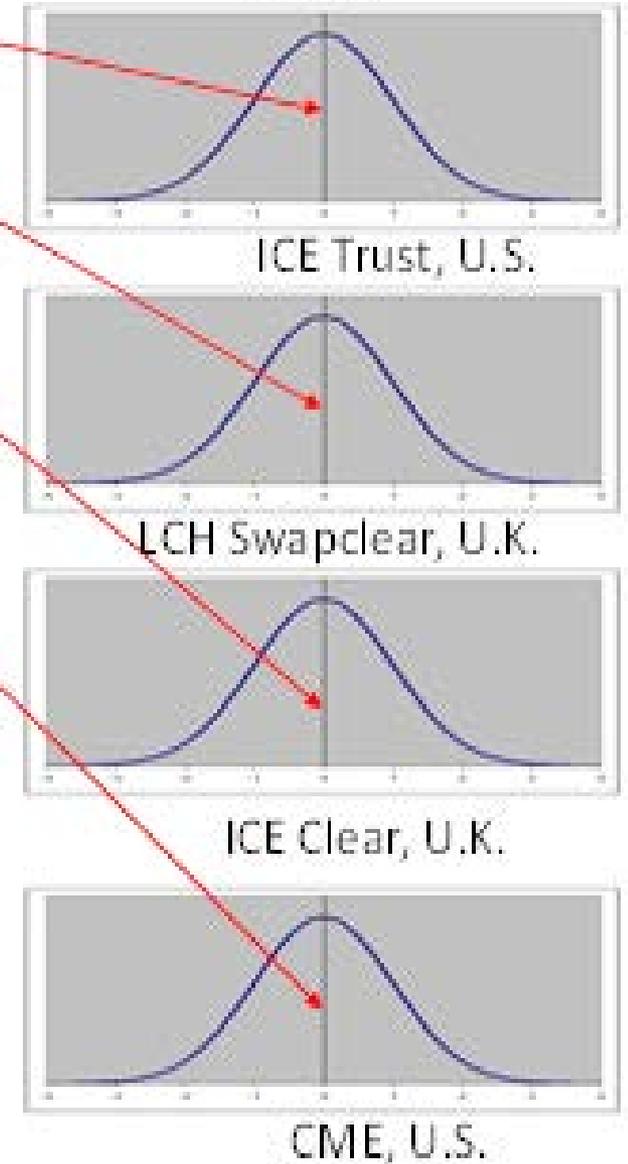
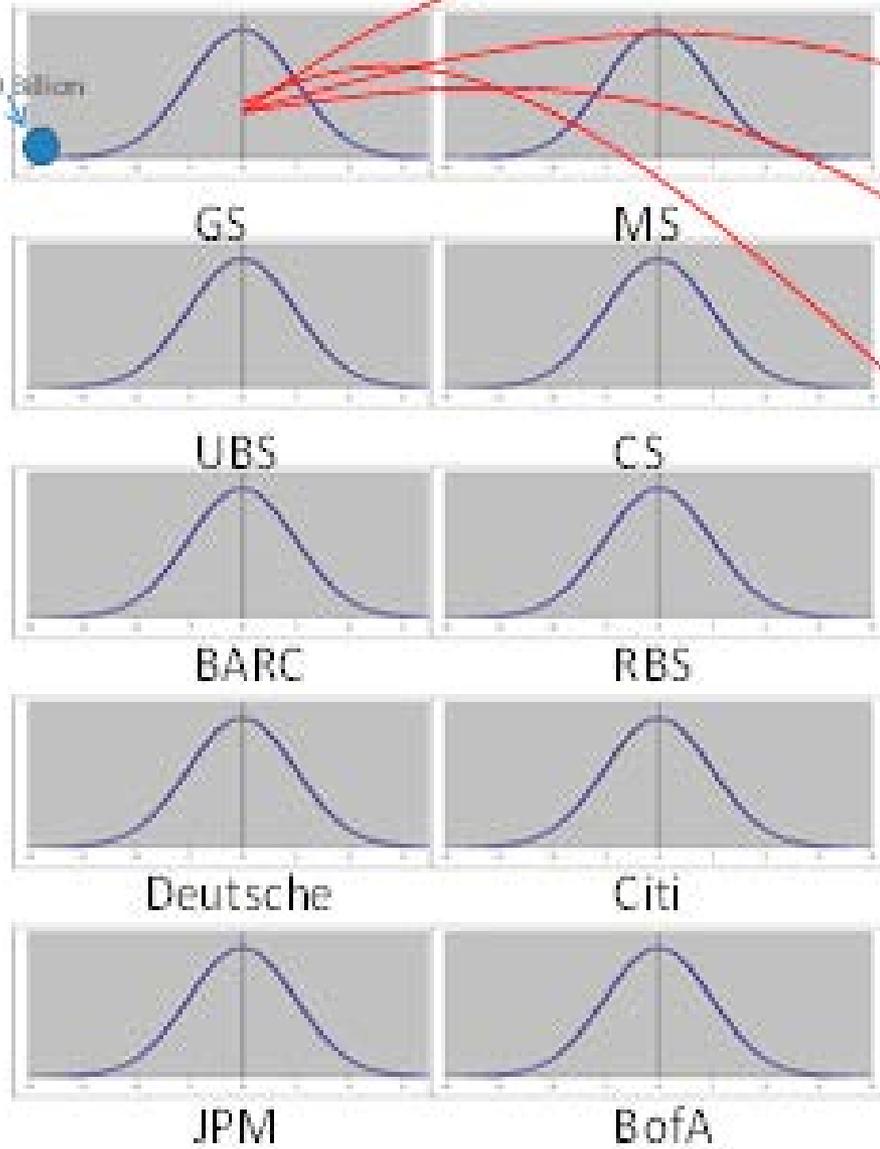


/1 Figure 1 is a snapshot of “z” or the nonbank/bank nexus explained in the analytical framework. The dealer bank depicted above are active in the cross-border collateral intermediation. . So “zi” is important for dealer bank “i”. The ultimate borrowers also borrow directly from commercial banks; however they are not shown in this figure as their interaction with nonbanks is minimal; hence “zi” is negligible.

Moving OTC derivatives to CCPs

SIFIs

CCPs



Risk from this market is indeed sizable due to inadequate collateral supporting the OTC Derivative transactions

Table 1: Under-collateralization in the OTC Derivatives Market

	Gross market value								
	H2 2008	H1 2009	H2 2009	H1 2010	H2 2010	H1 2011	H2 2011	H1 2012	H2 2012
GRAND TOTAL	35,281	25,314	21,542	24,673	21,296	19,518	27,285	25,392	24,740
A. Foreign exchange contracts	4,084	2,470	2,070	2,524	2,482	2,336	2,555	2,217	2,304
B. Interest rate contracts	20,087	15,478	14,020	17,533	14,746	13,244	20,001	19,113	18,833
C. Equity-linked contracts	1,112	879	708	706	648	708	679	645	605
D. Commodity contracts	955	682	545	457	526	471	487	390	358
E. Credit default swaps	5,116	2,987	1,801	1,666	1,351	1,345	1,586	1,187	848
F. Unallocated	3,927	2,817	2,398	1,788	1,543	1,414	1,977	1,840	1,792
GRASS CREDIT EXPOSURE *	5,005	3,744	3,521	3,578	3,480	2,971	3,912	3,668	3,626

* 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. Source BIS

CCP and shifting taxpayer “put”

- Generally speaking, large losses stemming to a bank from their OTC derivative positions—if it results in bank bailout —will typically be picked up by taxpayer from the jurisdiction in which the bank is located.
 - For example, derivative losses at branches of a Canadian bank in a foreign jurisdiction (e.g., London) is a Canadian taxpayer liability. Ditto for say Deutsche Bank branch in London (liability is of German taxpayer)
- However, moving OTC derivatives positions from say a Canadian bank to a foreign CCP that is owned/incorporated in a foreign jurisdiction (UK), shifts some of the Canadian taxpayer liability related to cleared OTC contracts to a UK taxpayer liability if UK had to bail-out the CCP.
- Benefits vs. Costs of building this infrastructure?

When plumbing breaks...

- Should nonbanks be bailed out?
- Recent SIFI designation to insurers, CCPs.... (and perhaps) asset managers?
 - **Nonbank/bank nexus: regulators trying to understand this** (data gaps? working groups on repo vs rehypothecation/sec lending/OTC derivatives/shadow banking etc.)
 - Recent regulations will likely shrink banks; however bailing out nonbanks (MMMF, CCPs etc.) would be going back to square one!
 - VMGH proposal for CCPs (largely a UK initiative)—a “bail-in” for nonbanks **but only embraced marginally, even in UK!**
(forthcoming, RBA analytical study shows VMGH-related contagion to be minimal)