How the Financial System Works

- A Map of Money Flows in the Global Financial Ecosystem -

by Zoltan Pozsar

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- 1. The Hierarchy of Money.
- 2. The Hierarchy of Access.
- 3. The Hierarchy of Uses.
- 4. The Dealer Eco-System.
- 5. The Macro Perspective.
- 6. Policy Implications.

Four core institutions:	
	Central Bank
Central bank,	(Federal Reserve)

Four core i	nstitutio	ons:				
				Central		
Central ban big),	k, banks	(small	and	(Federal F	Reserve)	
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				Bank (wholes		

Four core institutions:		
	Central Bank (Federal Reserve)	Dealer Banks
Central bank, banks (small arbig), dealers,		
-	Banks (retail)	Dealer Banks
	Banks (wholesale)	

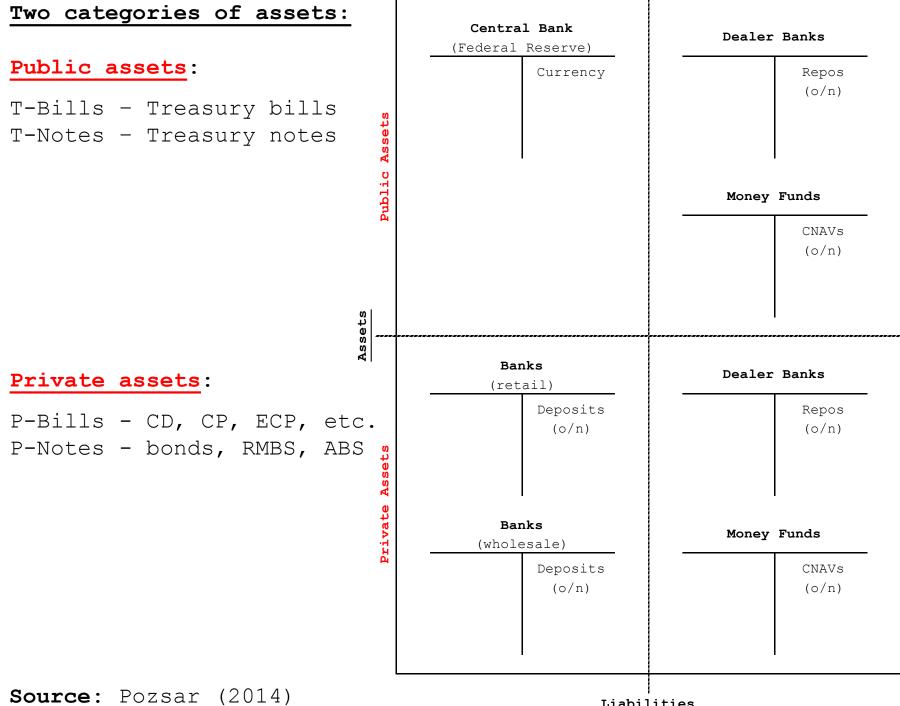
Four core institutions:	Central Bank (Federal Reserve)	Dealer Banks
Central bank, banks (small and big), dealers and money funds.	(2000202 1000210)	
		Money Funds
	Banks (retail)	Dealer Banks
	Banks (wholesale)	Money Funds

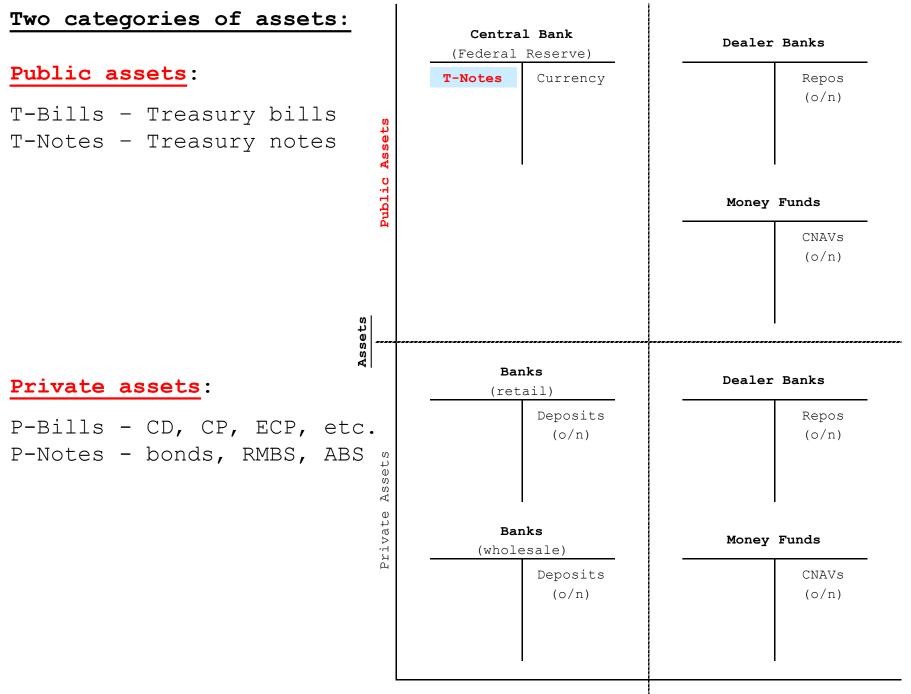
Four core money claims: Currency,	Central Bank (Federal Reserve) Currency	Money Funds
	Banks (retail) Banks (wholesale)	Dealer Banks Money Funds

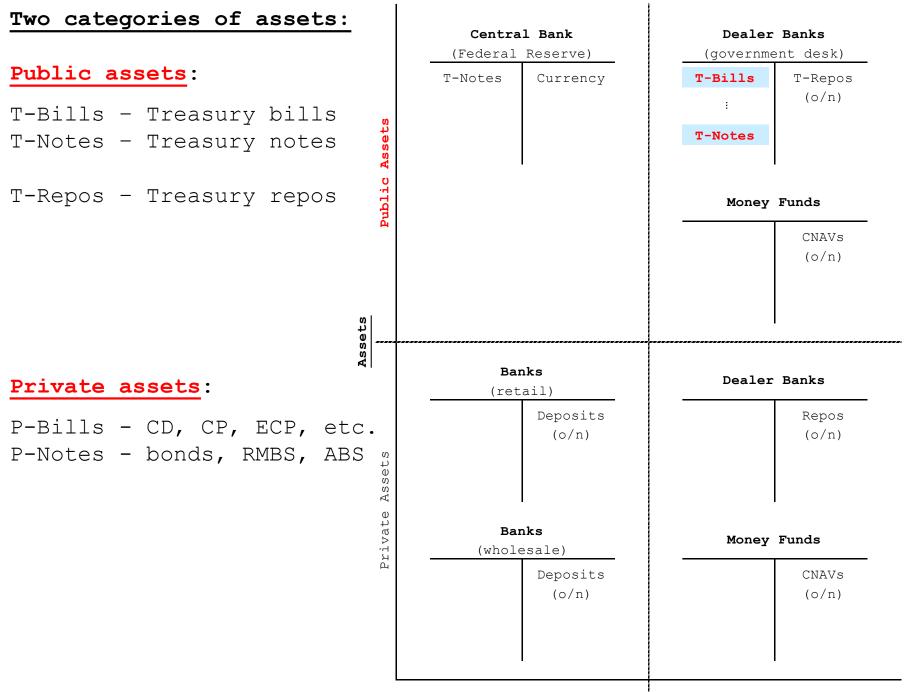
Four core money claims:	Central Bank	Dealer Banks
2	(Federal Reserve)	
Currency, deposits,	Currency	
		Money Funds
		I
	Banks (retail)	Dealer Banks
	Deposits	
	(o/n)	
	I I	
	Banks	Money Funds
	(wholesale)	
	Deposits	
	(o/n)	
		[
<u> </u>		

Four core money claims:	Central Bank (Federal Reserve)	Dealer Banks
Currency, deposits, repos,	Currency	Repos (o/n) Money Funds
	Banks (retail) Deposits (o/n)	Dealer Banks Repos (o/n)
	Banks (wholesale) Deposits (o/n)	Money Funds

Four core money claims: Central Bank Dealer Banks (Federal Reserve) Currency, deposits, repos Repos Currency (o/n) and constant NAV shares. Money Funds **CNAVs** (o/n) Banks Dealer Banks (retail) Deposits Repos (o/n) (o/n) Banks Money Funds (wholesale) Deposits **CNAVs** (o/n) (o/n)







Two categories of assets: Central Bank Dealer Banks (Federal Reserve) (government desk) Public assets: T-Repos T-Notes Currency T-Bills (o/n) T-Bills - Treasury bills T-Notes T-Notes - Treasury notes Money Funds T-Repos - Treasury repos (government-only) T-CNAVs - Treasury CNAVs T-Bills T-CNAVs (o/n) Banks Dealer Banks Private assets: (retail) P-Bills - CD, CP, LC., P-Notes - bonds, RMBS, ABS Deposits Repos (o/n) (o/n) Banks Money Funds (wholesale) Deposits CNAVs (o/n)(o/n)

Source: Pozsar (2014)

Two categories of assets:		D 1 D 1.
	Central Bank (Federal Reserve)	Dealer Banks (government desk)
<u>Public assets</u> :	T-Notes Currency	T-Bills T-Repos
T-Bills - Treasury bills T-Notes - Treasury notes		: (o/n) T-Notes
T-Repos - Treasury repos T-CNAVs - Treasury CNAVs		Money Funds (government-only) T-Bills T-CNAVs (o/n)
Private assets:	Banks (retail)	Dealer Banks
P-Bills - CD, CP, ECP, etc. P-Notes - bonds, RMBS, ABS	P-Loans Deposits (o/n)	Repos (o/n)
Private	Banks (wholesale)	Money Funds
Д	Deposits (o/n)	CNAVs (o/n)
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Two categories of assets: Central Bank Dealer Banks (Federal Reserve) (government desk) Public assets: T-Repos T-Notes Currency T-Bills (o/n) T-Bills - Treasury bills Public Assets T-Notes T-Notes - Treasury notes Money Funds T-Repos - Treasury repos (government-only) T-CNAVs - Treasury CNAVs T-Bills T-CNAVs (o/n)Banks Dealer Banks Private assets: (retail) P-Loans Deposits Repos P-Bills - CD, CP, ECP, etc. (o/n) (o/n) P-Notes - bonds, RMBS, ABS Banks Money Funds (wholesale) Deposits P-Notes CNAVs (o/n) (o/n)P-Loans

Source: Pozsar (2014)

Two categories of assets: Central Bank Dealer Banks (Federal Reserve) (government desk) Public assets: T-Repos T-Notes Currency T-Bills (o/n) T-Bills - Treasury bills Public Assets T-Notes T-Notes - Treasury notes Money Funds T-Repos - Treasury repos (government-only) T-CNAVs - Treasury CNAVs T-Bills T-CNAVs (o/n)Banks Dealer Banks Private assets: (retail) (credit desk) P-Loans Deposits P-Bills P-Repos P-Bills - CD, CP, ECP, etc. (o/n) (o/n) P-Notes - bonds, RMBS, ABS P-Notes P-Repos - private repos Banks Money Funds (wholesale) P-Notes Deposits CNAVs (o/n) (o/n)P-Loans

Source: Pozsar (2014)

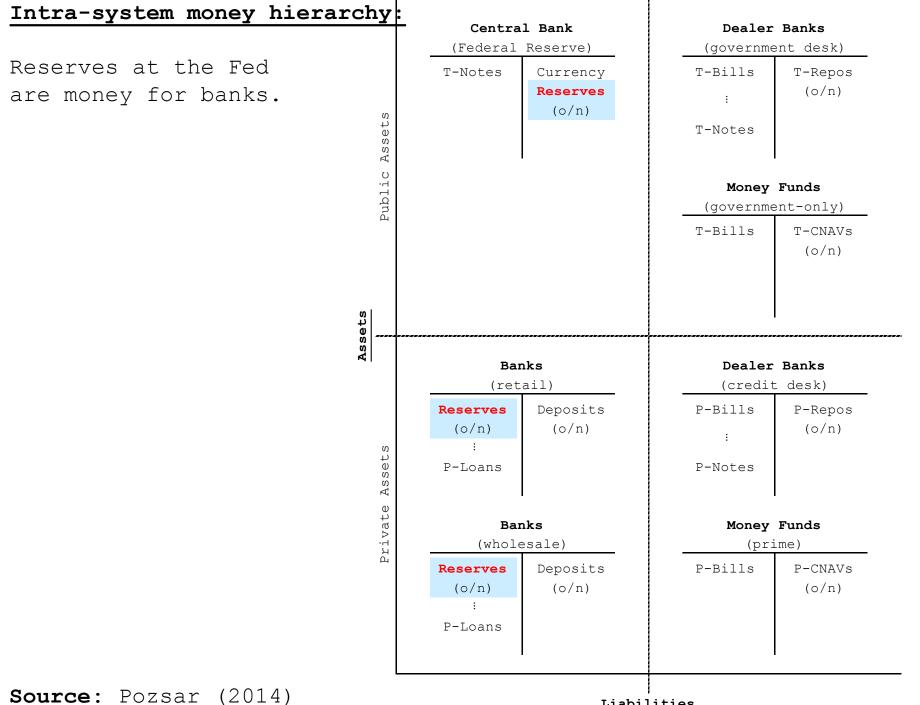
Two categories of assets: Central Bank Dealer Banks (Federal Reserve) (government desk) Public assets: T-Repos T-Notes Currency T-Bills (o/n) T-Bills - Treasury bills Public Assets T-Notes T-Notes - Treasury notes Money Funds T-Repos - Treasury repos (government-only) T-CNAVs - Treasury CNAVs T-Bills T-CNAVs (o/n)Banks Dealer Banks Private assets: (retail) (credit desk) P-Loans Deposits P-Bills P-Repos P-Bills - CD, CP, ECP, etc. (o/n) (o/n) P-Notes - bonds, RMBS, ABS P-Notes P-Repos - private repos Banks Money Funds P-CNAVs - private CNAVs (wholesale) (prime) P-Bills P-CNAVs P-Notes Deposits (o/n) (o/n) P-Loans Source: Pozsar (2014)

Deposits' special function: Central Bank Dealer Banks (Federal Reserve) (government desk) Banks form the backbone of T-Repos T-Notes Currency T-Bills (o/n)the payments system and facilitate the **net payments** T-Notes (via deposits) of all enti- $\frac{n}{2}$ ties that are lower in the g Money Funds system-hierarchy, including (government-only) dealers and money funds. T-Bills T-CNAVs (o/n) Banks Dealer Banks (retail) (credit desk) P-Loans Deposits P-Bills P-Repos (o/n) (o/n) Assets P-Notes Private Banks Money Funds (wholesale) (prime) Deposits P-CNAVs P-Notes P-Bills (o/n) (o/n)P-Loans

Liabilities

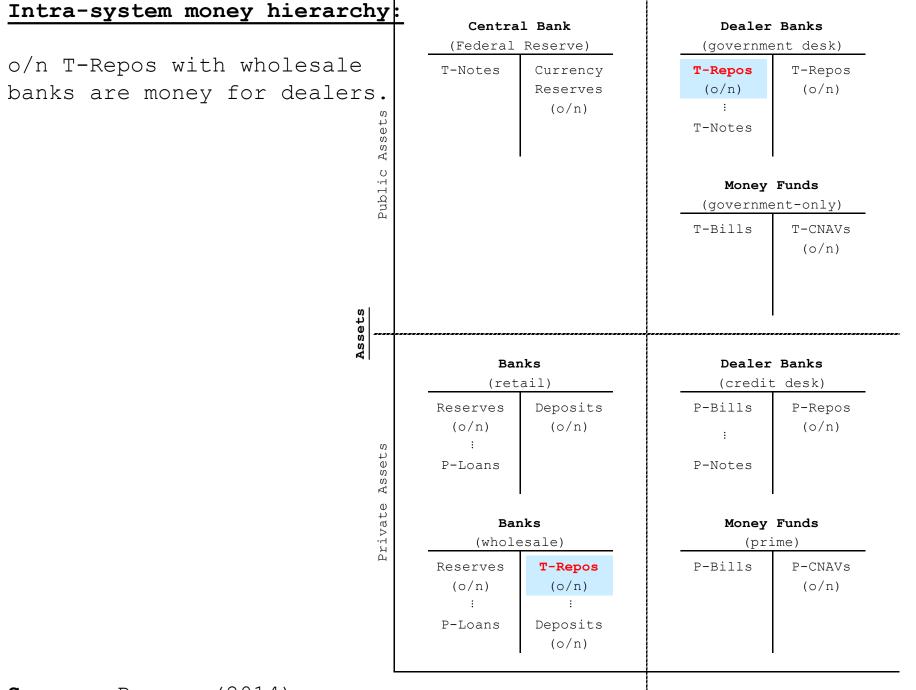
Storing payment surpluses: Central Bank Dealer Banks (Federal Reserve) (government desk) What happens with net pay-T-Repos T-Notes Currency T-Bills (o/n)ment surpluses at the end of the day? Through what ins- $\frac{0}{2}$ T-Notes truments are money balances stored within the system? Money Funds (government-only) For every institution, money T-Bills T-CNAVs (o/n)is something different. This is the intra-system hierarchy of money... Banks Dealer Banks (retail) (credit desk) P-Loans Deposits P-Bills P-Repos (o/n) (o/n) Assets P-Notes Private Banks Money Funds (wholesale) (prime) P-CNAVs P-Notes Deposits P-Bills (o/n)(o/n)P-Loans

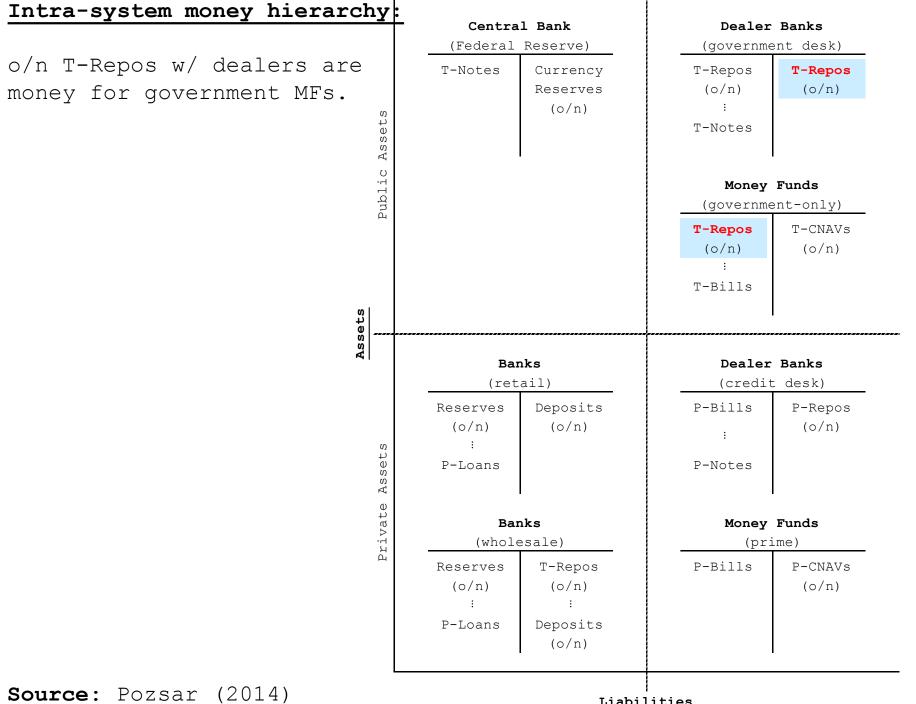
Source: Pozsar (2014)

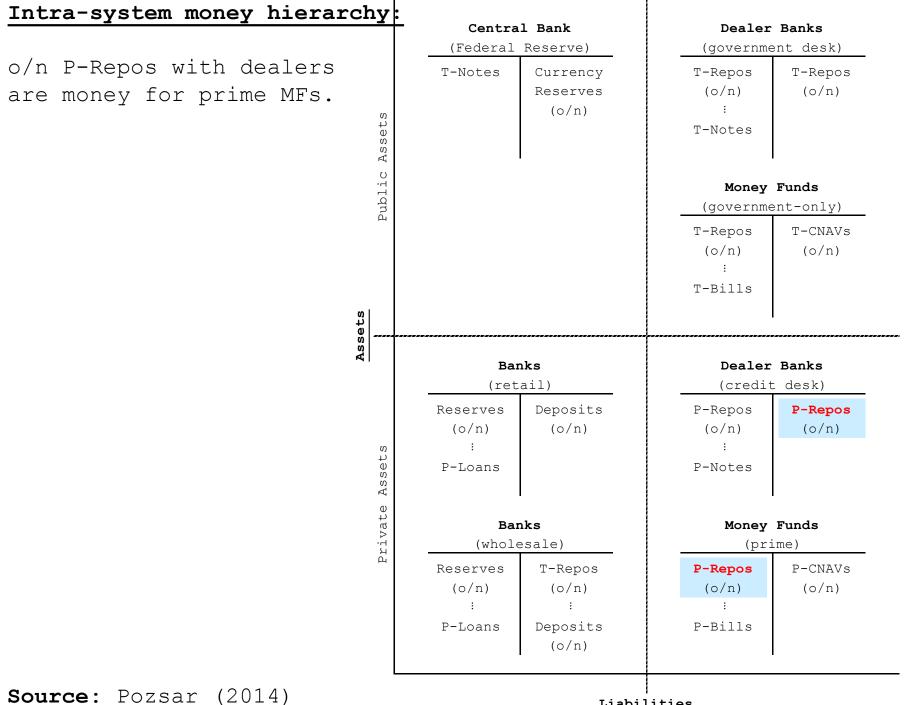


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Liabilities





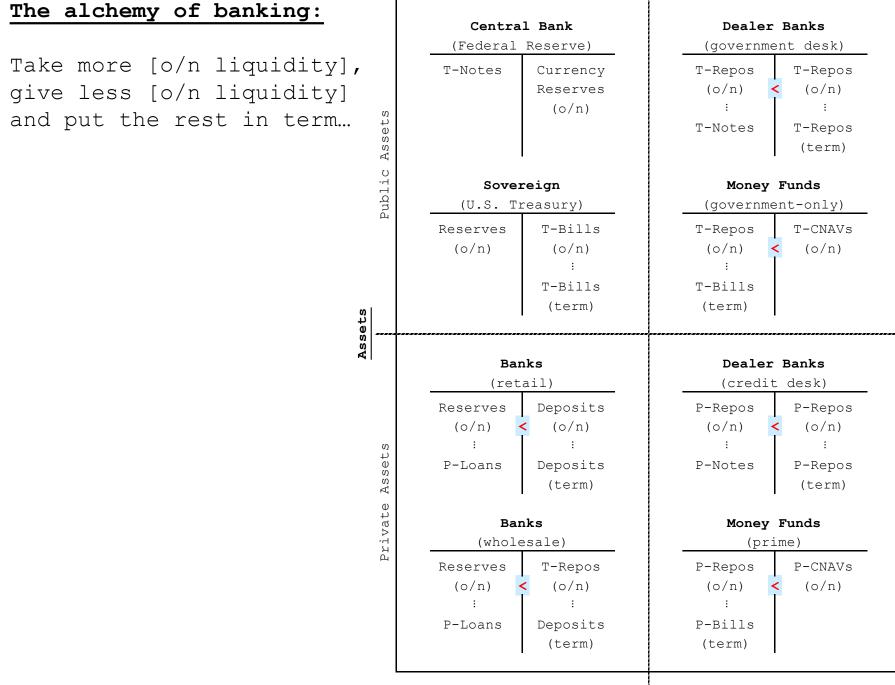


		1 Bank Reserve)	Dealer Banks (government desk)
Assets	T-Notes	Currency Reserves (o/n)	T-Repos T-Repos (o/n) (o/n) : T-Notes
			Money Funds (government-only)
<u> </u>			T-Repos T-CNAVs (o/n) (o/n) : T-Bills
	Ba r (ret		Dealer Banks (credit desk)
Assers	Reserves (o/n) : P-Loans	Deposits (o/n)	P-Repos P-Repos (o/n) (o/n) : P-Notes
י שר אין	Ba ı (whole	n ks esale)	Money Funds (prime)
		T-Repos	P-Repos P-CNAVs
P P P	Reserves (o/n) :	(o/n) : Deposits	(o/n) (o/n) : P-Bills

The sovereign as a "bank": Central Bank Dealer Banks (Federal Reserve) (government desk) Without the sovereign the T-Repos T-Notes T-Repos Currency (o/n) (o/n)money matrix is incomplete. Reserves (o/n)T-Notes We do not typically think of her as a bank, but the Sovereign Money Funds sovereign is also capable (U.S. Treasury) (government-only) of absorbing money demand. T-Bills T-CNAVs Reserves T-Repos (o/n) (o/n) (o/n) (o/n) T-Bills Assets Banks Dealer Banks (retail) (credit desk) Reserves Deposits P-Repos P-Repos (o/n) (o/n) (o/n) (o/n) Assets P-Loans P-Notes Private Banks Money Funds (wholesale) (prime) P-CNAVs Reserves T-Repos P-Repos (o/n)(o/n)(o/n) (o/n)Deposits P-Bills P-Loans (o/n) Source: Pozsar (2014)

What are money-like claims? Central Bank Dealer Banks (Federal Reserve) (government desk) Par at maturity versus T-Repos T-Repos T-Notes Currency Reserves (o/n) (o/n)par on demand claims. (o/n) T-Repos T-Notes Par at maturity in the (term) near term (o/n < 1 yr). Public Sovereign Money Funds (government-only) (U.S. Treasury) Breakable and negotiable T-Bills T-Repos T-CNAVs Reserves (o/n) (o/n) (o/n) (o/n) claims that do not trade at par in real time (puts T-Bills T-Bills (term) prior to maturity subject a (term) to penalty, market risks) 🖔 Banks Dealer Banks (retail) (credit desk) Reserves Deposits P-Repos P-Repos (o/n) (o/n) (o/n) (o/n) Assets Deposits P-Repos P-Loans P-Notes (term) (term) Private Banks Money Funds (wholesale) (prime) P-CNAVs Reserves T-Repos P-Repos (o/n)(o/n)(o/n) (o/n)Deposits P-Loans P-Bills (term) (term)

Source: Pozsar (2014)



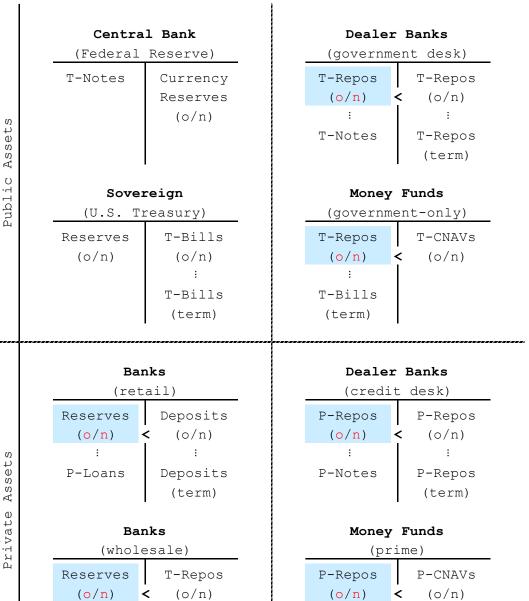
The alchemy of banking:

Take more [o/n liquidity], give less [o/n liquidity] and put the rest in term...

...this exposes "banks" to rollover risks, and if there is a run you ask: "do I have enough [o/n] liquidity to survive?".

Different institutions have different sets of backups for survival if o/n liquidity runs out.

It is the type and mix of these backups (or "puts") that determine the strength of money claims' promise of at par on demand liquidity.



Source: Pozsar (2014)

P-Bills

(term)

Deposits

(term)

P-Loans

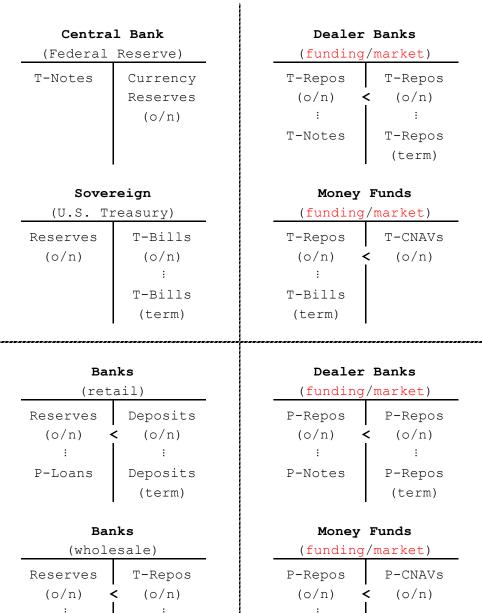
Hierarchy of liquidity puts: Central Bank Dealer Banks (Federal Reserve) (government desk) Money funds can borrow T-Repos T-Repos T-Notes Currency (o/n)only limited amounts. Reserves (o/n) (o/n) T-Notes T-Repos If this option is exhausted $^{\circ}_{\alpha}$ (term) money funds must sell. Sovereign Money Funds (funding/market) (U.S. Treasury) In a panic, this will likely T-Bills T-CNAVs Reserves T-Repos (o/n) (o/n) (o/n) < (o/n) spiral into a fire sale. T-Bills T-Bills (term) (term) Assets Banks Dealer Banks (retail) (credit desk) Reserves Deposits P-Repos P-Repos < (o/n) (o/n) (o/n) < (o/n)Assets Deposits P-Repos P-Loans P-Notes (term) (term) Private Banks Money Funds (wholesale) (funding/market) P-Repos P-CNAVs Reserves T-Repos (o/n) (o/n) (o/n) < (o/n) Deposits P-Loans P-Bills (term) (term)

Source: Pozsar (2014)

Hierarchy of liquidity puts: Central Bank Dealer Banks (Federal Reserve) (funding/market) Dealers have more room to T-Repos T-Repos T-Notes Currency (o/n) borrow against their assets. Reserves (o/n) (o/n) T-Notes T-Repos If this option is exhausted $^{\circ}_{\alpha}$ (term) dealers must sell too. Sovereign Money Funds (funding/market) (U.S. Treasury) In a panic, this will likely T-Bills T-CNAVs Reserves T-Repos (o/n) (o/n) (o/n) < (o/n) spiral into a fire sale too. T-Bills T-Bills (term) (term) Assets Banks Dealer Banks (funding/market) (retail) Reserves Deposits P-Repos P-Repos < (o/n) (o/n) (o/n) (o/n) Assets Deposits P-Repos P-Loans P-Notes (term) (term) Private Banks Money Funds (wholesale) (funding/market) P-Repos P-CNAVs Reserves T-Repos (o/n) (o/n) (o/n) < (o/n) Deposits P-Loans P-Bills (term) (term)

Source: Pozsar (2014)

Hierarchy of liquidity puts: Borrowing against assets and selling assets is access to funding and market liquidit∜ Funding and market liquidity are private liquidity puts. They both depend on private market participants (banks and dealers) for execution, Asse



Private Deposits P-Loans (term)

Assets

P-Bills (term)

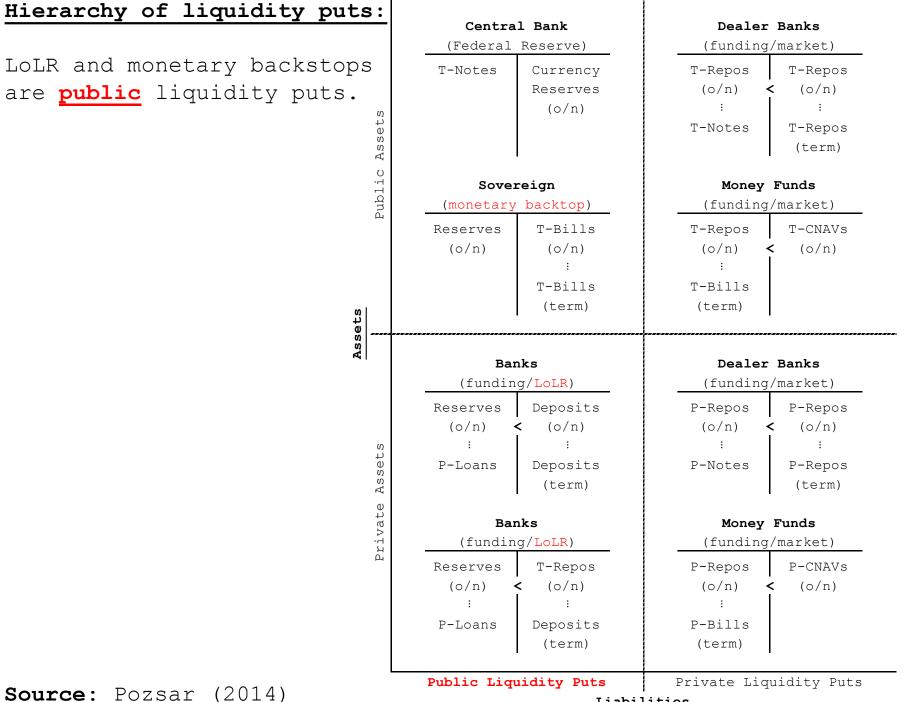
Private Liquidity Puts

Hierarchy of liquidity puts: Central Bank Dealer Banks (funding/market) (Federal Reserve) Retail and wholesale banks T-Repos T-Repos T-Notes Currency (o/n) can borrow against assets or Reserves (o/n) (o/n) put them to the central bank T-Notes T-Repos (term) Retail and wholesale banks Sovereign Money Funds hardly ever have to sell. (funding/market) (U.S. Treasury) T-Bills T-CNAVs T-Repos Reserves (o/n) (o/n) (o/n) < (o/n) This is access to funding as well as lender of last T-Bills T-Bills (term) (term) resort (LoLR) liquidity. Assets Banks Dealer Banks (funding/LoLR) (funding/market) Deposits P-Repos P-Repos Reserves < (o/n) (o/n) (o/n) (o/n) Assets Deposits P-Repos P-Loans P-Notes (term) (term) Private Banks Money Funds (funding/LoLR) (funding/market) P-Repos P-CNAVs Reserves T-Repos (o/n) (o/n) (o/n) < (o/n) Deposits P-Loans P-Bills (term) (term)

Source: Pozsar (2014)

Private Liquidity Puts

Hierarchy of liquidity puts:				
		l Bank	Dealer	
_,		Reserve)	(funding	/market)
The sovereign has a monetary backstop (usually a taboo; often used during WWI & II to and recently the OMT, see	T-Notes	Currency Reserves (o/n)	T-Repos (o/n) · : T-Notes	T-Repos (o/n) : T-Repos (term)
McCulley and Pozsar, 2012).	Sove	reign	Money	Funds
Pub1		backtop)	-	/market)
	Reserves (o/n)	T-Bills (o/n) : T-Bills (term)	T-Repos	T-CNAVs (o/n)
Assets		n ks g/LoLR)	1	Banks /market)
	Reserves	Deposits	P-Repos	P-Repos
	(o/n)	(o/n)	. , .	(o/n)
ώ.	:	i i	:	:
Asset	P-Loans	Deposits (term)	P-Notes	P-Repos (term)
Private		n ks g/LoLR)	Money (funding	Funds /market)
Д	Reserves	T-Repos	P-Repos	P-CNAVs
	(o/n)	(0/n)	(o/n) ·	(o/n)
	:	i	:	
	P-Loans	Deposits (term)	P-Bills (term)	
		(• • ,		



Hierarchy of liquidity puts:

LoLR and monetary backstops are **public** liquidity puts.

But official liquidity puts are of value only if one has the capital to put up the haircut at the central bank to borrow the needed funds.

If capital is short the hierarchy of credit puts overrides the hierarchy of liquidity puts.

Central Bank

(Federal	Reserve)
T-Notes	Currency
	Reserves
	(o/n)

${\tt Sovereign}$

(monetary	backtop)
Reserves	T-Bills
(o/n)	(o/n)
	:
	T-Bills
	(term)

Dealer Banks

(funding/market)	
T-Repos	T-Repos
(o/n) •	< (o/n)
:	:
T-Notes	T-Repos
	(term)

Money Funds

(funding/market)	
T-Repos	T-CNAVs
(o/n) •	(o/n)
i .	
T-Bills	
(term)	

Banks

(funding/LoLR)	
Reserves	Deposits
(o/n)	(o/n)
:	ŧ
P-Loans	Deposits
	(term)
·	-

Assets

Banks

(funding/LoLR)	
Reserves	T-Repos
(o/n) •	< (o/n)
:	:
P-Loans	Deposits
	(term)
	-

Dealer Banks

(funding/market)		
P-Repos	P-Repos	
(o/n) •	(o/n)	
:	:	
P-Notes	P-Repos	
	(term)	

Money Funds

(funding/market)		
P-Repos	P-CNAVs	
(o/n)	(o/n)	
:		
P-Bills		
(term)		
!		

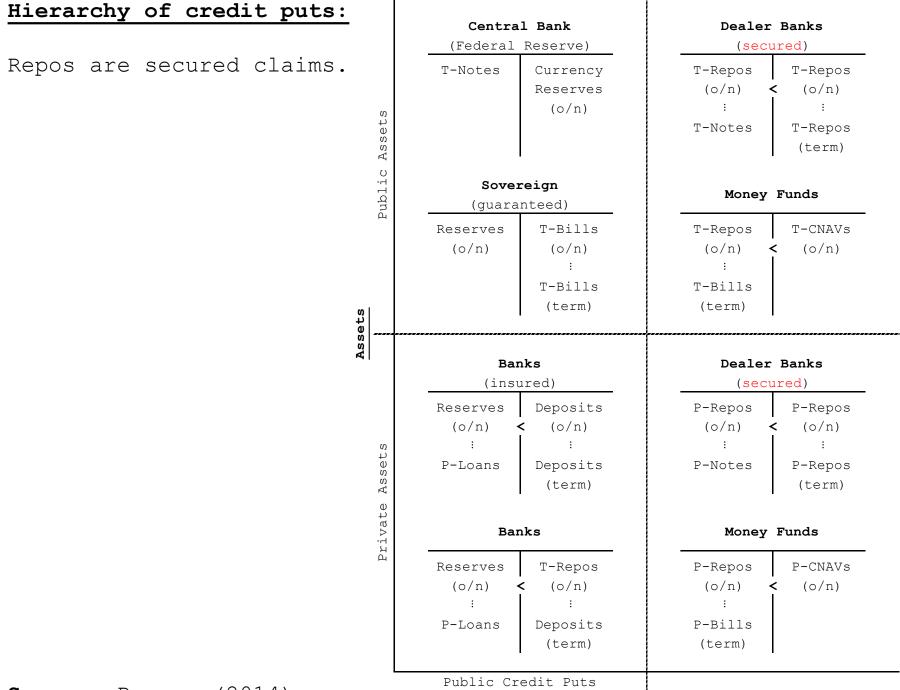
Public Liquidity Puts

Private Liquidity Puts

Hierarchy of credit puts: Central Bank Dealer Banks (Federal Reserve) T-Bills are guaranteed. T-Repos T-Notes Currency T-Repos Reserves (o/n) (o/n) (o/n) Public Assets T-Notes T-Repos (term) Sovereign Money Funds (quaranteed) Reserves T-Bills T-CNAVs T-Repos (o/n) (o/n) (o/n) (o/n) T-Bills T-Bills (term) (term) Assets Banks Dealer Banks Reserves Deposits P-Repos P-Repos (o/n) (o/n) (o/n) (o/n) Assets P-Loans Deposits P-Notes P-Repos (term) (term) Private Banks Money Funds T-Repos P-Repos P-CNAVs Reserves (o/n) (o/n) (o/n) (o/n) < Deposits P-Bills P-Loans (term) (term)

Hierarchy of credit puts: Central Bank Dealer Banks (Federal Reserve) Deposits are government T-Repos T-Notes Currency T-Repos insured up to \$250,000. (o/n) (o/n) Reserves (o/n) Public Assets T-Notes T-Repos (term) Sovereign Money Funds (guaranteed) T-Bills T-CNAVs Reserves T-Repos (o/n) (o/n) (o/n) (o/n) T-Bills T-Bills (term) (term) Assets Banks Dealer Banks (insured) Reserves Deposits P-Repos P-Repos (o/n) (o/n) (o/n) (o/n) Assets P-Loans Deposits P-Notes P-Repos (term) (term) Private Banks Money Funds P-CNAVs Reserves T-Repos P-Repos (o/n) (o/n) (o/n) (o/n) P-Loans Deposits P-Bills (term) (term)

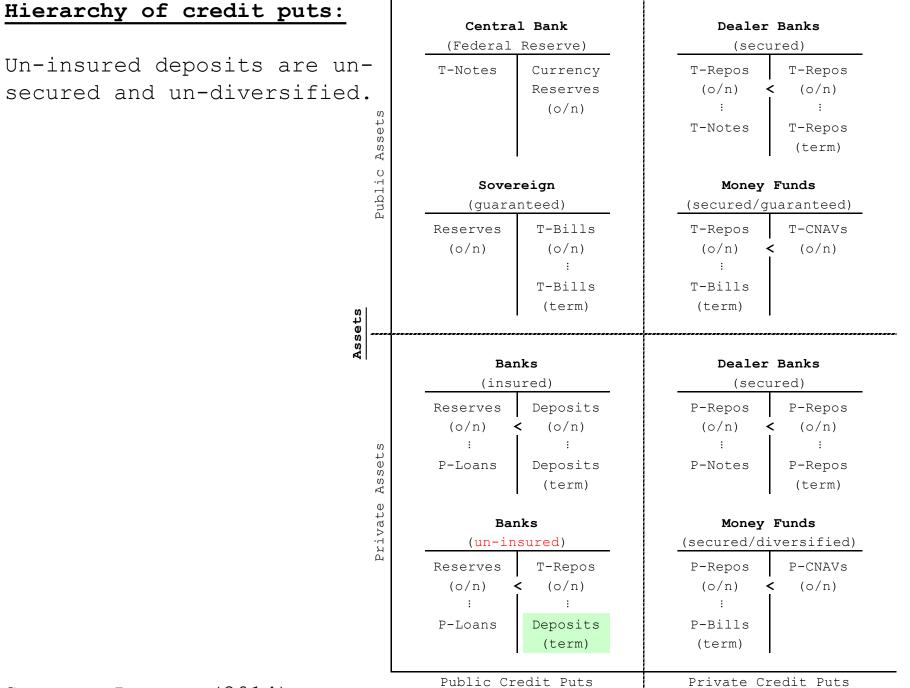
Hierarchy of credit puts: Central Bank Dealer Banks (Federal Reserve) Guarantees and insurance T-Repos T-Notes Currency T-Repos (o/n) (o/n) are public credit puts. Reserves (o/n) Public Assets T-Notes T-Repos (term) Sovereign Money Funds (guaranteed) T-Bills T-CNAVs Reserves T-Repos (o/n) (o/n) (o/n) (o/n) T-Bills T-Bills (term) (term) Assets Banks Dealer Banks (insured) Reserves Deposits P-Repos P-Repos (o/n) (o/n) (o/n) (o/n) Assets P-Loans Deposits P-Notes P-Repos (term) (term) Private Banks Money Funds P-Repos P-CNAVs Reserves T-Repos (o/n) (o/n) (o/n) (o/n) Deposits P-Bills P-Loans (term) (term) Public Credit Puts

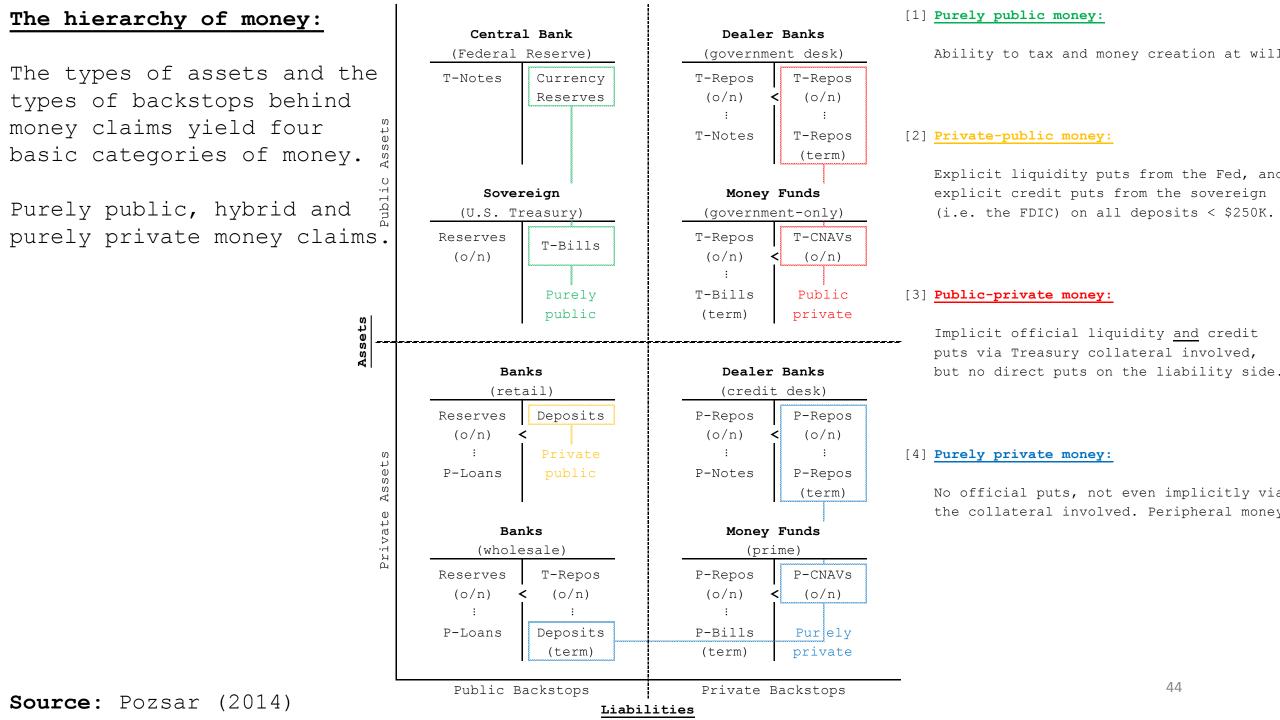


Source: Pozsar (2014)

Hierarchy of credit puts: Central Bank Dealer Banks (Federal Reserve) (secured) Money fund shares are backed T-Repos T-Notes Currency T-Repos (o/n) (o/n) either by secured and quaran-Reserves (o/n) teed assets, or secured and $\frac{n}{t}$ T-Notes T-Repos diversified assets. They may (term) also have reputational puts Sovereign Money Funds to their sponsor (weak puts) (guaranteed) (secured/guaranteed) T-Bills T-CNAVs Reserves T-Repos (o/n) (o/n) (o/n) (o/n) T-Bills T-Bills (term) (term) Assets Banks Dealer Banks (insured) (secured) Reserves Deposits P-Repos P-Repos (o/n) (o/n) (o/n) (o/n) Assets Deposits P-Repos P-Loans P-Notes (term) (term) Private Money Funds Banks (secured/diversified) Reserves T-Repos P-Repos P-CNAVs (o/n) (o/n) (o/n) < (o/n) Deposits P-Loans P-Bills (term) (term) Public Credit Puts

Hierarchy of credit puts: Central Bank Dealer Banks (Federal Reserve) (secured) Collateral, diversification T-Repos T-Notes Currency T-Repos (o/n) (o/n) and reputational puts are Reserves (o/n) all **private** credit puts. Public Assets T-Notes T-Repos (term) Sovereign Money Funds (secured/guaranteed) (guaranteed) T-Bills T-CNAVs Reserves T-Repos (o/n) (o/n) (o/n) (o/n) T-Bills T-Bills (term) (term) Assets Banks Dealer Banks (insured) (secured) Reserves Deposits P-Repos P-Repos (o/n) (o/n) (o/n) (o/n) Assets Deposits P-Repos P-Loans P-Notes (term) (term) Private Money Funds Banks (secured/diversified) P-CNAVs Reserves T-Repos P-Repos (o/n) (o/n) (o/n) < (o/n) Deposits P-Bills P-Loans (term) (term) Public Credit Puts Private Credit Puts





The hierarchy of money: Central Bank Dealer Banks (government desk) (Federal Reserve) The types of assets and the T-Notes T-Repos Currency T-Repos (o/n)types of backstops behind Reserves (o/n)money claims yield four T-Notes T-Repos basic categories of money. (term) Sovereign Money Funds Purely public, hybrid and (U.S. Treasury) (government-only) purely private money claims. T-Repos T-CNAVs Reserves T-Bills (o/n)(o/n) (o/n) Public T-Bills Public (term) shadow money Banks Dealer Banks (retail) (credit desk) Deposits P-Repos P-Repos Reserves (o/n) (o/n)(o/n) Assets P-Repos P-Loans P-Notes (term) Private Money Funds Banks (wholesale) (prime) Reserves T-Repos P-Repos P-CNAVs (o/n)(o/n) (o/n)(o/n) Private P-Loans Deposits P-Bills sha dow (term) (term) Public Backstops Private Backstops Source: Pozsar (2014) Liabilities

[1] Public money:

Ability to tax and money creation at will

[2] Insured money:

Explicit liquidity puts from the Fed, and explicit credit puts from the sovereign (i.e. the FDIC) on all deposits < \$250K.

[3] Public shadow money:

Implicit official liquidity and credit puts via Treasury collateral involved, but no direct puts on the liability side

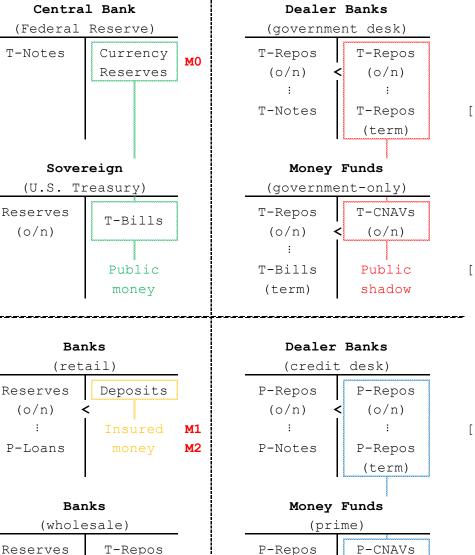
[4] Private shadow money:

No official puts, not even implicitly via the collateral involved. Peripheral money

The types of assets and the types of backstops behind money claims yield four basic categories of money.

Purely public, hybrid and purely private money claims.

Traditional money supply...



- [1] Public money (M0, or base money):
 - Ability to tax and money creation at will
- [2] Insured money (M1 and M2):
 - Explicit liquidity puts from the Fed, and explicit credit puts from the sovereign (i.e. the FDIC) on all deposits < \$250K.
- [3] Public shadow money:
 - Implicit official liquidity and credit puts via Treasury collateral involved, but no direct puts on the liability side
- [4] Private shadow money:
 - No official puts, not even implicitly via the collateral involved. Peripheral money

Source: Pozsar (2014)

Public Backstops

(o/n)

Deposits

(term)

(o/n)

P-Loans

Assets

Private

Private Backstops Liabilities

(o/n)

P-Bills

(term)

(o/n)

Private sha dow

The types of assets and the types of backstops behind money claims yield four basic categories of money.

Purely public, hybrid and purely private money claims.

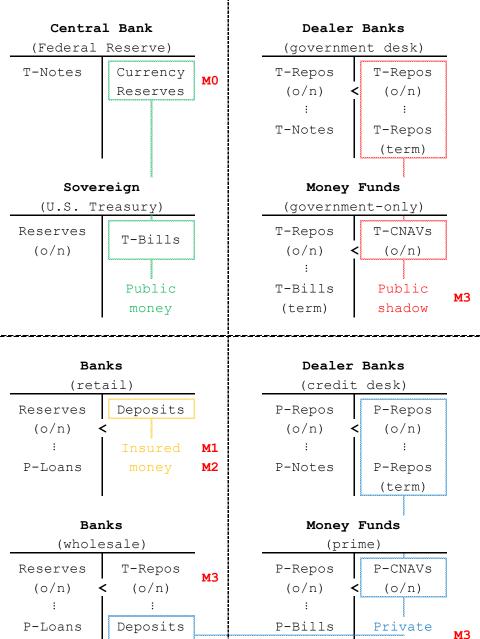
Ass

Assets

Private

Traditional money supply

VS. shadow money supply.



[1] Public money (M0, or base money):

Ability to tax and money creation at will

[2] Insured money (M1 and M2):

Explicit liquidity puts from the Fed, and explicit credit puts from the sovereign (i.e. the FDIC) on all deposits < \$250K.

[3] Public shadow money (M3):

Implicit official liquidity <u>and</u> credit puts via Treasury collateral involved, but no direct puts on the liability side

[4] Private shadow money (M3):

No official puts, not even implicitly via the collateral involved. Peripheral money

Source: Pozsar (2014)

Public Backstops Private Backstops

Liabilities

(term)

(term)

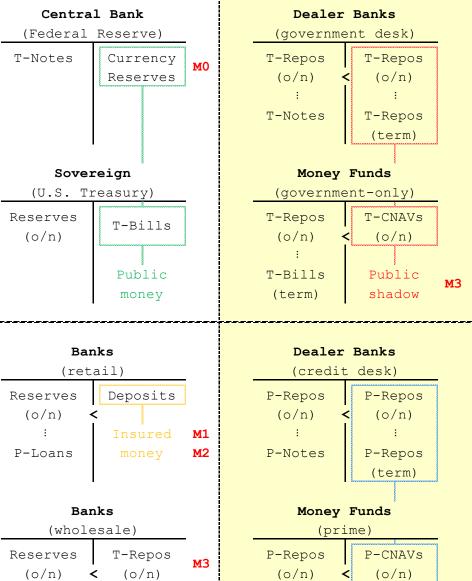
sha dow

The types of assets and the types of backstops behind money claims yield four basic categories of money.

Purely public, hybrid and purely private money claims.

Traditional money supply VS. shadow money supply.

The shadow banking system...



[1] Public money (M0, or base money):

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[4] Private shadow money (M3):

No official puts, not even implicitly via the collateral involved. Peripheral money

Source: Pozsar (2014)

Public Backstops

Deposits

(term)

P-Loans

Private

Private Backstops Liabilities

P-Bills

(term)

Private

sha dow

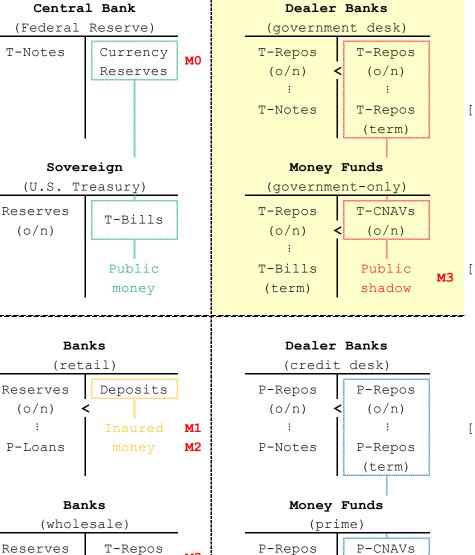
The types of assets and the types of backstops behind money claims yield four basic categories of money.

Purely public, hybrid and purely private money claims.

Traditional money supply VS. shadow money supply.

The shadow banking system...

[1] Public-private subsystem (public collateral, maturity and liquidity transformation see Carney and Panetta, 201



(o/n)

P-Bills

(term)

(o/n)

Private

sha dow

м3

[1] Public money (M0, or base money):

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[3] Public shadow money (M3):

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[4] Private shadow money (M3):

No official puts, not even implicitly via the collateral involved. Peripheral money

Source: Pozsar (2014)

Public Backstops Private Backstops

Liabilities

(o/n)

Deposits

(term)

(o/n)

P-Loans

The types of assets and the types of backstops behind money claims yield four basic categories of money.

Purely public, hybrid and purely private money claims.

Traditional money supply vs. shadow money supply.

The shadow banking system...

[1] Public-private subsystem (public collateral, maturity and liquidity transformation see Carney and Panetta, 2011

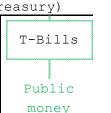
[2] Purely private subsystem (private collateral, credit, maturity and liquidity trafo see Pozsar et al, 2010)

Central Bank (Federal Reserve)

Reserves

(o/n)

T-Notes Currency Reserves Sovereign (U.S. Treasury)



Dealer Banks (government desk)

T-Repos T-Repos (o/n)(o/n) T-Notes T-Repos (term) Money Funds

(government-only) T-CNAVs T-Repos (o/n) (o/n) T-Bills Public shadow (term)

Dealer Banks

Money Funds

(o/n)

P-Repos

(term)

P-CNAVs

[3] Public shadow money (M3):

[2] Insured money (M1 and M2):

[1] Public money (M0, or base money):

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[4] Private shadow money (M3):

No official puts, not even implicitly via the collateral involved. Peripheral money

(retail) (credit desk) Deposits P-Repos P-Repos Reserves

(o/n)P-Loans M2

Banks

(term)

Banks (wholesale)

Reserves T-Repos (o/n)(o/n)P-Loans Deposits

(prime) P-Repos (o/n)

(o/n)

P-Notes

(o/n) P-Bills Private sha dow (term)

Private Backstops

Public Backstops Source: Pozsar (2014) Liabilities

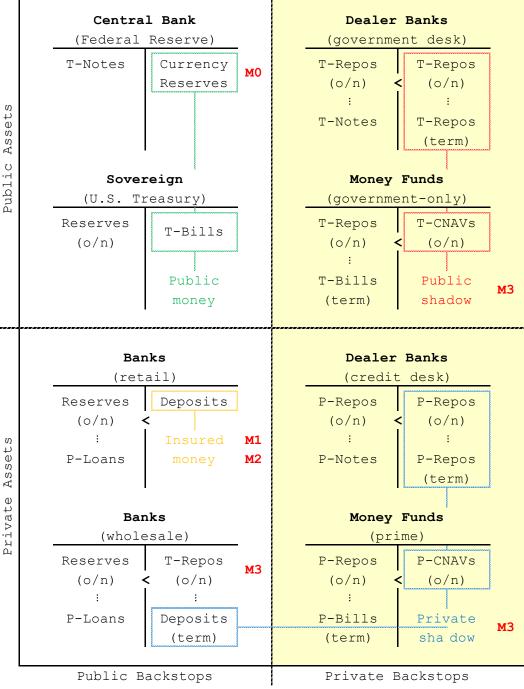
Enter the Fed's RRPs:

Recall that only banks and the sovereign can have reserve accounts at the Fed.

For dealers, money is o/n T-Repos with large banks.

For money funds, money is o/n T-Repos with dealers.

No longer...

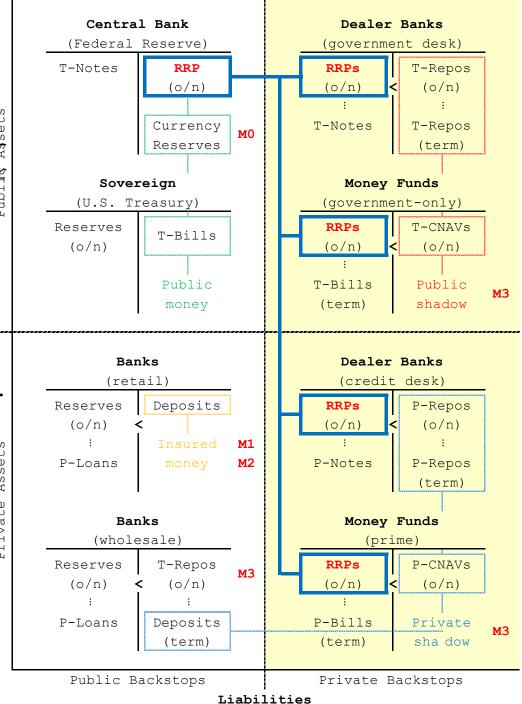


Source: Pozsar (2014)

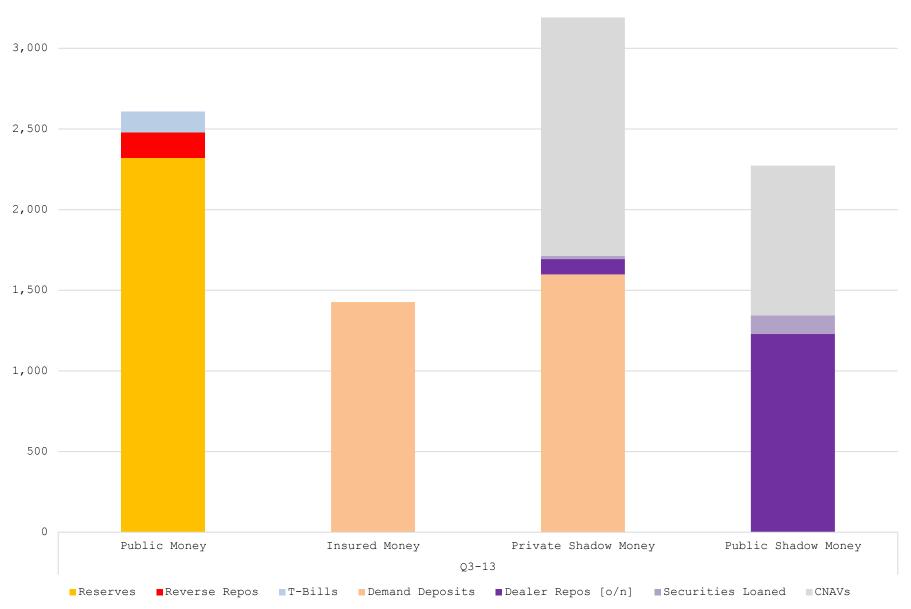
Enter the Fed's RRPs:

RRPs effectively give money funds and dealers, the core entities of the shadow ban-so king system, access to a rest serve account at the Fed for the very first time in U.S. monetary history. Do appreciate the evolutionary significance of this step and look beyond the view that step and look beyo

RRPs are likely a station, of this shortly in Part II).

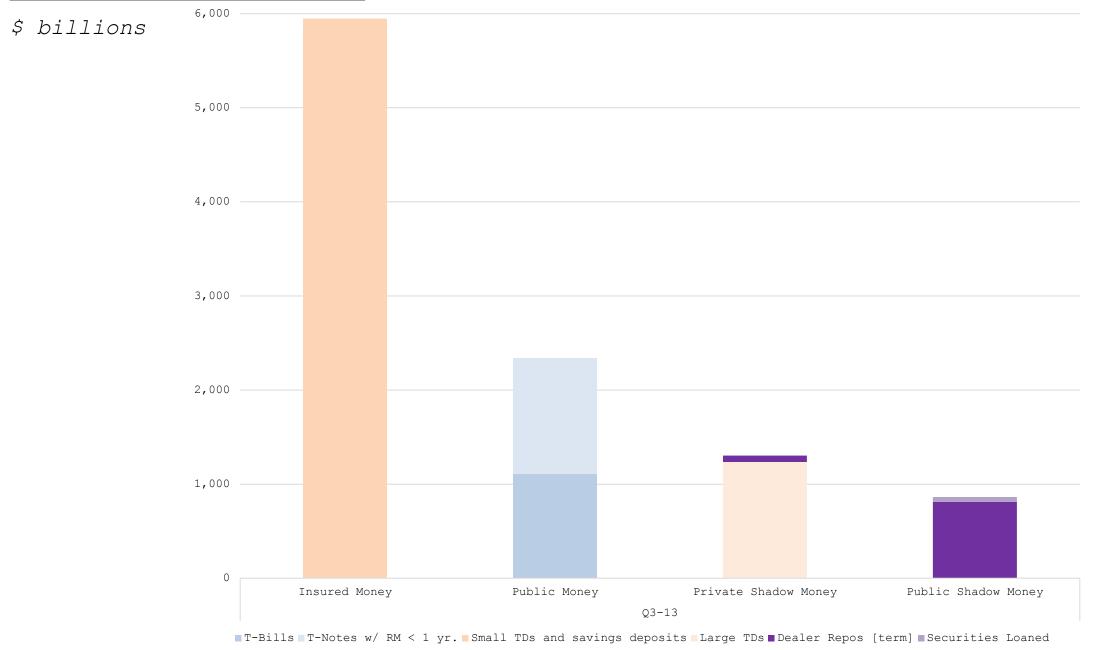


\$ billions



Source: Federal Reserve Z.1 and H.8, New York Fed (FR 2004), FDIC, U.S. Treasury

Term money claims by type:



Source: Federal Reserve Z.1 and H.8, New York Fed (FR 2004) and author's calculations

- 1. The Hierarchy of Money.
- 2. The Hierarchy of Access.
- 3. The Hierarchy of Uses.
- 4. The Dealer Eco-System.
- 5. The Macro Perspective.
- 6. Policy Implications.

Retail cash investors: Central Bank Dealer Banks (Federal Reserve) (government desk) Mom and pop depositors. T-Repos T-Notes Currency T-Repos (o/n) (o/n) Reserves (o/n) Holdings of cash and Assets T-Notes T-Repos insured bank deposits. (term) Public Sovereign Money Funds (U.S. Treasury) (government-only) T-Bills T-CNAVs Reserves T-Repos (o/n) (o/n) (o/n) (o/n) < T-Bills T-Bills (term) (term) Assets Banks Dealer Banks (insured) (credit desk) Reserves Deposits P-Repos P-Repos (o/n) (o/n) (o/n) (o/n) Assets P-Loans Deposits P-Notes P-Repos (term) (term) Private Money Funds Banks (wholesale) (prime) P-CNAVs Reserves T-Repos P-Repos (o/n) (o/n) (o/n) (o/n) Deposits P-Bills P-Loans (term) (term) Public Backstops Private Backstops

Institutional cash pools: Central Bank Dealer Banks (Federal Reserve) (government desk) At least \$10bn in cash AuM T-Repos T-Repos T-Notes Currency (o/n) Reserves (o/n) (see Pozsar, 2011 and 2012). (o/n) T-Notes T-Repos Cash portfolio managers (term) Sovereign Money Funds Mandate: "Do not lose". (U.S. Treasury) (government-only) T-Bills T-CNAVs Reserves T-Repos (o/n) (o/n) (o/n) < (o/n) Restricted to invest mostly in money market instruments. T-Bills T-Bills (term) (term) Assets Banks Dealer Banks (retail) (credit desk) Reserves Deposits P-Repos P-Repos (o/n) (o/n) (o/n) (o/n) Assets Deposits P-Repos P-Loans P-Notes (term) (term) Private Banks Money Funds (wholesale) (prime) P-CNAVs Reserves T-Repos P-Repos (o/n)(o/n) (o/n) < (o/n) P-Loans Deposits P-Bills (term) (term) Public Backstops Private Backstops

Institutional cash pools: Central Bank Dealer Banks Cash PM (government desk) (Federal Reserve) (reserve managers) At least \$10bn in cash AuM T-Repos T-Repos "Cash" T-Notes Currency (o/n) Reserves (o/n) (o/n)(see Pozsar, 2011 and 2012). ÷ (o/n)"Cash" Equity T-Notes T-Repos Cash portfolio managers (permanent) (term) (term) Sovereign Money Funds Mandate: "Do not lose". (U.S. Treasury) (government-only) T-CNAVs T-Bills T-Repos Reserves (o/n) (o/n) (o/n) < (o/n) Restricted to invest mostly in money market instruments. T-Bills T-Bills (term) (term) [1] FX reserve managers' liquidity tranches. Banks Dealer Banks (retail) (credit desk) Reserves Deposits P-Repos P-Repos (o/n) (o/n) (o/n) (o/n) Assets Deposits P-Repos P-Loans P-Notes (term) (term) Private Banks Money Funds (wholesale) (prime) P-CNAVs Reserves T-Repos P-Repos (o/n) (o/n) (o/n) < (o/n) Deposits P-Loans P-Bills (term) (term) Public Backstops Private Backstops Source: Pozsar (2014)

At least \$10bn in cash AuM (see Pozsar, 2011 and 2012).

Cash portfolio managers (PM $_{x}^{\varphi}$

Mandate: "Do not lose".

Restricted to invest <u>mostly</u> in money market instruments.

[1] FX reserve managers' liquidity tranches.

[2] Global corporate cash balances (on and offshore). $^{\circ}_{\mathfrak{p}}$

Central Bank

(Federal	Reserve)
T-Notes	Currency
	Reserves
	(o/n)

${\tt Sovereign}$

(U.S. Treasury)		
Reserves	T-Bills	
(o/n)	(o/n)	
	:	
	T-Bills	
	(term)	

Dealer Banks

(government desk)	
T-Repos	T-Repos
(o/n) •	< (o/n)
:	:
T-Notes	T-Repos
	(term)

Money Funds

(government-only)	
T-Repos	T-CNAVs
(o/n) •	< (o/n)
:	
T-Bills	
(term)	

Cash PM

(reserve	managers)
"Cash"	
(o/n)	:
:	
"Cash"	Equity
(term)	(permanent)

Cash PM

(corporations)	
"Cash"	
(o/n)	ŧ
:	
"Cash"	Equity
(term)	(permanent)

Banks

(retail)	
Reserves	Deposits
(o/n) •	(o/n)
:	:
P-Loans	Deposits
	(term)

Banks

(wholesale)	
Reserves (o/n)	T-Repos
:	:
P-Loans	Deposits
	(term)

Dealer Banks

(credit desk)	
P-Repos	P-Repos
(o/n) •	(o/n)
:	:
P-Notes	P-Repos
	(term)

Money Funds

(prime)	
P-Repos	P-CNAVs
(o/n)	(o/n)
:	
P-Bills	
(term)	
'	-

Public Backstops

Private Backstops

59

At least \$10bn in cash AuM (see Pozsar, 2011 and 2012).

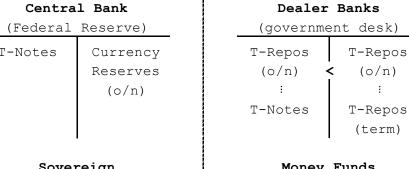
Cash portfolio managers

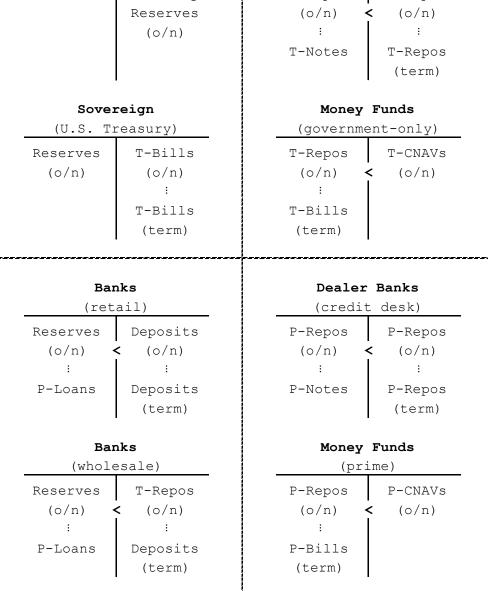
Mandate: "Do not lose".

Restricted to invest mostly in money market instruments.

- [1] FX reserve managers' liquidity tranches.
- [2] Global corporate cash
- [3] Institutional investors $^{\mathcal{F}}_{\omega}$ pooled cash balances.

Central Bank	
(Federal	Reserve)
T-Notes	Currency Reserves
	(o/n)
	•





Money Funds (prime)		
P-Repos (o/n) : P-Bills (term)	P-CNAVs (o/n)	

(reserve managers) "Cash" (o/n): Equity "Cash"

(term)

(permanent)

Cash PM

Cash PM				
(corporations)				
"Cash"				
(o/n)	:			
:				
"Cash"	Equity			
(term)	(permanent)			

Cash PM				
(asset managers)				
"Cash" (o/n) :	i			
"Cash" (term)	Equity (temporary)			

Source: Pozsar (2014)

Public Backstops

Private Backstops

At least \$10bn in cash AuM (see Pozsar, 2011 and 2012).

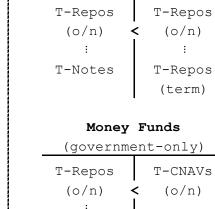
Cash portfolio managers

Mandate: "Do not lose".

Restricted to invest mostly in money market instruments.

- [1] FX reserve managers' liquidity tranches.
- [2] Global corporate cash balances (on and offshore).
- [3] Institutional investors $^{?}_{0}$ pooled cash balances.
- [4] Seclenders' cash collateral reinvestment accounts.

Central Bank				
(Federal	Reserve)			
T-Notes	Currency Reserves			
	(o/n)			
Sovereign				

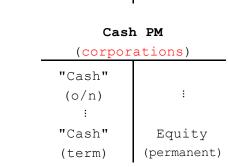


T-Bills

(term)

Dealer Banks

(government desk)



Cash PM

(reserve managers)

Equity

(permanent)

"Cash"

(o/n)

÷

"Cash"

(term)

	term)
T-	-Bills
(o/n)	(o/n) :

(U.S. Treasury)

Reserves

T-Bills

Banks			
(retail)			
Reserves (o/n)	Deposits (o/n)		
÷	:		
P-Loans	Deposits		
	(term)		

Banks				
(whole	esale)			
Reserves	T-Repos			
(o/n) •	< (o/n)			
:	:			
P-Loans	Deposits			
	(term)			

Dealer Banks			
(credit desk)			
P-Repos (o/n)	P-Repos (o/n)		
i i	:		
P-Notes	P-Repos (term)		

	Money Funds (prime)		
(Repos (o/n) : -Bills term)	<	P-CNAVs
P-			(o/n)

Cash PM				
(asset managers)				
"Cash"				
(o/n)	:			
:				
"Cash"	Equity			
(term)	(temporary)			

Cash PM (seclenders)			
"Cash"	Cash		
(o/n)	(collateral)		
÷			
"Cash"			
(term)			

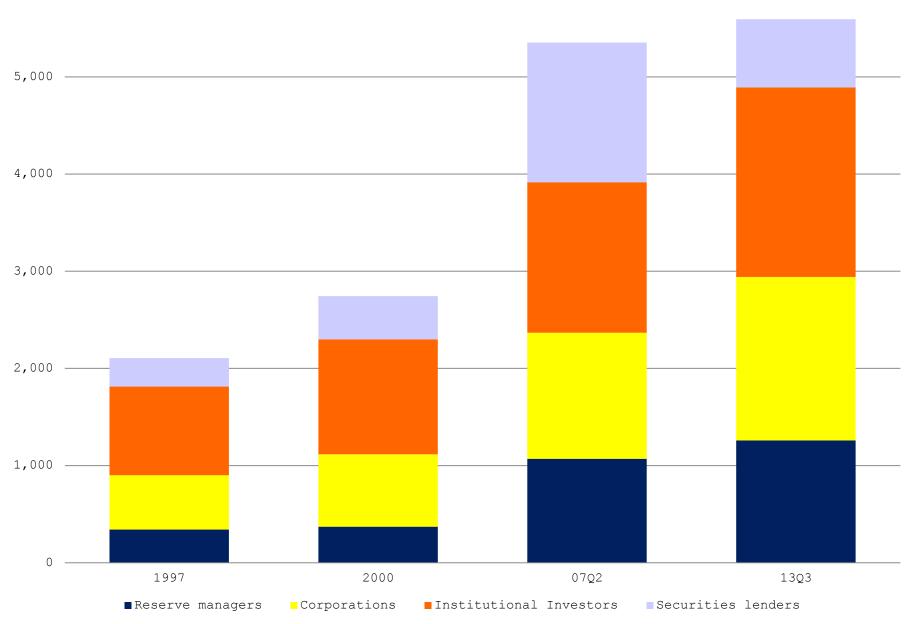
Source: Pozsar (2014)

Public Backstops

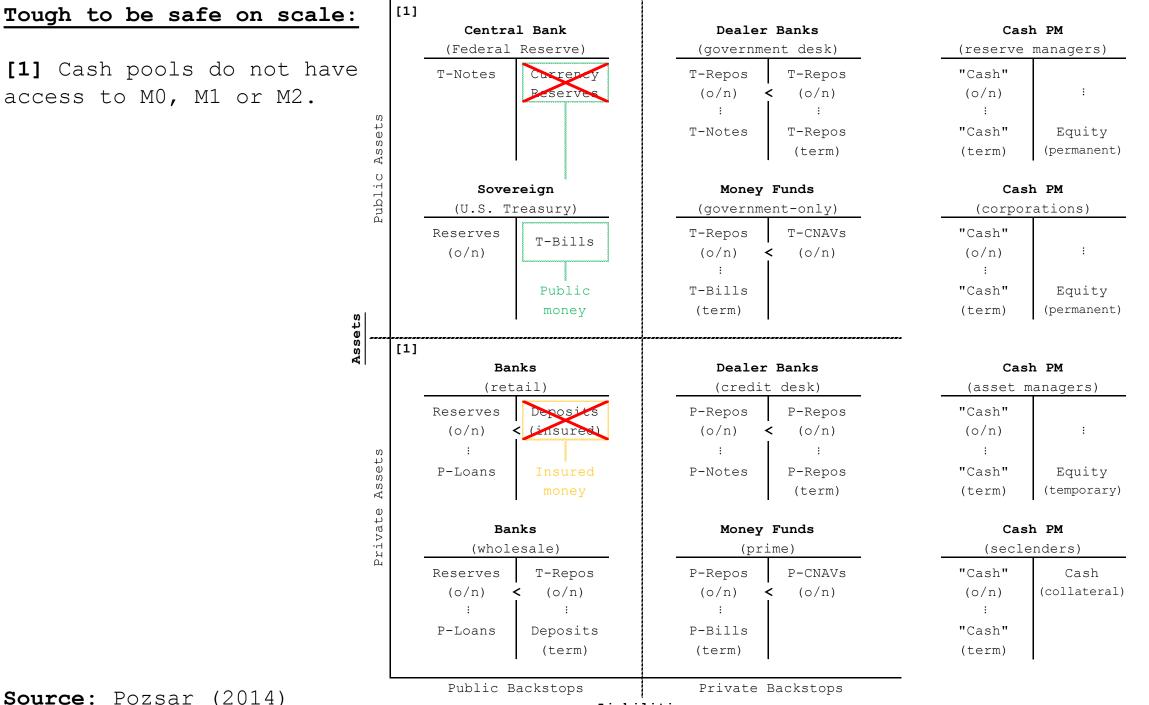
Private Backstops

6**,**000 —

\$ billions



Source: Federal Reserve Z.1, BIS, ICI and author's calculations



Liabilities

[1] Tough to be safe on scale: Central Bank Dealer Banks Cash PM (Federal Reserve) (government desk) (reserve managers) [1] Cash pools do not have Currer T-Repos T-Notes T-Repos "Cash" (o/n) Reserve (o/n)(o/n)access to MO, M1 or M2... ÷ "Cash" Equity T-Notes T-Repos \Rightarrow ... for cash pools, money (permanent) (term) (term) begins where M2 ends. Public Sovereign Money Funds Cash PM (U.S. Treasury) (government-only) (corporations) T-CNAVs "Cash" T-Repos Reserves T-Bills (o/n) (o/n) (o/n) (o/n) < Public T-Bills "Cash" Equity money (term) (term) (permanent) Assets [1] Banks Dealer Banks Cash PM (credit desk) (retail) (asset managers) Reserves Deposi P-Repos P-Repos "Cash" (o/n) < (insured) (o/n) (o/n) (o/n) Assets P-Repos "Cash" Equity P-Loans P-Notes (term) (term) (temporary) Private Money Funds Cash PM Banks (wholesale) (seclenders) (prime) P-CNAVs "Cash" Reserves T-Repos P-Repos Cash (o/n) (o/n) (o/n)(collateral) (o/n)(o/n) : : Deposits P-Bills "Cash" P-Loans (term) (term) (term)

Public Backstops Private Backstops

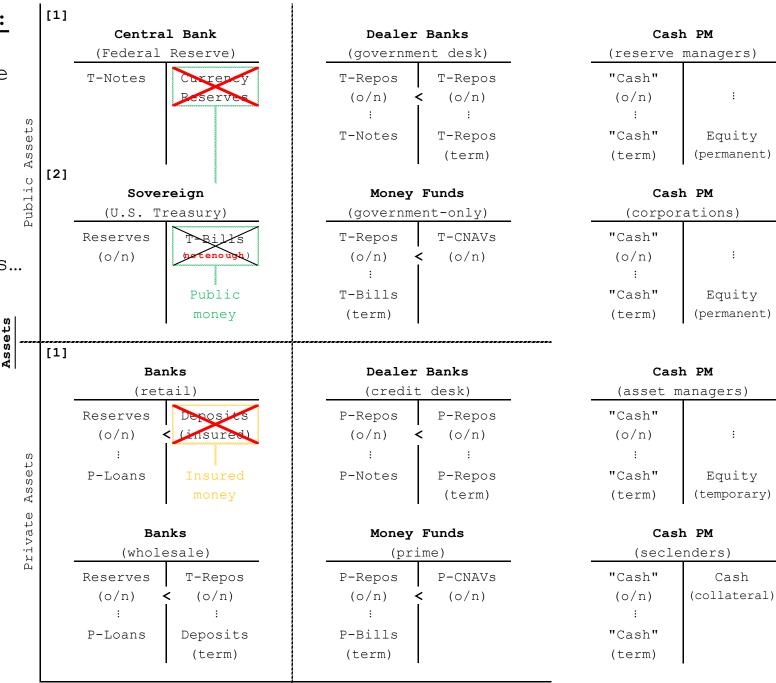
Source: Pozsar (2014)

Tough to be safe on scale: [1] Cash pools do not have

access to M0, M1 or M2.

 \Rightarrow For cash pools, money begins where M2 ends.

[2] Cash pools cannot get enough U.S. Treasury bills...

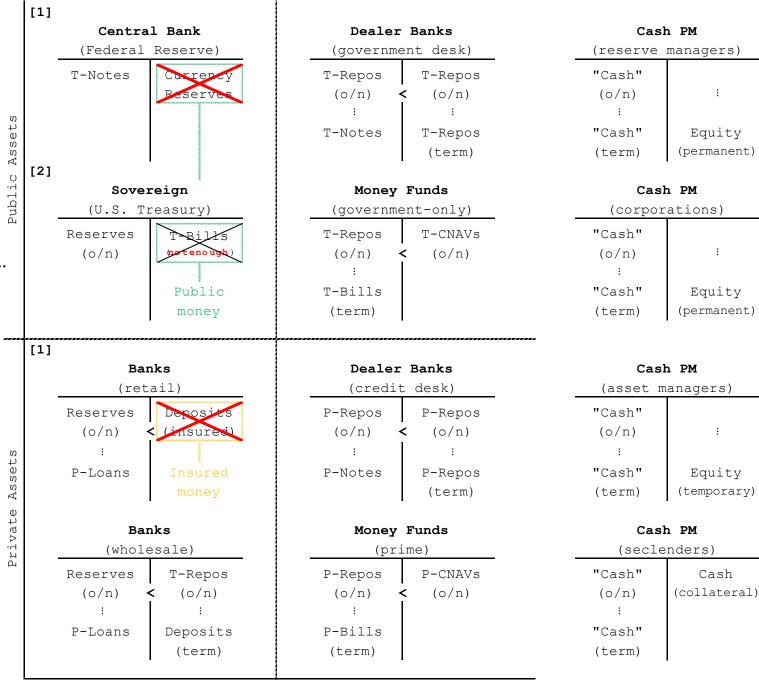


Source: Pozsar (2014)

Public Backstops Private Backstops

Tough to be safe on scale: [1] Cash pools do not have access to M0, M1 or M2.

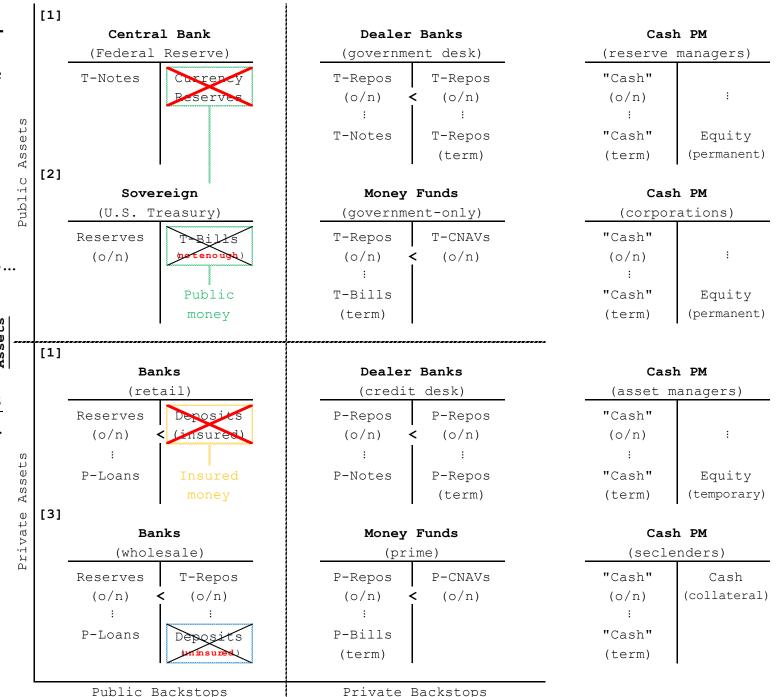
- ⇒ For cash pools, money begins where M2 ends.
- [2] Cash pools cannot get enough U.S. Treasury bills...
- \Rightarrow ...inelastic supply of public money claims.



Source: Pozsar (2014)

Public Backstops Private Backstops

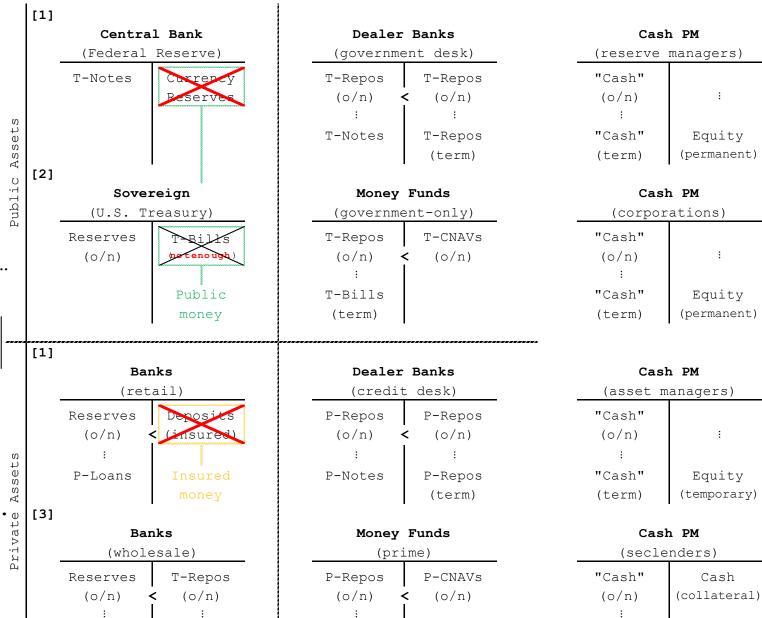
- [1] Cash pools do not have access to M0, M1 or M2.
- \Rightarrow For cash pools, money begins where M2 ends.
- [2] Cash pools cannot get enough U.S. Treasury bills...
- \Rightarrow ...inelastic supply of public money claims.
- [3] Cash pools have <u>limits</u>
 on un-secured credit risk...



Source: Pozsar (2014)

Tichilit

- [1] Cash pools do not have access to M0, M1 or M2.
- \Rightarrow For cash pools, money begins where M2 ends.
- [2] Cash pools cannot get enough U.S. Treasury bills...
- \Rightarrow ...inelastic supply of public money claims.
- [3] Cash pools have <u>limits</u> on un-secured credit risk...
- \Rightarrow ...inelastic demand for un-insured bank deposits.



P-Bills

(term)

Source: Pozsar (2014)

Public Backstops Private Backstops

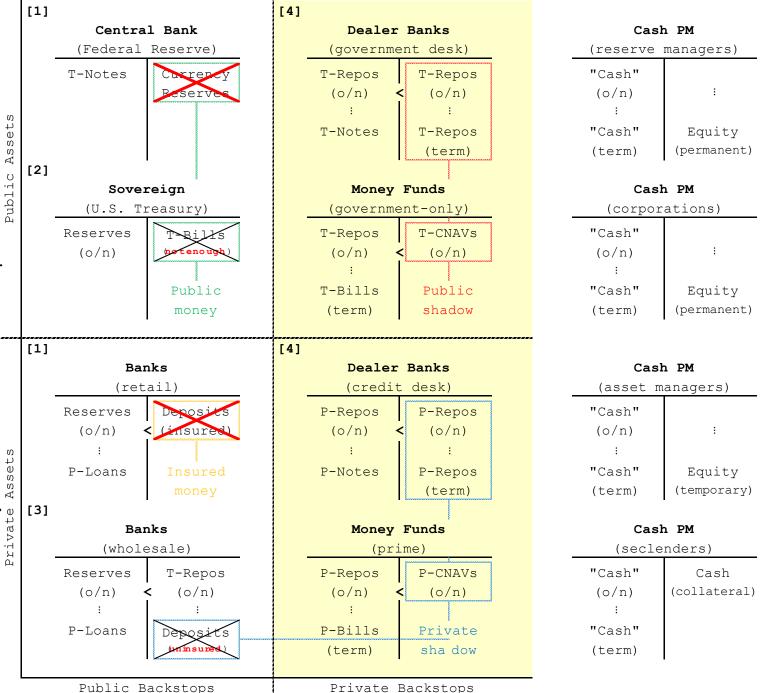
Liabilities

P-Loans

"Cash"

(term)

- [1] Cash pools do not have access to M0, M1 or M2.
- \Rightarrow For cash pools, money begins where M2 ends.
- [2] Cash pools cannot get enough U.S. Treasury bills...
- \Rightarrow ...inelastic supply of public money claims.
- [3] Cash pools have <u>limits</u> on un-secured credit risk...
- ⇒ …inelastic demand for un-insured bank deposits.
- [4] Cash pools opt for second best alternatives...



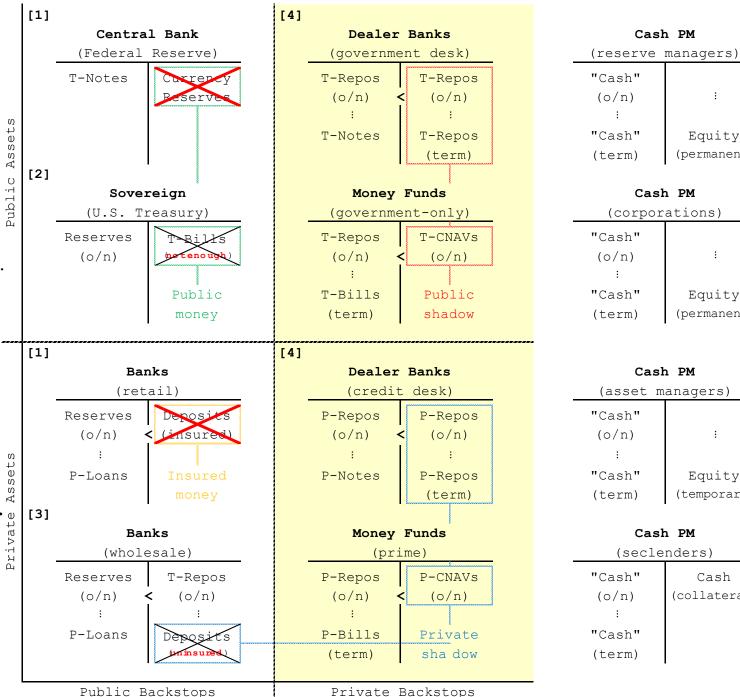
69

Source: Pozsar (2014)

Liabilities

- [1] Cash pools do not have access to M0, M1 or M2.
- \Rightarrow For cash pools, money begins where M2 ends.
- [2] Cash pools cannot get enough U.S. Treasury bills...
- \Rightarrow ...inelastic supply of public money claims.
- [3] Cash pools have limits on un-secured credit risk...
- ⇒ ...inelastic demand for un-insured bank deposits.
- [4] Cash pools opt for second best alternatives ...
- \Rightarrow ...the elastic middle of shadow money claims.

Source: Pozsar (2014)



Liabilities

70

:

Equity

(permanent)

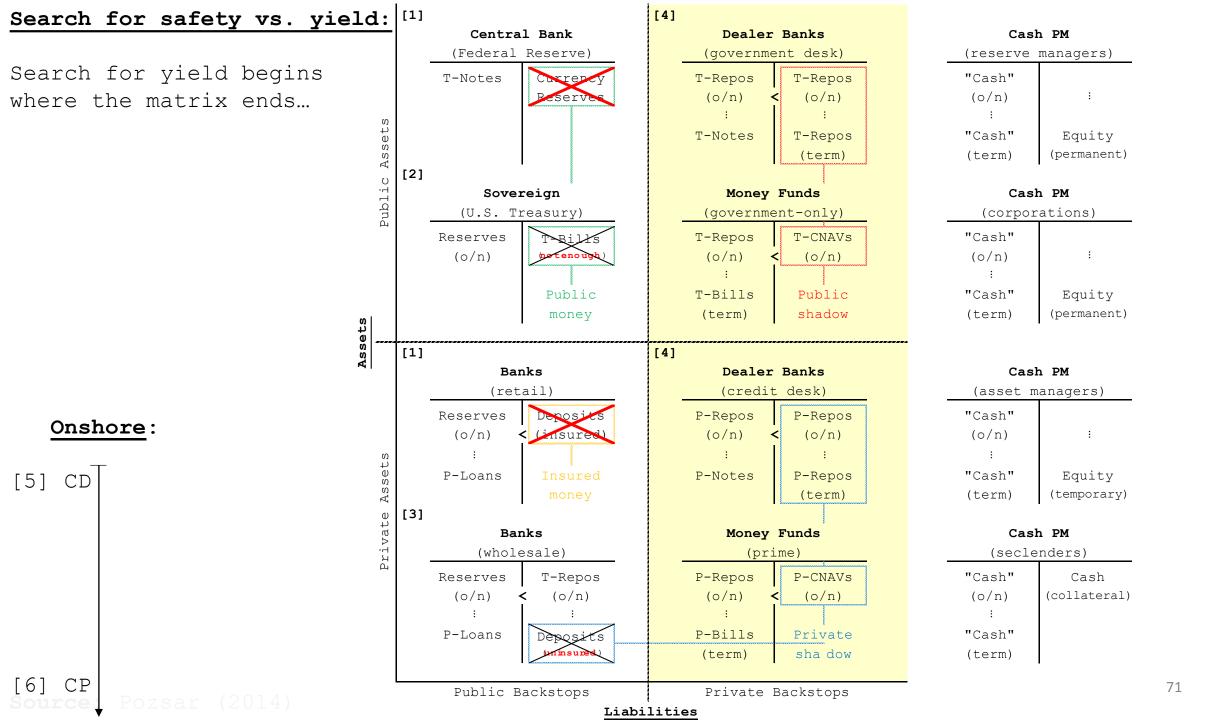
Equity (permanent)

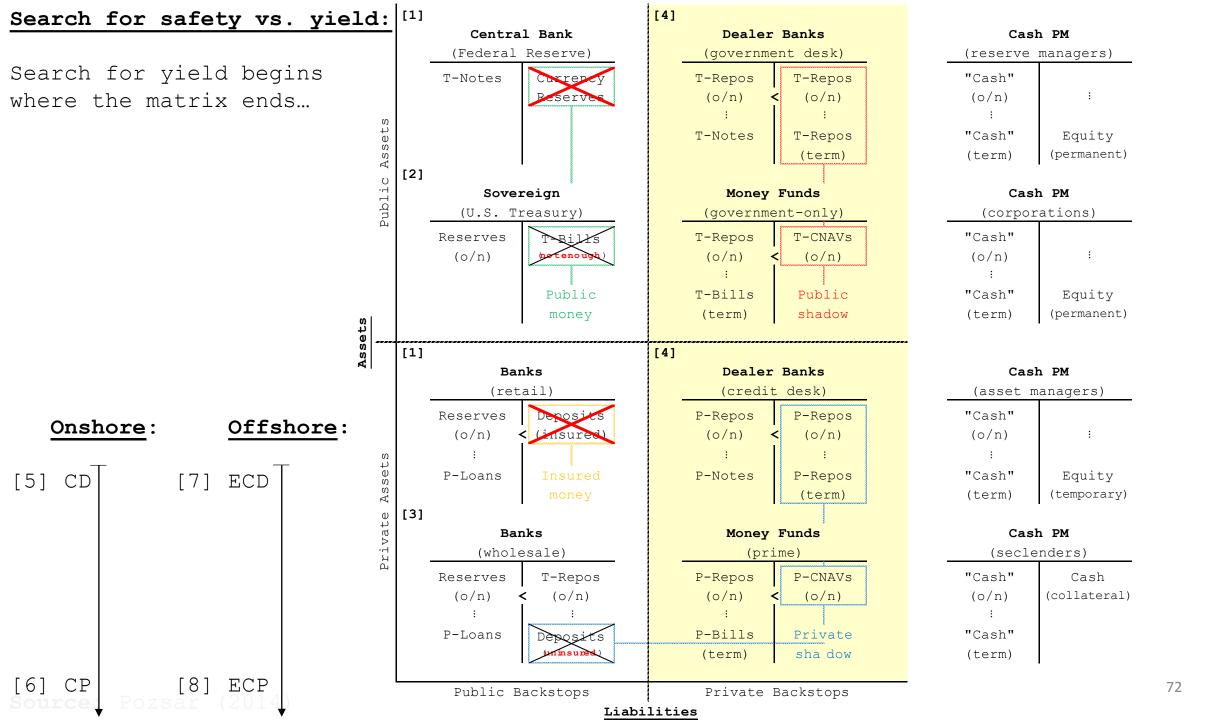
Equity

(temporary)

Cash

(collateral)



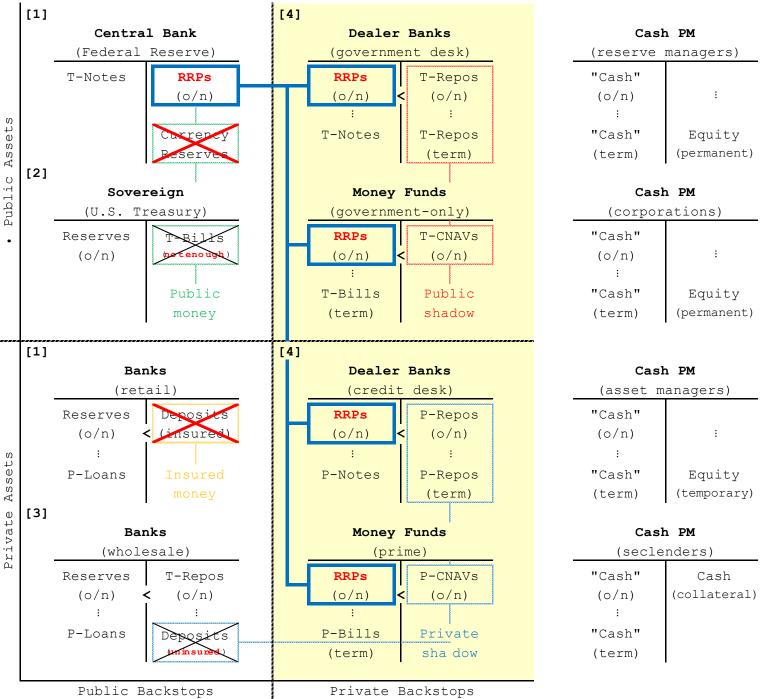


RRPs and cash pools:

Unlike individuals, banks and now shadow banks, cash pools still do **not** have a direct access to the Fed's liabilities (the ultimate form of money, and the safe assets around).

That is, corporations and asset managers are still constrained to holding mostly shadow money claims.

But the quality of shadow money claims is now much better because they are now backed (at least in part) by something better (RRPs) than ever before.



Source: Pozsar (2014)

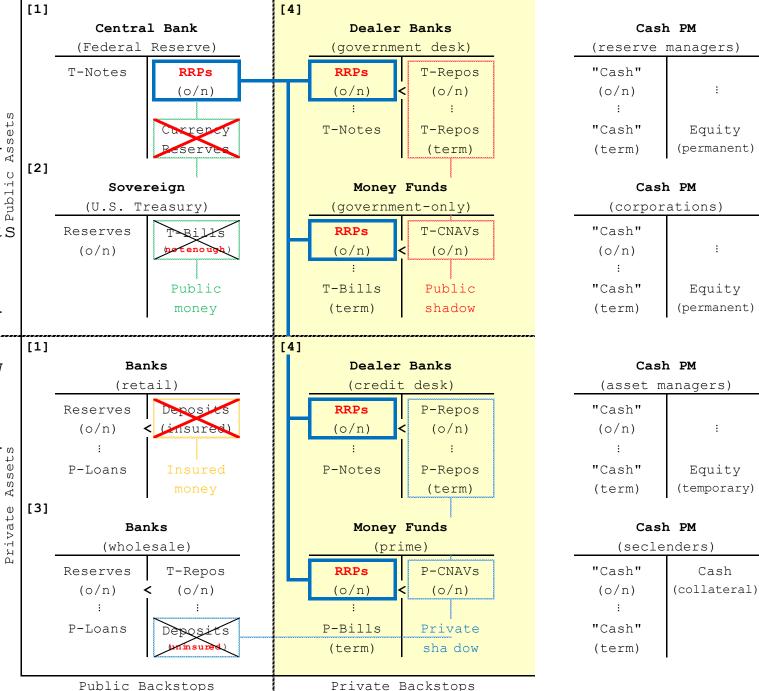
RRPs and cash pools:

Consider RRPs potential as a macro-prudential tool.

Required minimum RRP balan- $\frac{\sigma}{2}$ ces for shadow banks could become equivalent to what minimum reserve requirements are for traditional banks.

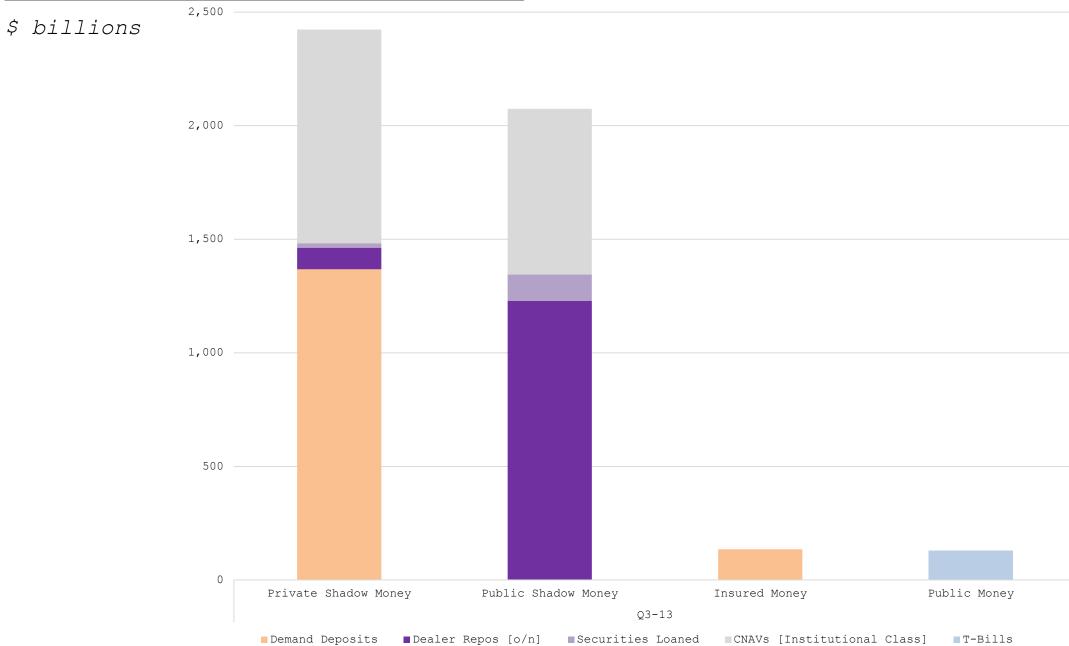
The implementation of minimum RRP balances would in crease the safety of shadow money claims further still.

This could be an evolution- $\frac{s}{2}$ ary step toward Mehrling's $\frac{s}{2}$ "dealer of last resort" in Bagehot 21^{st} century sense.



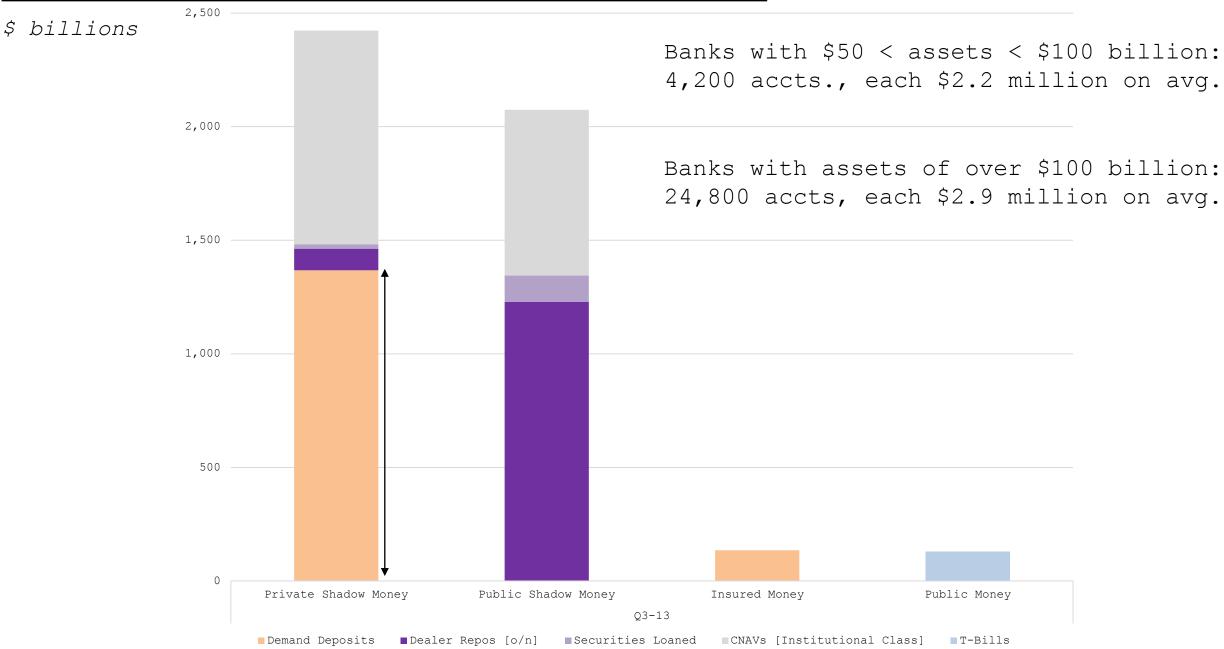
Source: Pozsar (2014)

Cash pools' access to overnight money:



Source: Haver, Federal Reserve Board, Federal Reserve Bank of New York, FDIC

Not all un-insured demand deposits belong to cash pools:

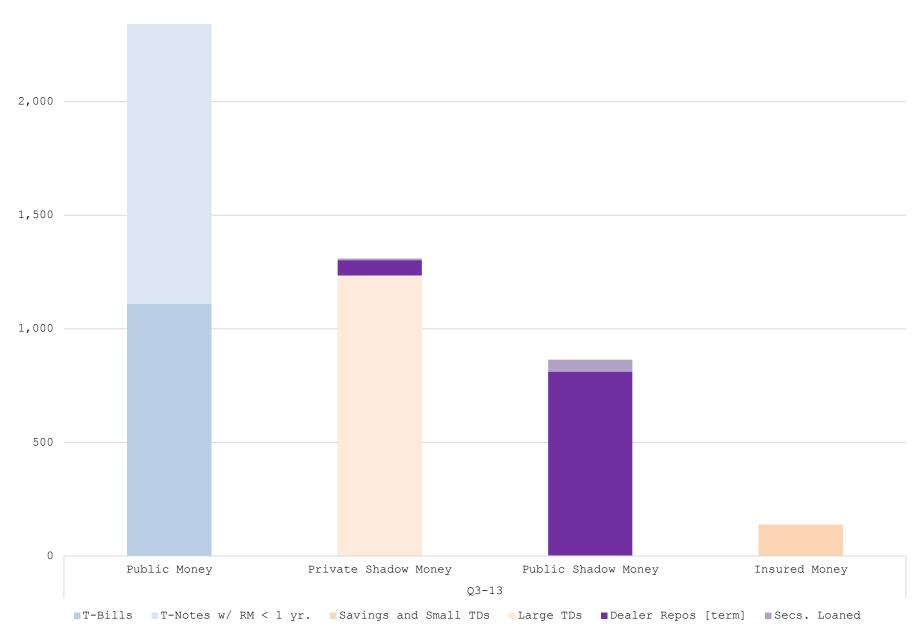


Source: Haver, Federal Reserve Board, Federal Reserve Bank of New York, FDIC

Cash pools' access to term money:

2,500

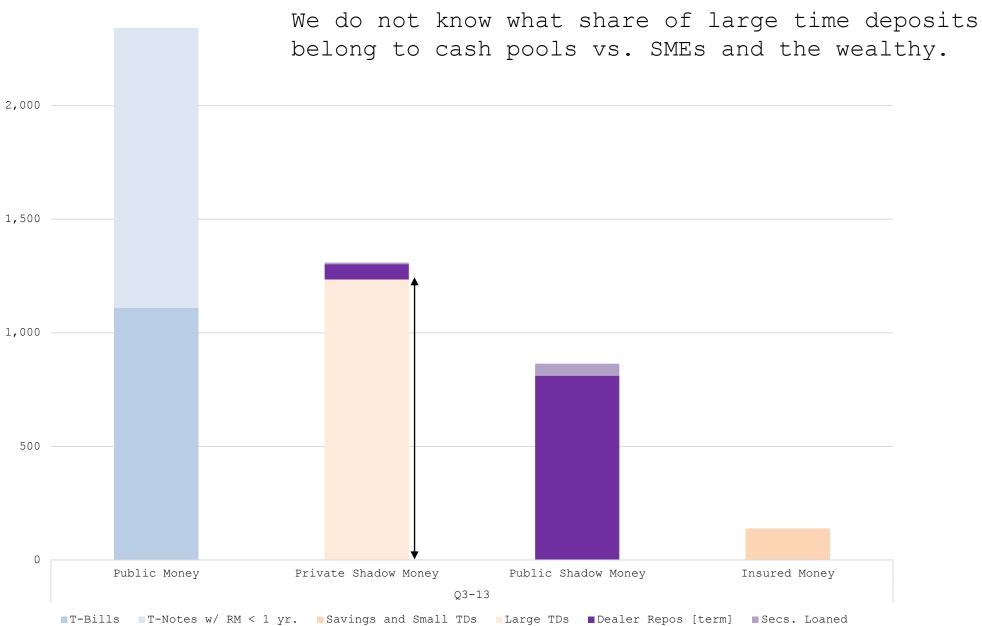
\$ billions



Source: Haver, Federal Reserve Board, Federal Reserve Bank of New York

Not all large time deposits belong to cash pools:





Source: Haver, Federal Reserve Board, Federal Reserve Bank of New York

- 1. The Hierarchy of Money.
- 2. The Hierarchy of Access.
- 3. The Hierarchy of Uses.
- 4. The Dealer Eco-System.
- 5. The Macro Perspective.
- 6. Policy Implications.

Money creation: Central Bank Dealer Banks Cash PM (Federal Reserve) (government desk) (reserve managers) Retail banks create money T-Repos T-Repos "Cash" T-Notes Currency (o/n) : and credit ex nihilo (see Reserves (o/n)(o/n)÷ (o/n)for example Turner, 2013) Assets Equity T-Notes T-Repos "Cash" (permanent) (term) (term) Clear links to the real Public Sovereign Money Funds Cash PM economy through loans. (U.S. Treasury) (government-only) (corporations) "Cash" Reserves T-Bills T-Repos T-CNAVs (o/n) (o/n)(o/n) (o/n) (o/n) < T-Bills T-Bills "Cash" Equity (term) (term) (term) (permanent) Assets Banks Dealer Banks Cash PM (credit desk) (retail) (asset managers) Reserves Deposits P-Repos P-Repos "Cash" (o/n) (o/n) (o/n) (o/n) (o/n) : Assets Deposits P-Repos "Cash" Equity P-Loans P-Notes (local) (term) (term) (term) (temporary) Private Money Funds Cash PM Banks (wholesale) (seclenders) (prime) Deposit P-CNAVs "Cash" Reserves P-Repos Cash (o/n)(o/n) (o/n) (o/n) (o/n)(collateral) : P-Loans Deposits P-Bills "Cash" (local) (term) (term) (term)

Source: Pozsar (2014)

Public Backstops Private Backstops

Money dealing: Central Bank Dealer Banks Cash PM (Federal Reserve) (government desk) (reserve managers) Money dealing is borrowing T-Repos T-Notes T-Repos "Cash" Currency (o/n) and lending of short-term Reserves (o/n)(o/n)(o/n)money in the unsecured and $\frac{9}{4}$ "Cash" Equity T-Notes T-Repos secured and local and globa (permanent) (term) (term) (Eurodollar) money markets. Sovereign Money Funds Cash PM (U.S. Treasury) (government-only) (corporations) There are at least six "Cash" T-Bills T-Repos T-CNAVs Reserves (o/n) (o/n)(o/n) (o/n) (o/n) < forms of money dealing... T-Bills T-Bills "Cash" Equity (term) (term) (term) (permanent) Banks Dealer Banks Cash PM (retail) (credit desk) (asset managers) Reserves Deposits P-Repos P-Repos "Cash" (o/n) (o/n)(o/n) (o/n) (o/n) Assets Deposits P-Repos "Cash" Equity P-Loans P-Notes (local) (term) (term) (term) (temporary) Private Money Funds Banks Cash PM (wholesale) (prime) (seclenders) P-CNAVs "Cash" Reserves Deposit P-Repos Cash (o/n)(o/n) (o/n)(collateral) (o/n)(o/n) : P-Loans Deposits P-Bills "Cash" (local) (term) (term) (term)

Source: Pozsar (2014)

Public Backstops Private Backstops

Money dealing:			l Bank Reserve)	Dealer (governme			h PM managers)
[1] Interbank money dealing in the federal funds market.		es	Currency Reserves (o/n)	T-Repos (o/n) : T-Notes	T-Repos (o/n) : T-Repos (term)	"Cash" (o/n) : "Cash" (term)	Equity (permanent)
i.		Sover	reign	Money	Funds	Cas	h PM
Public	(U.		reasury)	(governme			rations)
Ω	Reserv	ves	T-Bills	T-Repos	T-CNAVs	"Cash"	
	(o/n		(o/n)	(o/n) •	(o/n)	(o/n)	:
			:	i		:	
			T-Bills	T-Bills		"Cash"	Equity
ਔ			(term)	(term)		(term)	(permanent)
Ass as a section of the section of t	1					-	
ब्द!		Ban (reta		Dealer (credit			h PM nanagers)
ब्द ।	Pasary	(reta	ail)	(credit	desk)	(asset m	h PM nanagers)
শ্ব	Reserv	(reta	ail) FF	(credit P-Repos	P-Repos	(asset m "Cash"	nanagers)
	(o/n	(reta	ail) FF	(credit	desk)	(asset m	
	(o/n	(reta	ail) FF	P-Repos (o/n)	P-Repos (o/n) :	(asset m "Cash"	managers) :
ه 0 1 0	(o/n : P-Loa	(reta	ail) FF (o/n) :	P-Repos (o/n)	P-Repos	(asset m "Cash" (o/n) :	nanagers)
Ass Sects	(o/n : P-Loa (loca	(reta	ail) FF (o/n) : Deposits	P-Repos (o/n)	P-Repos (o/n) : P-Repos	(asset n "Cash" (o/n) : "Cash"	nanagers) : Equity
Ass Sects	(o/n : P-Loa (loca	(retained property of the content of	ail) FF (o/n) : Deposits (term)	P-Repos (o/n) : P-Notes Money	P-Repos (o/n) : P-Repos (term)	(asset m "Cash" (o/n) : "Cash" (term)	Equity (temporary)
Ass Sects	(o/n : P-Loa (loca	(retained property) ves (retained property) ns (retained property) Ban	<pre>ail) FF (o/n) : Deposits (term)</pre>	P-Repos (o/n) : P-Notes	P-Repos (o/n) : P-Repos (term)	(asset m "Cash" (o/n) : "Cash" (term)	Equity (temporary)
0 t w	(o/n : P-Loa (loca ((retaves) <	TF (o/n) : Deposits (term) hks esale) FF	(credit P-Repos (o/n) : P-Notes Money (pr:	P-Repos (o/n) : P-Repos (term) Funds ime) P-CNAVs	(asset m "Cash" (o/n) : "Cash" (term) Cas (secle	Equity (temporary) h PM enders) Cash
Ass Sects	(o/n : P-Loa (loca (loca (so/n)	(retaves) <	ail) FF (o/n) : Deposits (term) hks esale) FF (o/n)	P-Repos (o/n) : P-Notes Money (pr: P-Repos (o/n)	P-Repos (o/n) : P-Repos (term) Funds ime)	(asset m "Cash" (o/n) : "Cash" (term) Cas (secle	Equity (temporary) h PM enders)
Ass Sects	(o/n : P-Loa (loca (loca (so/n) : (o/n) : :	(retaves ves v	ail) FF (o/n) : Deposits (term) hks esale) FF (o/n) :	(credit P-Repos (o/n) : P-Notes Money (pr: P-Repos (o/n) :	P-Repos (o/n) : P-Repos (term) Funds ime) P-CNAVs	(asset m "Cash" (o/n) : "Cash" (term) Cas (secle "Cash" (o/n) :	Equity (temporary) h PM enders) Cash
Ass Sects	(o/n : P-Loa (loca (loca (solution) (p-Loa)	(retaves) < ns 1) Ban whole	ail) FF (o/n) : Deposits (term) nks esale) FF (o/n) : Deposits	P-Repos (o/n) : P-Notes Money (pr: P-Repos (o/n) : P-Bills	P-Repos (o/n) : P-Repos (term) Funds ime) P-CNAVs	(asset m "Cash" (o/n) : "Cash" (term) Cas (secle "Cash" (o/n) : "Cash"	Equity (temporary) h PM enders) Cash
Ass Sects	(o/n : P-Loa (loca (loca (so/n) : (o/n) : :	(retaves) < ns 1) Ban whole	ail) FF (o/n) : Deposits (term) hks esale) FF (o/n) :	(credit P-Repos (o/n) : P-Notes Money (pr: P-Repos (o/n) :	P-Repos (o/n) : P-Repos (term) Funds ime) P-CNAVs	(asset m "Cash" (o/n) : "Cash" (term) Cas (secle "Cash" (o/n) :	Equity (temporary) h PM enders) Cash

Money dealing: Central Bank Dealer Banks Cash PM (Federal Reserve) (government desk) (reserve managers) [1] Interbank money dealing T-Repos T-Repos T-Notes [2] "Cash" Currency in the federal funds market. Reserves (o/n) (o/n) (o/n)(o/n)"Cash" Equity T-Notes T-Repos [2] Interdealer money dea-(permanent) (term) (term) ling in the GCF repo market Sovereign Money Funds Cash PM Publ (U.S. Treasury) (government-only) (corporations) T-Bills T-CNAVs "Cash" T-Repos Reserves (o/n) (o/n) (o/n) (o/n) (o/n) T-Bills T-Bills "Cash" Equity (term) (term) (term) (permanent) Cash PM Banks Dealer Banks (credit desk) (retail) (asset managers) Reserves FFP-Repos P-Repos "Cash" (o/n) (o/n) (o/n) (o/n) (o/n) Assets Deposits P-Repos "Cash" Equity P-Loans P-Notes (local) (term) (term) (term) (temporary) Private Banks Money Funds Cash PM (wholesale) (seclenders) (prime) FFFFP-CNAVs "Cash" [1] P-Repos Cash (o/n)(o/n)(o/n) (o/n)(collateral) (o/n) ÷ P-Loans Deposits P-Bills "Cash" (local) (term) (term) (term) Public Backstops Private Backstops Source: Pozsar (2014)

Money dealing: Central Bank Dealer Banks Cash PM (Federal Reserve) (government desk) (reserve managers) [1] Interbank money dealing [2] T-Repos T-Repos T-Notes "Cash" Currency (o/n) in the federal funds market. Reserves (o/n) (o/n)(o/n)"Cash" Equity T-Notes T-Repos [2] Interdealer money dea-(permanent) (term) (term) ling in the GCF repo market Sovereign Money Funds Cash PM (U.S. Treasury) (government-only) (corporations) Interlinked money dea-T-Repos T-CNAVs "Cash" T-Bills [3] Reserves (o/n) (o/n)(o/n) (o/n) (o/n) ling in the TRP repo market (cash PM -> MMF -> dealer). T-Bills T-Bills "Cash" Equity (term) (term) (term) (permanent) Banks Dealer Banks Cash PM (retail) (credit desk) (asset managers) Reserves FFP-Repos P-Repos "Cash" (o/n) (o/n) (o/n) (o/n) (o/n) Assets Deposits P-Repos "Cash" Equity P-Loans P-Notes (local) (term) (term) (term) (temporary) Private Money Funds Cash PM Banks (wholesale) (seclenders) (prime) FF[3] P-Repos P-CNAVs "Cash" [1] FFCash (o/n)(o/n)(o/n) (o/n)(collateral) (o/n) ÷ P-Loans Deposits P-Bills "Cash" (local) (term) (term) (term)

Source: Pozsar (2014)

Public Backstops Private Backstops

Liabilities

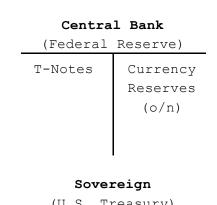
Money dealing:

[1] Interbank money dealing in the federal funds market.

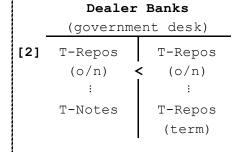
[2] Interdealer money dea- $\frac{\tilde{v}}{2}$ ling in the GCF repo market.

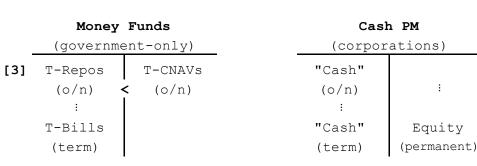
[3] Inter<u>linked</u> money dealing in the TRP repo market (cash PM -> MMF -> dealer).

[4] Interoffice money dealing via the NY branches of foreign banks, funded by selling Yankee CD and CP to prime money funds (see Shin, 2011 and 2013).



Sovererdu		
(U.S. Treasury)		
Reserves	T-Bills	
(o/n)	(o/n)	
	:	
	T-Bills	
	(term)	
	•	





Banks		
(ret	ail)	
Reserves	FF	
(o/n) •	(o/n)	
:	ŧ	
P-Loans	Deposits	
(local)	(term)	

Assets

		-
	Bar	nks
	(whole	esale)
[1]	FF	FF
	(- , ,	< (o/n)
	:	:
[4]	P-Loans	Deposits
	(global)	(term)
		•

Dealer Banks (credit desk)		
P-Repos	P-Repos (o/n) : P-Repos (term)	

		y Funds
[3]	P-Repos (o/n) : P-Bills (term)	P-CNAVs (o/n)

Cash PM			
(asset	(asset managers)		
"Cash"			
(o/n)	:		
:			
"Cash"	Equity		
(term)	(temporary)		

Cash PM

(reserve managers)

Equity

(permanent)

"Cash"

(o/n)

"Cash"

(term)

÷

Cash PM		
(secle	nders)	
"Cash" (o/n)	Cash (collateral)	
: "Cash" (term)		

Source: Pozsar (2014)

Public Backstops

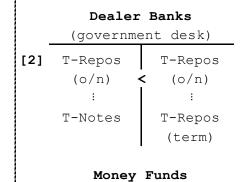
Private Backstops

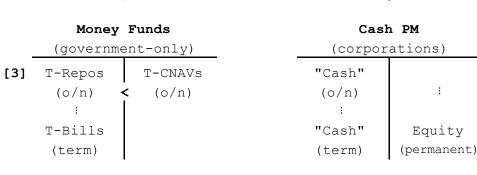
Money dealing:

- [1] Interbank money dealing in the federal funds market.
- [2] Interdealer money dea- $\frac{\circ}{4}$ ling in the GCF repo market.
- [3] Inter<u>linked</u> money dealing in the TRP repo market (cash PM -> MMF -> dealer).
- [4] Interoffice money dea ling via the NY branches of foreign banks, funded by selling Yankee CD and CP to prime money funds (see Shin, 2011 and 2013).
- [5] Crossborder money dealing via the headquarters of foreign banks selling Eurodollar CD and CP to prime money market funds.

Centra	l Bank
(Federal	Reserve)
T-Notes	Currency Reserves (o/n)
Sove	reign
(U.S. Ti	reasury)
-	m n'11

Sovereign		
(U.S. Tr	reasury)	
Reserves	T-Bills	
(o/n)	(o/n)	
	:	
	T-Bills	
	(term)	
	•	





Banks		
(ret	ail)	
Reserves	FF	
(o/n)	< (o/n)	
:	:	
P-Loans	Deposits	
(local)	(term)	

	(10041)	(CCIM)
	Ва	nks
	(whol	esale)
[1]	FF	FF
	(o/n)	< (o/n)
	ŧ	:
[4]	P-Loans	Deposits
	(global)	(term)

Dealer	Dealer Banks				
(credit desk)					
P-Repos	P-Repos				
(o/n)	(o/n)				
:	:				
P-Notes	P-Repos				
	(term)				
	•				

		(term)
	Money	Funds
	(pr	ime)
[3]	P-Repos	P-CNAVs
	(o/n)	< (o/n)
	:	:
[5]	P-Bills	P-CNAVs
	(global)	(o/n)
		•

Cash PM				
(asset	managers)			
"Cash"				
(o/n)	:			
:				
"Cash"	Equity			
(term)	(temporary)			
	-			

Cash PM

(reserve managers)

Equity

(permanent)

"Cash"

(o/n)

"Cash"

(term)

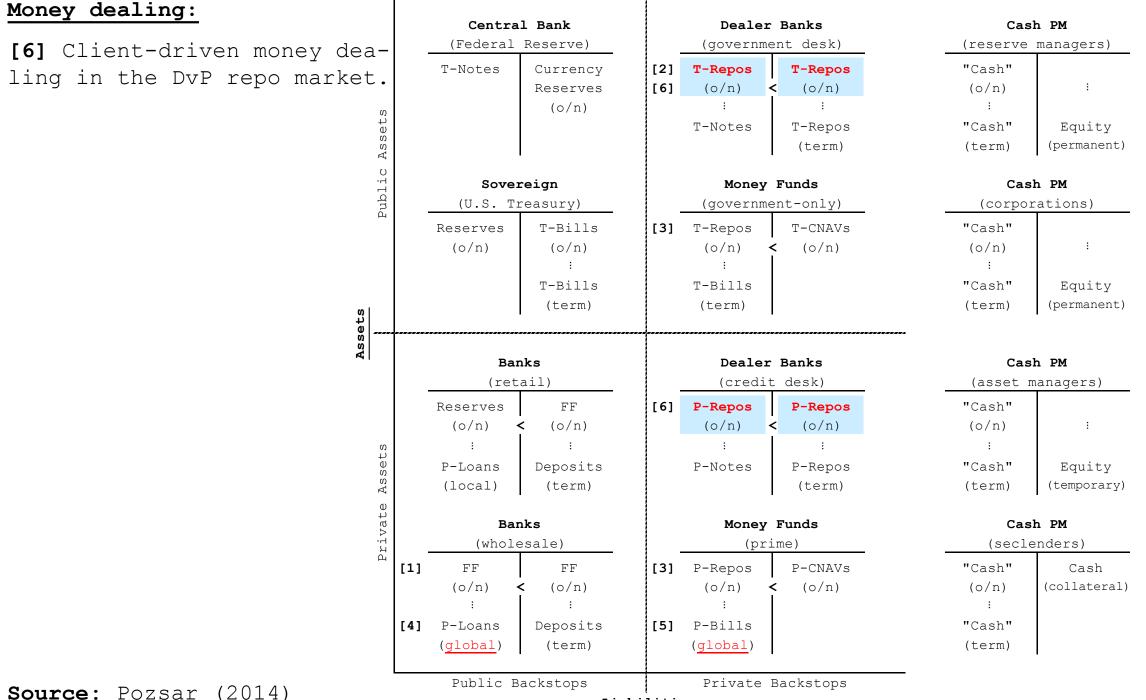
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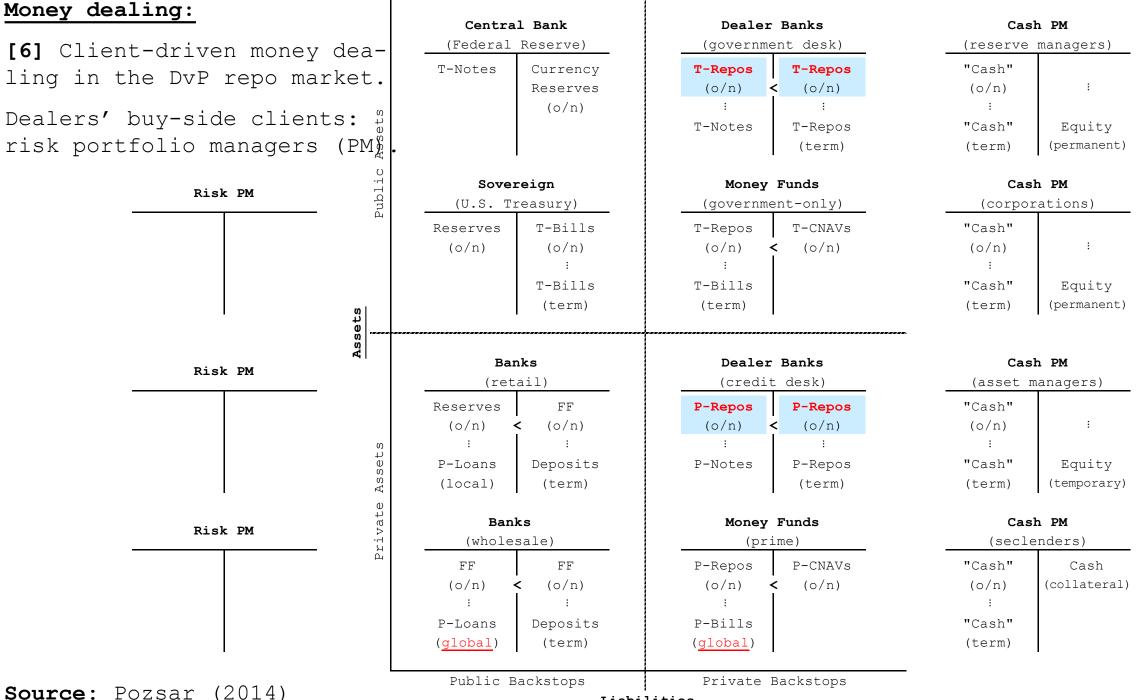
Cash PM					
(seclenders)					
"Cash" (o/n)	Cash (collateral)				
: "Cash" (term)					

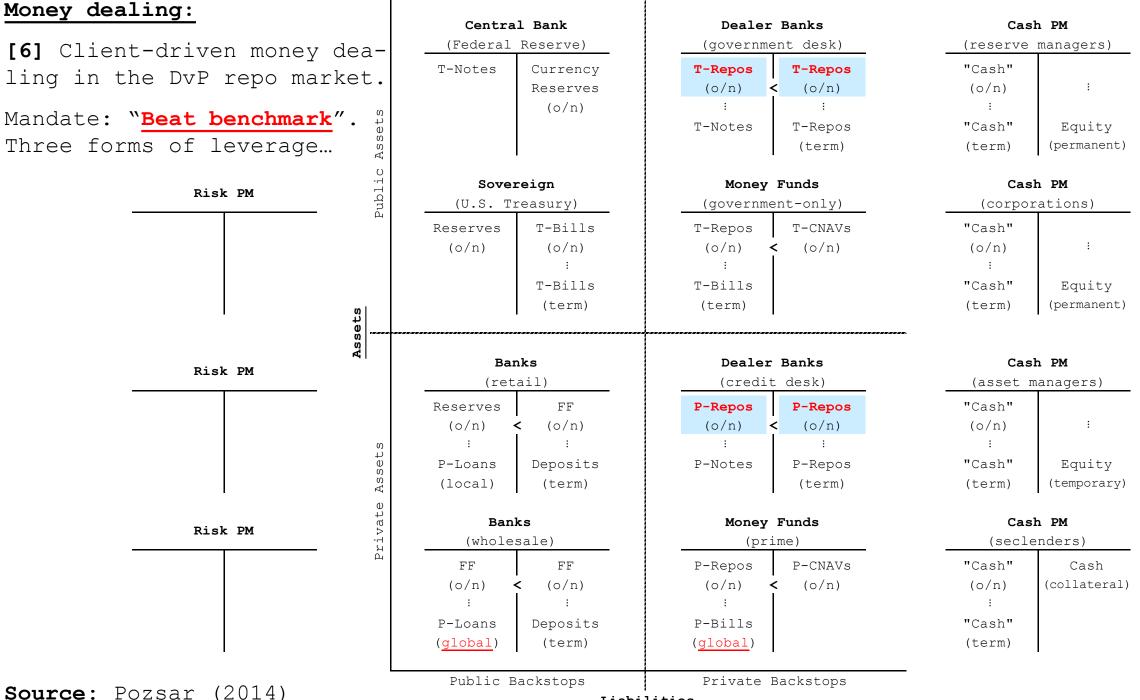
Source: Pozsar (2014)

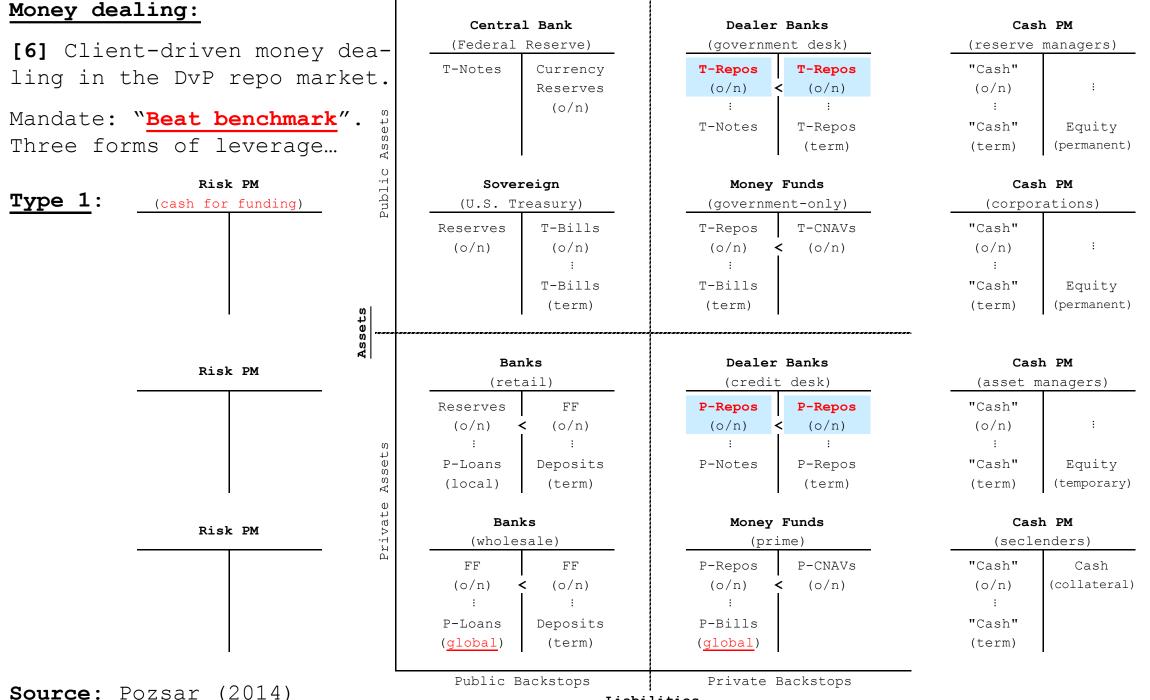
Public Backstops

Private Backstops

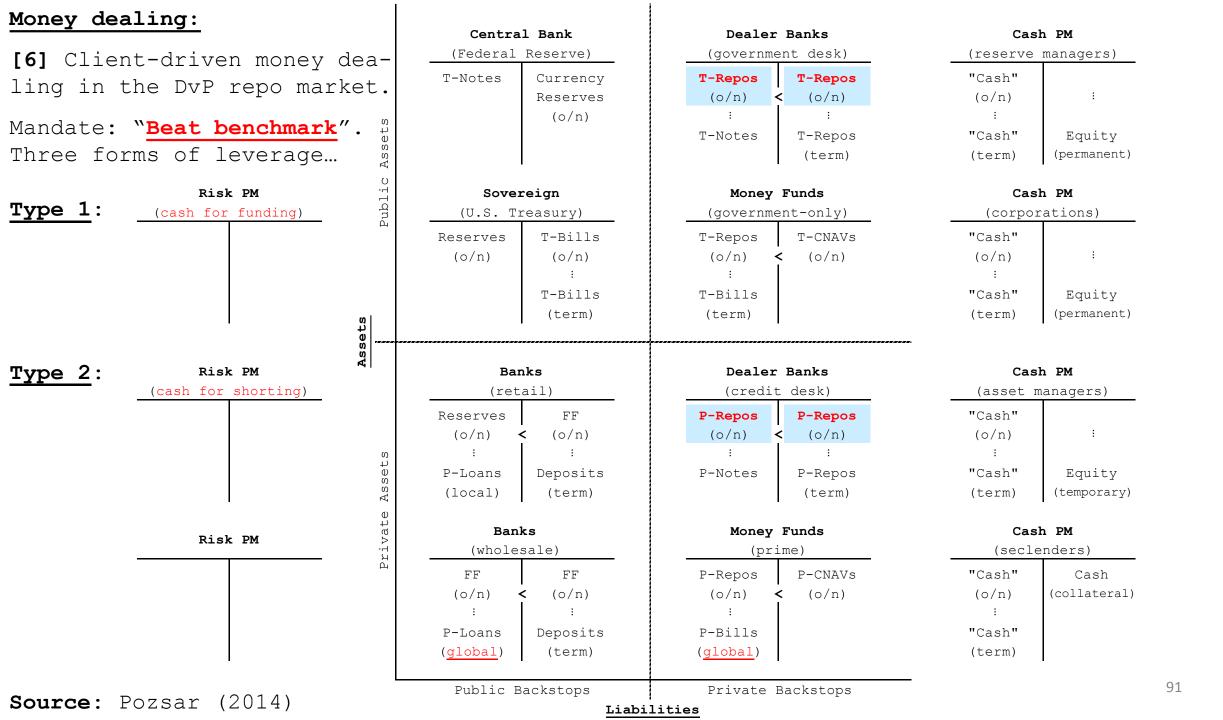


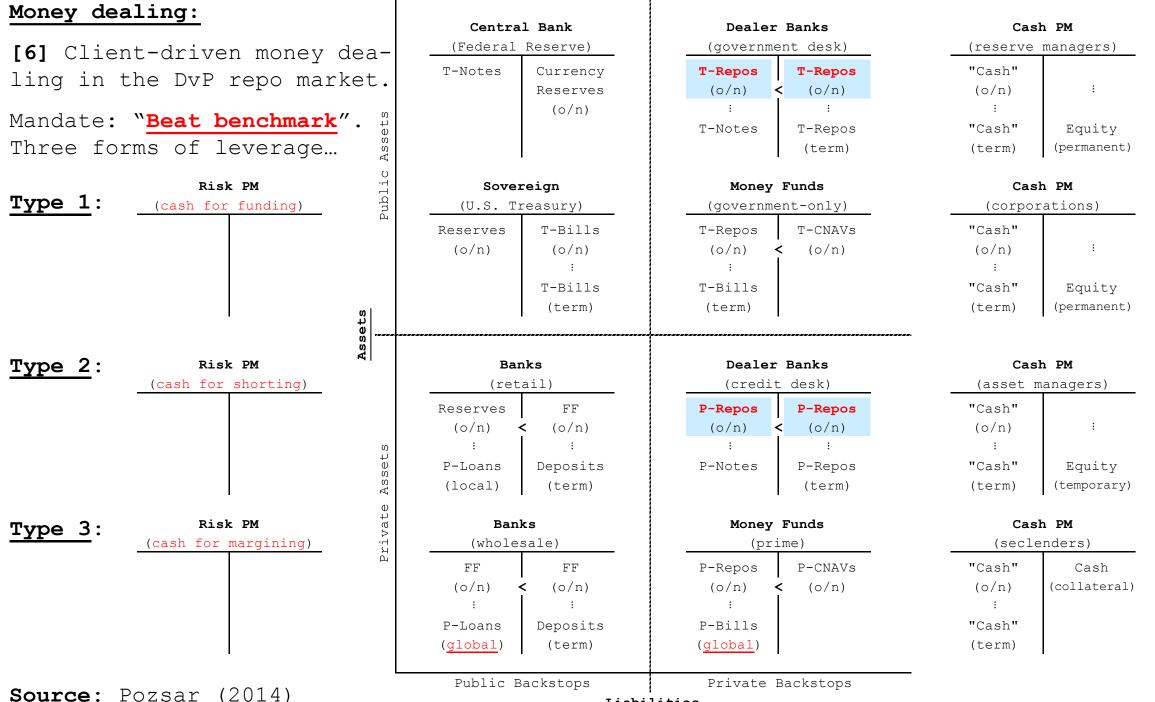




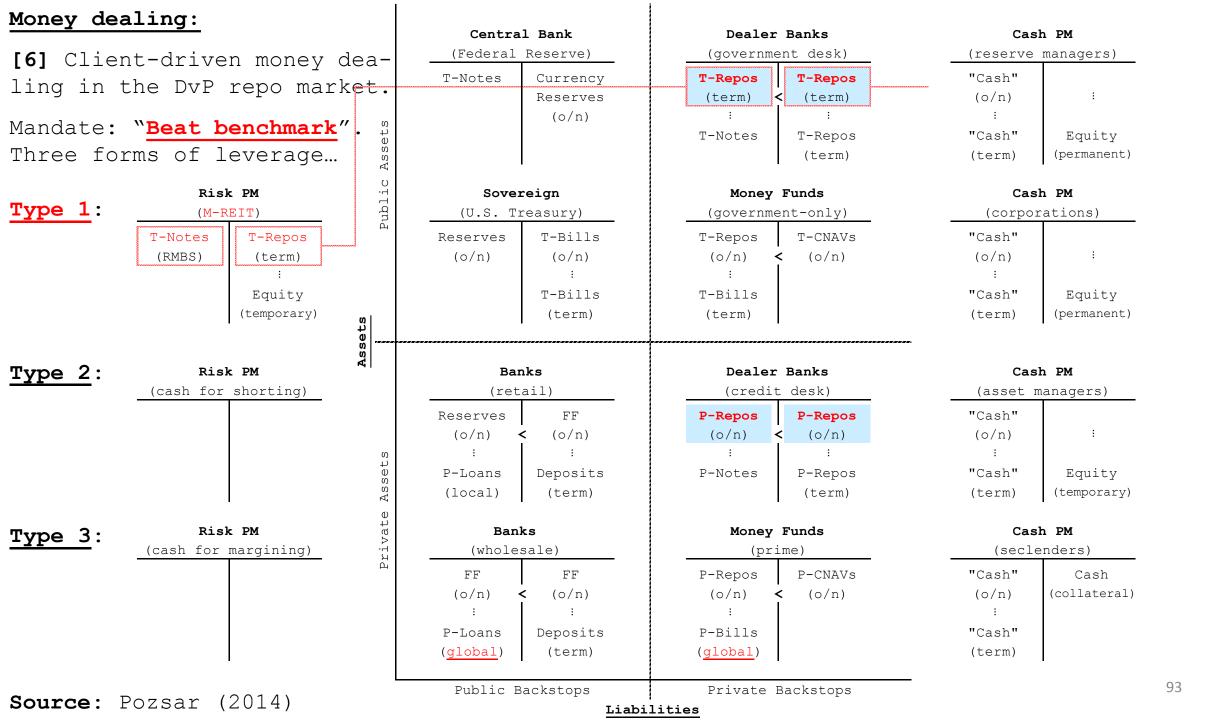


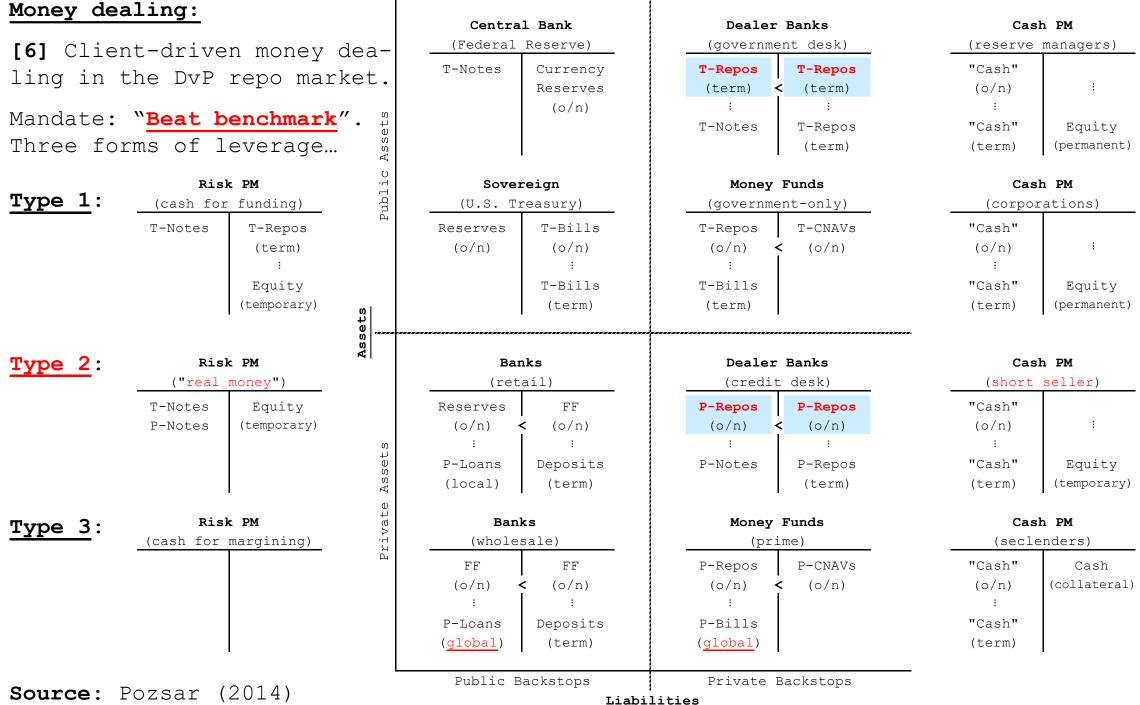
Liabilities

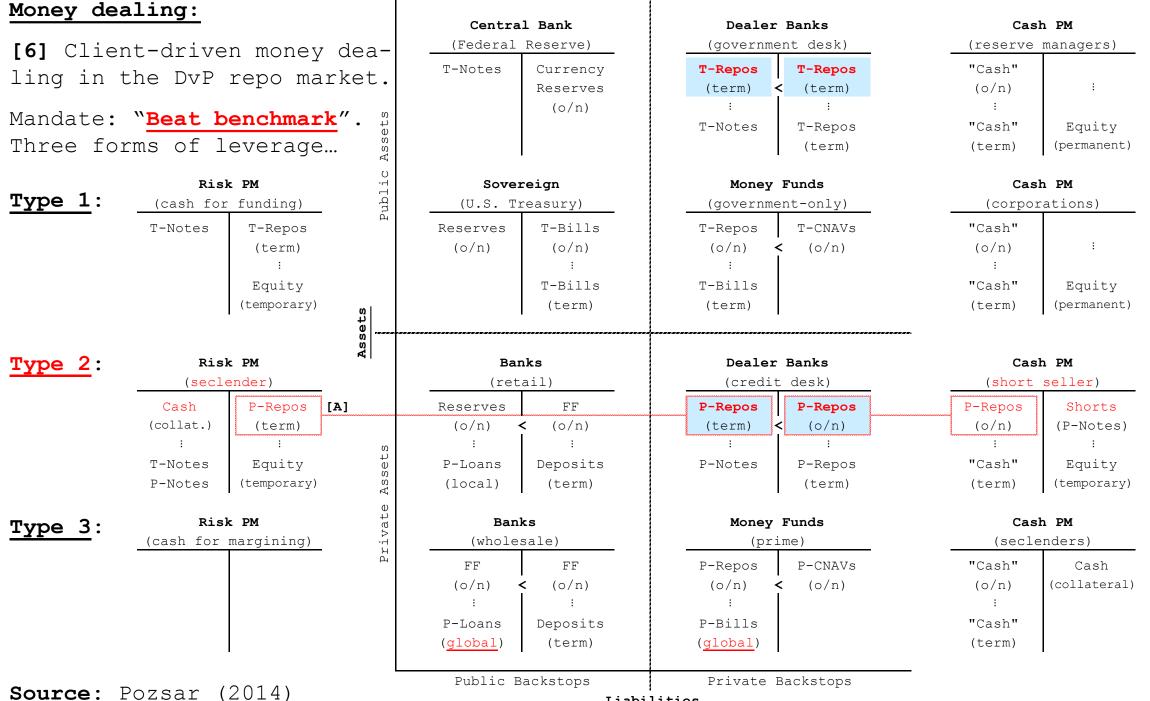


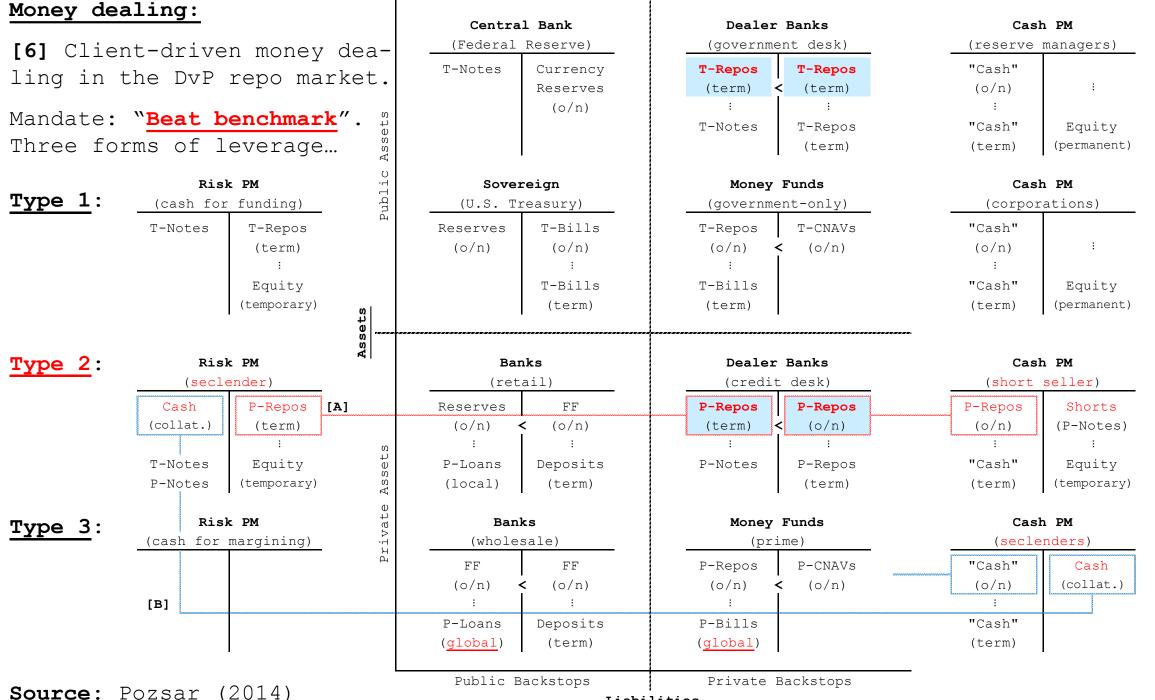


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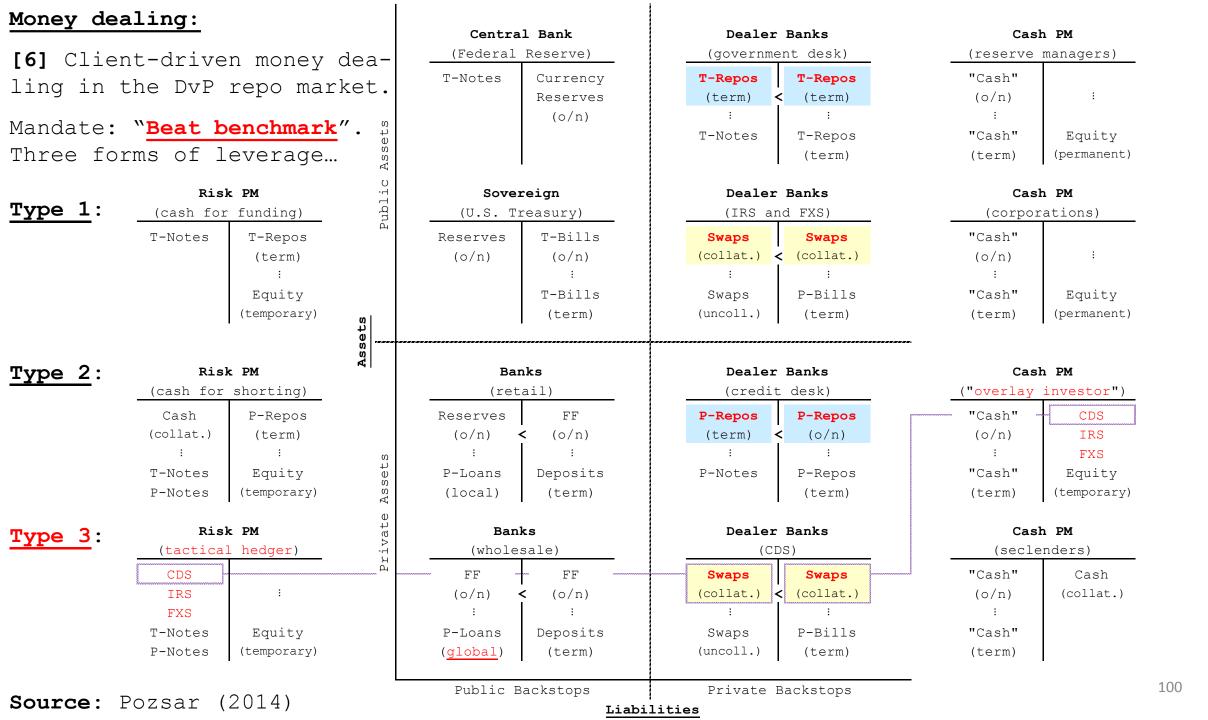
Liabilities

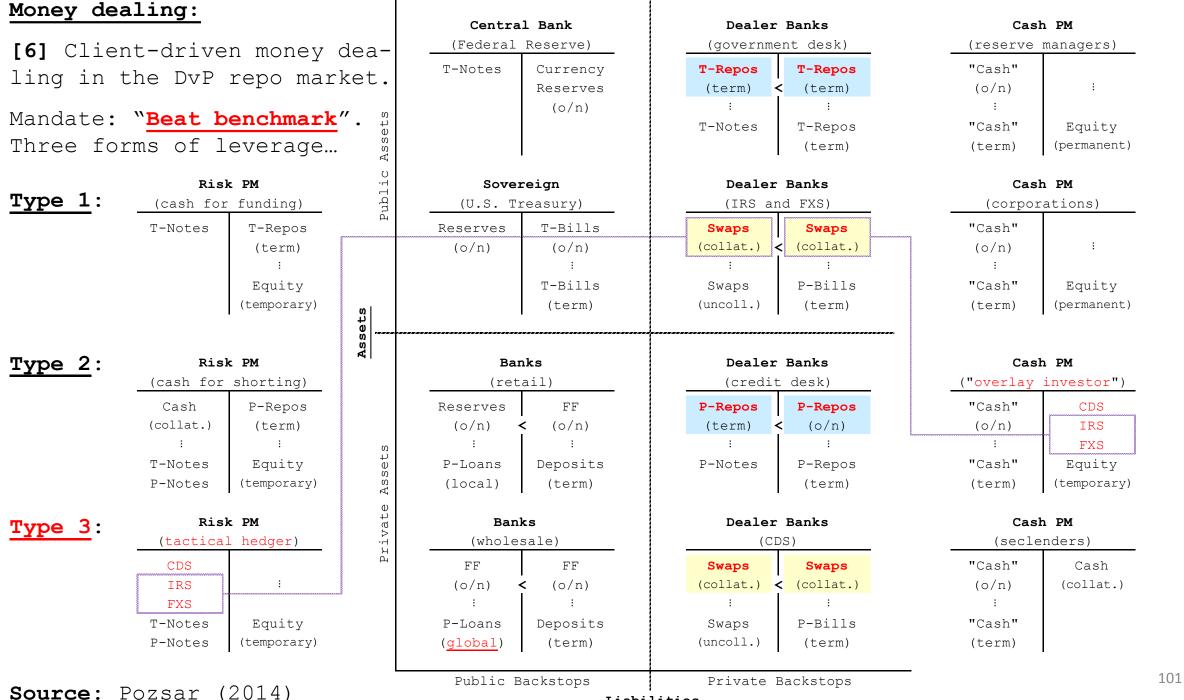
Money dealing: Central Bank Dealer Banks Cash PM (Federal Reserve) (government desk) (reserve managers) [6] Client-driven money dea-T-Repos T-Repos "Cash" T-Notes Currency ling in the DvP repo market. ÷ (term) (o/n)Reserves (term) (o/n)Mandate: "Beat benchmark". Equity T-Notes T-Repos "Cash" Three forms of leverage... (permanent) (term) (term) Risk PM Sovereign Money Funds Cash PM Type 1: (corporations) (cash for funding) (U.S. Treasury) (government-only) T-CNAVs "Cash" T-Notes T-Repos T-Bills T-Repos Reserves (o/n) (o/n)(o/n) (o/n) (o/n) (term) < Equity T-Bills T-Bills "Cash" Equity (temporary) (term) (term) (term) (permanent) Assets Risk PM Type 2: Banks Dealer Banks Cash PM (credit desk) ("overlay investor") (cash for shorting) (retail) P-Repos FFP-Repos P-Repos "Cash" CDS Cash Reserves (collat.) (o/n)(term) (o/n)(term) < (o/n) (o/n) IRS FXS Deposits P-Repos "Cash" Equity Equity T-Notes P-Loans P-Notes (local) P-Notes (temporary) (term) (term) (term) (temporary) Private Risk PM Banks Money Funds Cash PM Type 3: (tactical hedger) (wholesale) (prime) (seclenders) FFFFP-CNAVs CDS P-Repos "Cash" Cash (o/n)IRS (o/n)(o/n)< (o/n) (o/n)(collat.) FXS T-Notes Equity P-Loans Deposits P-Bills "Cash" P-Notes (temporary) (global) (term) (global) (term) Public Backstops Private Backstops Source: Pozsar (2014)

Liabilities

Money dealing: Central Bank Dealer Banks Cash PM (Federal Reserve) (government desk) (reserve managers) [6] Client-driven money dea-T-Repos T-Repos "Cash" T-Notes Currency ling in the DvP repo market. (term) (o/n)Reserves (term) (o/n)Mandate: "Beat benchmark". Equity T-Notes T-Repos "Cash" Three forms of leverage... (permanent) (term) (term) Risk PM Sovereign Cash PM Type 1: (cash for funding) (U.S. Treasury) (corporations) "Cash" T-Notes T-Repos T-Bills Reserves (o/n) (o/n)(o/n) (term) Equity T-Bills "Cash" Equity (temporary) (term) (term) (permanent) Assets Risk PM Type 2: Banks Dealer Banks Cash PM (credit desk) ("overlay investor") (cash for shorting) (retail) P-Repos FFP-Repos P-Repos "Cash" CDS Cash Reserves (collat.) (o/n) (term) (o/n)(term) < (o/n) (o/n) IRS FXS Assets Deposits P-Repos "Cash" Equity Equity T-Notes P-Loans P-Notes (temporary) (local) (temporary) P-Notes (term) (term) (term) Private Risk PM Banks Cash PM Type 3: (tactical hedger) (wholesale) (seclenders) FFFF"Cash" CDS Cash (o/n) IRS (o/n)(o/n)(collat.) FXS T-Notes Equity P-Loans Deposits "Cash" P-Notes (temporary) (global) (term) (term) Public Backstops Private Backstops Source: Pozsar (2014)

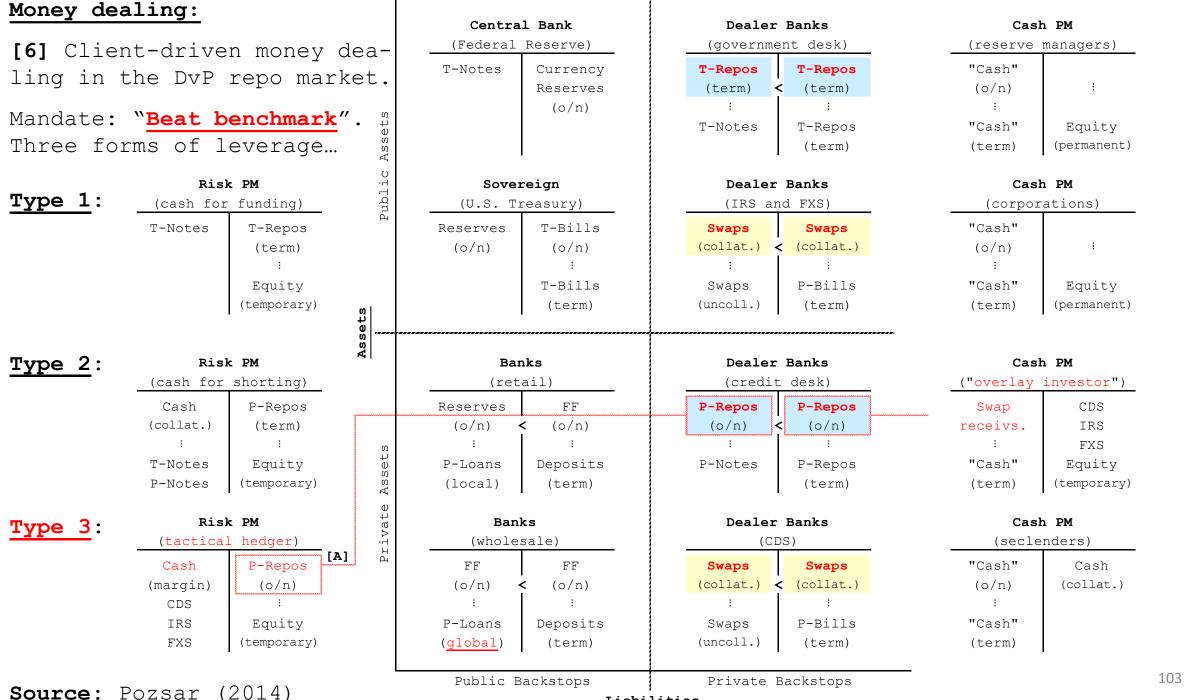
Money dealing: Central Bank Dealer Banks Cash PM (Federal Reserve) (government desk) (reserve managers) [6] Client-driven money dea-T-Repos T-Repos "Cash" T-Notes Currency ling in the DvP repo market. ÷ (o/n)Reserves (term) (term) (o/n): Mandate: "Beat benchmark". Equity T-Notes T-Repos "Cash" Three forms of leverage... (permanent) (term) (term) Risk PM Sovereign Dealer Banks Cash PM Type 1: (corporations) (cash for funding) (U.S. Treasury) (IRS and FXS) "Cash" T-Notes T-Repos T-Bills Swaps Swaps Reserves (collat.) < (collat.)</pre> (o/n) (o/n)(o/n) (term) Equity T-Bills Swaps P-Bills "Cash" Equity (temporary) (term) (uncoll.) (term) (term) (permanent) Assets Risk PM Type 2: Banks Dealer Banks Cash PM (cash for shorting) (retail) (credit desk) ("overlay investor") P-Repos FFP-Repos P-Repos "Cash" CDS Cash Reserves (collat.) (o/n)(term) (o/n)(term) < (o/n) (o/n) IRS FXS Deposits P-Repos "Cash" Equity Equity T-Notes P-Loans P-Notes P-Notes (temporary) (local) (term) (term) (term) (temporary) Private Risk PM Banks Dealer Banks Cash PM Type 3: (tactical hedger) (wholesale) (CDS) (seclenders) FFFFCDS Swaps "Cash" Cash Swaps (o/n)(collat.) < (collat.)</pre> IRS (o/n)(o/n)(collat.) ÷ FXS T-Notes Equity P-Loans Deposits P-Bills "Cash" Swaps P-Notes (temporary) (global) (term) (uncoll.) (term) (term) Public Backstops Private Backstops Source: Pozsar (2014) Liabilities



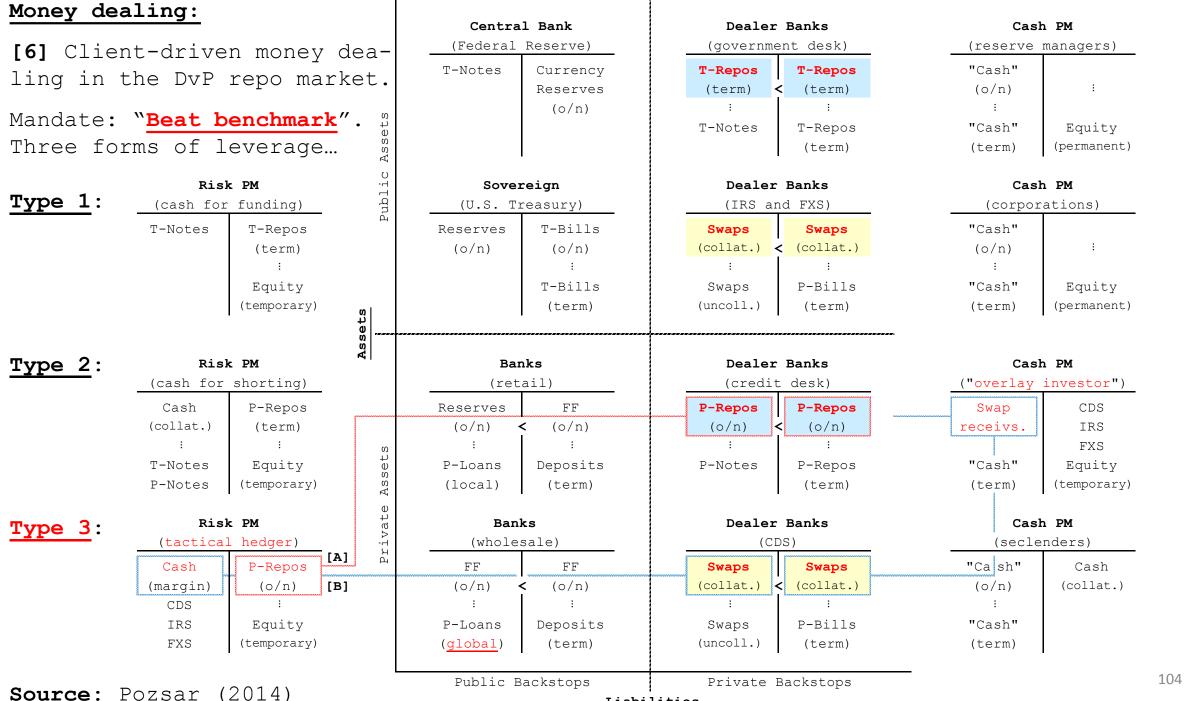


Liabilities

Money dealing: Central Bank Dealer Banks Cash PM (Federal Reserve) (government desk) (reserve managers) [6] Client-driven money dea-T-Repos T-Repos "Cash" T-Notes Currency ling in the DvP repo market. ÷ (o/n)Reserves (term) (term) (o/n): Mandate: "Beat benchmark". Equity T-Notes T-Repos "Cash" Three forms of leverage... (permanent) (term) (term) Risk PM Sovereign Dealer Banks Cash PM Type 1: (cash for funding) (U.S. Treasury) (IRS and FXS) (corporations) "Cash" T-Notes T-Repos T-Bills Swaps Swaps Reserves (collat.) < (collat.)</pre> (o/n) (o/n)(o/n) (term) Equity T-Bills Swaps P-Bills "Cash" Equity (temporary) (term) (uncoll.) (term) (term) (permanent) Assets Risk PM Dealer Banks Type 2: Banks Cash PM (credit desk) (cash for shorting) (retail) ("overlay investor") P-Repos FFP-Repos P-Repos Cash CDS Reserves Swap (collat.) (o/n)(term) (o/n)(term) < (o/n) receivs. IRS FXS Deposits P-Repos Equity "Cash" Equity T-Notes P-Loans P-Notes (local) P-Notes (temporary) (term) (term) (term) (temporary) Private Risk PM Banks Dealer Banks Cash PM Type 3: (tactical hedger) (wholesale) (CDS) (seclenders) FFFFMargin Swap Swaps "Cash" Cash Swaps (o/n)(collat.) < (collat.)</pre> call payables (o/n)(o/n)(collat.) ÷ CDS IRS Equity P-Loans Deposits P-Bills "Cash" Swaps FXS (temporary) (global) (term) (uncoll.) (term) (term) Public Backstops Private Backstops Source: Pozsar (2014) Liabilities



Liabilities



Liabilities

Where is the rea	l economy?						
		Centra	l Bank	Dealer	Banks	Casl	n PM
Money market fun	ding of	(Federal	Reserve)	(governme	ent desk)	<u>(reserve</u>	managers)
capital market lending		T-Notes	Currency	T-Repos	T-Repos	"Cash"	
-	- I		Reserves	(term) <	(term)	(o/n)	:
(see Mehrling et	a1, 2013).		(o/n)	:	:	:	
	α 0 1			T-Notes	T-Repos	"Cash"	Equity
	A 88 8				(term)	(term)	(permanent)
Ris	k PM : I I I I I I I I I I I I I I I I I I	Sove	reign	Dealer	Banks	Casl	n PM
(cash for	funding)	(U.S. T	reasury)	(IRS ar	nd FXS)	(corpor	ations)
T-Notes	Т-Repos	Reserves	T-Bills	Swaps	Swaps	"Cash"	
	(term)	(o/n)	(o/n)	(collat.) <	(collat.)	(o/n)	:
	:		:	;	:	:	
	Equity		T-Bills	Swaps	P-Bills	"Cash"	Equity
	(temporary) w l		(term)	(uncoll.)	(term)	(term)	(permanent)
	a the transfer of the transfer		•		•		•
	A S S						
Ris	k PM	Banks		Dealer Banks		Cash PM	
(cash for	shorting)	(ret	ail)	(credit	desk)	(asset m	anagers)
Cash	P-Repos	Reserves	FF	P-Repos	P-Repos	"Cash"	CDS
(collat.)	(term)	(o/n) ·	< (o/n)	(o/n) <	(o/n)	(o/n)	IRS
:	: w	:	:	:	:	:	FXS
T-Notes	Equity 0	P-Loans	Deposits	P-Notes	P-Repos	"Cash"	Equity
P-Notes	Equity 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	(local)	(term)		(term)	(term)	(temporary)
Risk PM (cash for margining)		Banks		Dealer Banks		Cash PM	
(cash for	margining)	(wholesale)		(CDS)		(seclenders)	
Cash	P-Repos	FF	FF	Swaps	Swaps	"Cash"	Cash
(margin)	(o/n)	(o/n) ·	(o/n)	(collat.) <	(collat.)	(o/n)	(collat.)
CDS	:	:	:	:	:	i i	
IRS	Equity	P-Loans	Deposits	Swaps	P-Bills	"Cash"	
FXS	(temporary)	(global)	(term)	(uncoll.)	(term)	(term)	
4						•	

Source: Pozsar (2014)

Where is the real economy? Central Bank Dealer Banks Cash PM (Federal Reserve) (government desk) (reserve managers) Money market funding of T-Repos "Cash" T-Notes Currency T-Repos capital market lending... Reserves (o/n)(term) (term) ÷ (o/n)[1] Funded risk PMs' Equity T-Notes T-Repos "Cash" securities portfolios, ... (permanent) (term) (term) Risk PM Dealer Banks Sovereign Cash PM (U.S. Treasury) (corporations) (cash for funding) (IRS and FXS) T-Notes T-Repos T-Bills Swaps "Cash" [1] Reserves Swaps (global) (o/n)(o/n)(collat.) < (collat.) (o/n)(term) : Equity T-Bills Swaps P-Bills "Cash" Equity (temporary) (term) (uncoll.) (term) (term) (permanent) Assets Cash PM Risk PM Banks Dealer Banks (cash for shorting) (retail) (credit desk) (asset managers) P-Repos FFP-Repos P-Repos "Cash" Cash CDS Reserves (collat.) (o/n) (term) (o/n)(o/n)(o/n) (o/n)IRS : FXS Deposits "Cash" Equity Equity P-Repos T-Notes P-Loans P-Notes (temporary) (temporary) P-Notes (local) (term) (term) (term) Private Risk PM Banks Dealer Banks Cash PM (cash for margining) (wholesale) (CDS) (seclenders) FFFFCash P-Repos Swaps "Cash" Cash Swaps (margin) (o/n) (o/n)(o/n)(collat.) < (collat.) (o/n)(collat.) CDS : IRS Equity P-Loans Deposits Swaps P-Bills "Cash" (temporary) FXS (global) (term) (uncoll.) (term) (term) Public Backstops Private Backstops

Source: Pozsar (2014)

Where is the rea	al economy?							
-			Central Bank		Dealer Banks		Cash PM	
Money market fur	nding of	(Federal Reserve)		(government desk)		(reserve managers)		
capital market l	-	T-Notes	Currency	T-Repos	T-Repos	"Cash"		
capital market i	-enaing		Reserves	(term) <	(term)	(o/n)	:	
[2] Foreign bank	ra/ IICD w		(o/n)	:	;	:		
[2] Foreign bank	ر ۱۳ (۲۵ (۲۵			T-Notes	T-Repos	"Cash"	Equity	
securities portf	ss' USD salation and salation salations				(term)	(term)	(permanent)	
Ris	k PM ∵⊣	Sove	reign	Dealer	Banks	Cas	h PM	
(cash for funding)		(U.S. Treasury)		(IRS and FXS)		(corporations)		
[1] T-Notes	funding)	Reserves	T-Bills	Swaps	Swaps	"Cash"	<u> </u>	
(global)	(term)	(o/n)	(o/n)	_	Swaps < (collat.)	(o/n)	:	
(<u>g105a1</u>)	(ceim)	(0/11)	(0/11)	(001140.)	:	(0/11)		
	Equity		T-Bills	Swaps	P-Bills	"Cash"	Equity	
	(temporary)		(term)	(uncoll.)	(term)	(term)	(permanent)	
	A S S S S S S S S S S S S S S S S S S S		(0 0 = ,		(• • • • • • • • • • • • • • • • • • •	(• • =,	, <u>, , , , , , , , , , , , , , , , , , </u>	
	8							
Ris	k PM	Banks		Dealer Banks		Cash PM		
(cash for	shorting)	(ret	ail)	(credit desk)		(asset managers)		
Cash	P-Repos	Reserves	FF	P-Repos	P-Repos	"Cash"	CDS	
(collat.)	(term)	(o/n)	< (o/n)	(o/n) <	(o/n)	(o/n)	IRS	
:	: o	:	:	:	:	:	FXS	
T-Notes	Equity 0	P-Loans	Deposits	P-Notes	P-Repos	"Cash"	Equity	
					- <u>1</u>	Cabii	1 1	
P-Notes	Equity 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	(local)	(term)		(term)	(term)	(temporary)	
					(term)	(term)	(temporary)	
Ris			ks	Dealer	(term)	(term)	(temporary)	
Ris (cash for	k PM ## ## ## ## ## ## ## ## ## ## ## ## ##	Ban (whole	ks sale)	Dealer (CI	(term) Banks DS)	(term) Casi (secle	(temporary) h PM enders)	
Ris (cash for Cash	k PM the state of	Ban (whole FF	ks sale) FF	Dealer (CI Swaps	(term) Banks DS) Swaps	(term) Casi (secle	(temporary) h PM enders) Cash	
Ris (cash for Cash (margin)	k PM ## ## ## ## ## ## ## ## ## ## ## ## ##	Ban (whole FF (o/n)	ks sale)	Dealer (CI Swaps	(term) Banks DS)	(term) Casi (secle	(temporary) h PM enders)	
Ris (cash for Cash (margin) CDS	k PM margining) P-Repos (o/n)	######################################	ks sale) FF (o/n) :	Dealer (CI Swaps (collat.)	(term) Banks DS) Swaps (collat.)	(term) Casi (secle "Cash" (o/n) :	(temporary) h PM enders) Cash	
Ris (cash for Cash (margin) CDS IRS	k PM margining) P-Repos (o/n) Equity	### Ban (whole FF (o/n) : [2] P-Loans	ks sale) FF (o/n) : Deposits	Dealer (CI Swaps (collat.) < : : Swaps	(term) **Banks DS) Swaps < (collat.) : P-Bills	(term) Casi (secle "Cash" (o/n) : "Cash"	(temporary) h PM enders) Cash	
Ris (cash for Cash (margin) CDS	k PM margining) P-Repos (o/n)	######################################	ks sale) FF (o/n) :	Dealer (CI Swaps (collat.)	(term) Banks DS) Swaps (collat.)	(term) Casi (secle "Cash" (o/n) :	(temporary) h PM enders) Cash	
Ris (cash for Cash (margin) CDS IRS FXS	k PM margining) P-Repos (o/n) Equity	Ban	ks sale) FF (o/n) : Deposits	Dealer (CI Swaps (collat.) < : Swaps (uncoll.)	(term) **Banks DS) Swaps < (collat.) : P-Bills	(term) Casi (secle "Cash" (o/n) : "Cash"	(temporary) h PM enders) Cash	

Where is the real economy? Central Bank Dealer Banks Cash PM (Federal Reserve) (government desk) (reserve managers) Money market funding of T-Repos "Cash" T-Notes Currency T-Repos capital market lending... Reserves (o/n)(term) (term) (o/n): [3] Large U.S. banks' Equity T-Notes T-Repos "Cash" securities portfolios,... (permanent) (term) (term) Public Risk PM Dealer Banks Cash PM Sovereign (cash for funding) (U.S. Treasury) (IRS and FXS) (corporations) [1] T-Notes T-Repos T-Bills Swaps "Cash" Reserves Swaps (global) (o/n)(o/n)(collat.) < (collat.) (o/n)(term) Equity T-Bills Swaps P-Bills "Cash" Equity (temporary) (term) (uncoll.) (term) (term) (permanent) Assets Cash PM Risk PM Banks Dealer Banks (cash for shorting) (retail) (credit desk) (asset managers) P-Repos FFP-Repos P-Repos "Cash" Cash CDS Reserves (collat.) (o/n) (term) (o/n)(o/n) (o/n) (o/n)IRS FXS Deposits "Cash" Equity P-Repos Equity T-Notes P-Loans P-Notes (temporary) (temporary) P-Notes (local) (term) (term) (term) Private Risk PM Banks Dealer Banks Cash PM (cash for margining) (wholesale) (CDS) (seclenders) FFFFCash P-Repos Swaps "Cash" Cash Swaps (margin) (o/n)(o/n)(o/n)(collat.) < (collat.) (o/n)(collat.) CDS : [2] IRS Equity P-Notes Deposits Swaps P-Bills "Cash" (temporary) [3] (global) FXS (term) (uncoll.) (term) (term) Public Backstops Private Backstops

Source: Pozsar (2014)

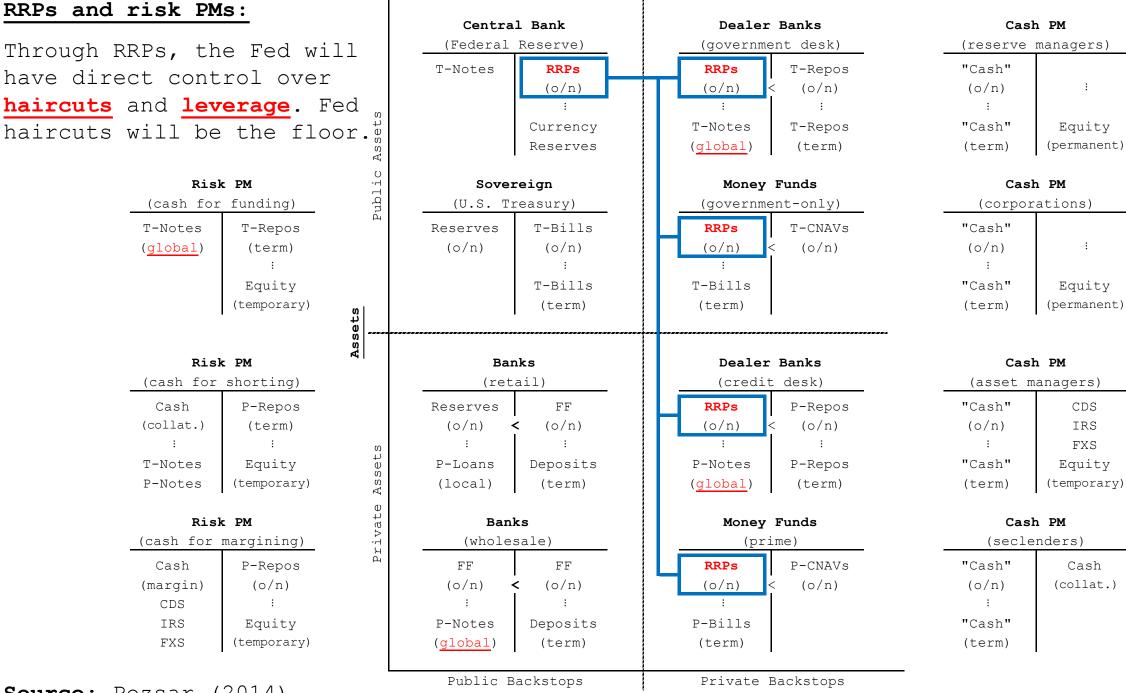
Where is the real economy? Central Bank Dealer Banks Cash PM (Federal Reserve) (government desk) (reserve managers) Money market funding of T-Repos "Cash" T-Notes Currency T-Repos capital market lending... Reserves (o/n)(term) (term) ÷ (o/n)[4] Dealer banks' securities T-Repos Equity [4] **T-Notes** "Cash" inventories (net financing) (global) (permanent) (term) (term) Risk PM Sovereign Dealer Banks Cash PM (cash for funding) (U.S. Treasury) (IRS and FXS) (corporations) [1] T-Notes T-Repos T-Bills Swaps "Cash" Reserves Swaps (global) (o/n)(o/n)(collat.) < (collat.) (o/n)(term) Equity T-Bills Swaps P-Bills "Cash" Equity (temporary) (term) (uncoll.) (term) (term) (permanent) sets Risk PM Banks Dealer Banks Cash PM (cash for shorting) (retail) (credit desk) (asset managers) P-Repos FFP-Repos "Cash" Cash P-Repos CDS Reserves (collat.) (o/n) (term) (o/n)(o/n) (o/n) (o/n)IRS : FXS P-Notes P-Repos "Cash" Equity Equity Deposits T-Notes P-Loans [4] (temporary) (temporary) P-Notes (local) (term) (global) (term) (term) Private Risk PM Banks Dealer Banks Cash PM (cash for margining) (wholesale) (CDS) (seclenders) FFFFCash P-Repos Swaps "Cash" Cash Swaps (o/n)(margin) (o/n) (o/n)(collat.) < (collat.) (o/n)(collat.) ÷ : ÷ CDS [2] IRS Equity P-Notes Deposits Swaps P-Bills "Cash" (temporary) [3] (global) FXS (term) (uncoll.) (term) (term) Public Backstops Private Backstops Source: Pozsar (2014)

Not all repos are equal: Central Bank Dealer Banks Cash PM (Federal Reserve) (government desk) (reserve managers) Most repos are responsible T-Repos "Cash" T-Notes Currency T-Repos for facilitating price dis-Reserves (o/n)(term) (term) covery in a market making ÷ (o/n)T-Notes Equity [4] T-Repos "Cash" context, but not funding (global) (permanent) (term) (term) the real economy directly. Risk PM Dealer Banks Publi Sovereign Cash PM (cash for funding) (U.S. Treasury) (IRS and FXS) (corporations) [1] T-Notes T-Repos T-Bills Swaps "Cash" Reserves Swaps (global) (o/n)(o/n)(collat.) < (collat.) (o/n)(term) ÷ Equity T-Bills Swaps P-Bills "Cash" Equity (temporary) (term) (uncoll.) (term) (term) (permanent) sets Risk PM Banks Dealer Banks Cash PM (cash for shorting) (retail) (credit desk) (asset managers) [Ø] Cash P-Repos Reserves FFP-Repos P-Repos "Cash" CDS (collat.) (o/n) (term) (o/n)(o/n)(o/n) (o/n)IRS FXS Deposits P-Notes "Cash" Equity Equity P-Repos T-Notes P-Loans (temporary) (local) (temporary) P-Notes (term) (global) (term) (term) Private Risk PM Banks Dealer Banks Cash PM (cash for margining) (wholesale) (CDS) (seclenders) FFFF[Ø] Cash P-Repos Swaps "Cash" Cash Swaps < (collat.) (o/n)(margin) (o/n)(o/n)(collat.) (o/n)(collat.) : : : ÷ CDS [2] IRS Equity P-Notes Deposits Swaps P-Bills "Cash" FXS (temporary) [3] (global) (term) (uncoll.) (term) (term) Public Backstops Private Backstops

Source: Pozsar (2014)

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Liabilities



Source: Pozsar (2014)

RRPs and risk PMs: Central Bank Dealer Banks Cash PM (Federal Reserve) (government desk) (reserve managers) Fed will have control over RRPs T-Repos T-Notes RRPs "Cash" market-based credit cycles. (o/n) (o/n)(o/n)(o/n)This will raise the cost of , : Equity T-Notes T-Repos "Cash" Currency leverage for risk PMs and (global) (permanent) Reserves (term) (term) reduce seclending volumes. Public Risk PM Sovereign Money Funds Cash PM (corporations) (cash for funding) (U.S. Treasury) (government-only) T-Repos "Cash" T-Notes T-Bills RRPs T-CNAVs Reserves (global) (term) (o/n)(o/n)(o/n) (o/n)(o/n): Equity T-Bills T-Bills "Cash" Equity (temporary) (term) (term) (term) (permanent) Risk PM Banks Dealer Banks Cash PM (cash for shorting) (retail) (credit desk) (asset managers) P-Repos Reserves FFP-Repos "Cash" Cash RRPs CDS (collat.) (o/n) (term) (o/n)(o/n)(o/n)(o/n)IRS : FXS Deposits P-Repos "Cash" Equity Equity T-Notes P-Loans P-Notes (temporary) (local) (temporary) P-Notes (term) (global) (term) (term) Private Banks Cash PM Risk PM Money Funds (cash for margining) (wholesale) (prime) (seclenders) FFFFP-CNAVs Cash P-Repos RRPs "Cash" Cash (o/n)(o/n)(margin) (o/n) (o/n)(o/n)(o/n)(collat.) ÷ ÷ CDS Equity P-Bills IRS P-Notes Deposits "Cash" (temporary) FXS (global) (term) (term) (term)

Source: Pozsar (2014)

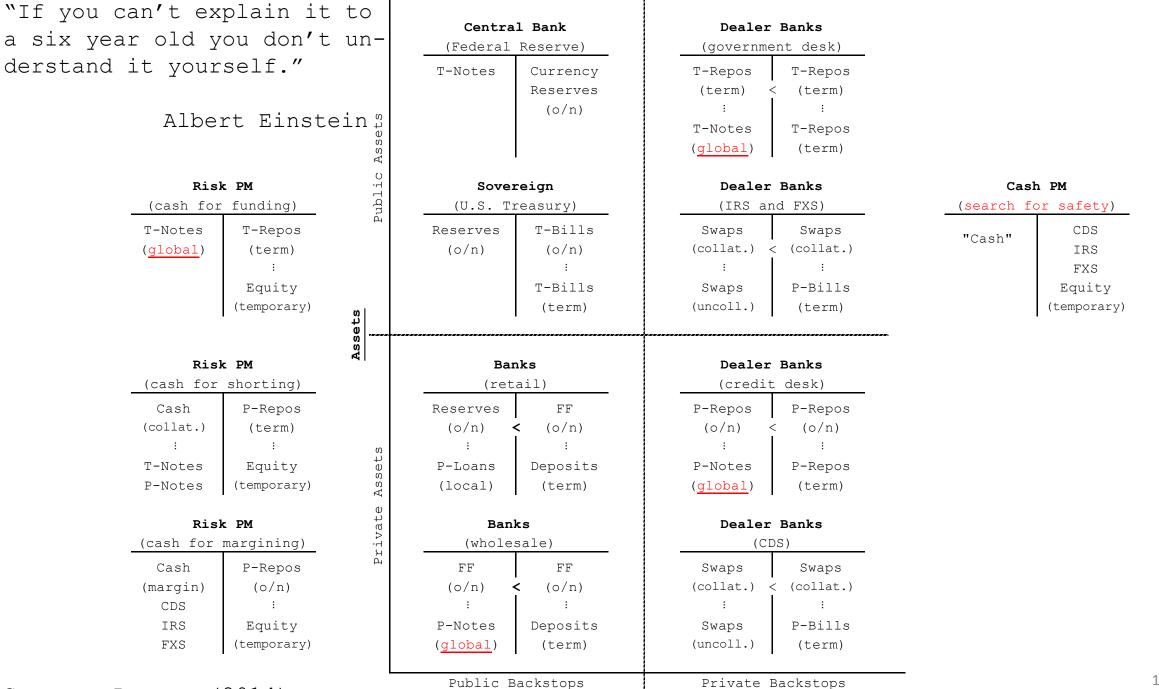
Public Backstops

Liabilities

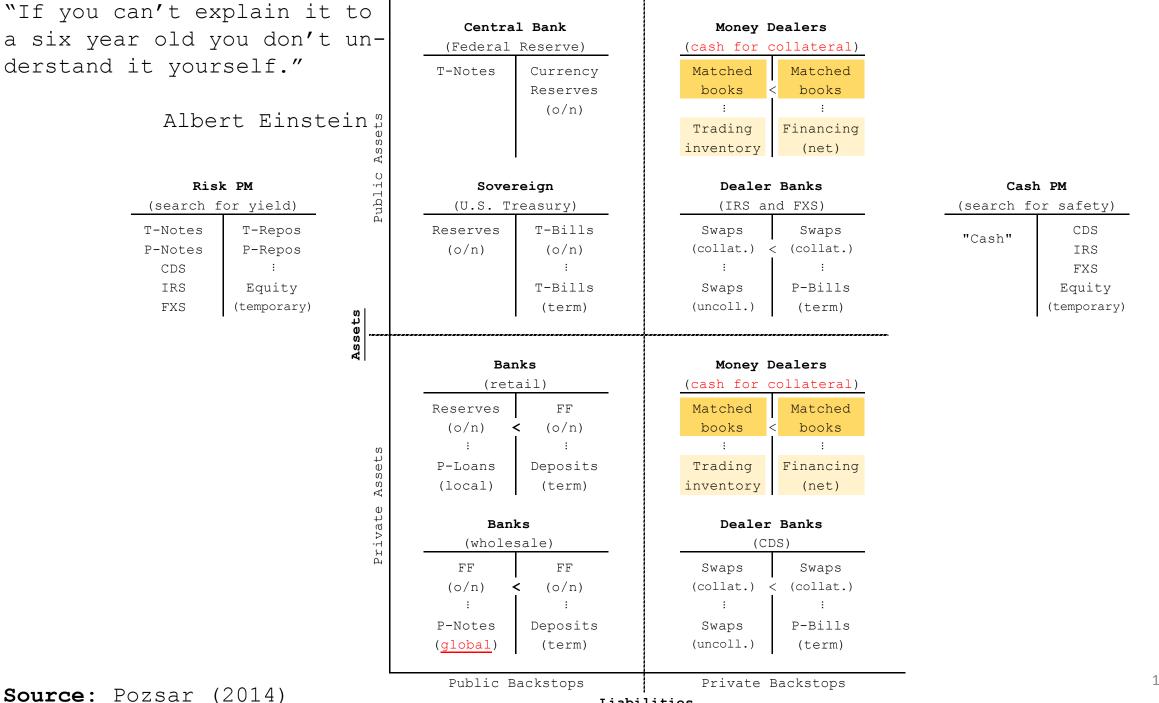
Private Backstops

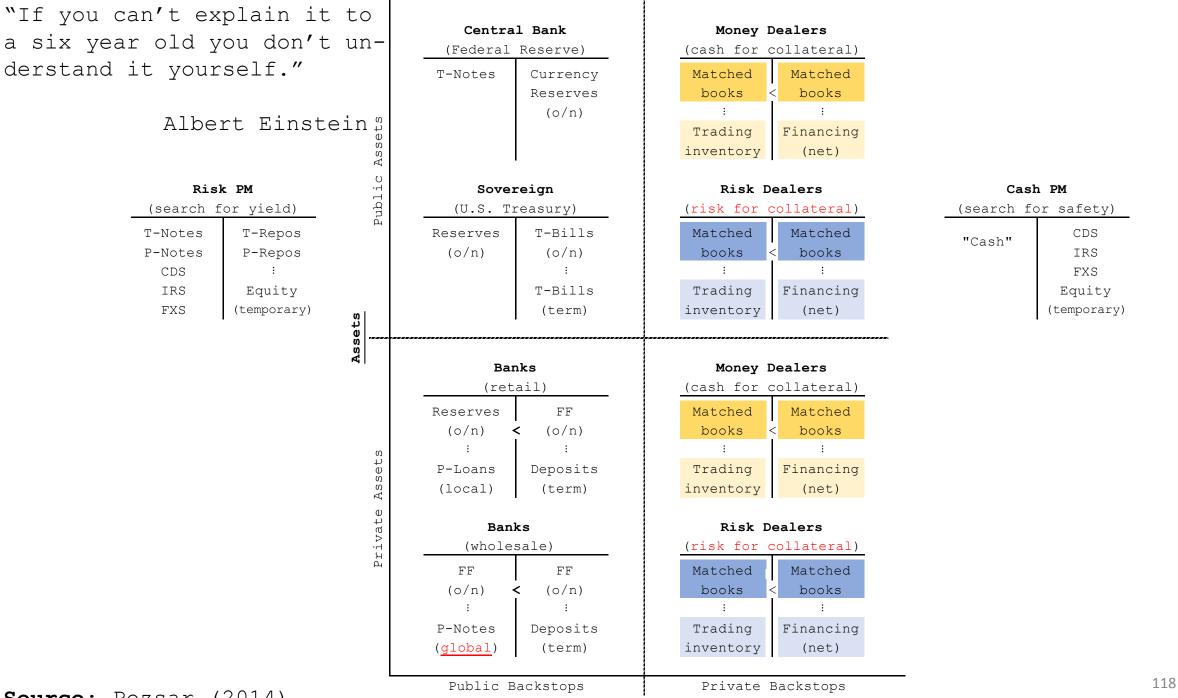
- 1. The Hierarchy of Money.
- 2. The Hierarchy of Access.
- 3. The Hierarchy of Uses.
- 4. The Dealer Eco-System.
- 5. The Macro Perspective.
- 6. Policy Implications.

"If you can't exp a six year old yo derstand it yours Alber	ou don't un-	T-Notes	A Bank Reserve) Currency Reserves (o/n)	Dealer (governme T-Repos (term) : T-Notes (global)			managers) : Equity (permanent)
Risk	PM	Sove	reign	Dealer	Banks	Casi	h PM
(cash for	funding)	(U.S. T	reasury)	(IRS ar	nd FXS)	(corpor	ations)
T-Notes	т-Repos	Reserves	T-Bills	Swaps	Swaps	"Cash"	
(global)	(term)	(o/n)	(o/n)	(collat.) <	< (collat.)	(o/n)	:
	:		:	:	:	:	
	Equity		T-Bills	Swaps	P-Bills	"Cash"	Equity
	(temporary)		(term)	(uncoll.)	(term)	(term)	(permanent)
Risk (cash for s	PM	Ba r (ret	nks ail)	Dealer (credit			n PM Lanagers)
Cash	P-Repos	Reserves	FF	P-Repos	P-Repos	"Cash"	CDS
(collat.)	(term)	` ' '	< (o/n)	1	< (o/n)	(o/n)	IRS
:	Equity ω	:	:	:	:		FXS
T-Notes	Equity ϕ	P-Loans	Deposits	P-Notes	P-Repos	"Cash"	Equity
P-Notes	(temporary) %	(local)	(term)	(<u>global</u>)	(term)	(term)	(temporary)
Risk	5	Ban		Dealer			h PM
(cash for m	nargining) H	(whole	T	(CI		·	nders)
Cash	P-Repos	F'F'	FF	Swaps	Swaps	"Cash"	Cash
(margin)	(o/n)		< (o/n)	i	< (collat.)	(o/n)	(collat.)
CDS	: 	;	; December	:	:	; !! C l. !!	
IRS FXS	Equity (temporary)	P-Notes	Deposits	Swaps (uncoll.)	P-Bills	"Cash"	
cx2	(cemborary)	(<u>global</u>)	(term)	(uncorr.)	(term)	(term)	I
Source: Pozsar (2	2014)	Public E	Backstops Liabi	Private 1	Backstops	-	;



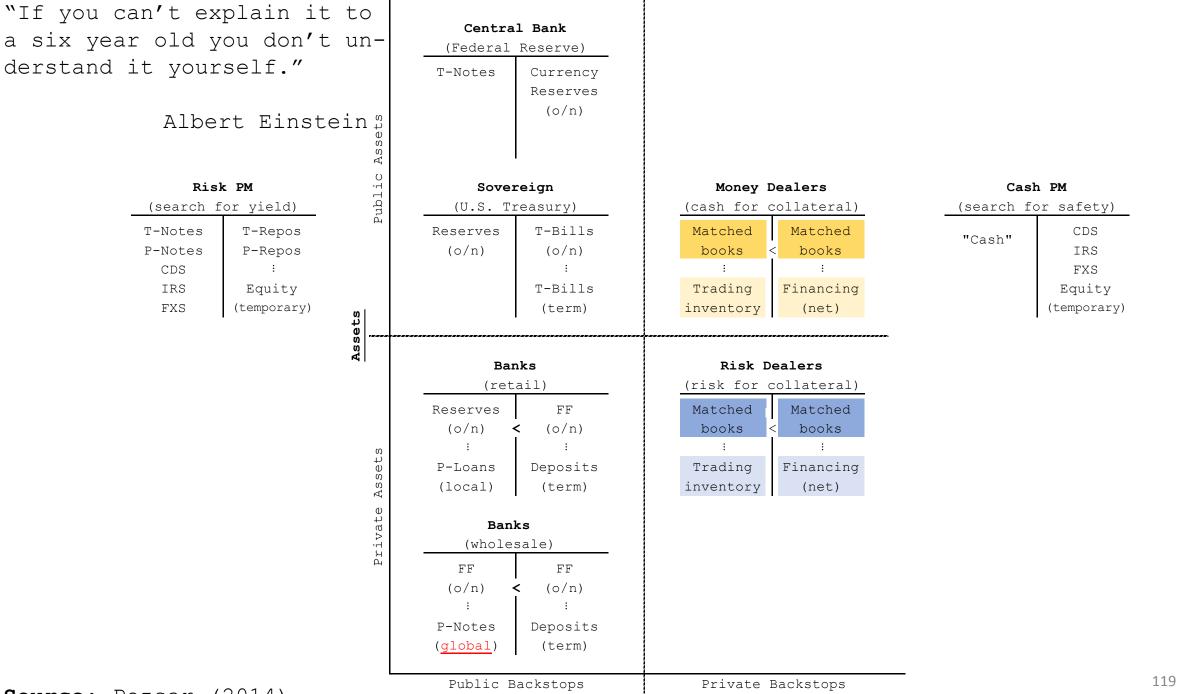
"If you can't explain it to Central Bank Dealer Banks a six year old you don't un-(Federal Reserve) (government desk) derstand it yourself." T-Repos T-Repos T-Notes Currency Reserves (term) (term) (o/n): Albert Einstein # T-Notes T-Repos (global) (term) Risk PM Dealer Banks Sovereign Cash PM (IRS and FXS) (search for yield) (U.S. Treasury) (search for safety) T-Bills T-Notes T-Repos Swaps Swaps CDS Reserves "Cash" (collat.) < (collat.) P-Notes P-Repos (o/n) (o/n) IRS FXS CDS IRS Equity T-Bills Swaps P-Bills Equity FXS (temporary) (temporary) (term) (uncoll.) (term) Banks Dealer Banks (credit desk) (retail) FFP-Repos P-Repos Reserves (o/n) (o/n) (o/n) (o/n) Deposits P-Repos P-Loans P-Notes (local) (term) (global) (term) Private Banks Dealer Banks (wholesale) (CDS) FFFFSwaps Swaps (o/n)(o/n) (collat.) < (collat.) P-Bills P-Notes Deposits Swaps (global) (term) (uncoll.) (term) 116 Public Backstops Private Backstops Source: Pozsar (2014) Liabilities





Source: Pozsar (2014)

Liabilities



"If you can't explain it to a six year old you don't understand it yourself."

Albert Einstein

Risk PM

(search f	or yield)
T-Notes	T-Repos
P-Notes	P-Repos
CDS	:
IRS	Equity
FXS	(temporary)

Money Dealers

	(cash for	С	collateral)
	Matched		Matched
books		<	books
	:		:
	Trading		Financing
	inventory		(net)

Cash PM

	(search	fo	or	safety)	
	"Cash"			CDS	
Casii				IRS	
				FXS	
				Equity	
			(temporary)

Risk Dealers

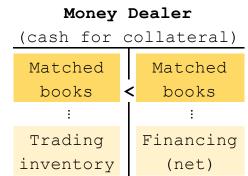
(risk for collateral)

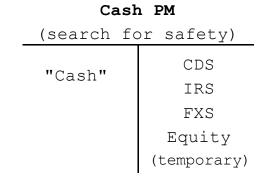
Matched	Matched
books	books
:	:
Trading	Financing
inventory	(net)

Risk PM (search for yield) T-Notes T-Repos P-Notes P-Repos CDS : IRS Equity

(temporary)

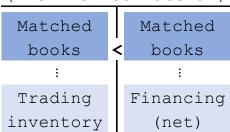
FXS





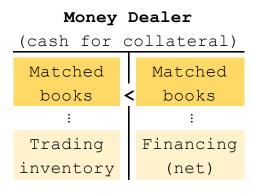
Risk Dealer

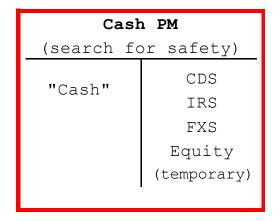
(risk for collateral)



Risk and cash PMs...

Risk PM			
(search f	or yield)		
T-Notes	T-Repos		
P-Notes	P-Repos		
CDS	:		
IRS	Equity		
FXS	(temporary)		
	·		

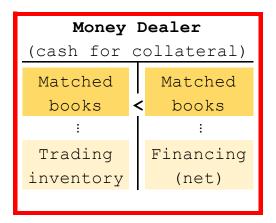


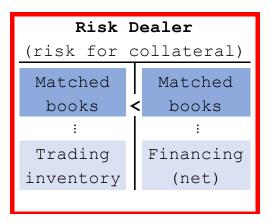


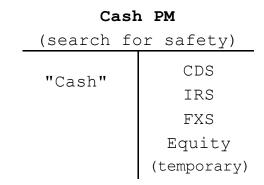


Risk and cash PMs and money and risk dealers.

Risk PM			
(search f	or yield)		
T-Notes	T-Repos		
P-Notes	P-Repos		
CDS	:		
IRS	Equity		
FXS	(temporary)		



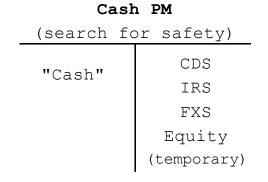


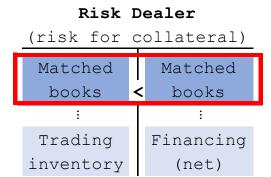


Risk and cash PMs and money and risk dealers. Matched book...

Risk PM		
(search f	or yield)	
T-Notes	T-Repos	
P-Notes	P-Repos	
CDS	:	
IRS	Equity	
FXS	(temporary)	

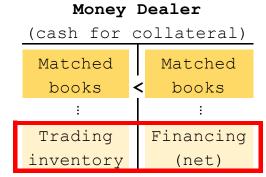


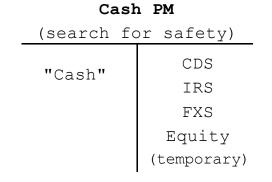




Risk and cash PMs and money and risk dealers. Matched book and "inventory" (net) positions.

Risk PM			
(search for yield)			
T-Notes	T-Repos		
P-Notes	P-Repos		
CDS	:		
IRS	Equity		
FXS	(temporary)		





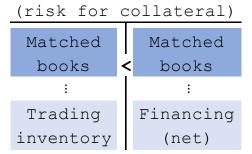


Search for yield versus search for safety:

Risk PMs are security rich but return poor. They <u>always</u> search for yield. Cash PMs are cash rich but safety poor. They primarily search for safety.

Risk PM		Money I	Dealer	Cash PM				
(search f	or yield)	(cash for c	(cash for collateral)		sh for collateral) ((search for safety)	
T-Notes	T-Repos	Matched	Matched	"Cash"	CDS			
P-Notes	P-Repos	books	books	Casii	IRS			
CDS	:	:	:		FXS			
IRS	Equity	Trading	Financing		Equity			
FXS	(temporary)	inventory	(net)		(temporary)			
·					•			

Risk Dealer

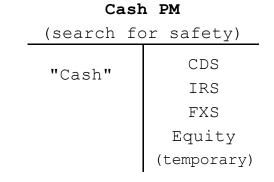


Natural complements:

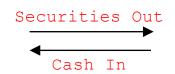
Risk PMs repo securities out and cash in. Cash PMs repo cash out and securities in.

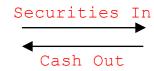
Risk PM		
(search f	or yield)	
T-Notes	T-Repos	
P-Notes	P-Repos	
CDS	:	
IRS	Equity	
FXS	(temporary)	

Money Dealer			
(cash for d	collateral)		
Matched	Matched		
books	< books		
:	:		
Trading	Financing		
inventory	(net)		





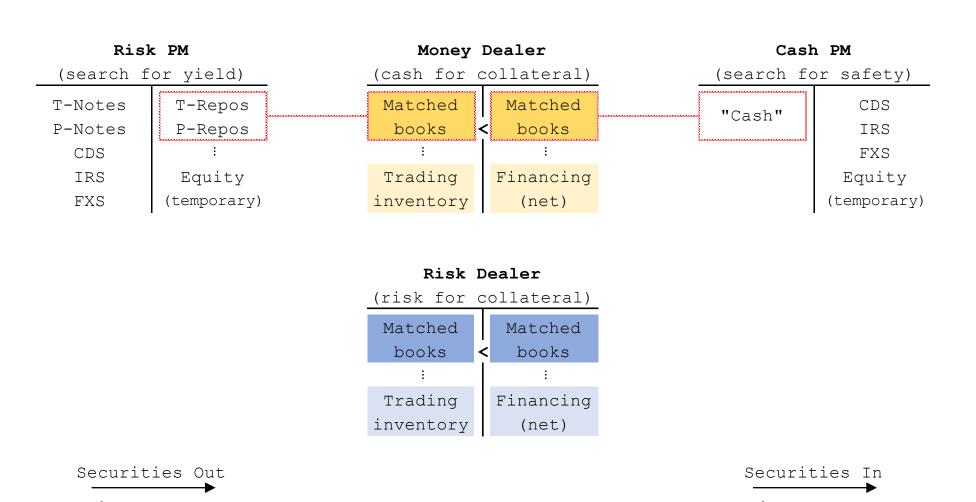




The role of collateral:

Collateral gives sense of safety for cash lenders. Cash enables risk taking via funding and shorting.

Cash In

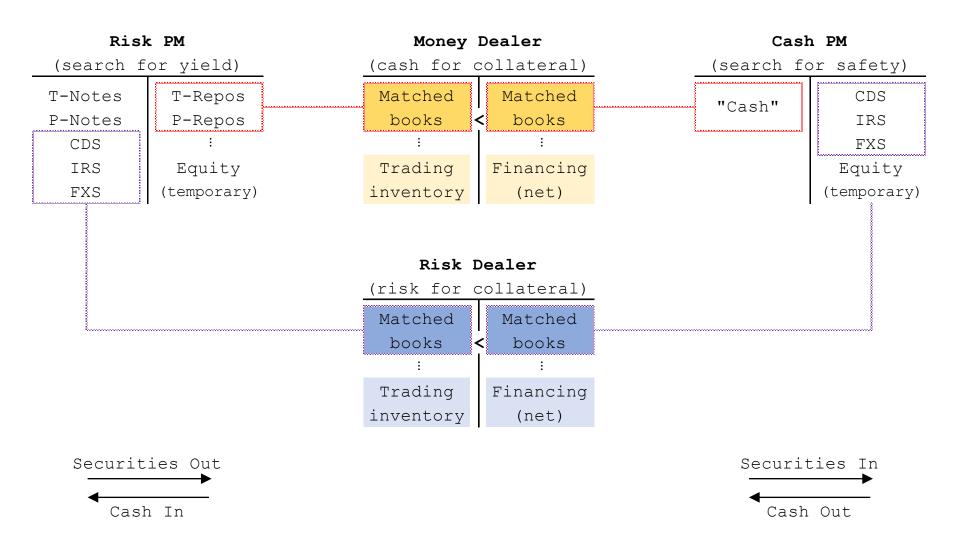


Source: Pozsar (2014)

Cash Out

The role of collateral:

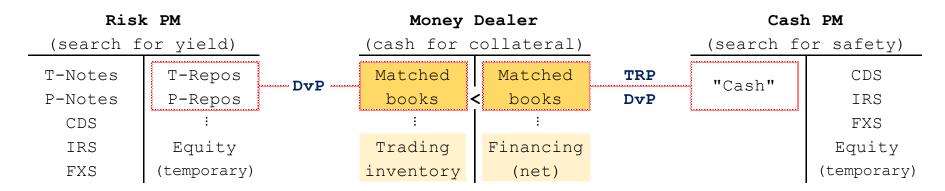
Swaps positions give rise to un-secured derivatives receivables for those in the money. Collateral gives sense of safety for those in the money, who are de facto cash lenders.



Sizing the U.S. repo market:

\$ trillions as of 2012Q2

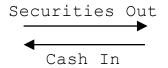
Cash PMs placed over \$3 trillion in cash with dealers. Of this, \$2.5 trillion were lent on, with the difference used to finance inventories. Risk PMs absorbed \$2 trillion in funding.

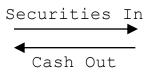


GCF

(inter-dealer)

Reverse Repo Transactions			Repo Transactions		
\$2,446	<u>Total</u>	\$2,446	\$3 , 035	<u>Total</u>	\$3 , 035
\$463	GCF	\$463	\$463	GCF	\$463
_	_	_	\$1 , 608	TRP	\$1,608
\$1,983	DvP	\$1 , 983	\$964	DvP	\$964
-	Net	\$589	_	_	-

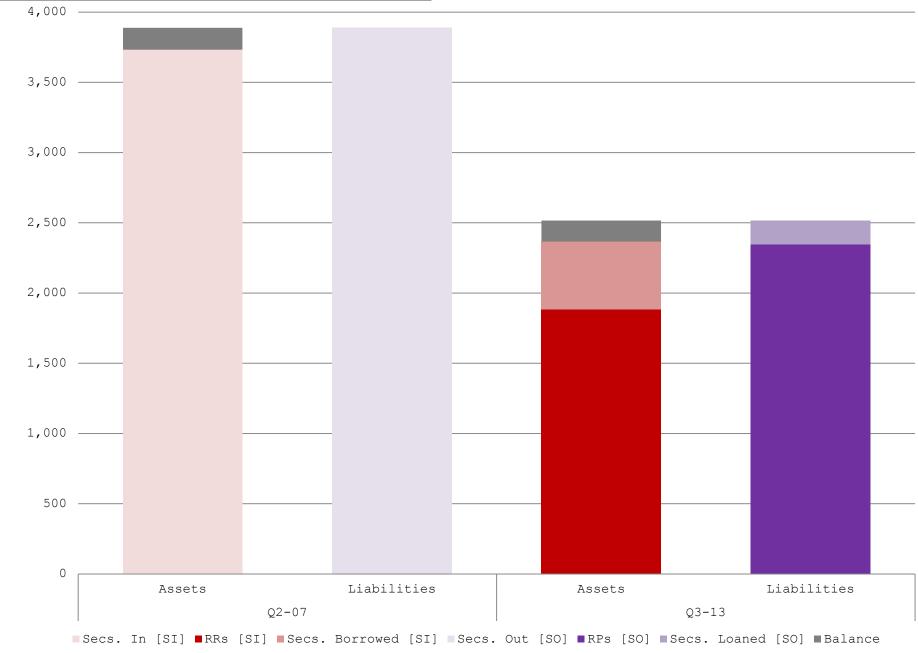




Source: Pozsar (2014) and Copeland et al (2012)

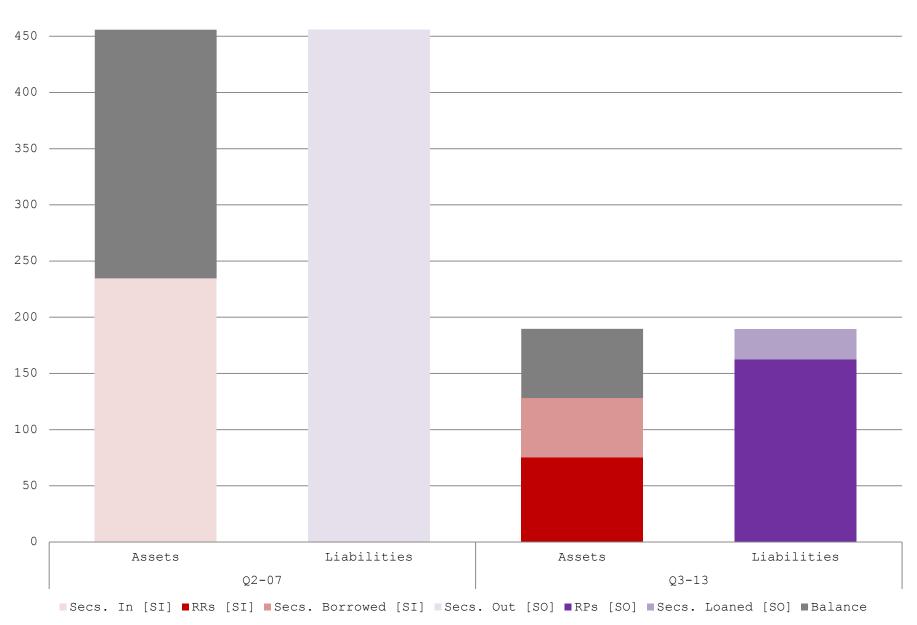
Money dealing using public bonds by motive:

\$ trillions



500

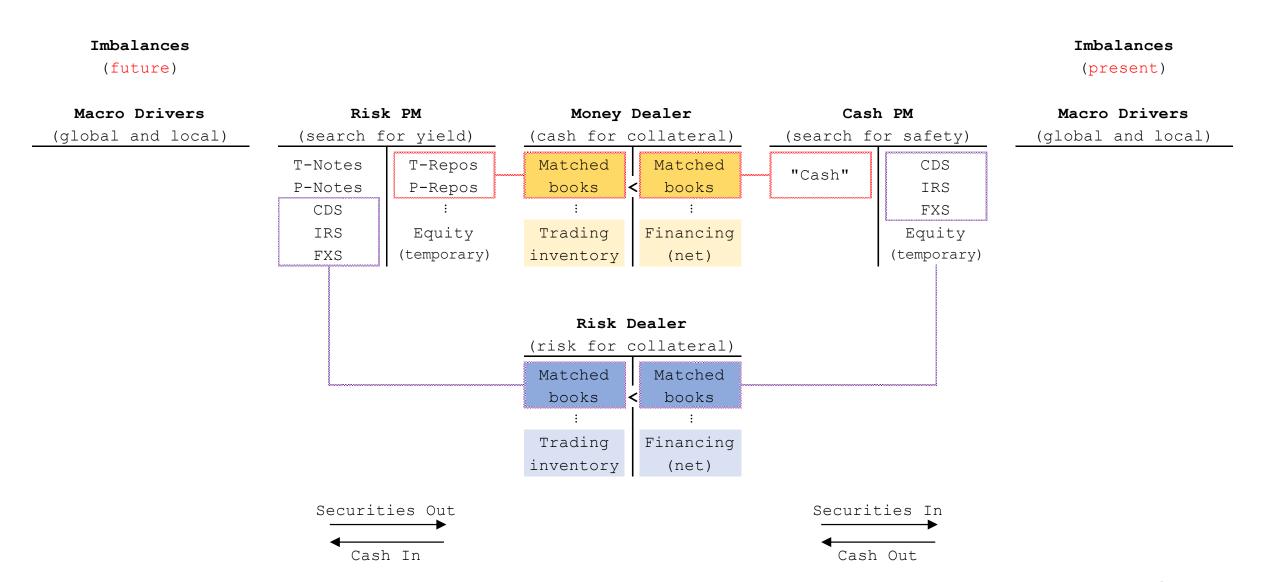
\$ trillions



Source: Haver, Federal Reserve Bank of New York

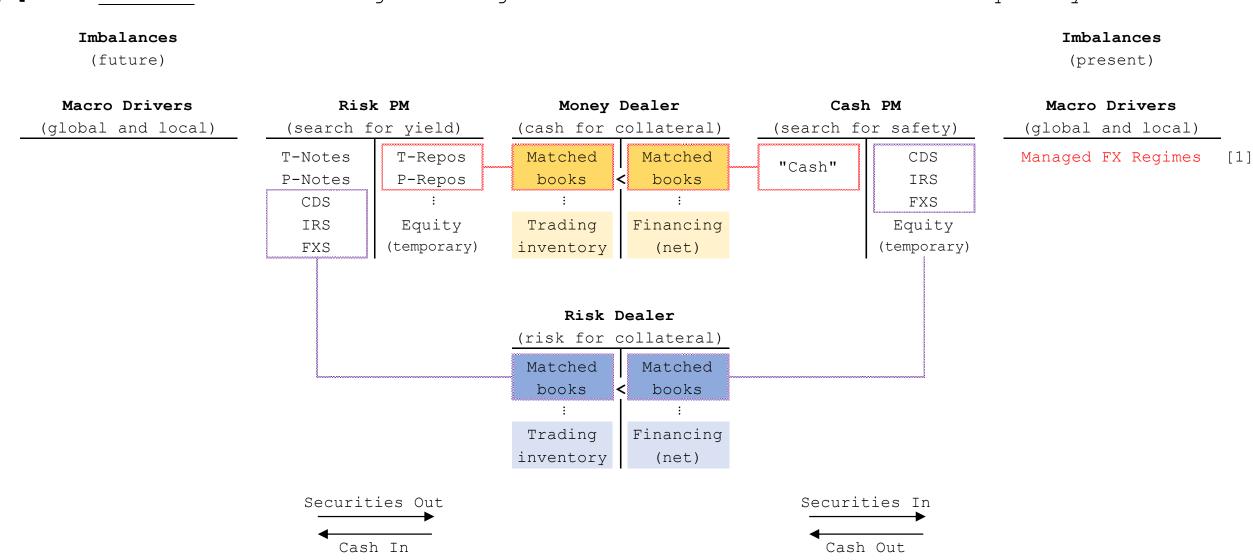
- 1. The Hierarchy of Money.
- 2. The Hierarchy of Access.
- 3. The Hierarchy of Uses.
- 4. The Dealer Eco-System.
- 5. The Macro Perspective.
- 6. Policy Implications.

Present and future <u>macro imbalances</u> shape the contours of the global financial eco-system. What dealer banks do is a reflection of the eco-system they inhabit.



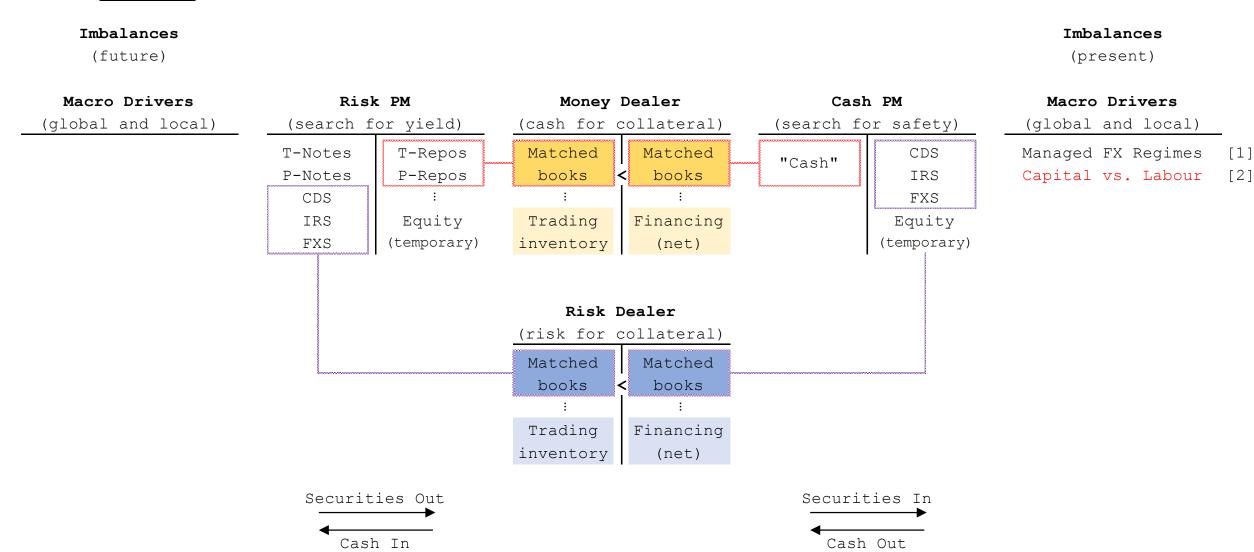
The secular rise of cash PMs has been driven by...

[1] the secular rise of managed FX regimes and FX reserves' so-called "liquidity tranches".



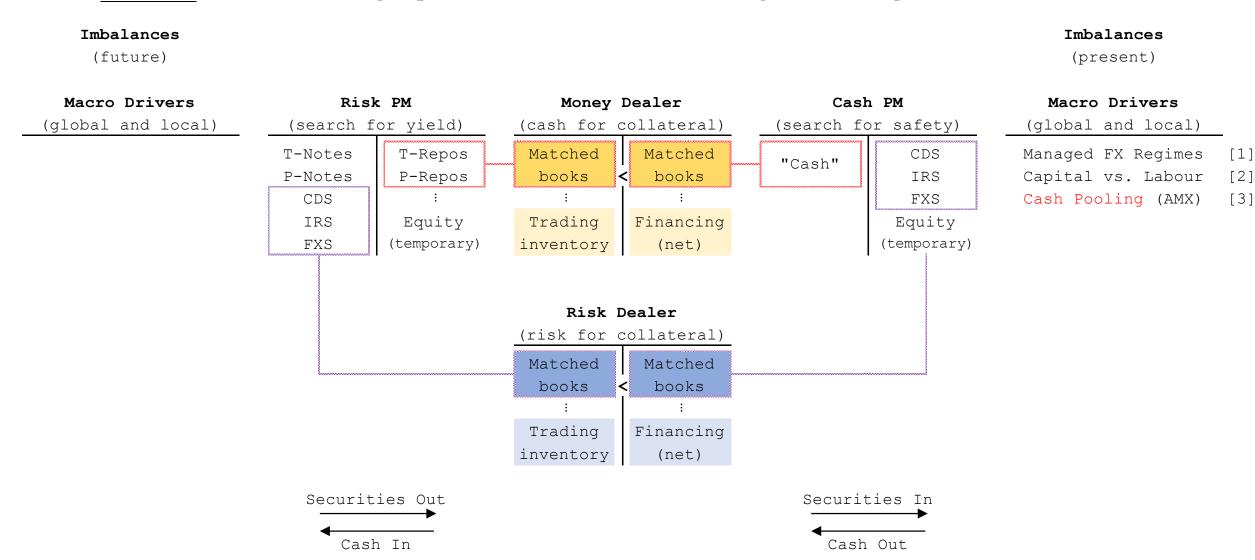
The secular rise of cash PMs has been driven by...

[2] the <u>secular</u> rise of corporate profits vs. stagnant wages and capex (see Summers, 2013).



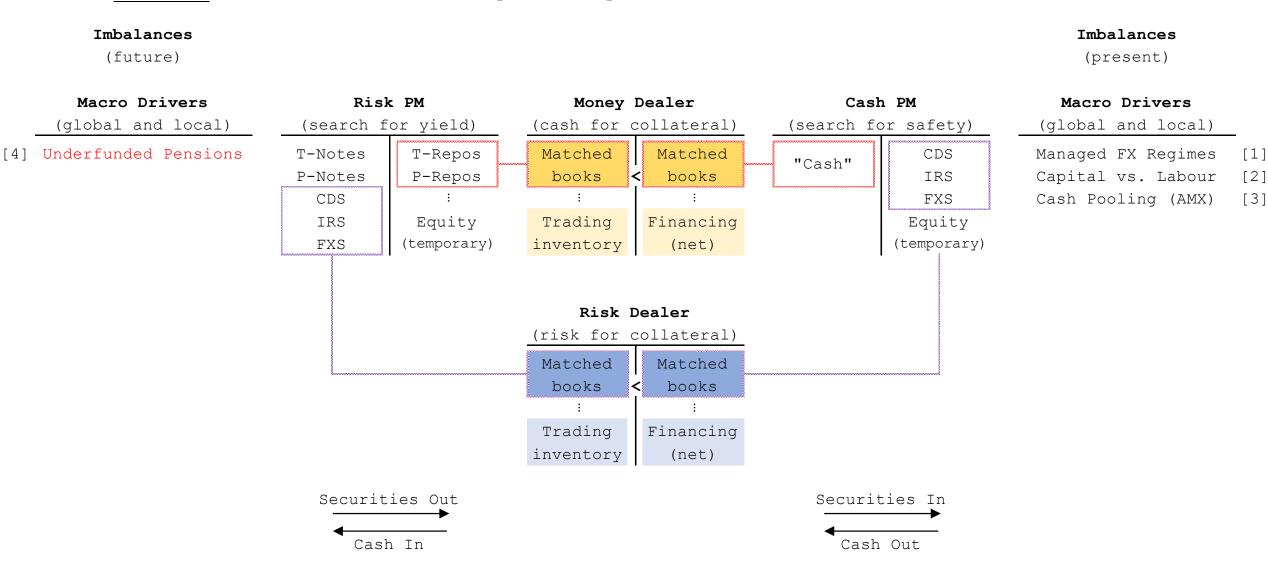
The secular rise of cash PMs has been driven by...

[3] the secular rise of a highly concentrated asset management complex (see OFR, 2013).



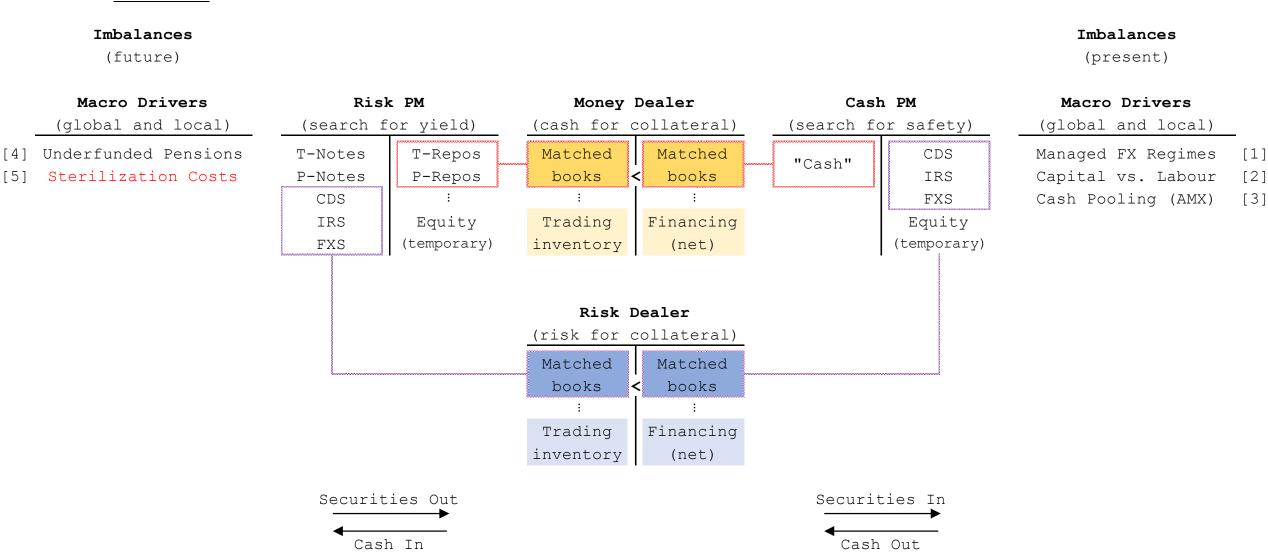
The secular rise of risk PMs has been driven by...

[4] the secular rise in underfunded pension promises (see Caballero, 2013).



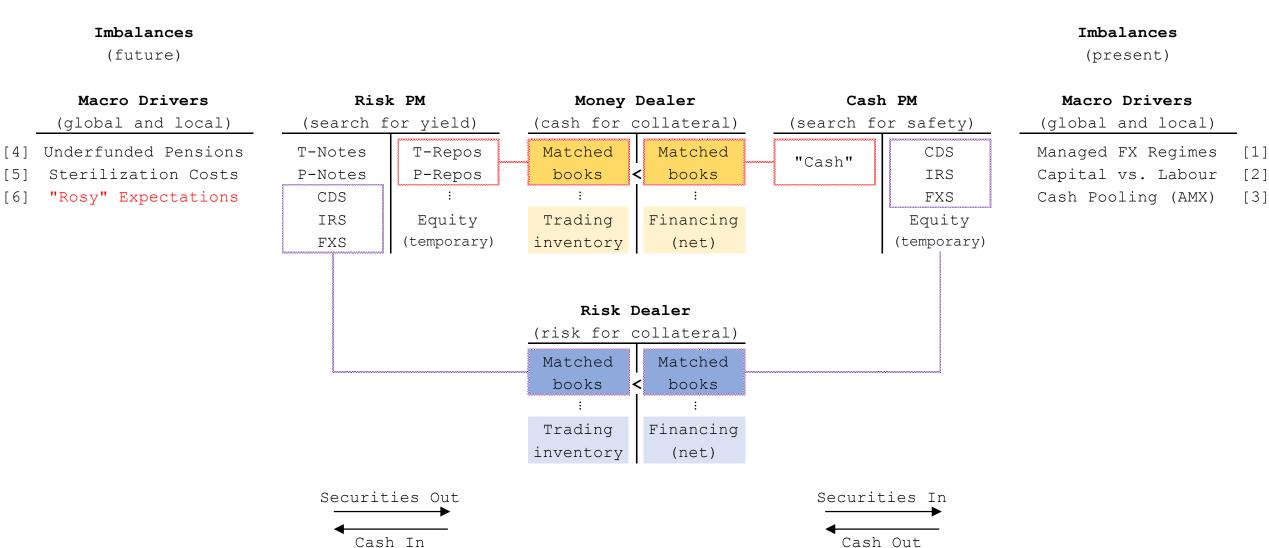
The secular rise of risk PMs has been driven by...

[5] the secular rise in FX reserves' sterilization costs (see Borio et al, 2008).

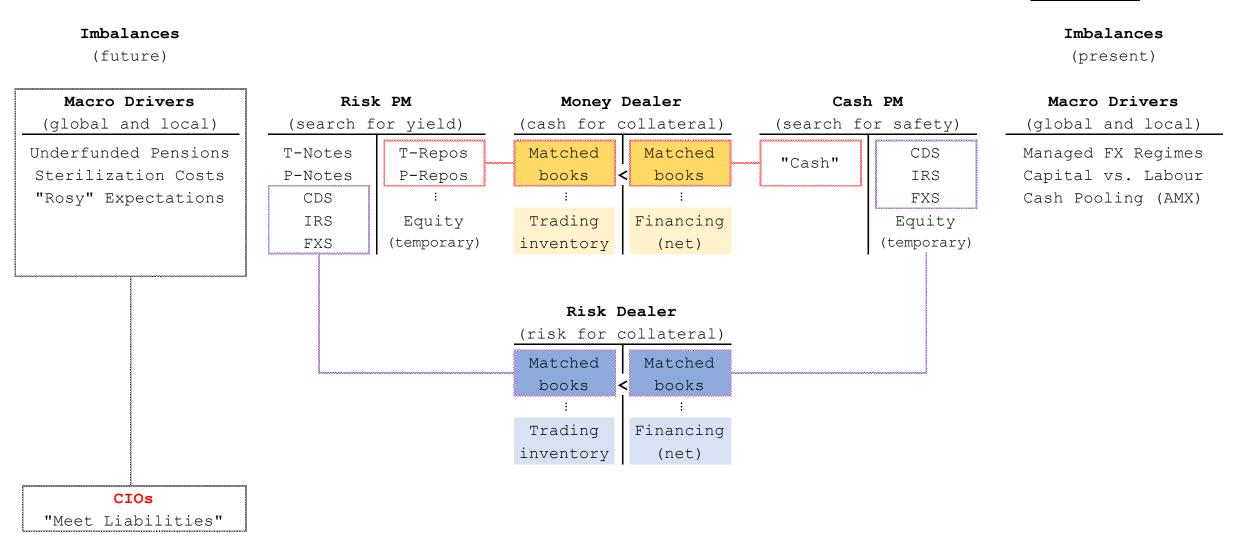


The secular rise of risk PMs has been driven by...

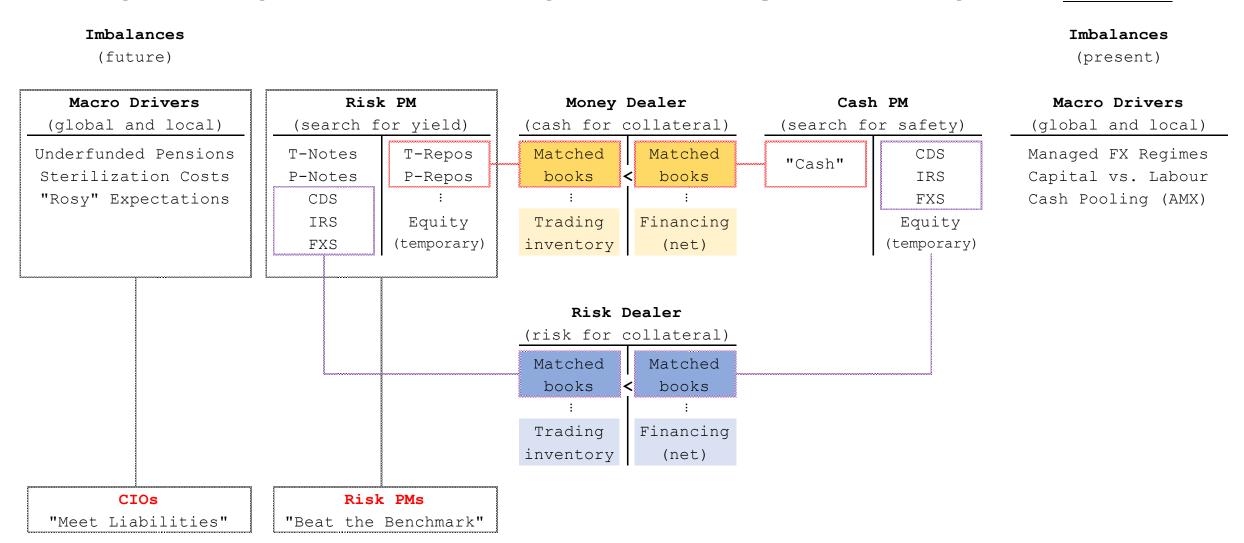
[6] the secular decline in yields and un-changed return expectations (see BlackRock, 2013).



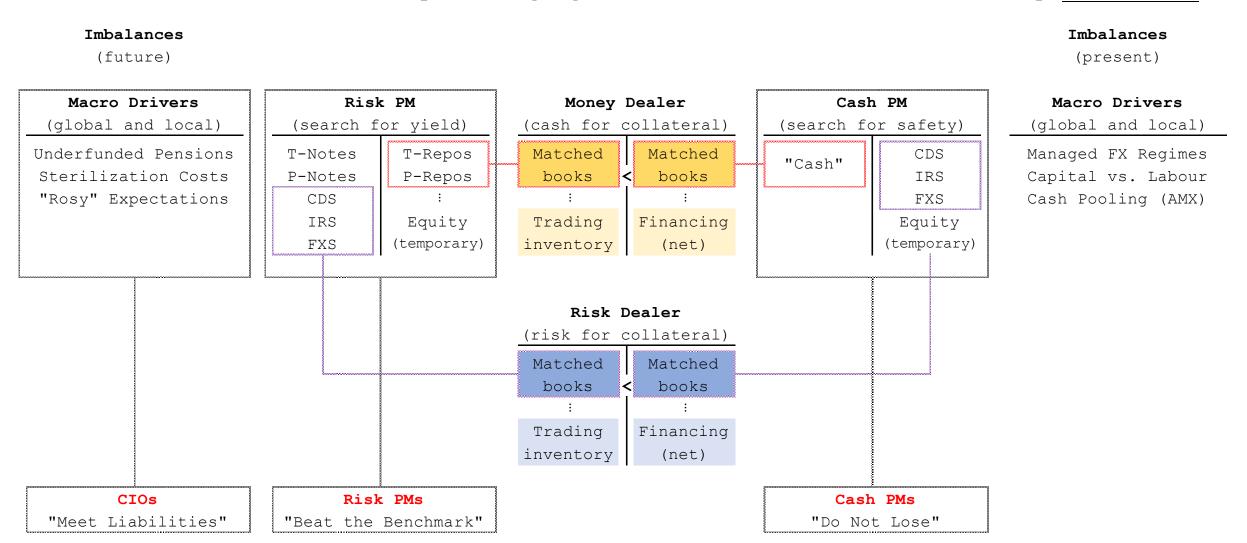
[1] <u>CIOs</u> aim to generate enough return to fulfil their mandate to "<u>meet liabilities</u>". This is why CIOs look beyond long-only strategies and allocate to leveraged risk PMs.



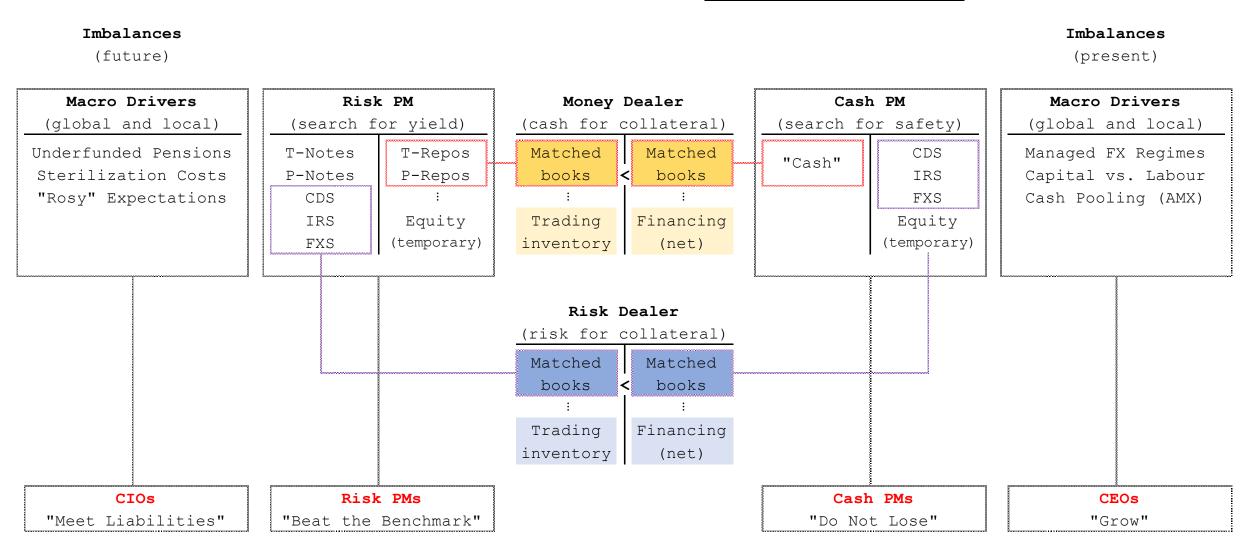
[2] Risk PMs aim to generate enough return to fulfil their mandate to "beat benchmarks". Risk PMs get leverage from dealers, who get the cash to provide leverage from cash PMs.



[3] <u>Cash PMs</u> aim to generate some return while fulfilling their mandate to "<u>do not lose</u>". Cash PMs minimize credit risk by lending against collateral and are fanned by imbalances.



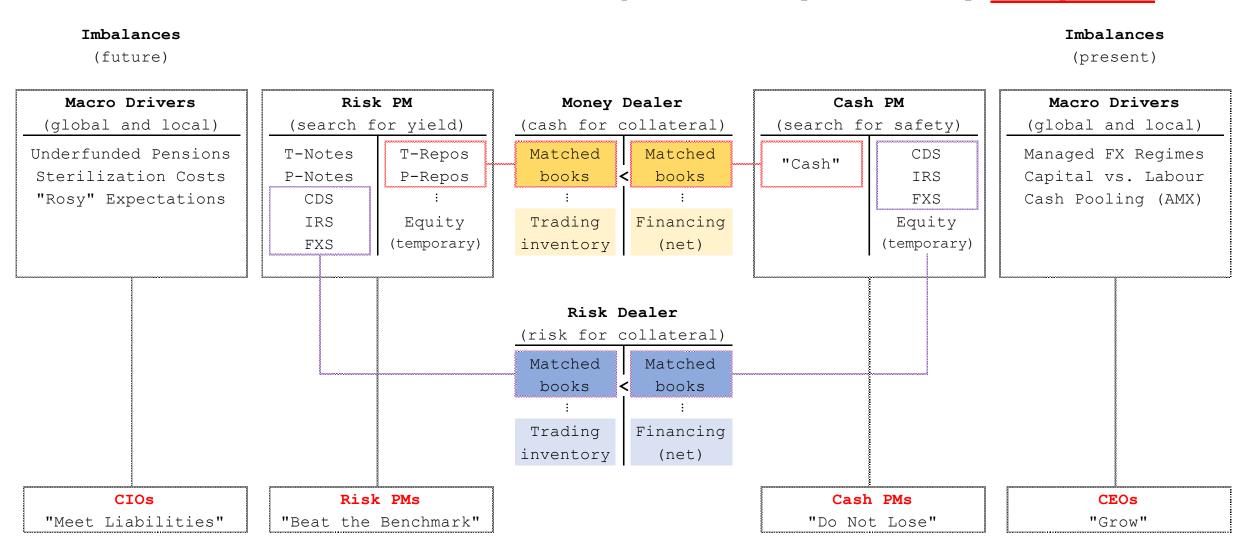
[4] <u>CEOs</u> at both the corporate and national levels are mandated to "grow" their profits and economies, respectively and this contributes to the skewed distribution of present incomes.



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Implications for macro and asset price models:

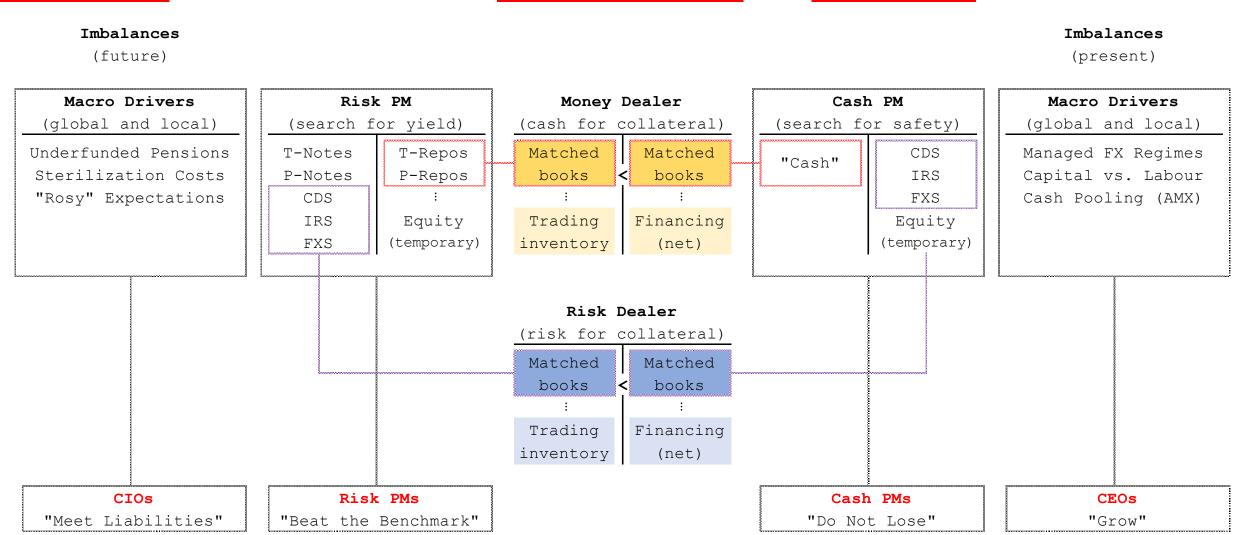
These goal-driven rigidities are not included in asset price models. Topics for future research include the extent to which these compress the 10-year Treasury term premium.



Source: Pozsar (2014)

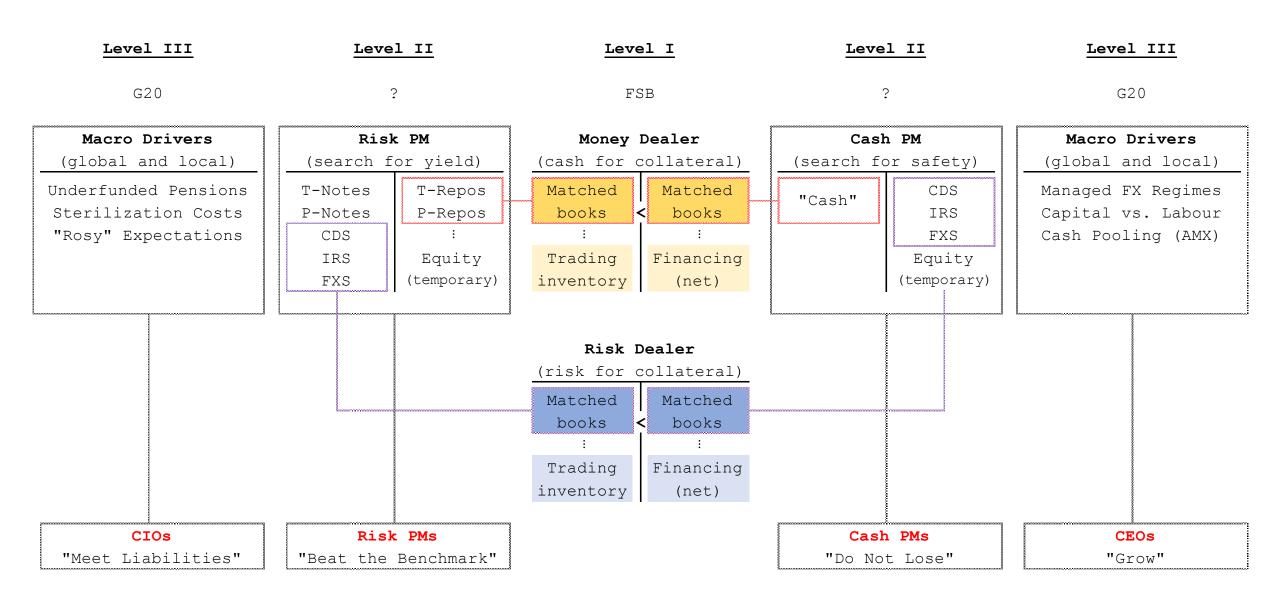
Implications for global macro-financial accounting:

None of these aspects of the eco-system are measured by the U.S. Flow of Funds Accounts. The **Flow of Funds** accounts need a set of **Flow of Collateral** and **Flow or Risk** satellite accounts.



Source: Pozsar (2014)

Implications for governance:



Source: Pozsar (2014)

Conclusions:

A Macro View on Shadow Banking

- 1. Bond portfolios are getting more and more leveraged and bonds are becoming more and more valuable as collateral.
- 2. Leveraged bond portfolios help asset-liability matching in an ever-lower yield environment and collateral gives cash pools safety in a system w/ an outdated safety net.
- 3. Credit, maturity and liquidity transformation is a start, but ask "why": to manage future and present imbalances.
- 4. Credit transformation: bond-like volatility and equity-like returns to help CIOs meet future promises ("theme").
- 5. Maturity and liquidity transformation: safe, short-term assets for the safekeeping of skewed incomes ("theme").
- 6. RRPs are about more than just controlling short rates. They give shadow banks access to a reserve account at the Fed, and are a first step toward "dealer of last resort".

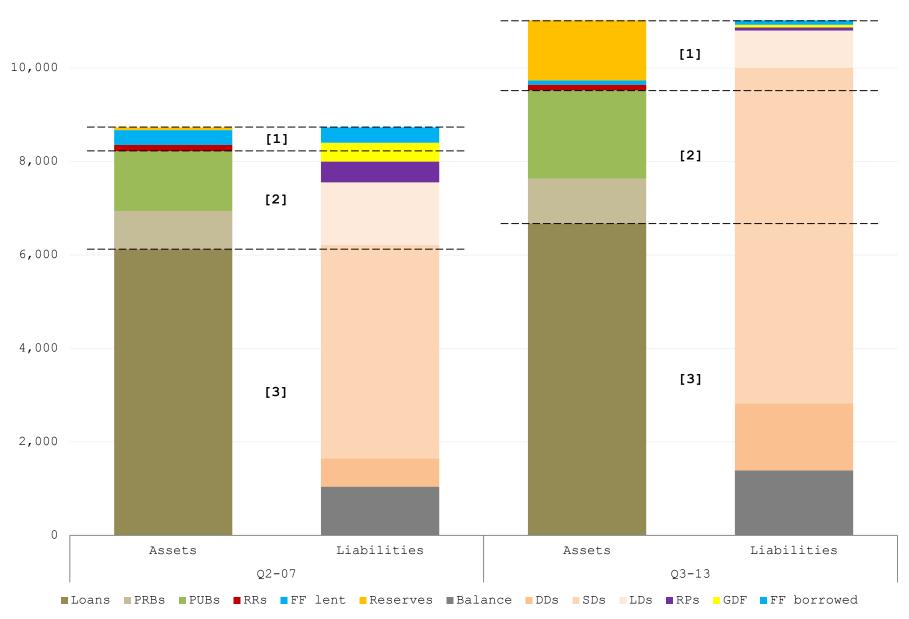
References:

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- Pozsar, Zoltan, 2013, "Shadow Banking and the Global Financial Eco-System," VoxEU.
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- Pozsar, Zoltan, 2011, "Institutional Cash Pools and the Triffin Dilemma of the U.S. Banking System," IMF WP 11/190.

Data Appendix:

12,000

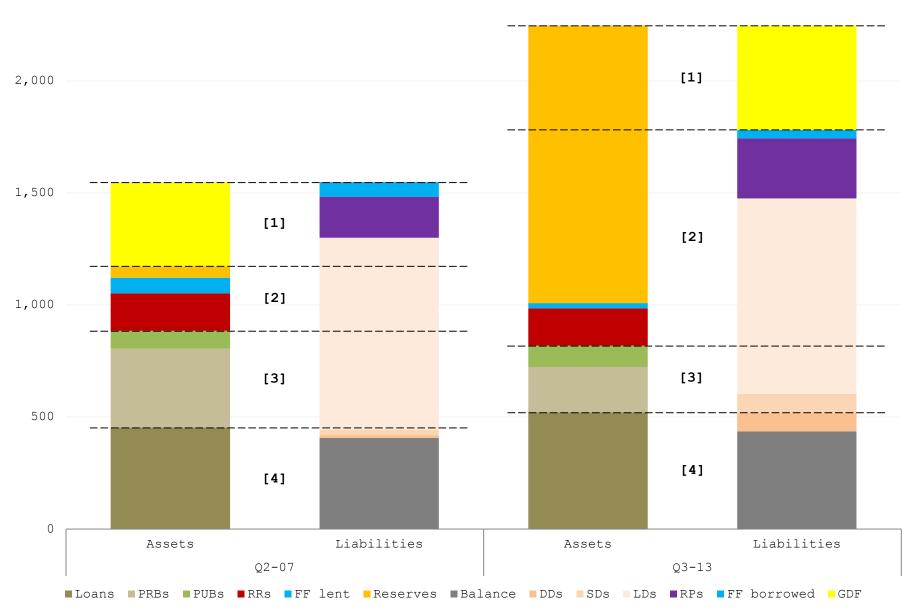
\$ billions



Source: Haver, Federal Reserve Z.1, H.8 and author's calculations

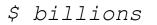
2,500

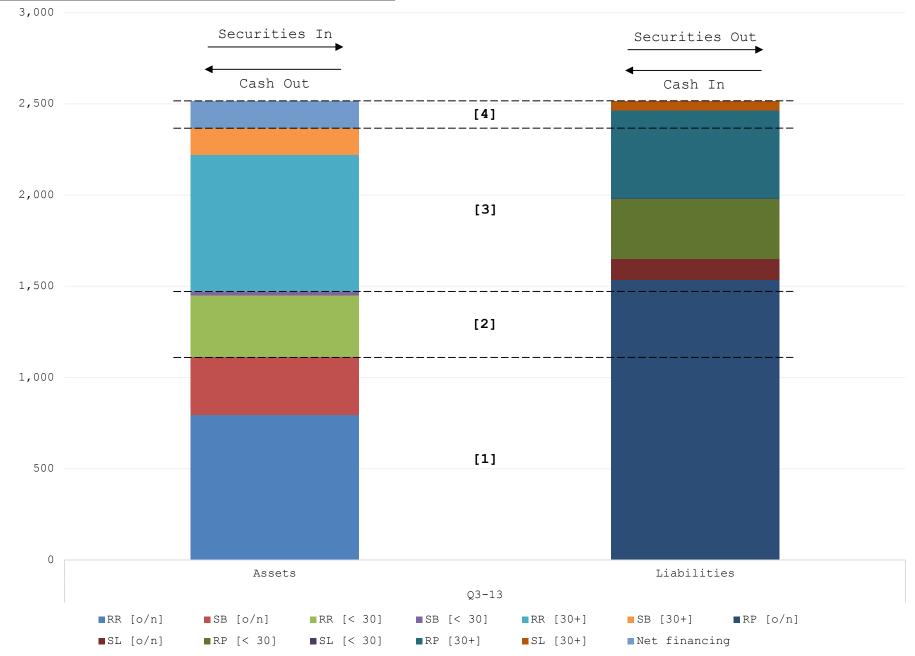
\$ billions



Source: Haver, Federal Reserve Z.1, H.8 and author's calculations

Dealer Banks' "Government" Trading Desks:

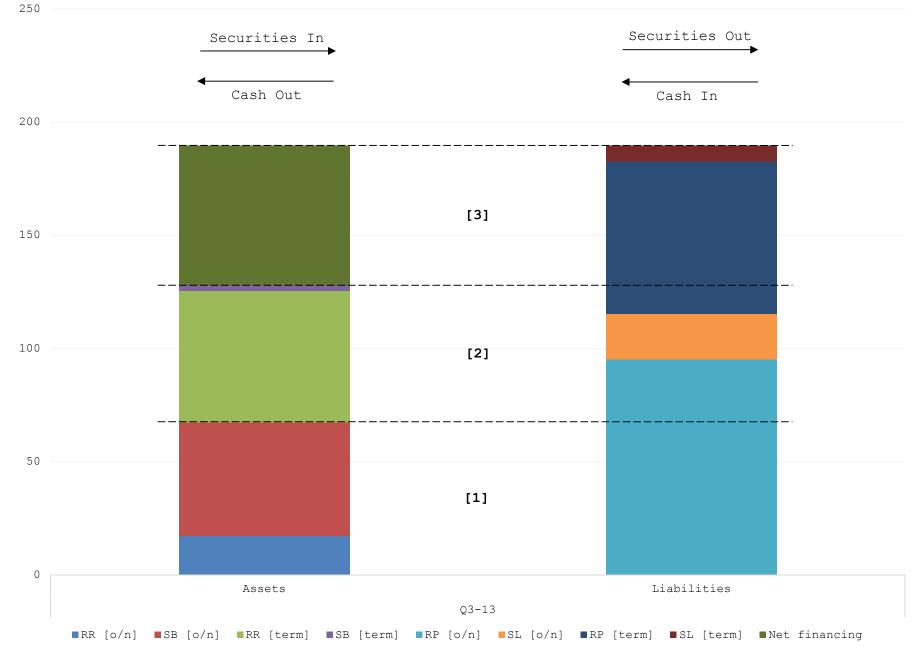




Source: Haver, New York Fed (FR 2004) and author's calculations

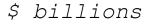
Dealer Banks' "Credit" Trading Desks:

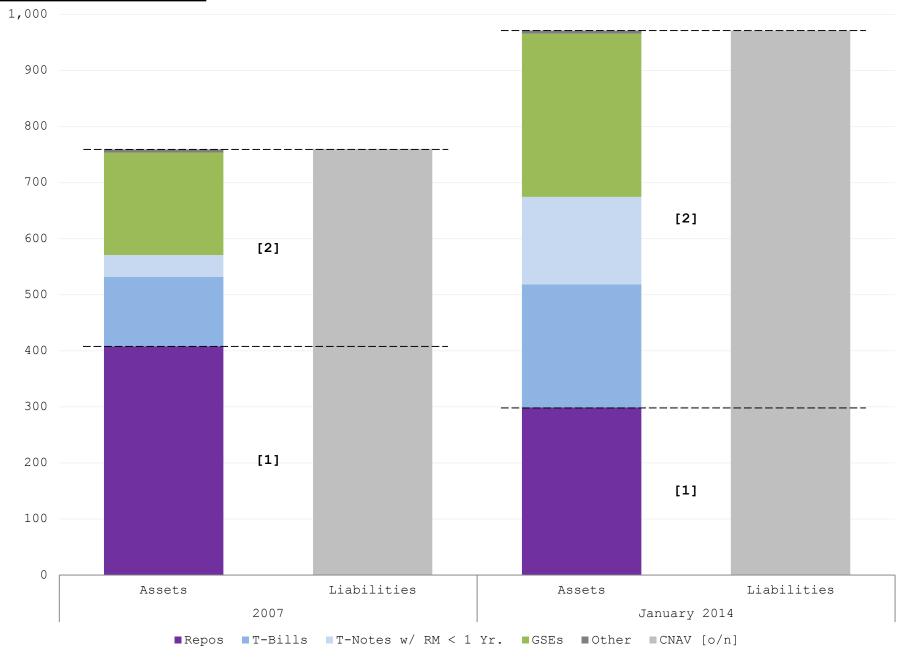
\$ billions



Source: Haver, New York Fed (FR 2004) and author's calculations

Government-Only Money Funds:



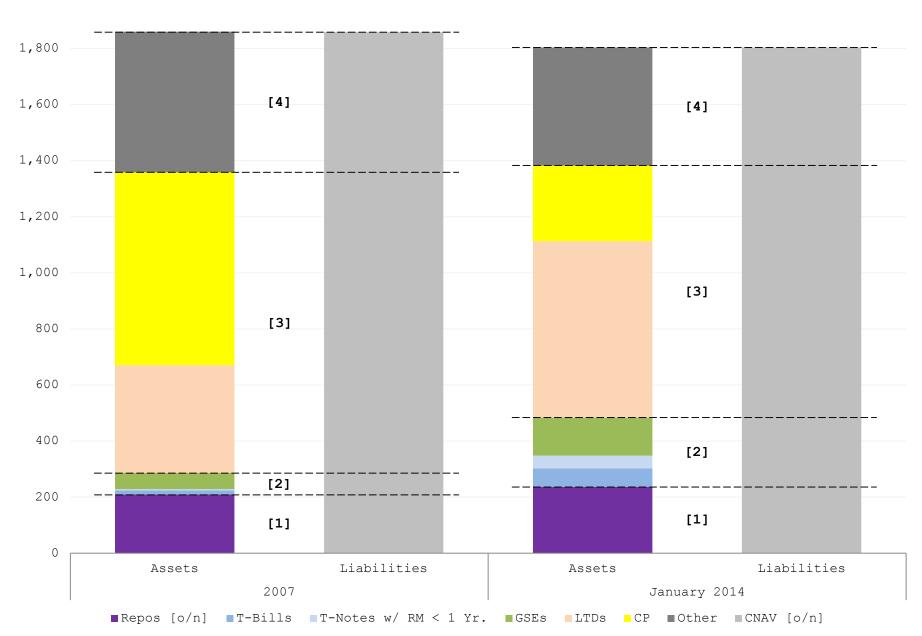


Source: Haver, SEC and author's calculations

Prime Money Funds:

2,000

\$ billions

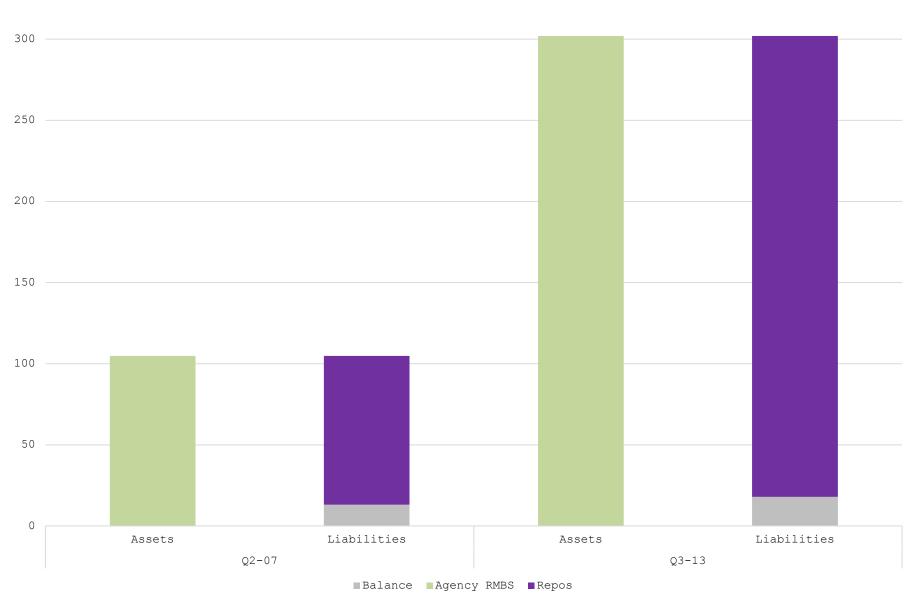


Source: Haver, SEC and author's calculations

Mortgage REITs:

350

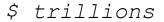
\$ billions

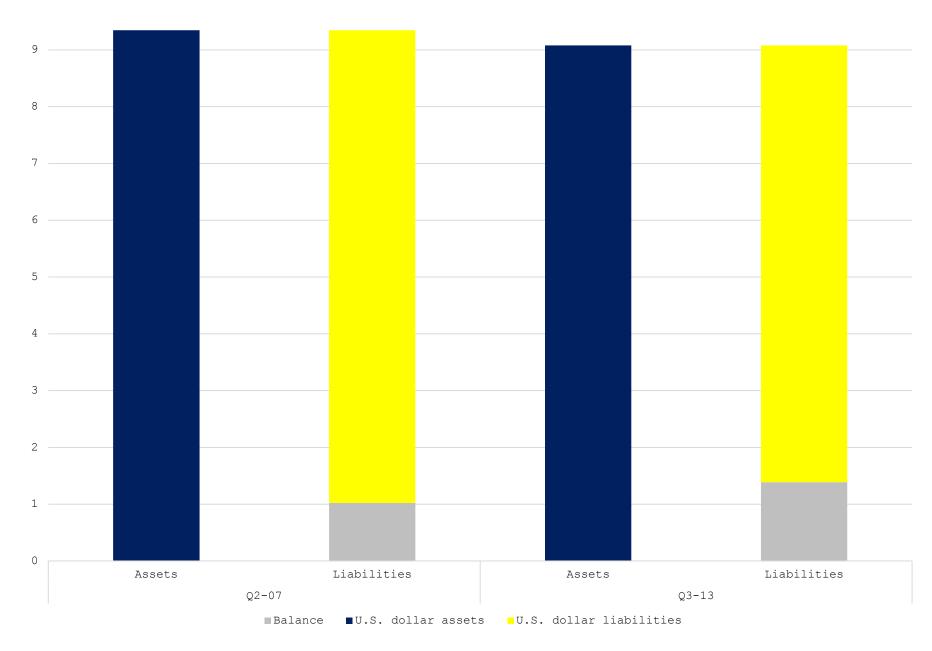


Source: Haver, Federal Reserve Z.1

Offshore Dollar Banking:

10





Source: BIS