

How the Financial System Works

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

by Zoltan Pozsar

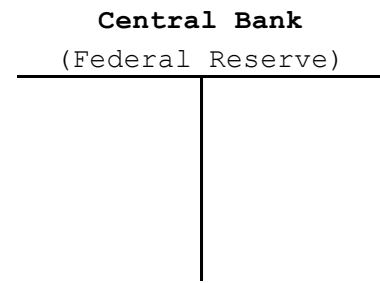
Senior Adviser

Office of Financial Research, U.S. Treasury

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.

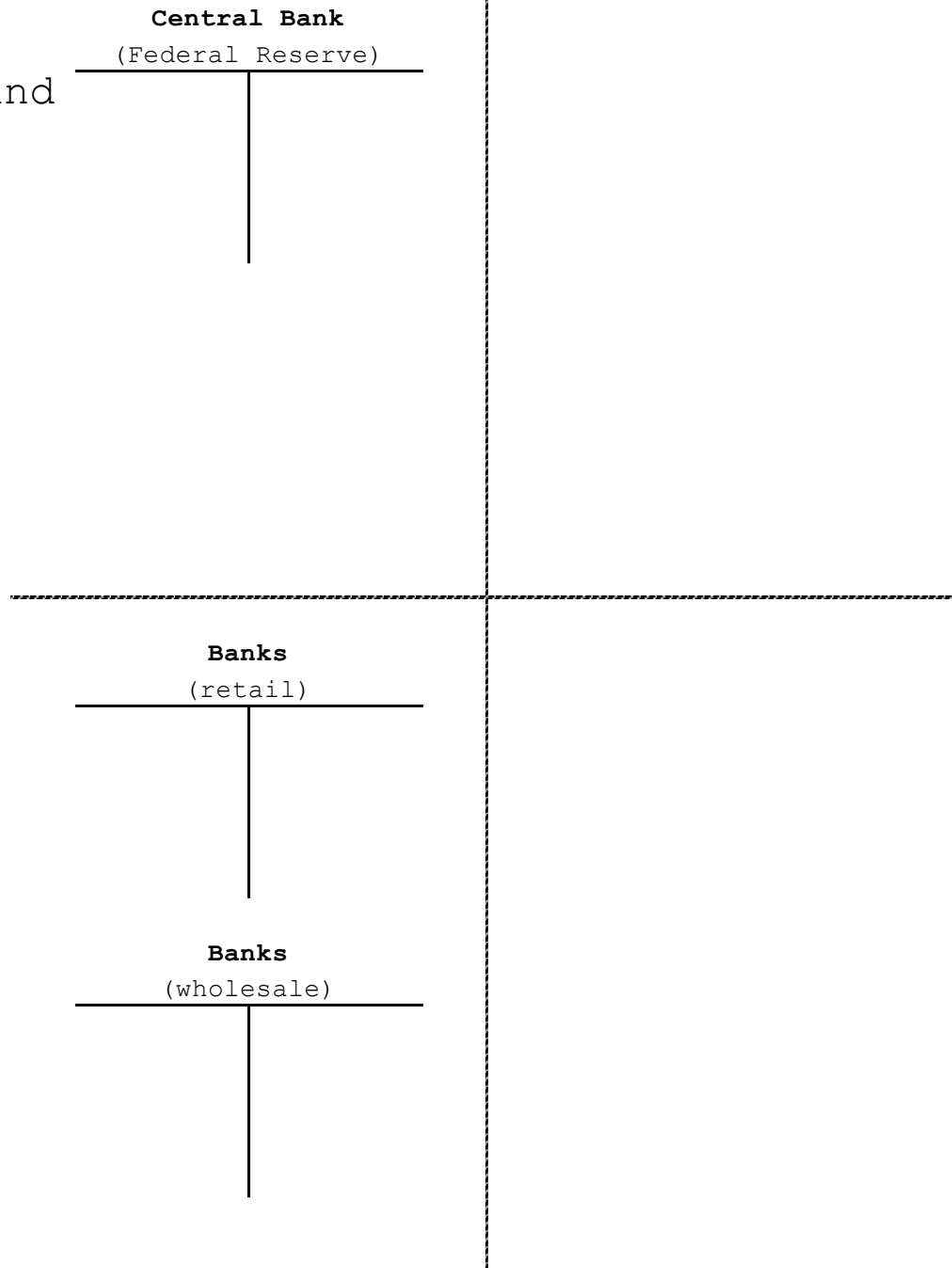
Four core institutions:

Central bank, ...



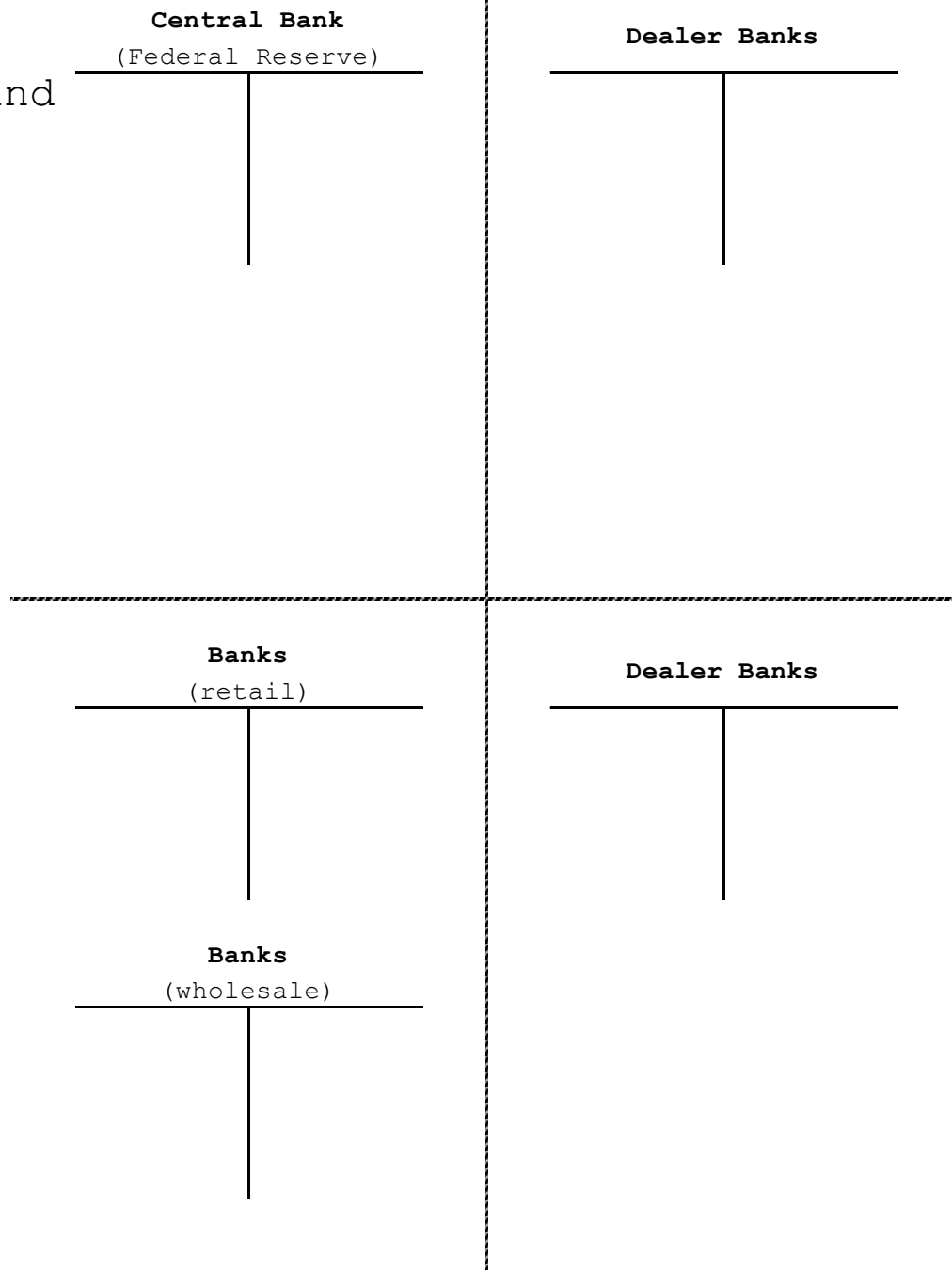
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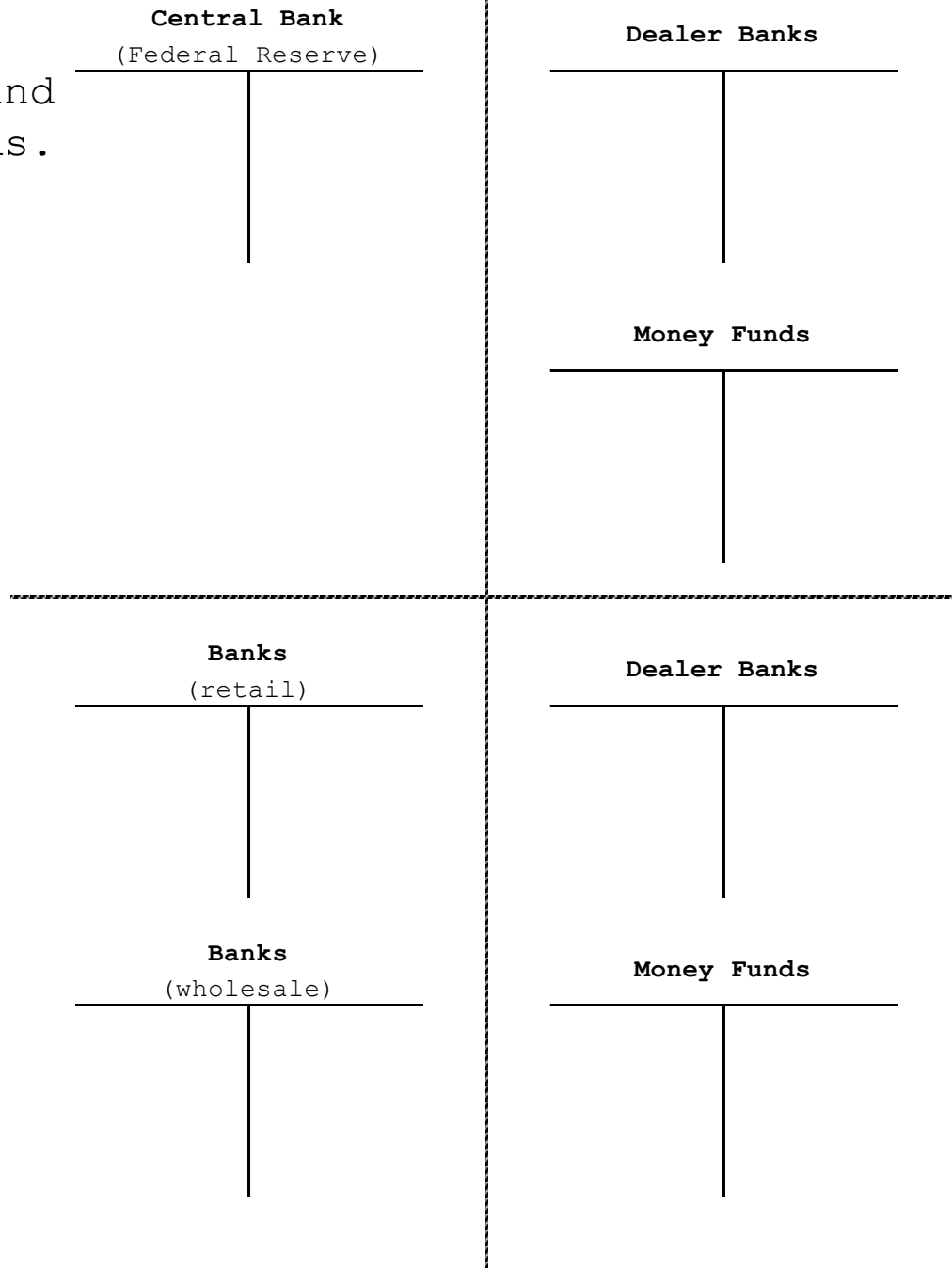
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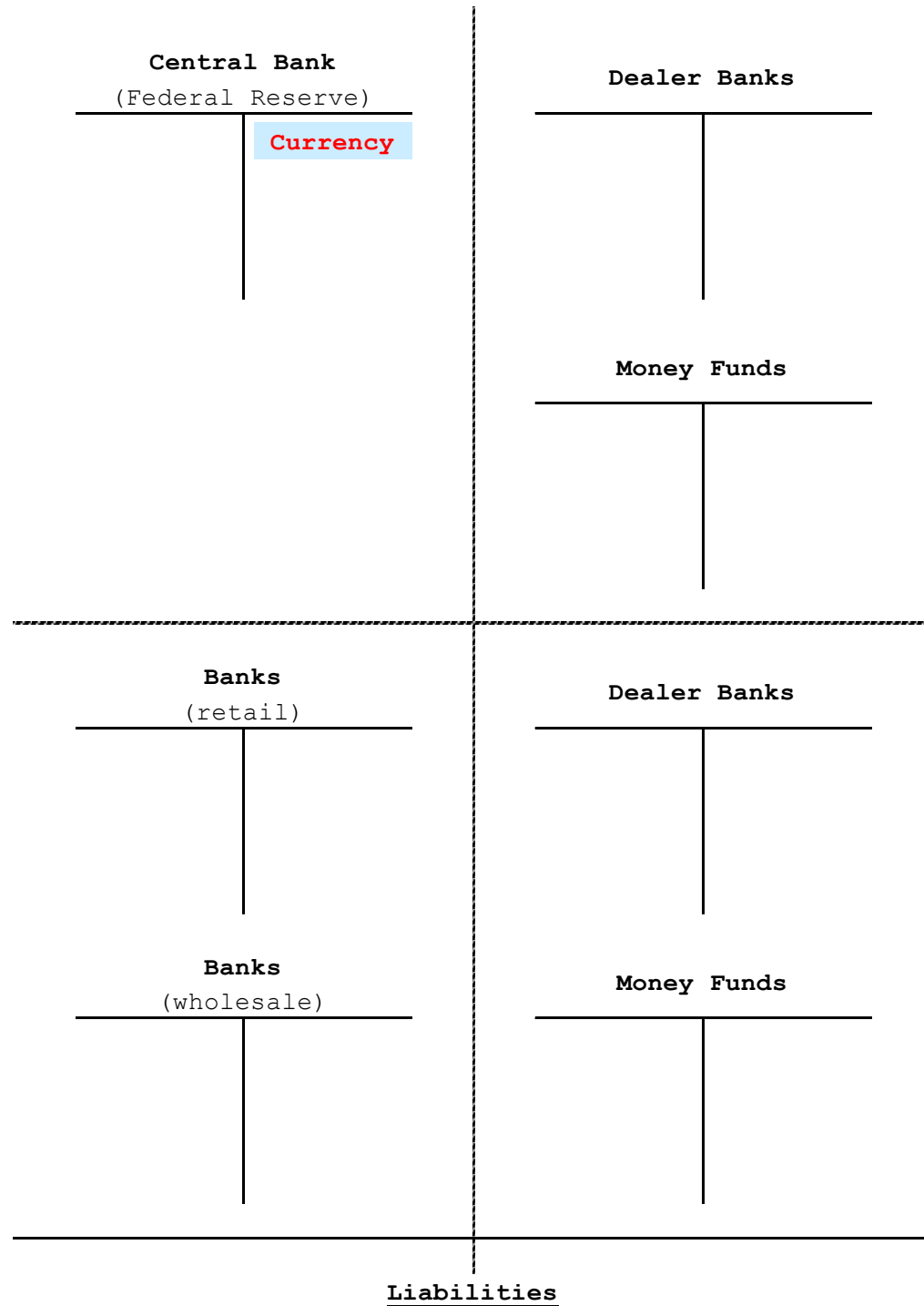
Four core institutions:

Central bank, banks (small and big), dealers and money funds.



Four core money claims:

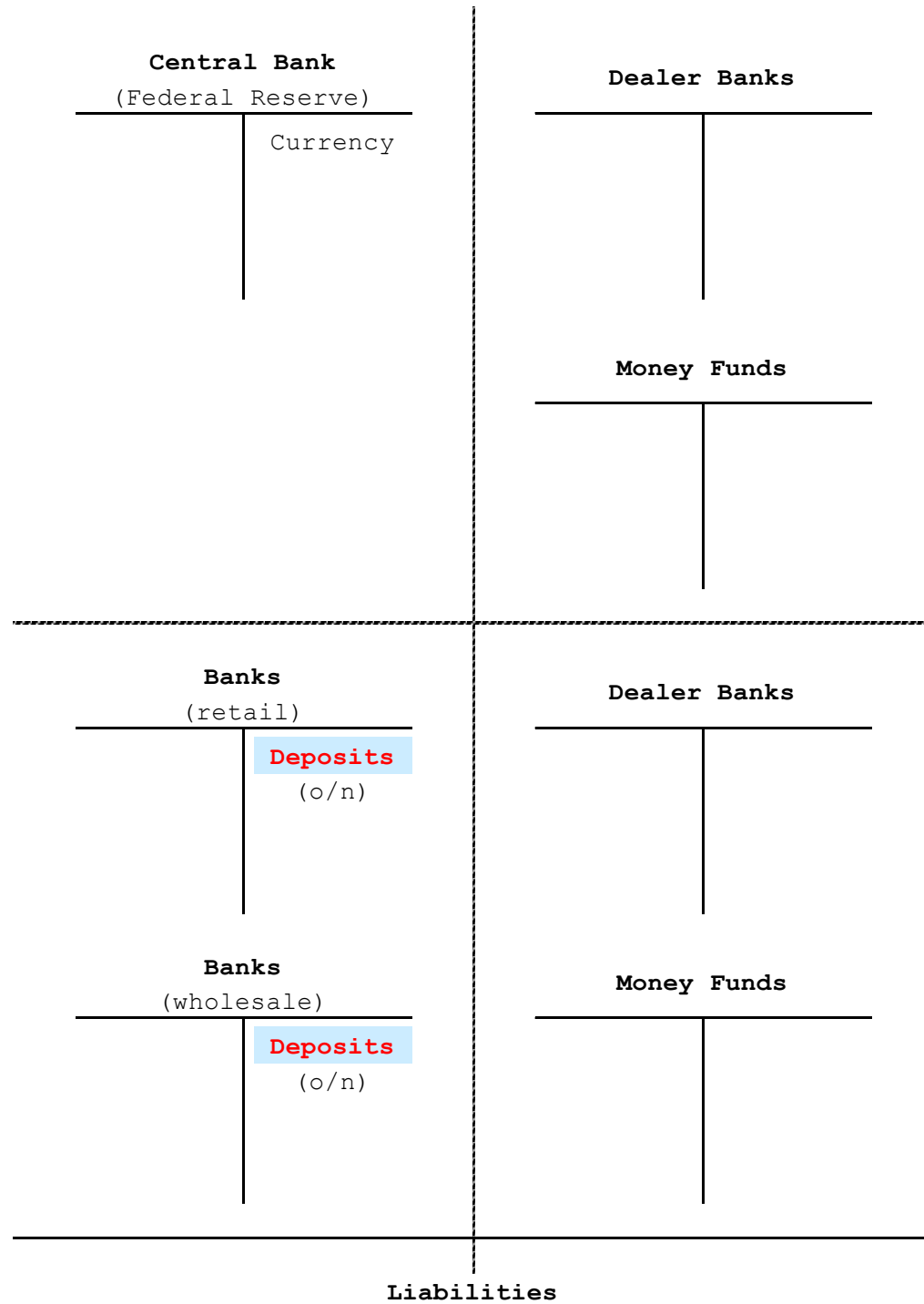
Currency, ...



Source: Pozsar (2014)

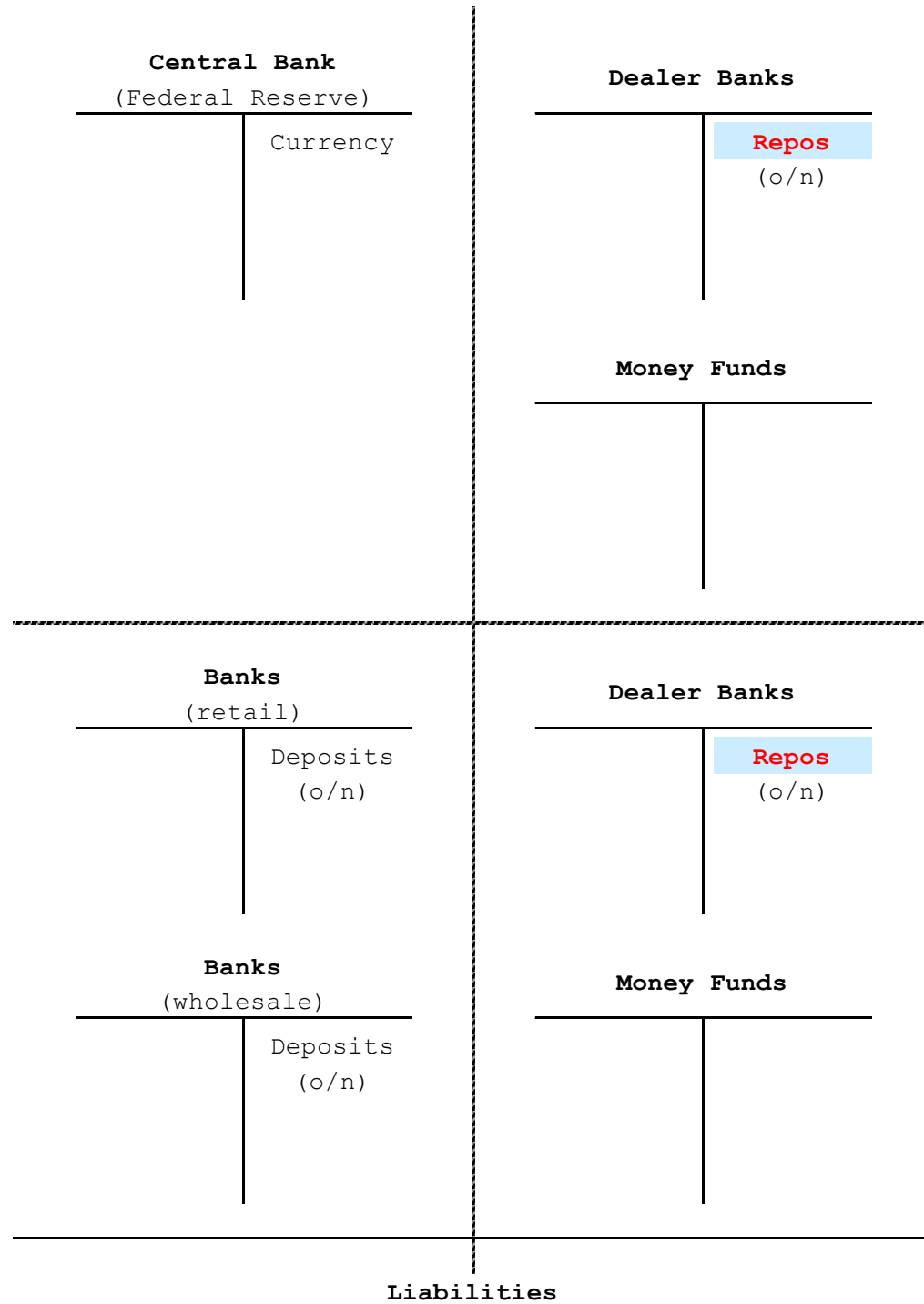
Four core money claims:

Currency, deposits, ...



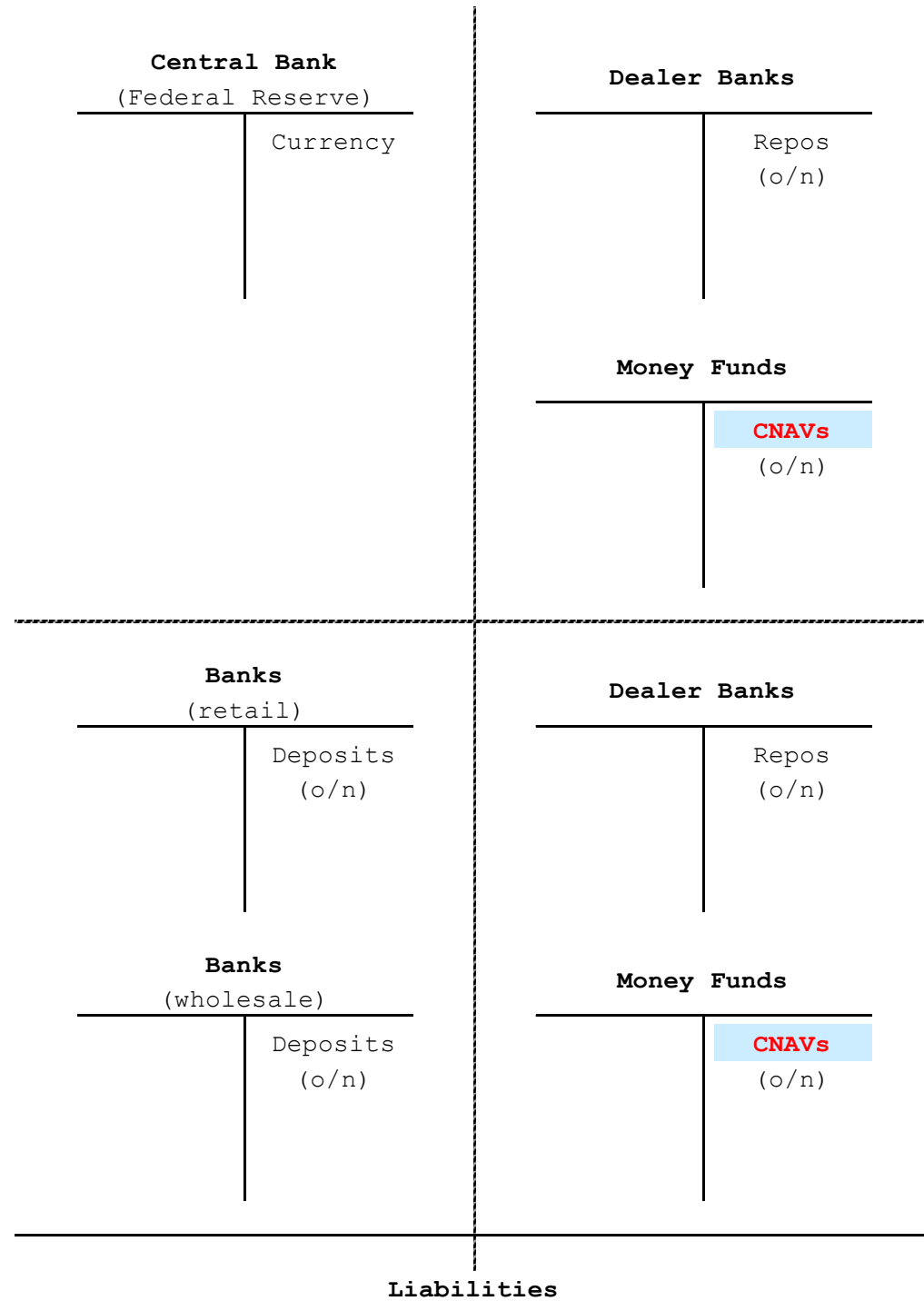
Four core money claims:

Currency, deposits, repos,...



Four core money claims:

Currency, deposits, repos
and constant NAV shares.



Two categories of assets:

Public assets:

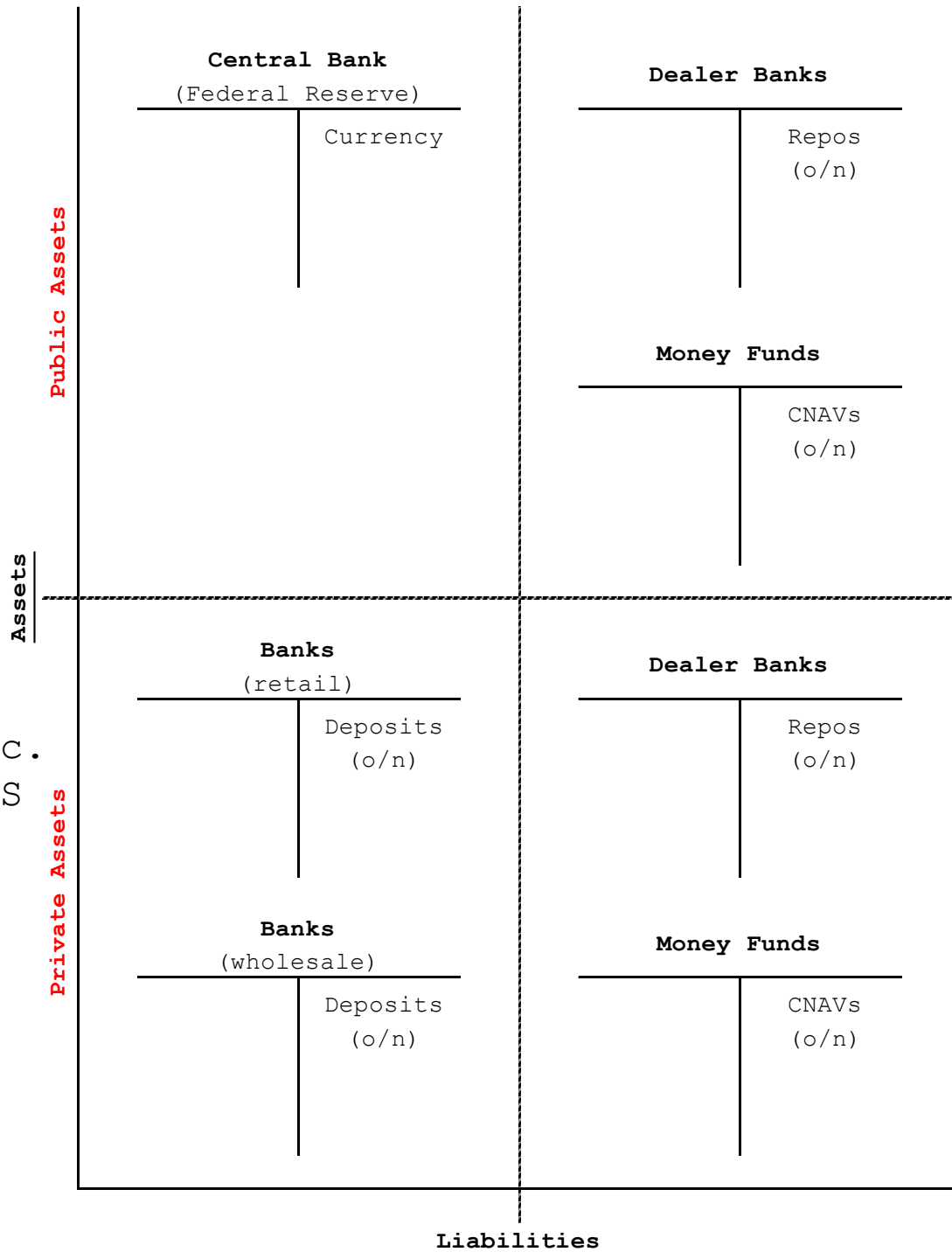
T-Bills - Treasury bills

T-Notes - Treasury notes

Private assets:

P-Bills - CD, CP, ECP, etc.

P-Notes - bonds, RMBS, ABS



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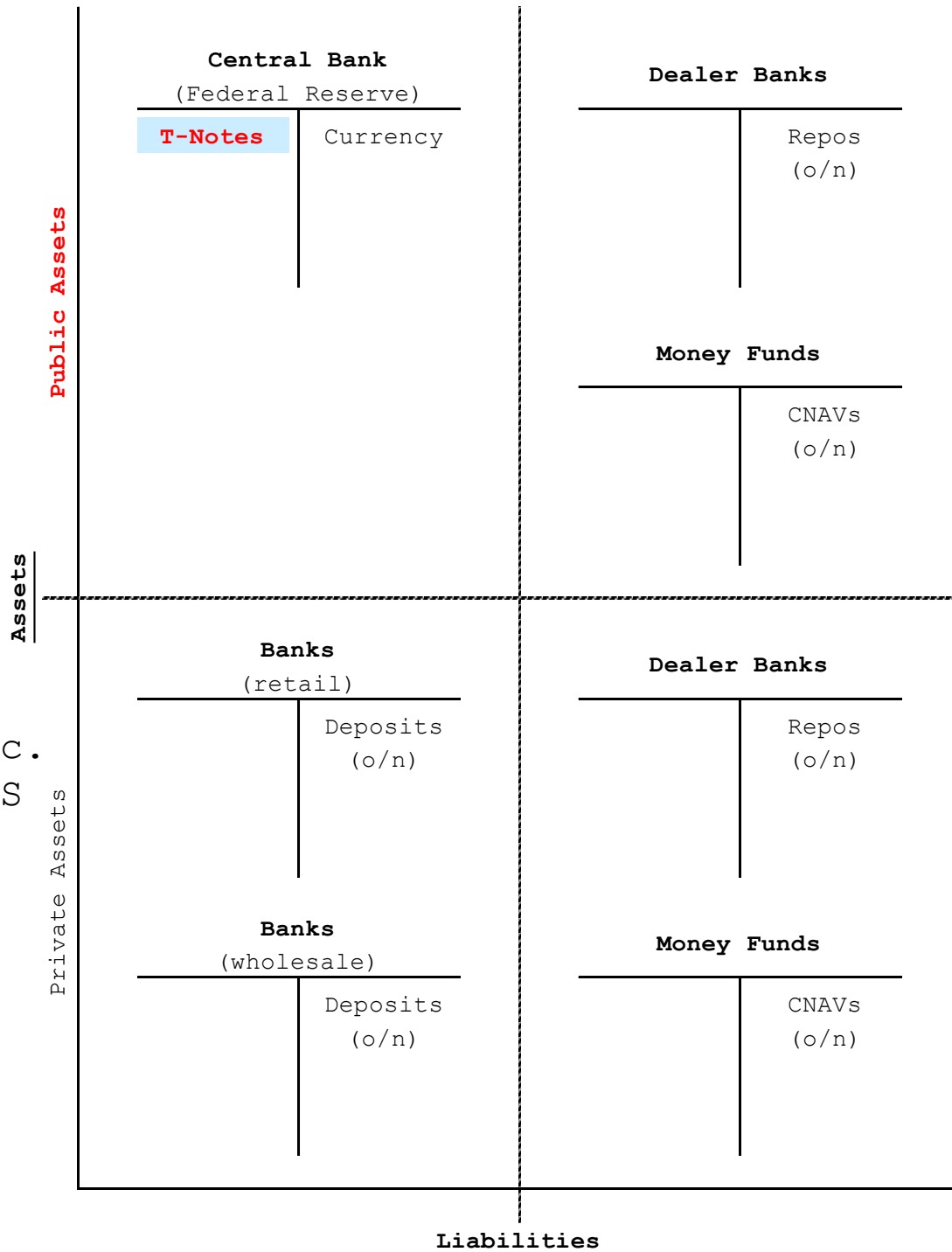
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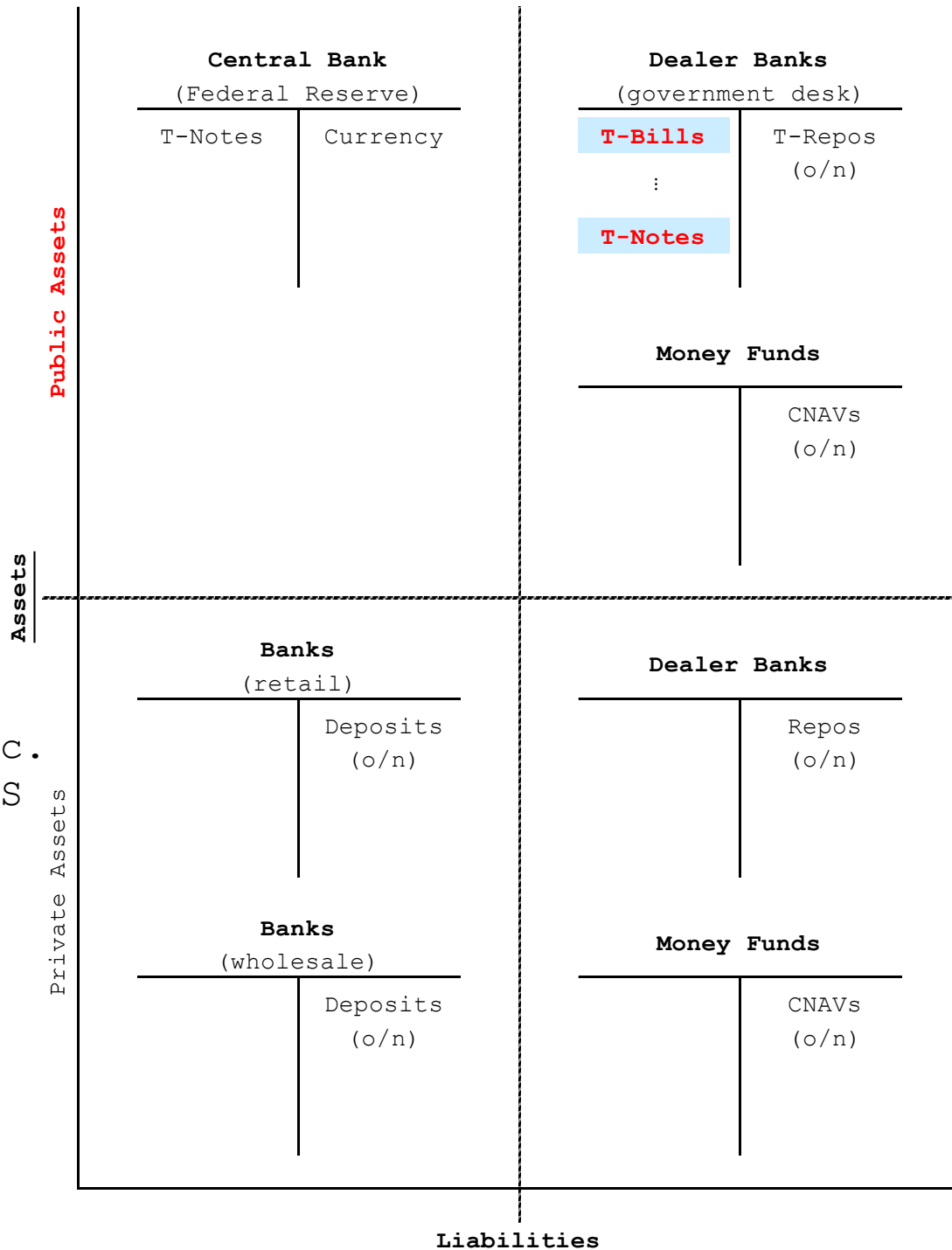
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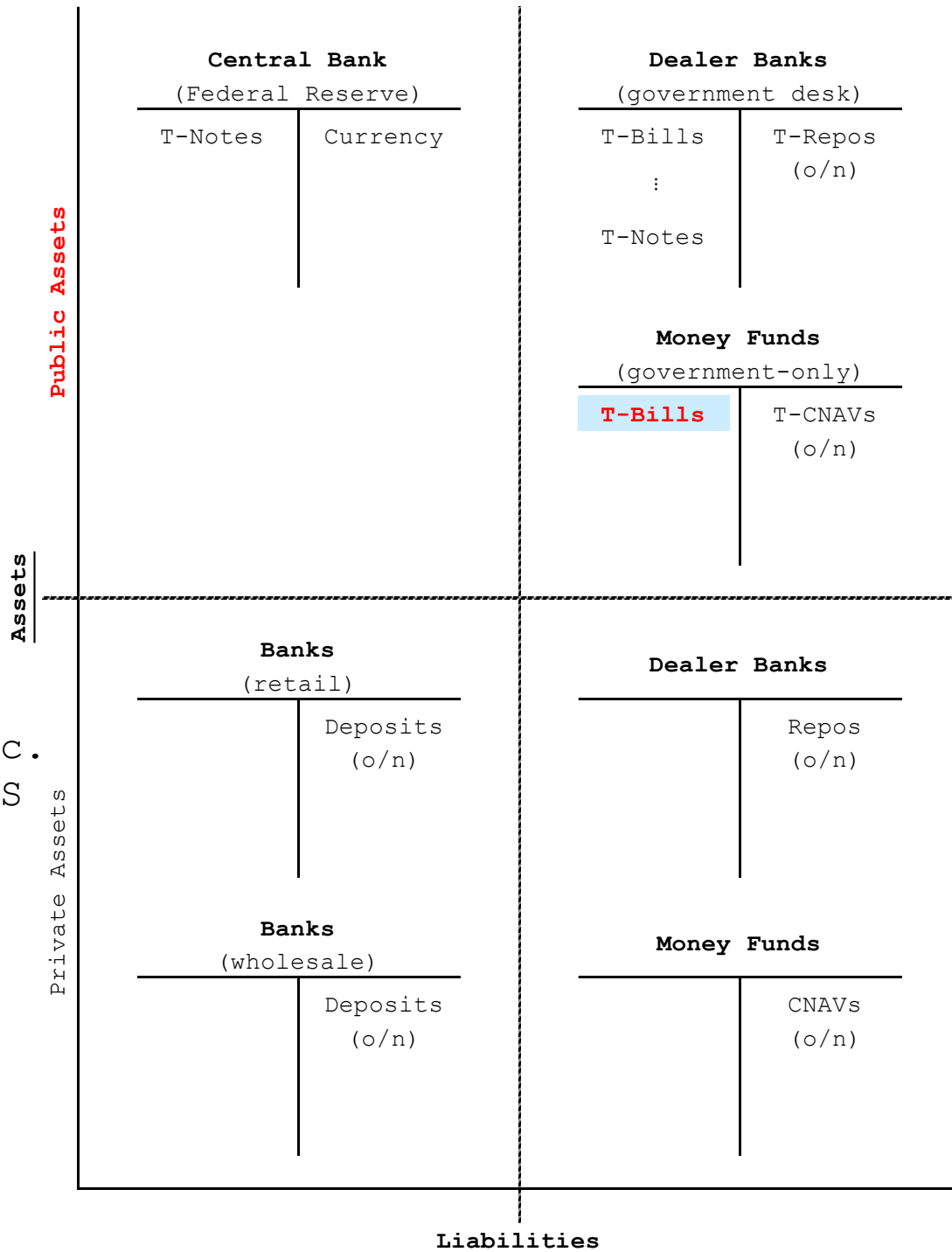
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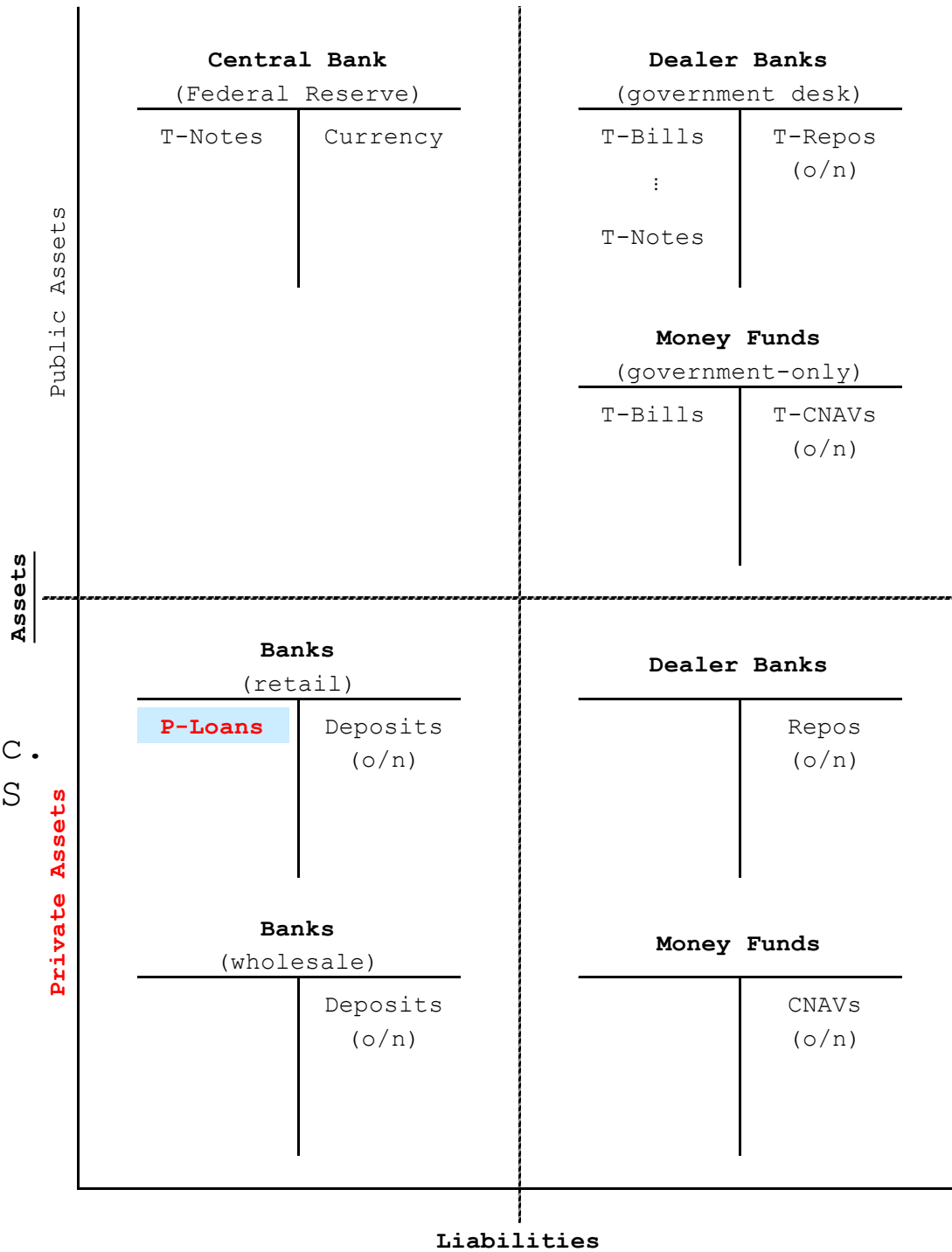
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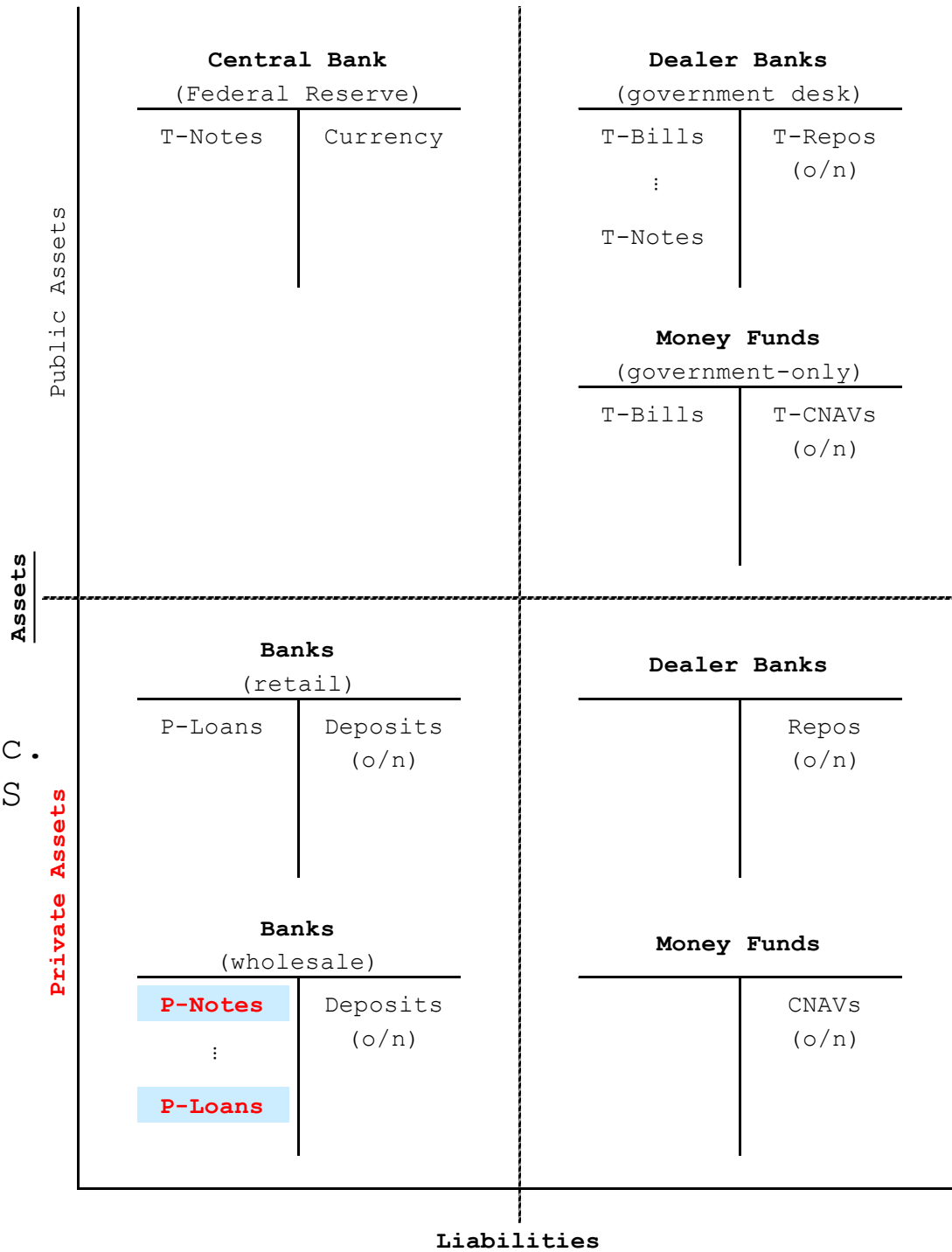
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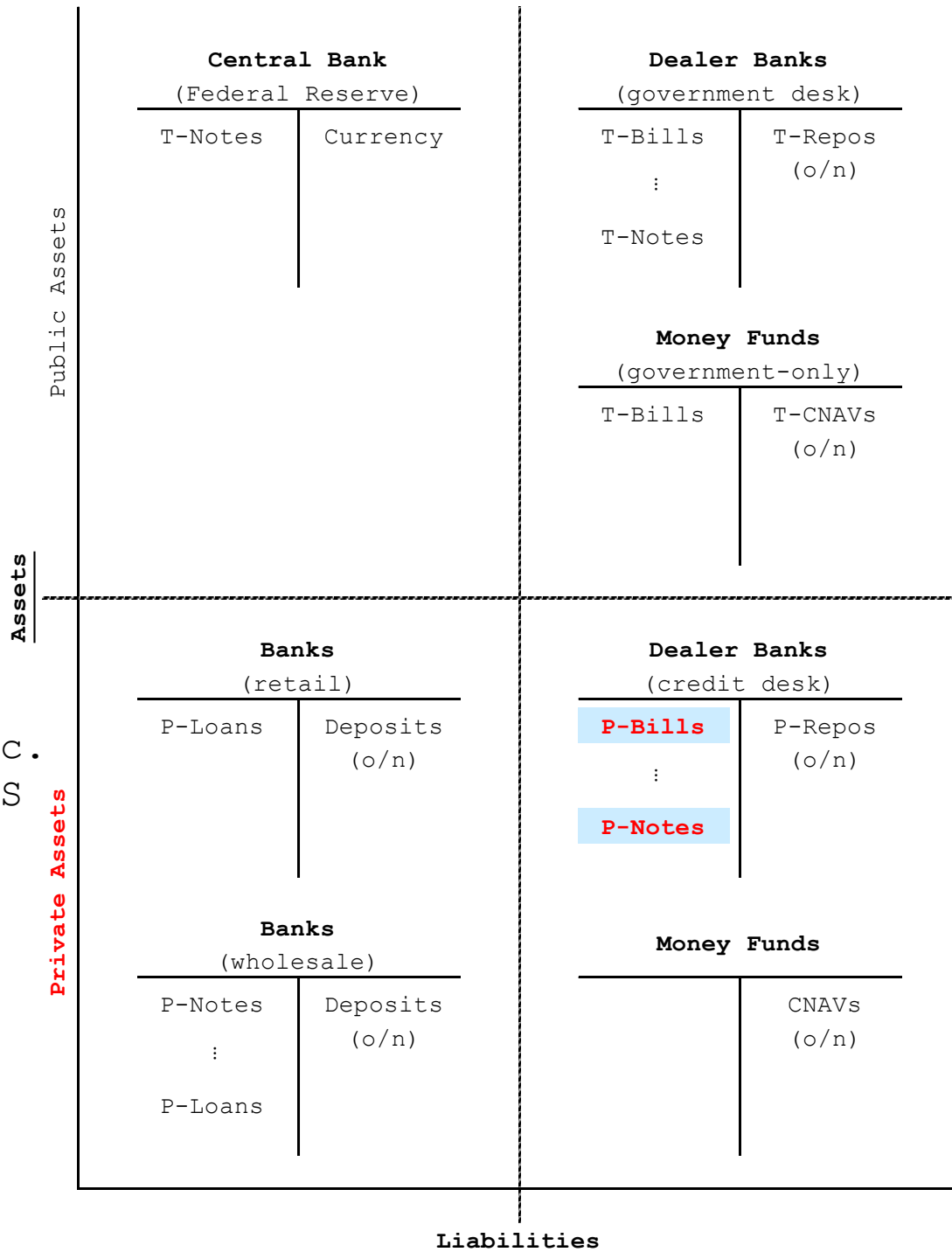
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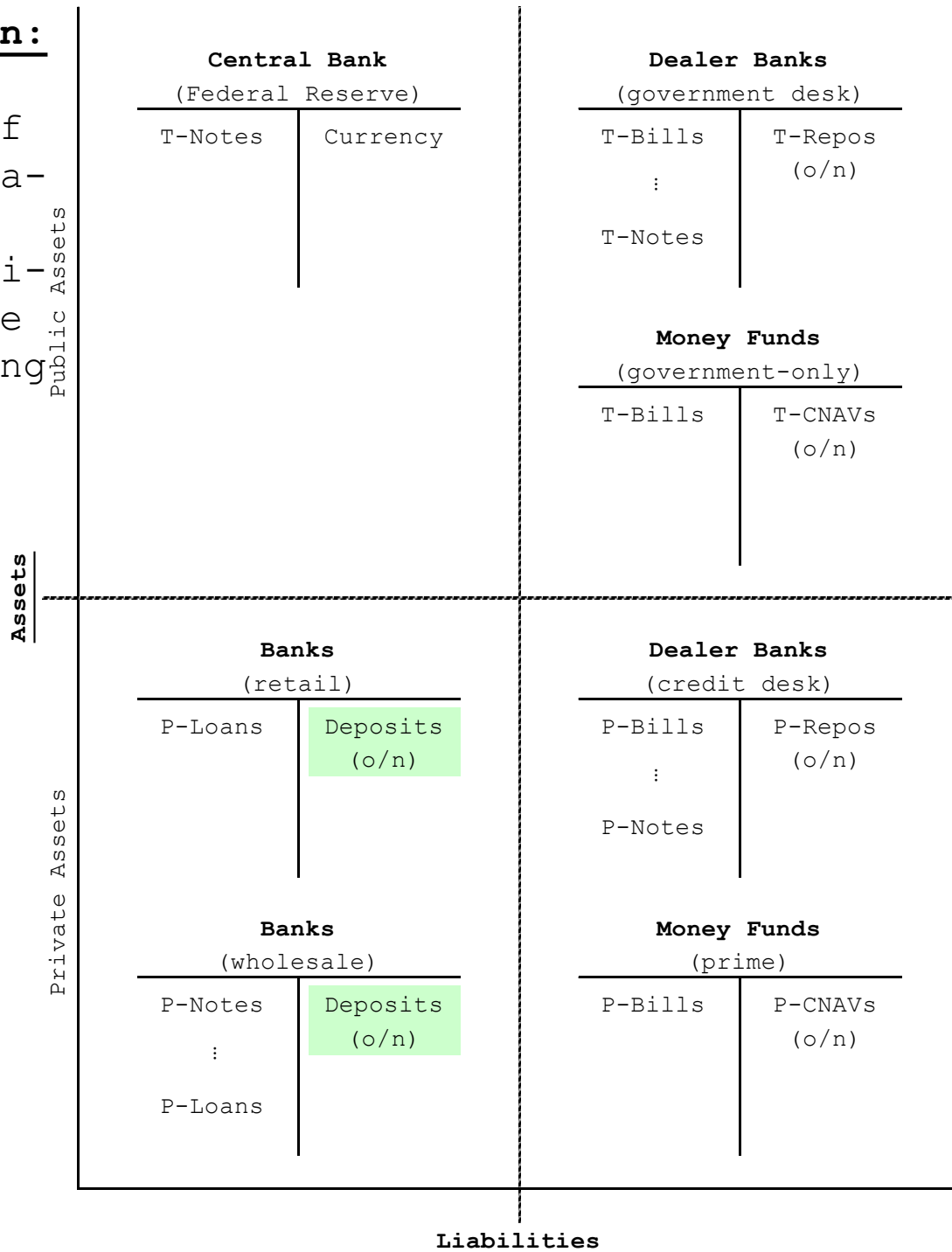
P-Repos - private repos

P-CNAVs - private CNAVs

Public Assets	Central Bank (Federal Reserve)		Dealer Banks (government desk)	
	T-Notes	Currency	T-Bills	T-Repos (o/n)
			:	
			T-Notes	
	Money Funds (government-only)			
	T-Bills	T-CNAVs (o/n)		
Assets				
Private Assets	Banks (retail)		Dealer Banks (credit desk)	
	P-Loans	Deposits (o/n)	P-Bills	P-Repos (o/n)
			:	
			P-Notes	
	Banks (wholesale)		Money Funds (prime)	
	P-Notes	Deposits (o/n)	P-Bills	P-CNAVs (o/n)
	:			
	P-Loans			
			Liabilities	

Deposits' special function:

Banks form the backbone of the payments system and facilitate the **net payments** (via deposits) of all entities that are lower in the system-hierarchy, including dealers and money funds.



Storing payment surpluses:

What happens with net payment **surpluses** at the end of the day? Through what instruments are money balances stored within the system?

For every institution, money is something different.

This is the intra-system hierarchy of money...

Public Assets

Assets

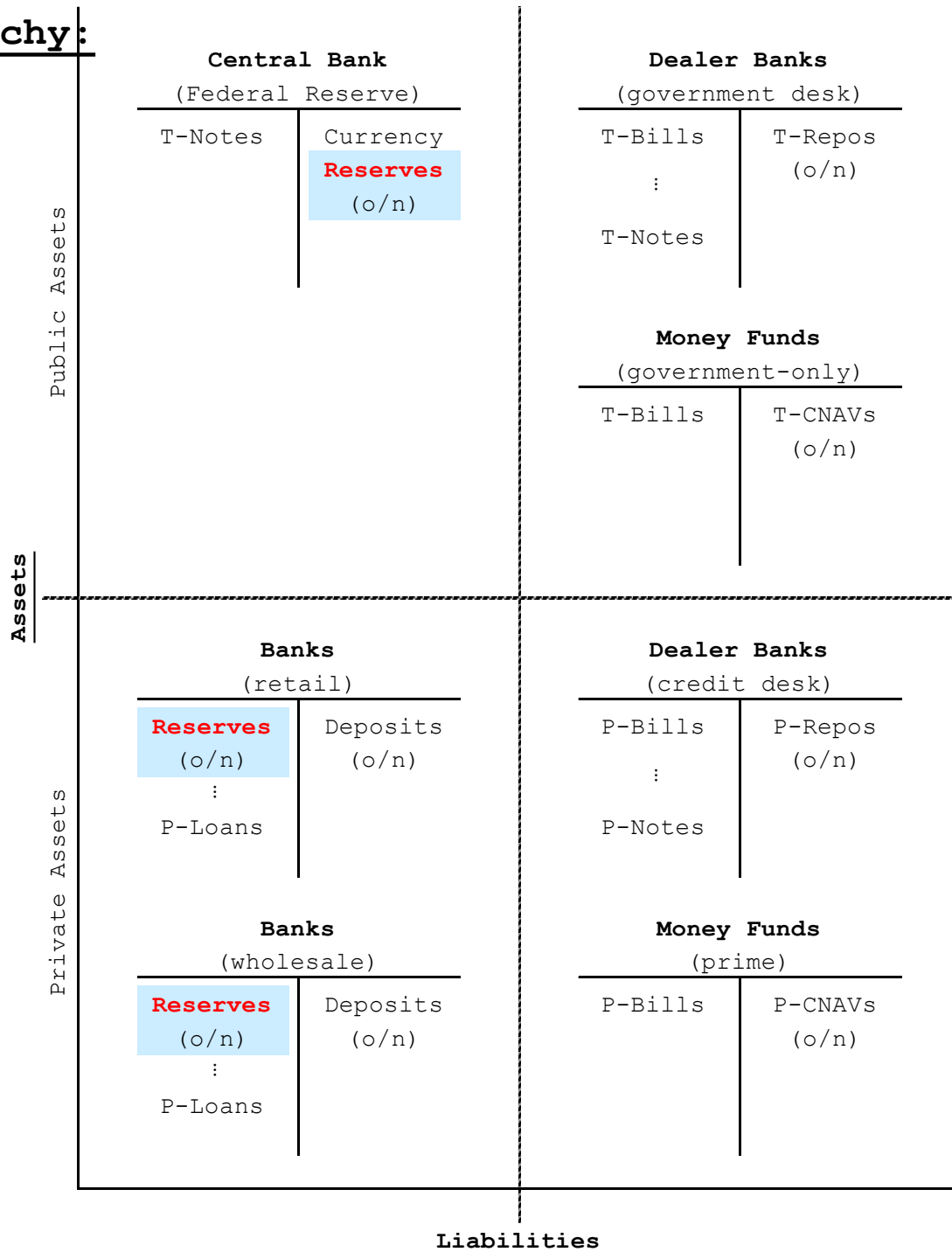
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Public Assets		Private Assets									
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Liabilities

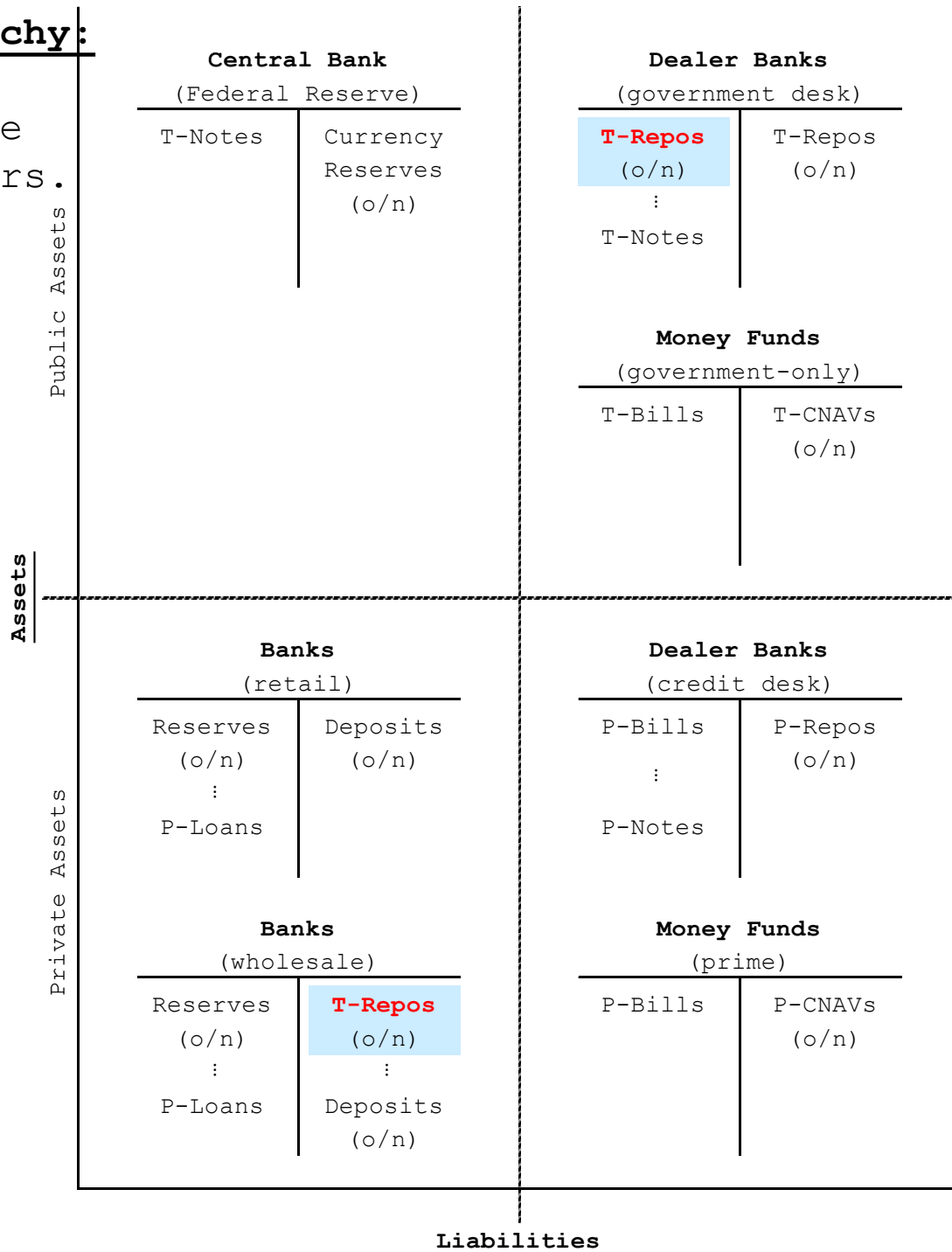
Intra-system money hierarchy:

Reserves at the Fed are money for banks.



Intra-system money hierarchy:

o/n T-Repos with wholesale banks are money for dealers.



Intra-system money hierarchy:

o/n T-Repos w/ dealers are money for government MFs.

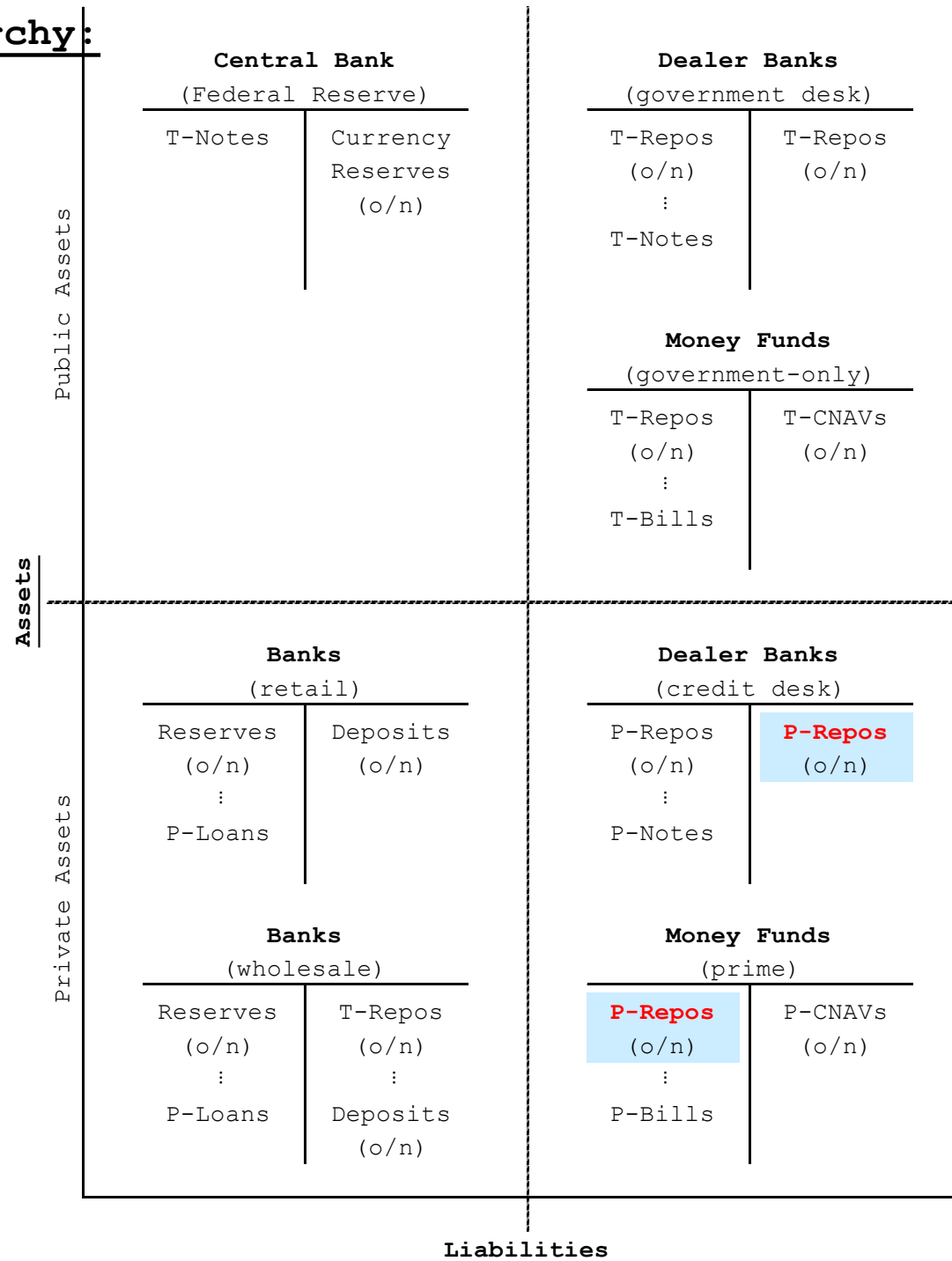
Public Assets	Central Bank (Federal Reserve)		Dealer Banks (government desk)	
	T-Notes	Currency Reserves (o/n)	T-Repos (o/n)	T-Repos (o/n)
			⋮	
			T-Notes	
Private Assets	Money Funds (government-only)		Money Funds (prime)	
	T-Repos (o/n)	T-CNAVs (o/n)	P-Bills	P-CNAVs (o/n)
			⋮	
			T-Bills	
Assets	Banks (retail)		Dealer Banks (credit desk)	
	Reserves (o/n)	Deposits (o/n)	P-Bills	P-Repos (o/n)
	⋮		⋮	
	P-Loans		P-Notes	
	Banks (wholesale)		Money Funds (prime)	
	Reserves (o/n)	T-Repos (o/n)	P-Bills	P-CNAVs (o/n)
	⋮	⋮		
	P-Loans	Deposits (o/n)		

Source: Pozsar (2014)

Liabilities

Intra-system money hierarchy:

o/n P-Repos with dealers are money for prime MFs.



Public Assets	Central Bank (Federal Reserve)	Dealer Banks (government desk)												
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⋮														
P-Bills														
Liabilities	Liabilities													



The sovereign as a "bank":

Without the sovereign the money matrix is incomplete.

We do not typically think of her as a bank, but the sovereign is also capable of absorbing money demand.

Public Assets	Central Bank (Federal Reserve)		Dealer Banks (government desk)	
	T-Notes	Currency Reserves (o/n)	T-Repos (o/n)	T-Repos (o/n)
			⋮	
			T-Notes	
Assets	Sovereign (U.S. Treasury)		Money Funds (government-only)	
	Reserves (o/n)	T-Bills (o/n)	T-Repos (o/n)	T-CNAVs (o/n)
			⋮	
			T-Bills	
Private Assets	Banks (retail)		Dealer Banks (credit desk)	
	Reserves (o/n)	Deposits (o/n)	P-Repos (o/n)	P-Repos (o/n)
	⋮		⋮	
	P-Loans		P-Notes	
Private Assets	Banks (wholesale)		Money Funds (prime)	
	Reserves (o/n)	T-Repos (o/n)	P-Repos (o/n)	P-CNAVs (o/n)
	⋮	⋮	⋮	
	P-Loans	Deposits (o/n)	P-Bills	
	<u>Liabilities</u>			

What are money-like claims?

Par at maturity versus par on demand claims.

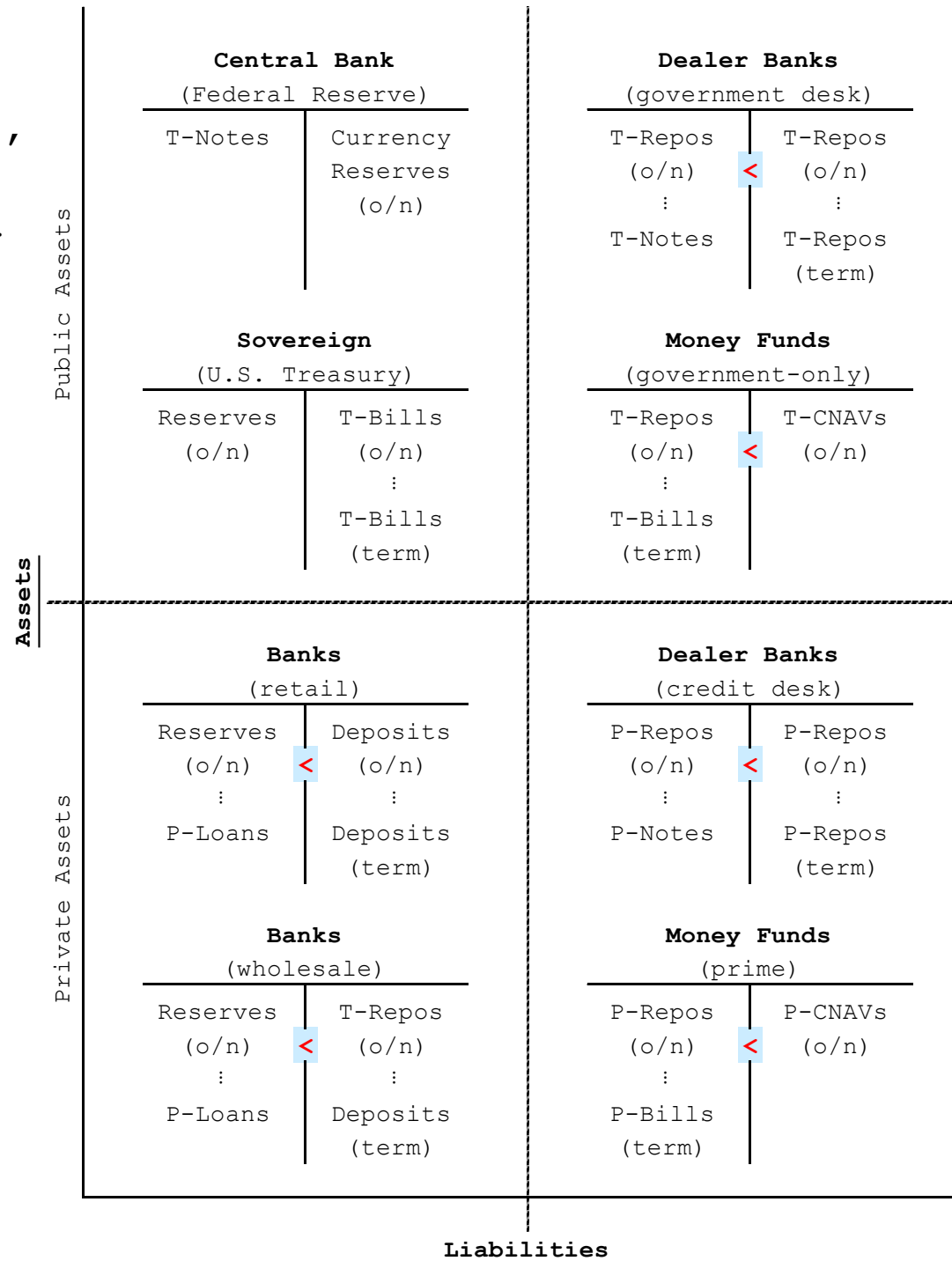
Par at maturity in the near term ($o/n < 1$ yr).

Breakable and negotiable claims that do not trade at par in real time (puts prior to maturity subject to penalty, market risks)

Public Assets	Assets	Central Bank (Federal Reserve)	Dealer Banks (government desk)											
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Sovereign (U.S. Treasury)	Money Funds (government-only)													
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Private Assets	Liabilities	Banks (retail)	Dealer Banks (credit desk)											
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The alchemy of banking:

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



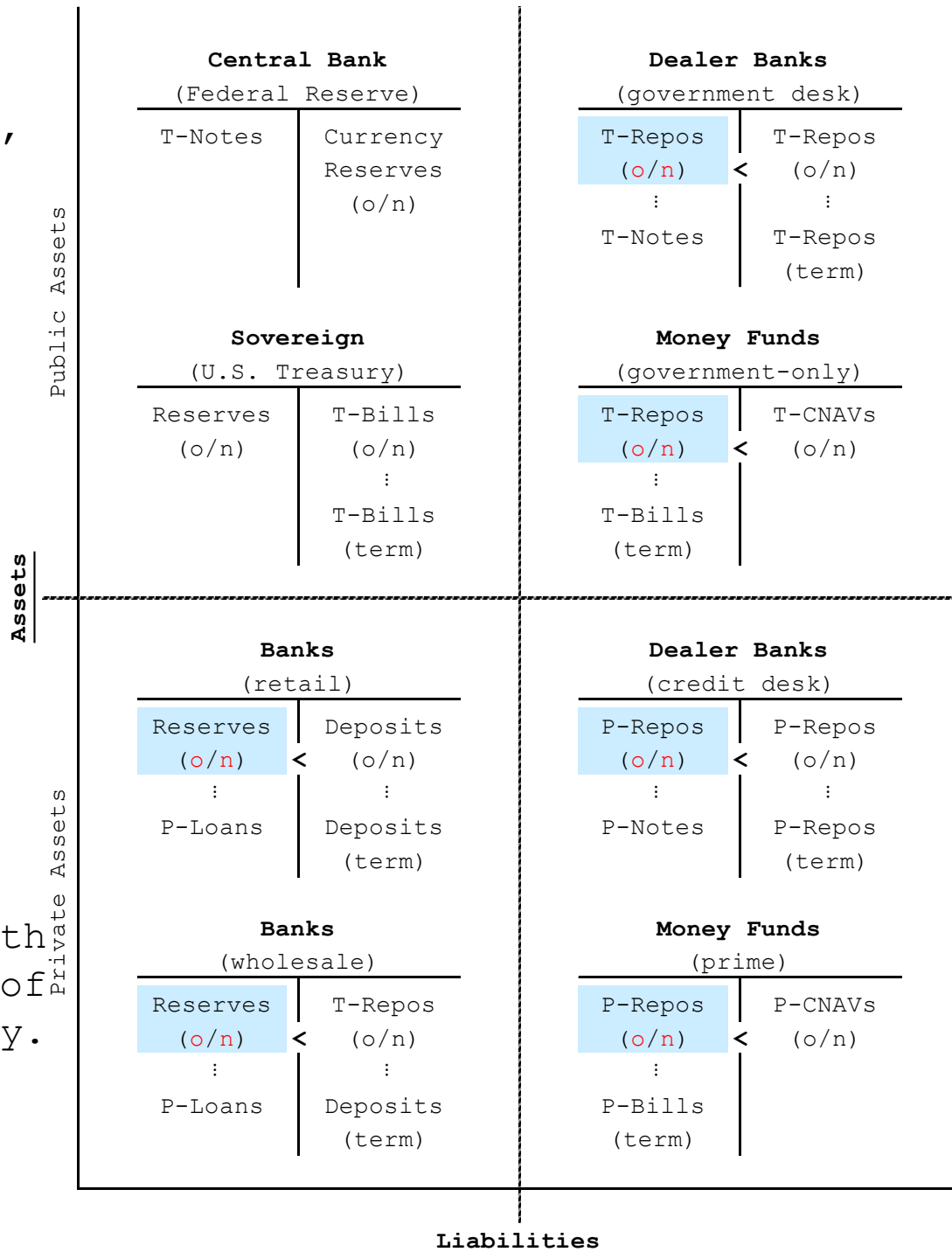
The alchemy of banking:

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.



Hierarchy of liquidity puts:

Money funds can borrow only limited amounts.

If this option is exhausted money funds must sell.

In a panic, this will likely spiral into a fire sale.

Public Assets

Assets

Private Assets

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

Dealer Banks (government desk)	
T-Repos (o/n)	< T-Repos (o/n)
⋮	⋮
T-Notes	T-Repos (term)

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

Money Funds (funding/market)	
T-Repos (o/n)	< T-CNAVs (o/n)
⋮	⋮
T-Bills (term)	

Banks (retail)	
Reserves (o/n)	< Deposits (o/n)
⋮	⋮
P-Loans	Deposits (term)

Dealer Banks (credit desk)	
P-Repos (o/n)	< P-Repos (o/n)
⋮	⋮
P-Notes	P-Repos (term)

Banks (wholesale)	
Reserves (o/n)	< T-Repos (o/n)
⋮	⋮
P-Loans	Deposits (term)

Money Funds (funding/market)	
P-Repos (o/n)	< P-CNAVs (o/n)
⋮	⋮
P-Bills (term)	

Liabilities

Hierarchy of liquidity puts:

Dealers have more room to borrow against their assets.

If this option is exhausted dealers must sell too.

In a panic, this will likely spiral into a fire sale too.

Public Assets

Assets

Private Assets

Central Bank
(Federal Reserve)

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

Dealer Banks
(funding/market)

T-Repos (o/n)	<	T-Repos (o/n)
⋮		⋮
T-Notes		T-Repos (term)

Sovereign
(U.S. Treasury)

Reserves (o/n)	T-Bills (o/n)
	⋮
	T-Bills (term)

Money Funds
(funding/market)

T-Repos (o/n)	<	T-CNAVs (o/n)
⋮		⋮
T-Bills (term)		

Banks
(retail)

Reserves (o/n)	<	Deposits (o/n)
⋮		⋮
P-Loans		Deposits (term)

Dealer Banks
(funding/market)

P-Repos (o/n)	<	P-Repos (o/n)
⋮		⋮
P-Notes		P-Repos (term)

Banks
(wholesale)

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

Money Funds
(funding/market)

P-Repos (o/n)	<	P-CNAVs (o/n)
⋮		⋮
P-Bills (term)		

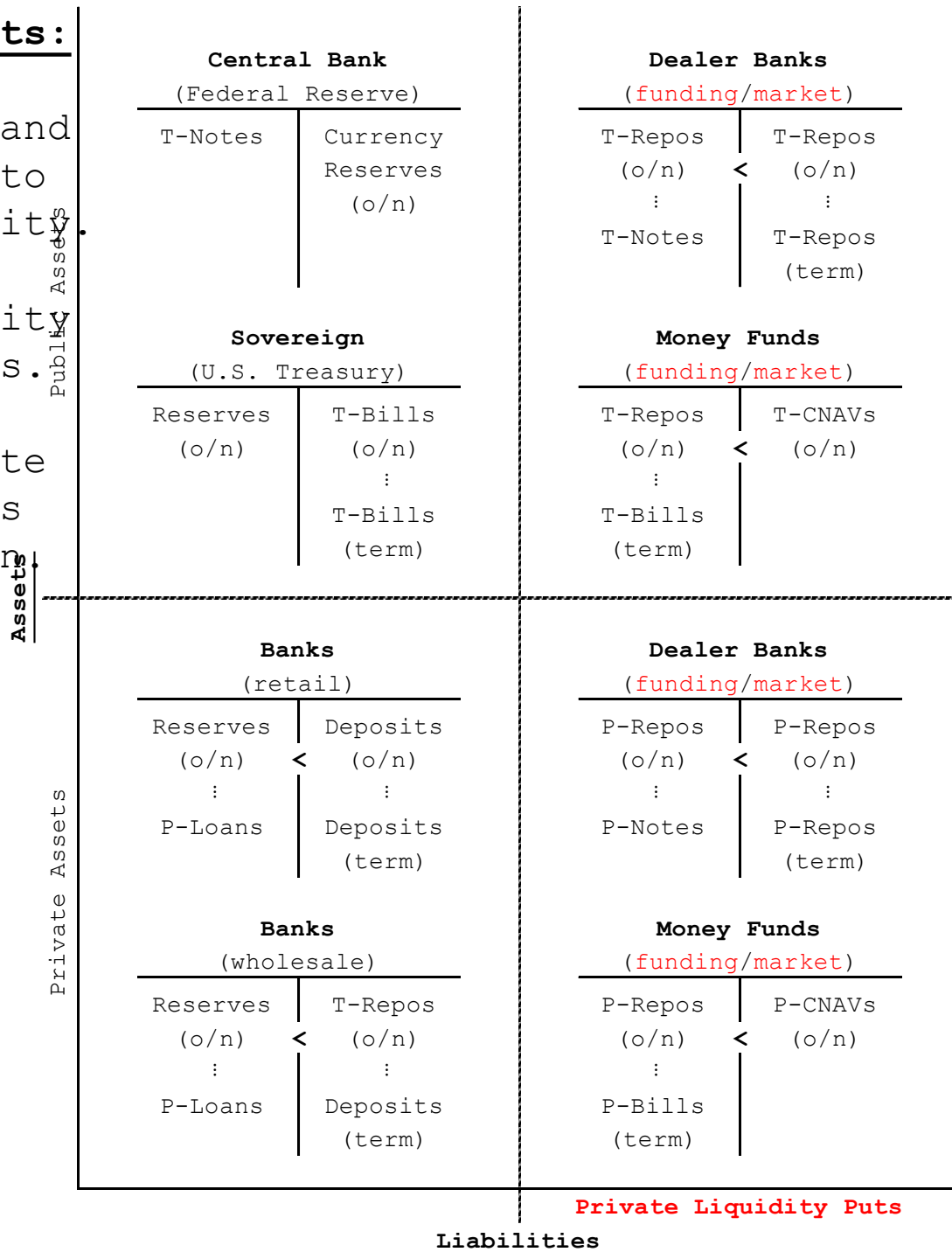
Liabilities

Hierarchy of liquidity puts:

Borrowing against assets and selling assets is access to funding and market liquidity.

Funding and market liquidity are private liquidity puts.

They both depend on private market participants (banks and dealers) for execution.



Source: Pozsar (2014)

Hierarchy of liquidity puts:

Retail and wholesale banks can borrow against assets or put them to the central bank.

Retail and wholesale banks hardly ever have to sell.

This is access to funding as well as lender of last resort (LoLR) liquidity.

Public Assets	Central Bank (Federal Reserve)	Dealer Banks (funding/market)																		
	<table border="1"> <tr> <td style="text-align: center;">T-Notes</td> <td style="text-align: center;">Currency Reserves (o/n)</td> </tr> </table>	T-Notes	Currency Reserves (o/n)	<table border="1"> <tr> <td style="text-align: center;">T-Repos (o/n)</td> <td style="text-align: center;"><</td> <td style="text-align: center;">T-Repos (o/n)</td> </tr> <tr> <td style="text-align: center;">⋮</td> <td style="text-align: center;"> </td> <td style="text-align: center;">⋮</td> </tr> <tr> <td style="text-align: center;">T-Notes</td> <td style="text-align: center;"> </td> <td style="text-align: center;">T-Repos (term)</td> </tr> </table>	T-Repos (o/n)	<	T-Repos (o/n)	⋮		⋮	T-Notes		T-Repos (term)							
	T-Notes	Currency Reserves (o/n)																		
	T-Repos (o/n)	<	T-Repos (o/n)																	
⋮		⋮																		
T-Notes		T-Repos (term)																		
Sovereign (U.S. Treasury)	Money Funds (funding/market)																			
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⋮		⋮																		
T-Bills (term)		T-Bills (term)																		
Private Assets	Banks (funding/LoLR)	Dealer Banks (funding/market)																		
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P-Bills (term)		P-Bills (term)																		
Assets		Private Liquidity Puts																		
Liabilities																				

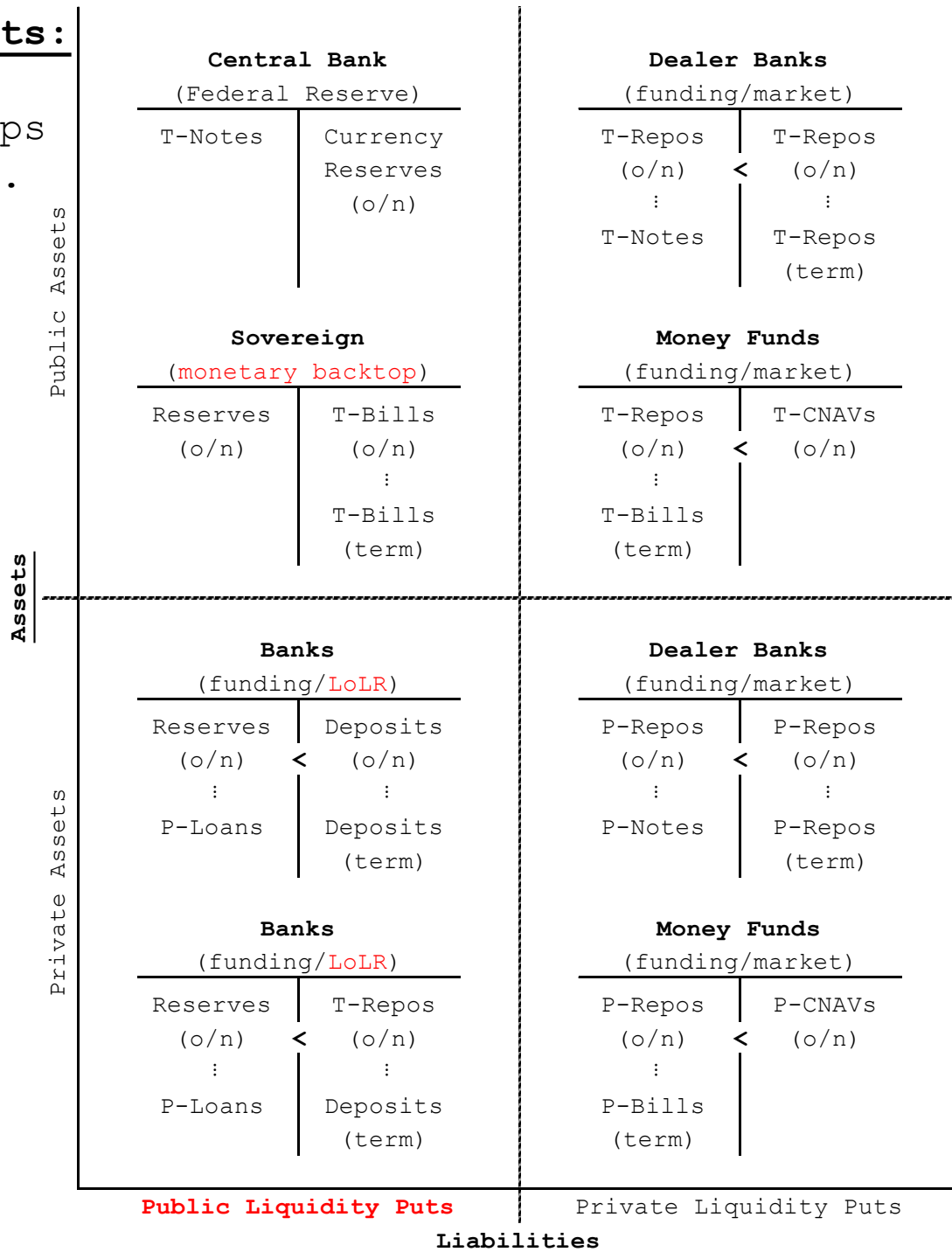
Hierarchy of liquidity puts:

The sovereign has a monetary backstop (usually a taboo; often used during WWI & II and recently the OMT, see McCulley and Pozsar, 2012).

Public Assets	Assets	Central Bank (Federal Reserve)	Dealer Banks (funding/market)																		
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		T-Repos (o/n)	<	T-Repos (o/n)																	
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T-Notes		T-Repos (term)																			
Sovereign (monetary backstop)	Money Funds (funding/market)																				
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P-Loans		Deposits (term)																			
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Banks (funding/LoLR)	Money Funds (funding/market)																				
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Reserves (o/n)	<	T-Repos (o/n)																			
⋮		⋮																			
P-Loans		Deposits (term)																			
P-Repos (o/n)	<	P-CNAVs (o/n)																			
⋮		⋮																			
P-Bills (term)		⋮																			
		Private Liquidity Puts																			
		<u>Liabilities</u>																			

Hierarchy of liquidity puts:

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



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.

Public Assets

Assets

Private Assets

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

Dealer Banks (funding/market)	
T-Repos (o/n)	T-Repos (o/n)
⋮	⋮
T-Notes	T-Repos (term)

Sovereign (monetary backstop)	
Reserves (o/n)	T-Bills (o/n)
	⋮
	T-Bills (term)

Money Funds (funding/market)	
T-Repos (o/n)	T-CNAVs (o/n)
⋮	
T-Bills (term)	

Banks (funding/LoLR)	
Reserves (o/n)	Deposits (o/n)
⋮	⋮
P-Loans	Deposits (term)

Dealer Banks (funding/market)	
P-Repos (o/n)	P-Repos (o/n)
⋮	⋮
P-Notes	P-Repos (term)

Banks (funding/LoLR)	
Reserves (o/n)	T-Repos (o/n)
⋮	⋮
P-Loans	Deposits (term)

Money Funds (funding/market)	
P-Repos (o/n)	P-CNAVs (o/n)
⋮	
P-Bills (term)	

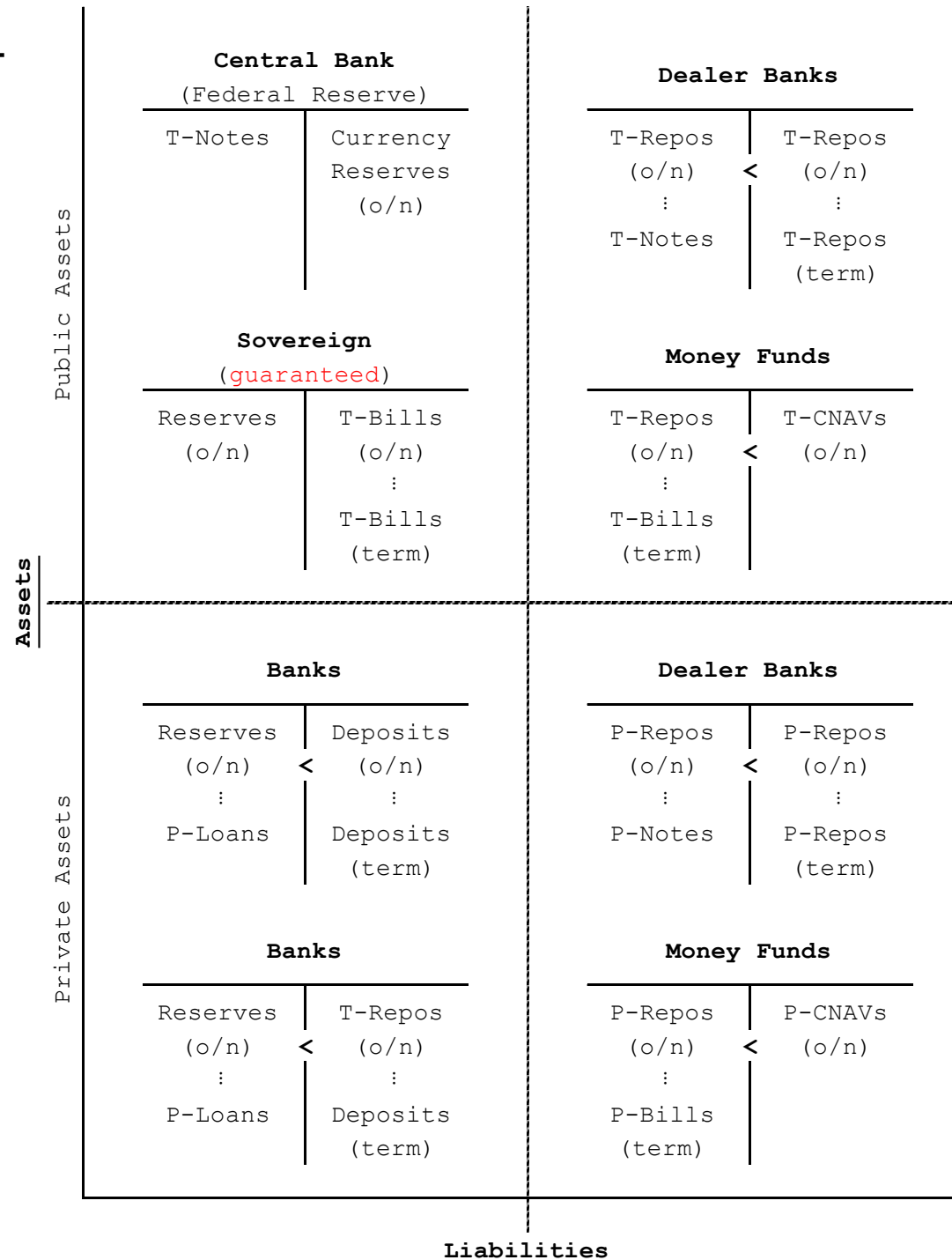
Public Liquidity Puts

Private Liquidity Puts

Liabilities

Hierarchy of credit puts:

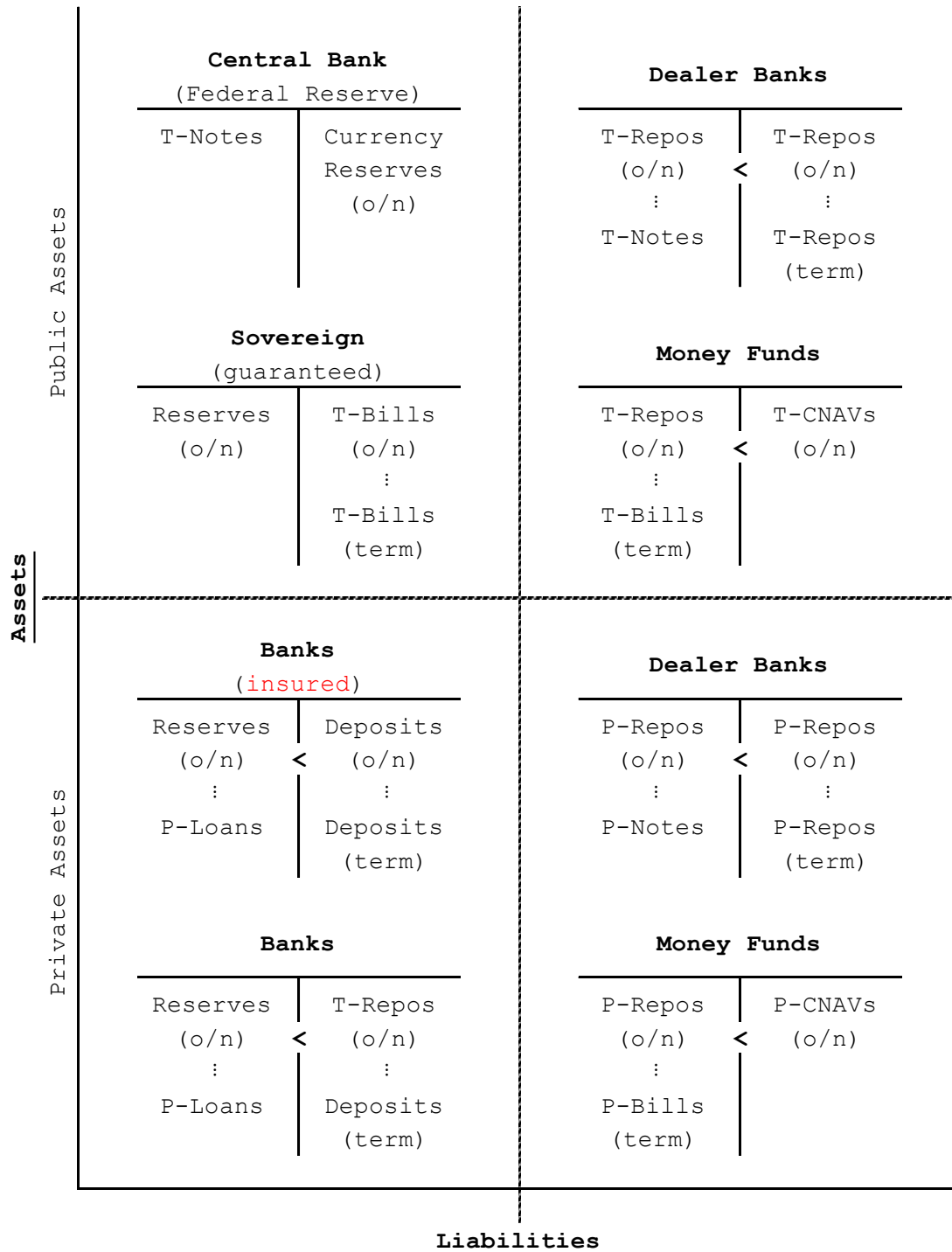
T-Bills are guaranteed.



Liabilities

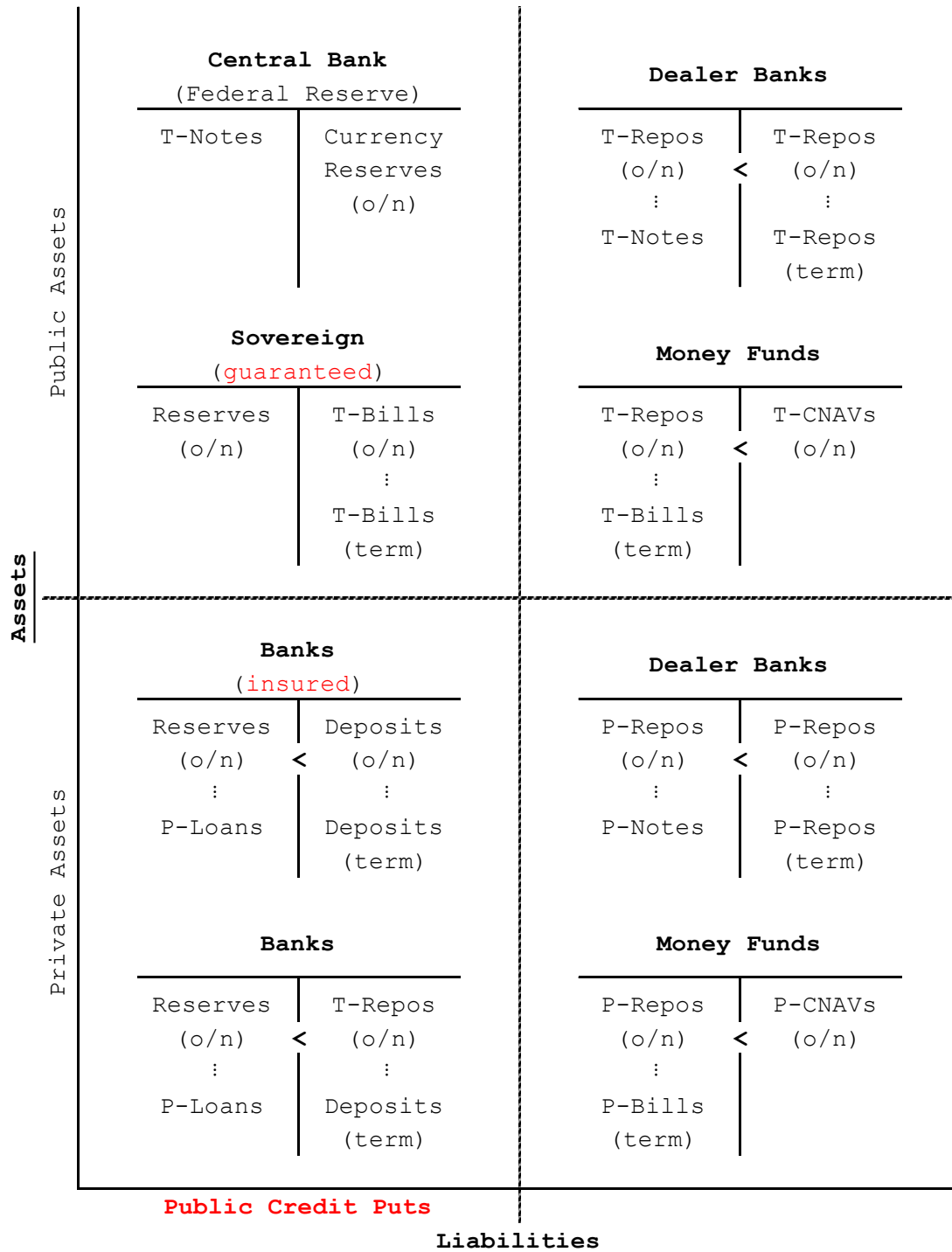
Hierarchy of credit puts:

Deposits are government insured up to \$250,000.



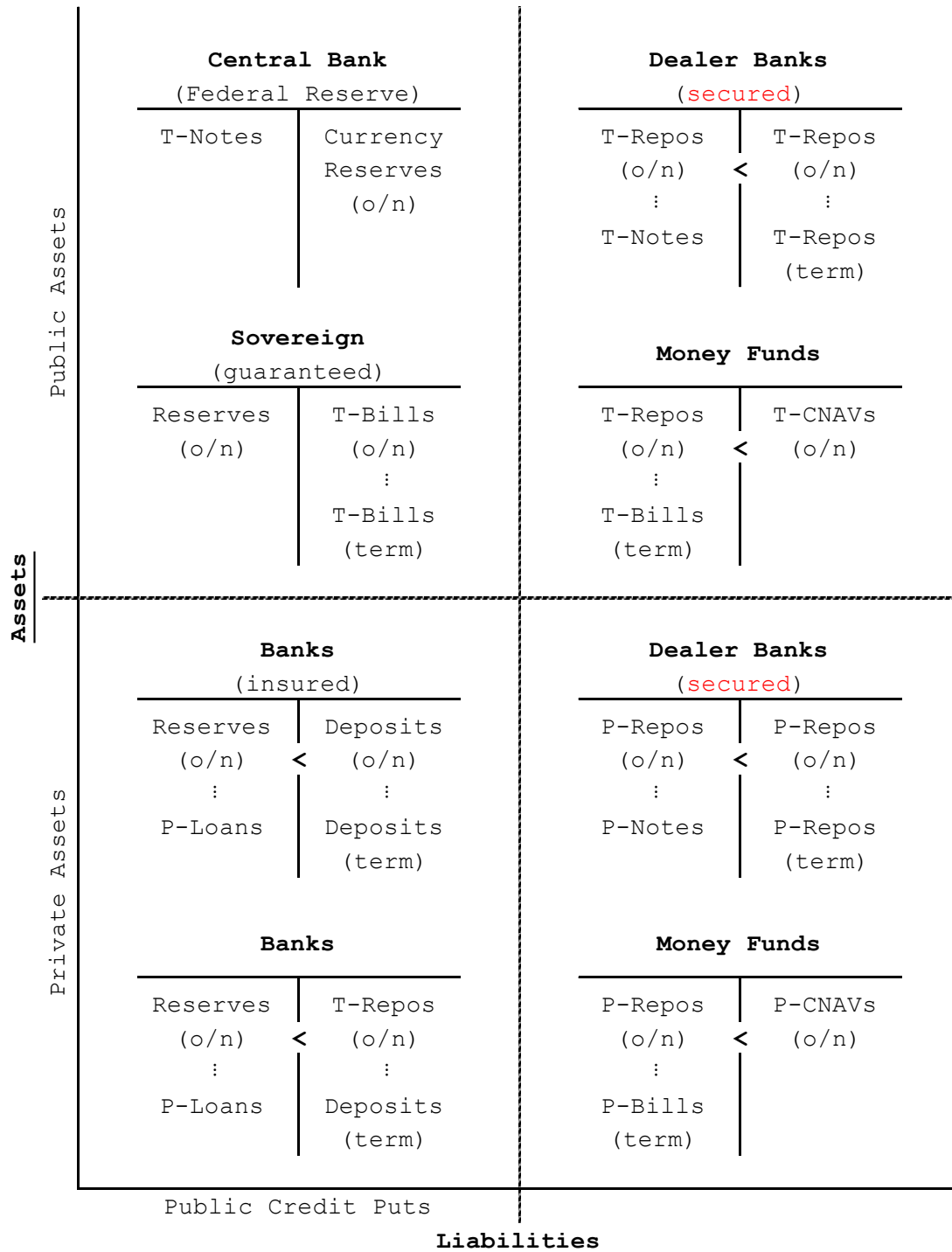
Hierarchy of credit puts:

Guarantees and insurance are **public** credit puts.



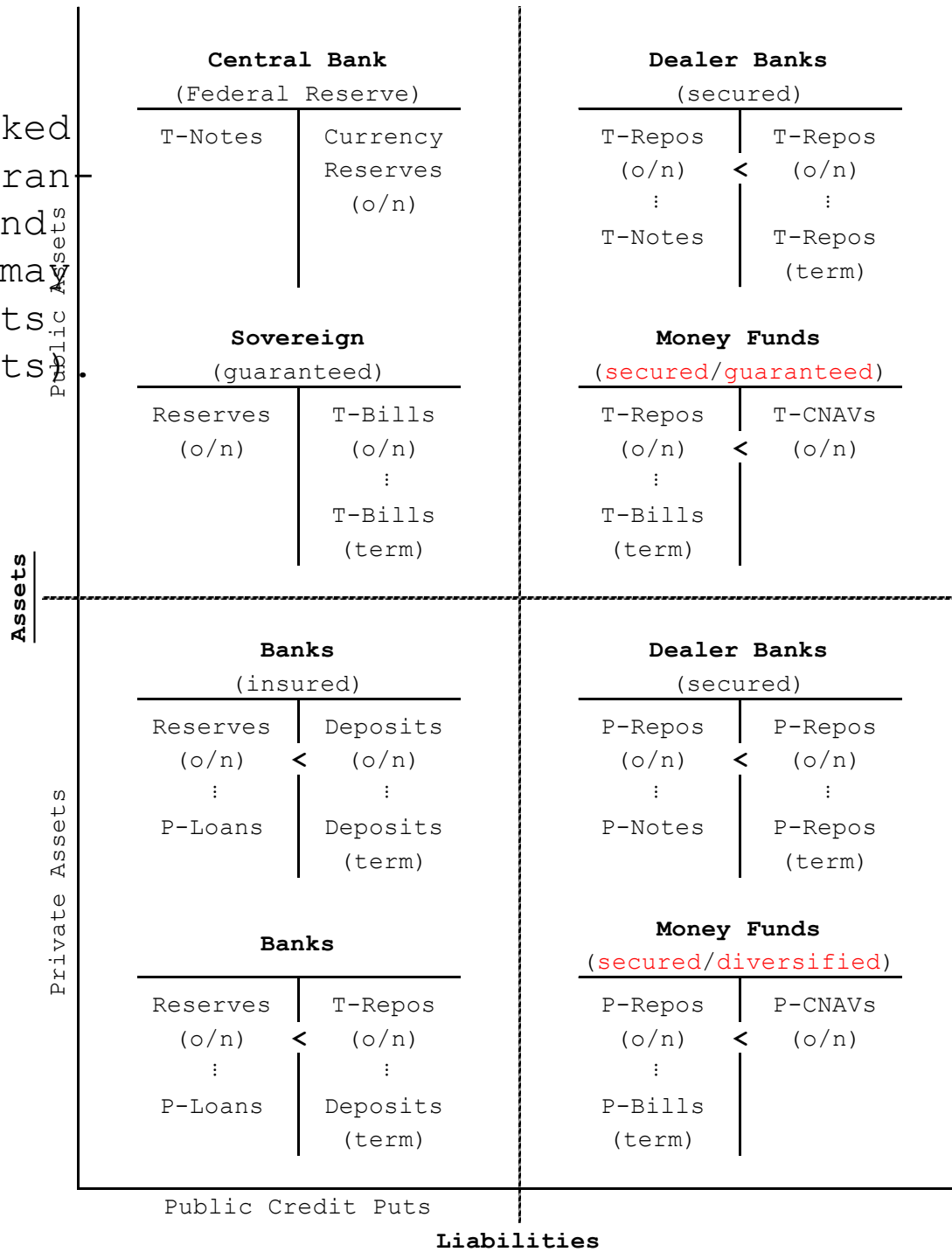
Hierarchy of credit puts:

Repos are secured claims.



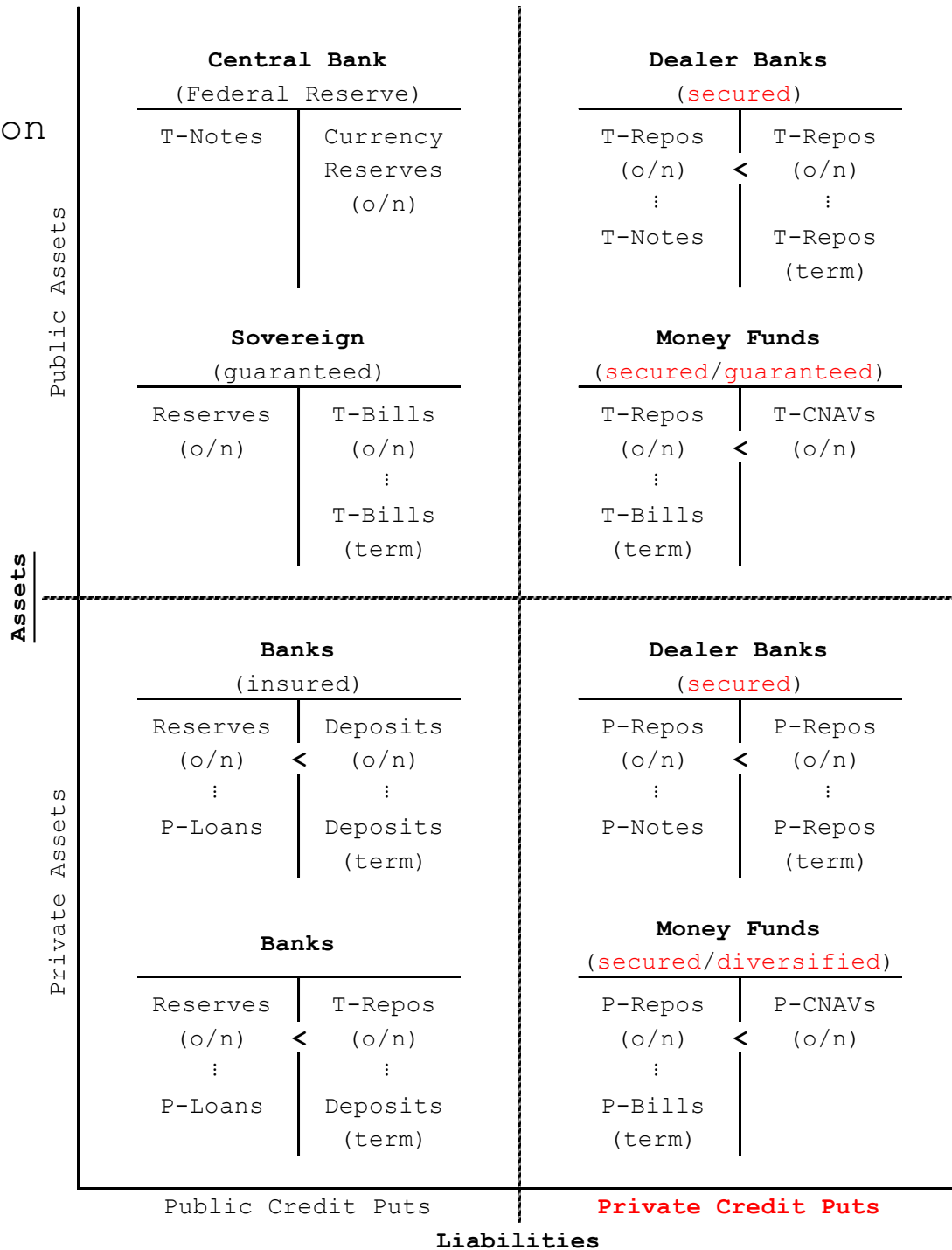
Hierarchy of credit puts:

Money fund shares are backed either by secured and guaranteed assets, or secured and diversified assets. They may also have reputational puts to their sponsor (weak puts)



Hierarchy of credit puts:

Collateral, diversification and reputational puts are all **private** credit puts.



Hierarchy of credit puts:

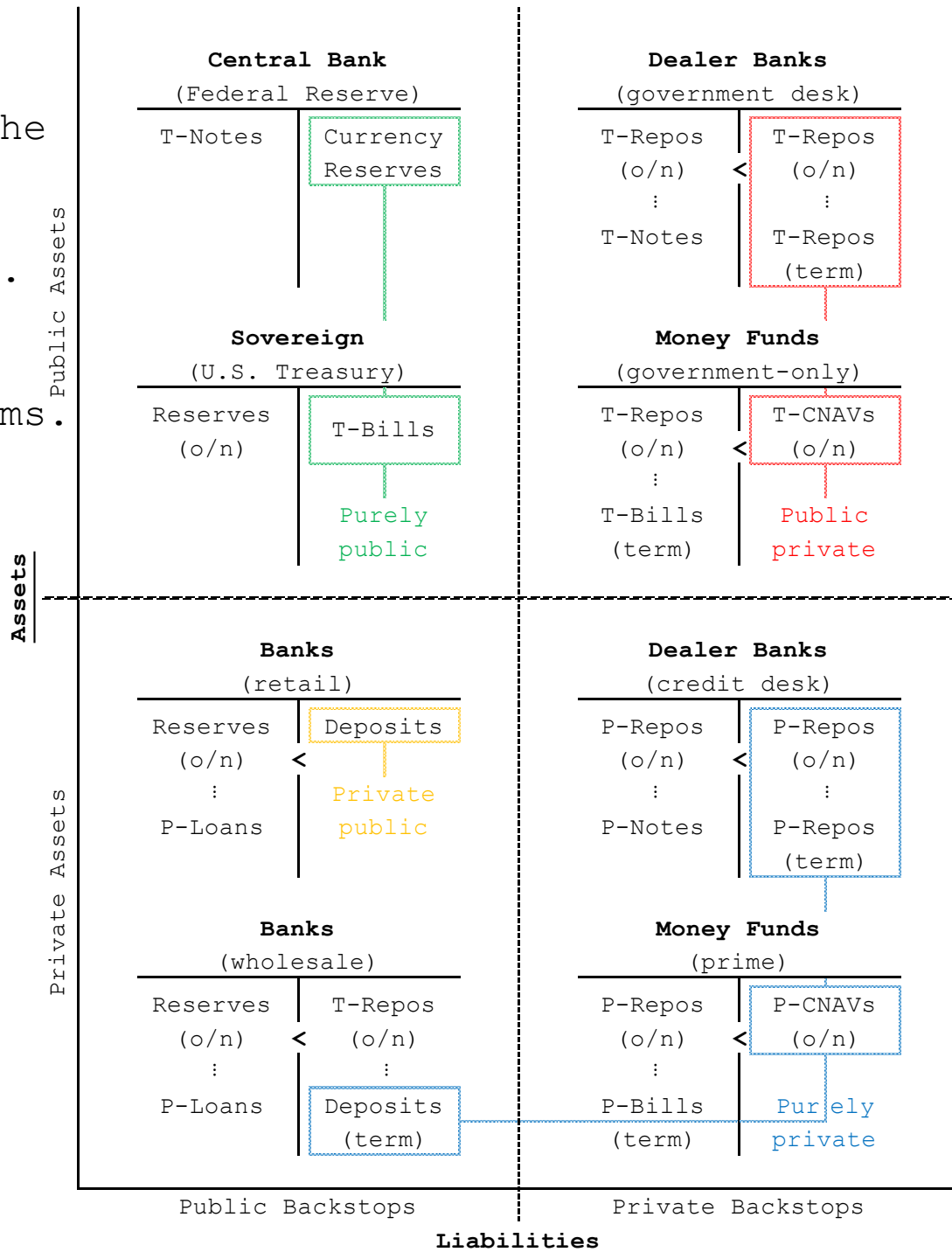
Un-insured deposits are un-secured and un-diversified.

Public Assets	Central Bank (Federal Reserve)		Dealer Banks (secured)	
	T-Notes	Currency Reserves (o/n)	T-Repos (o/n)	T-Repos (o/n)
			⋮	⋮
			T-Notes	T-Repos (term)
Assets	Sovereign (guaranteed)		Money Funds (secured/guaranteed)	
	Reserves (o/n)	T-Bills (o/n)	T-Repos (o/n)	T-CNAVs (o/n)
		⋮	⋮	
		T-Bills (term)	T-Bills (term)	
Private Assets	Banks (insured)		Dealer Banks (secured)	
	Reserves (o/n)	Deposits (o/n)	P-Repos (o/n)	P-Repos (o/n)
	⋮	⋮	⋮	⋮
	P-Loans	Deposits (term)	P-Notes	P-Repos (term)
Private Assets	Banks (un-insured)		Money Funds (secured/diversified)	
	Reserves (o/n)	T-Repos (o/n)	P-Repos (o/n)	P-CNAVs (o/n)
	⋮	⋮	⋮	
	P-Loans	Deposits (term)	P-Bills (term)	
	Public Credit Puts		Private Credit Puts	
	<u>Liabilities</u>			

The hierarchy of 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.



[1] Purely public money:

Ability to tax and money creation at will

[2] Private-public money:

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

[3] Public-private money:

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

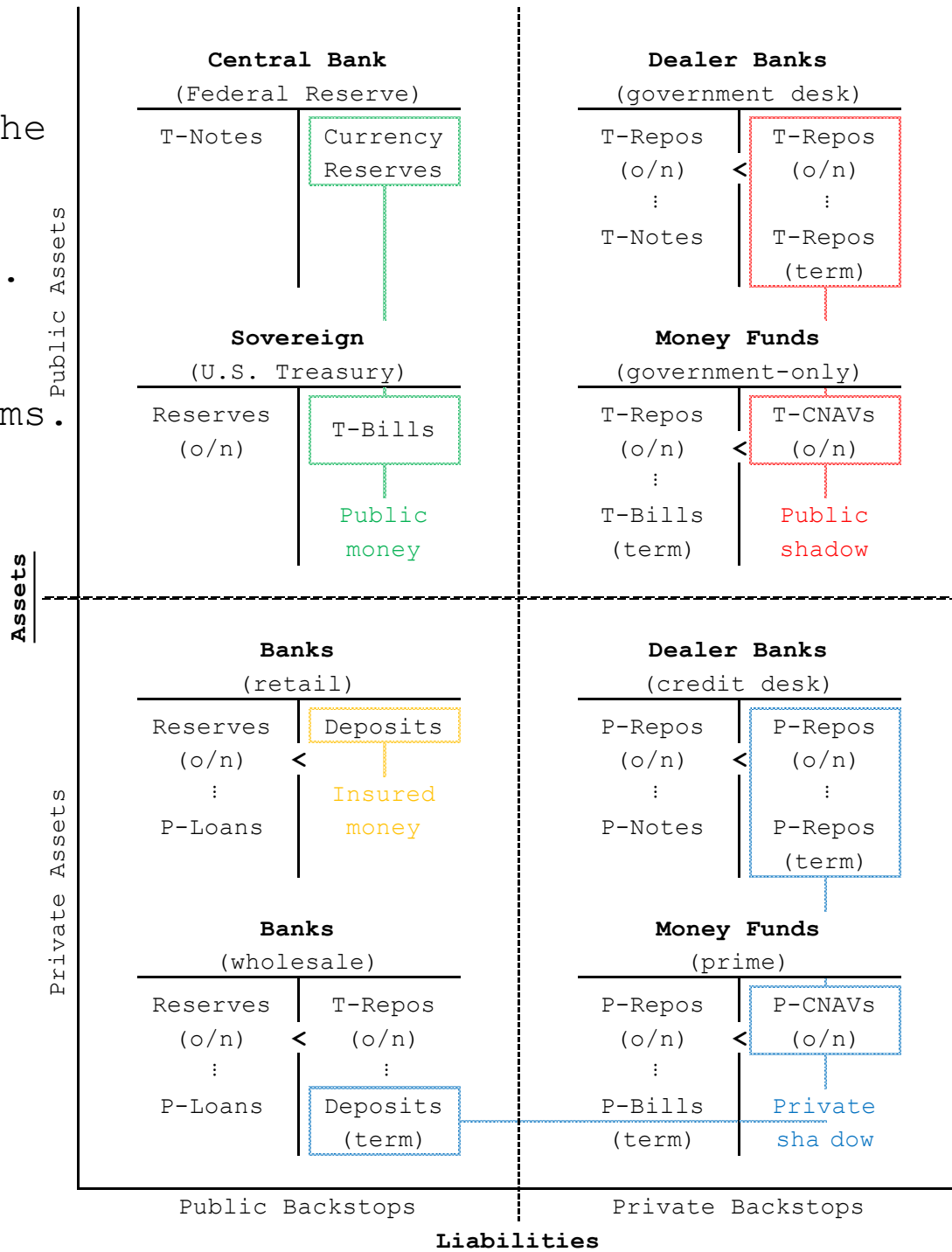
[4] Purely private money:

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

The hierarchy of 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.



[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:

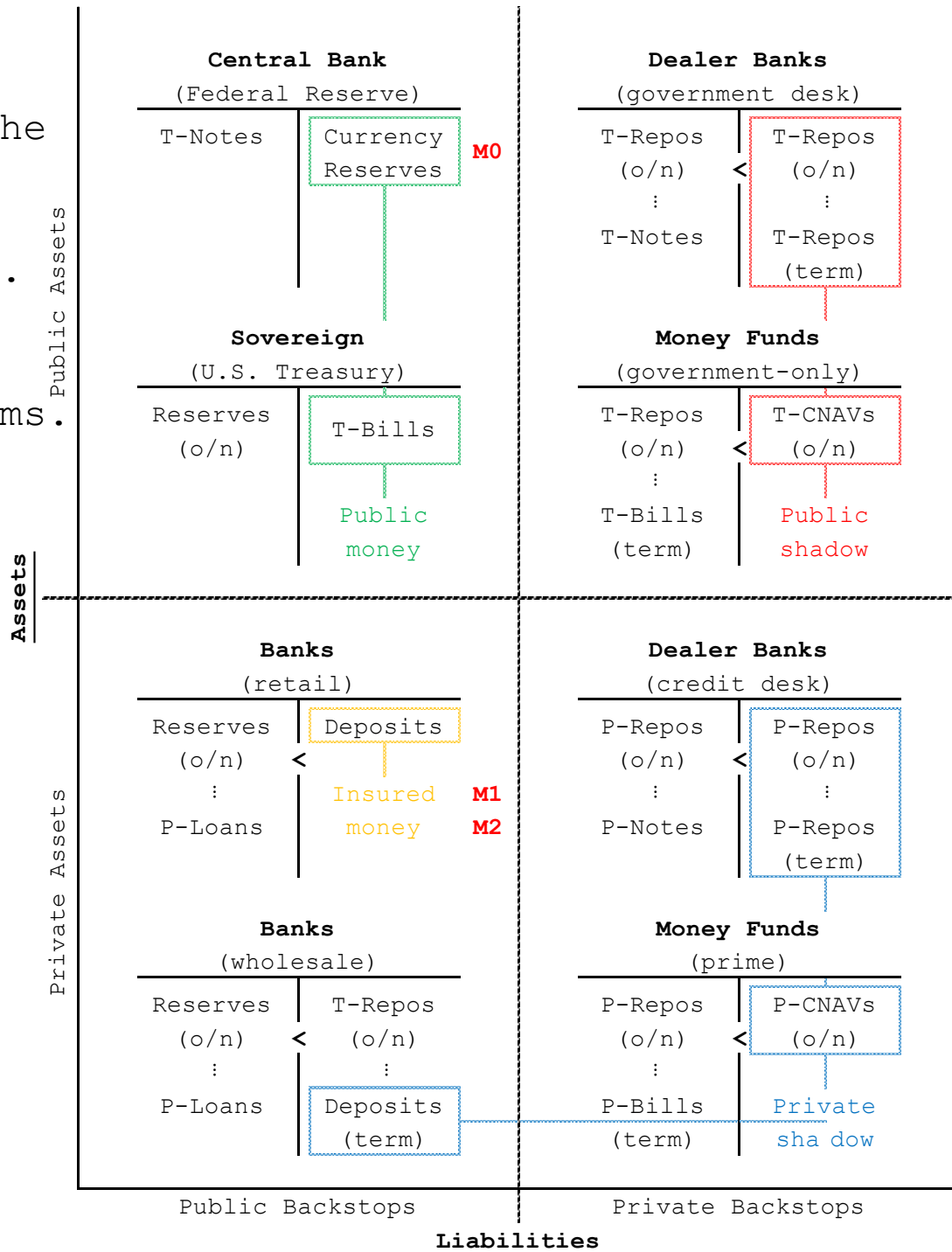
No official puts, not even implicitly via the collateral involved. Peripheral money

The hierarchy of 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:

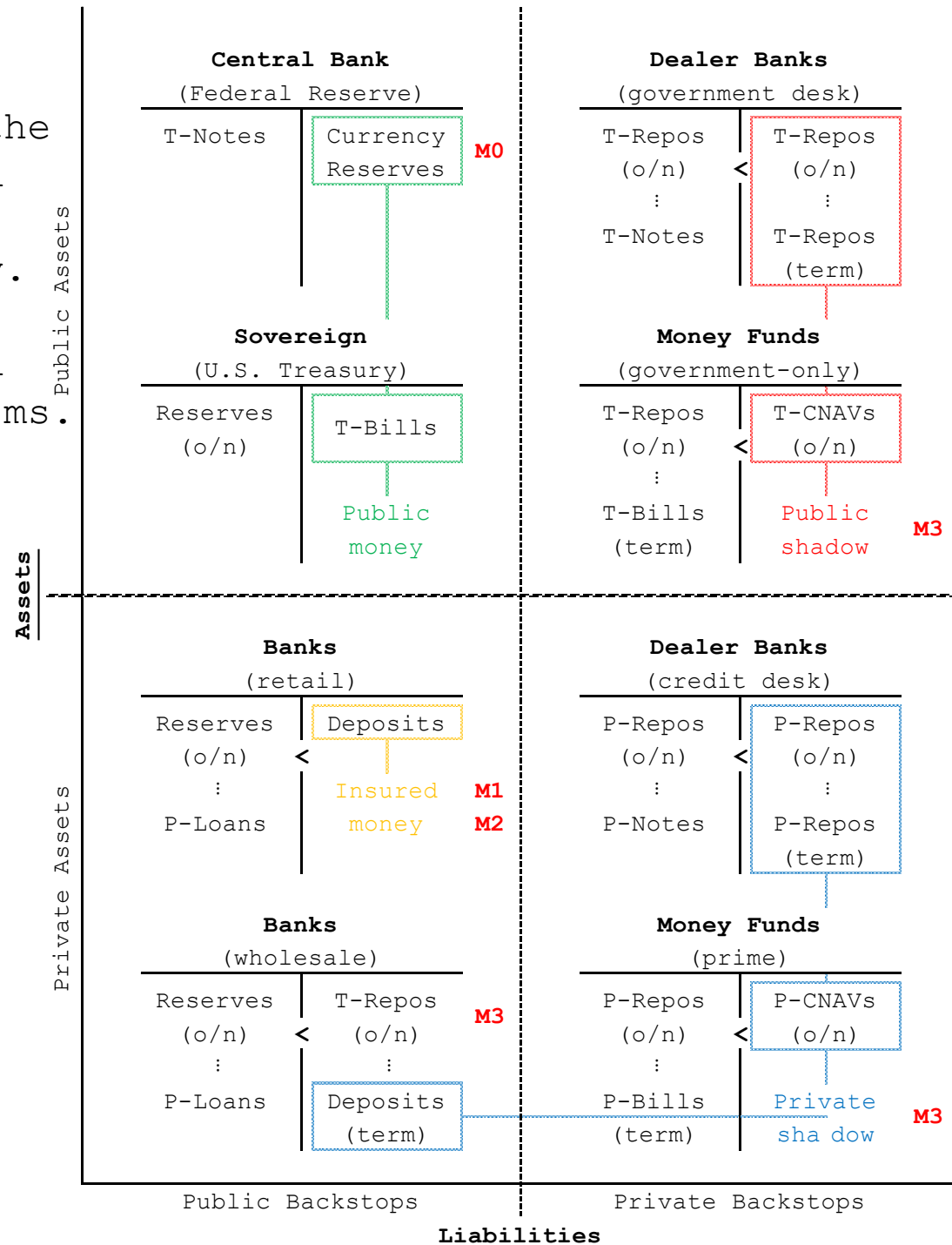
No official puts, not even implicitly via the collateral involved. Peripheral money

The hierarchy of 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 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 and credit puts via Treasury collateral involved, but no direct puts on the liability side.

[4] Private shadow money (M3):

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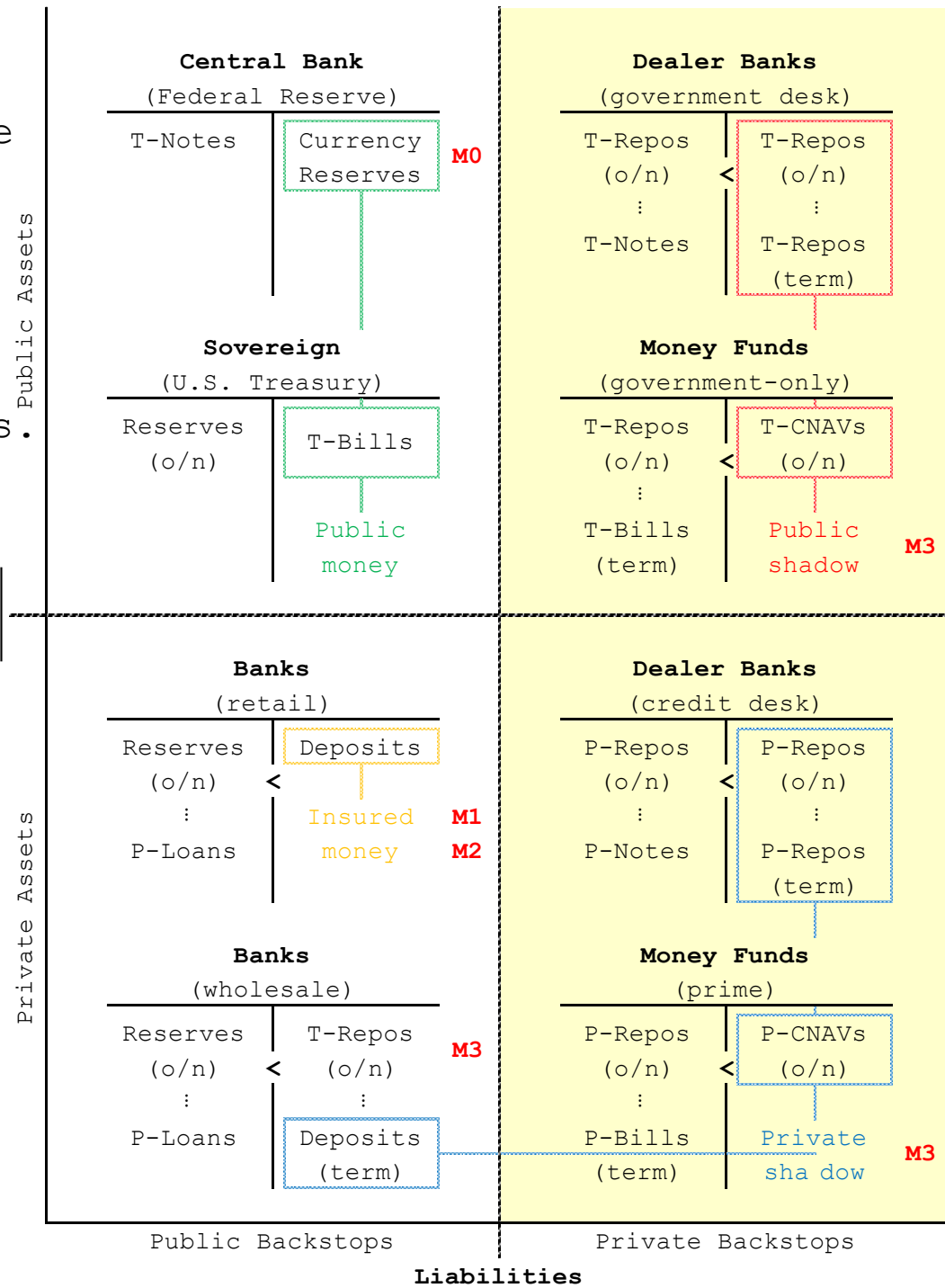
The hierarchy of money:

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 vs. shadow money supply.

The shadow banking system...



[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 and 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

The hierarchy of money:

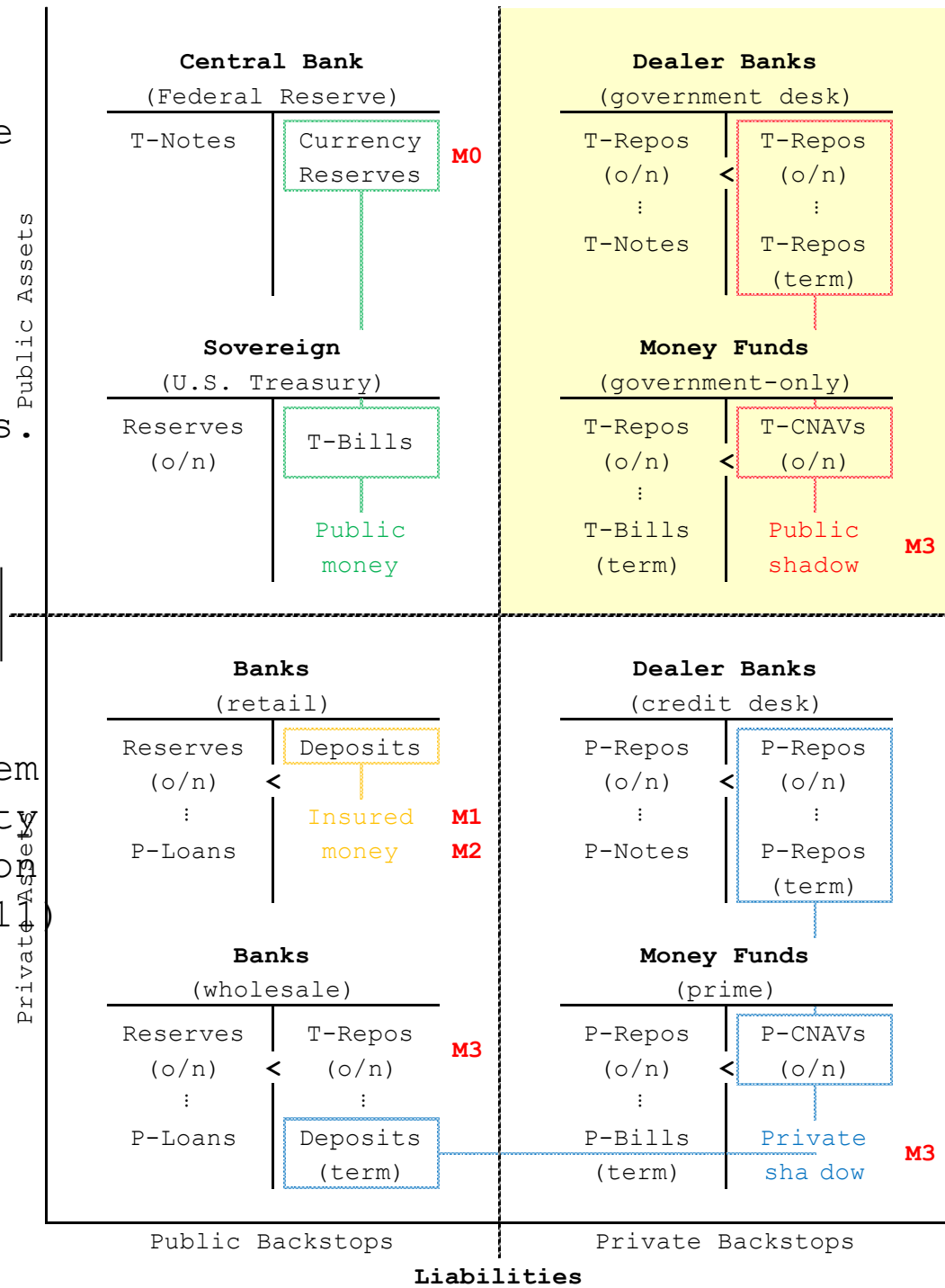
The types of assets and the types of backstops behind money claims yield four basic categories of money.

Purely public, hybrid and purely private money claims.

Traditional money supply vs. shadow money supply.

The shadow banking system...

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



[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 and 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

The hierarchy of 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 vs. shadow money supply.

The shadow banking system...

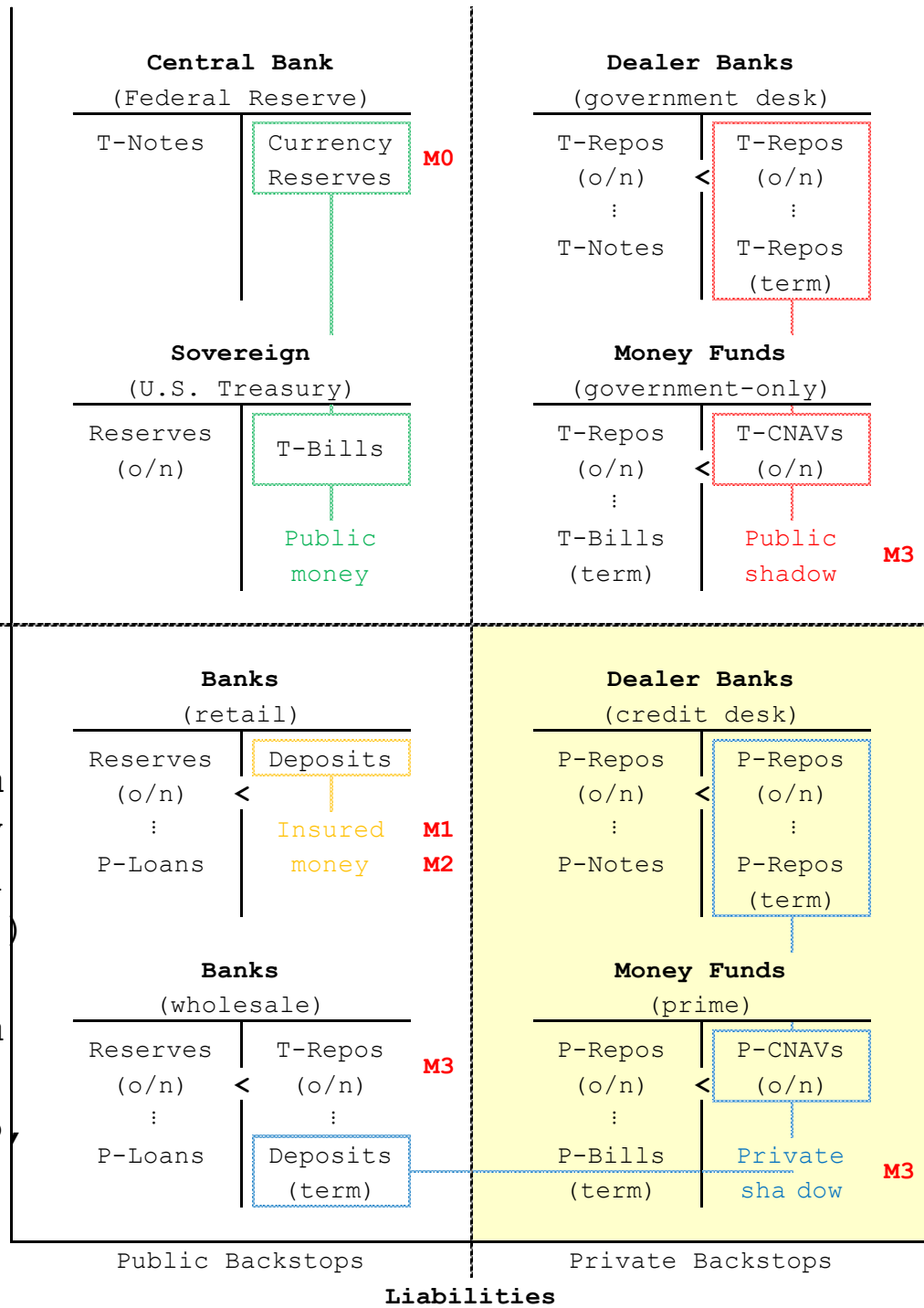
[1] Public-private subsystem (public collateral, maturity and liquidity transformation see Carney and Panetta, 2011)

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

Public Assets

Assets

Private Assets



[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 and 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

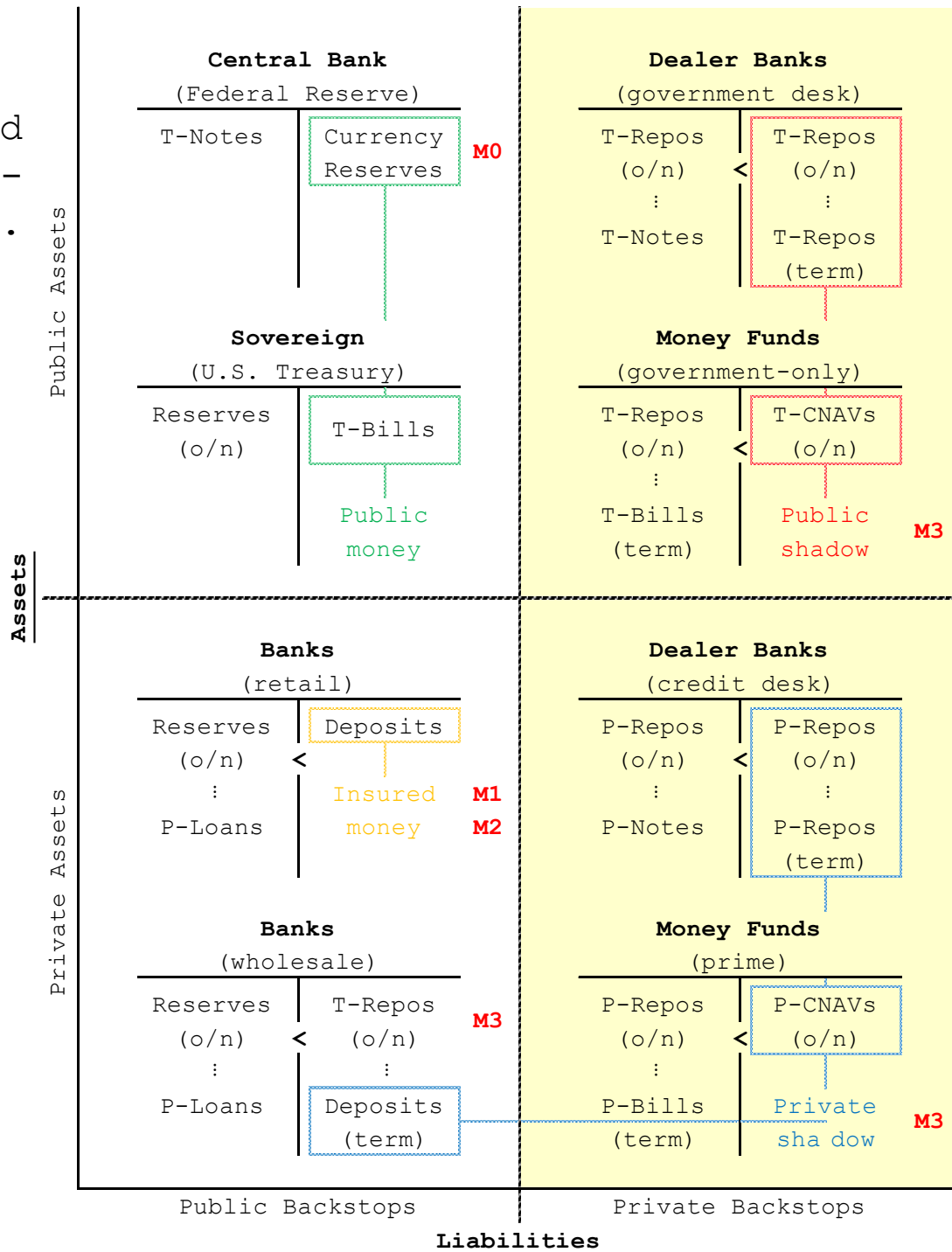
Enter the Fed's RRP's:

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.

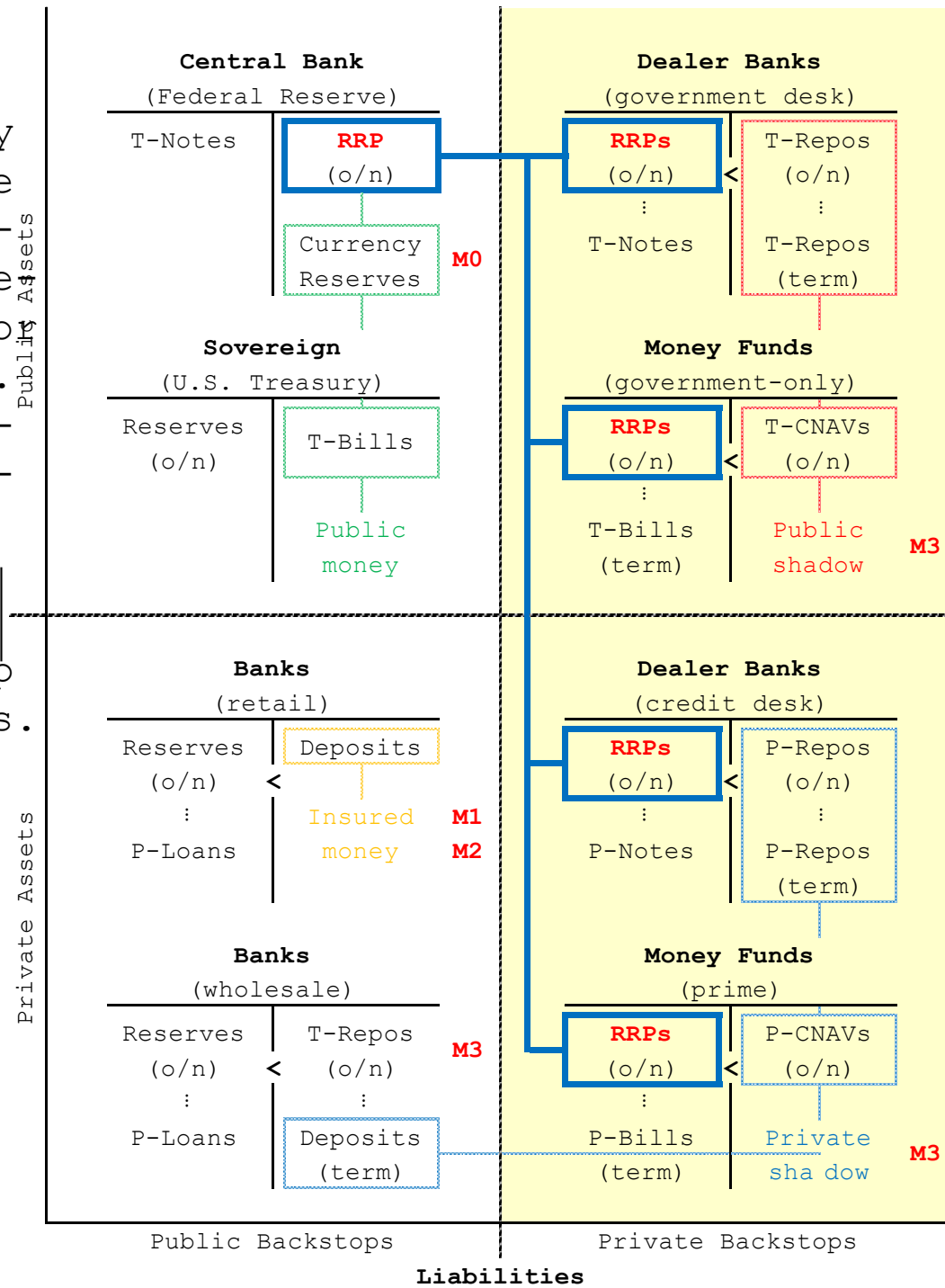
No longer...



Enter the Fed's RRP's:

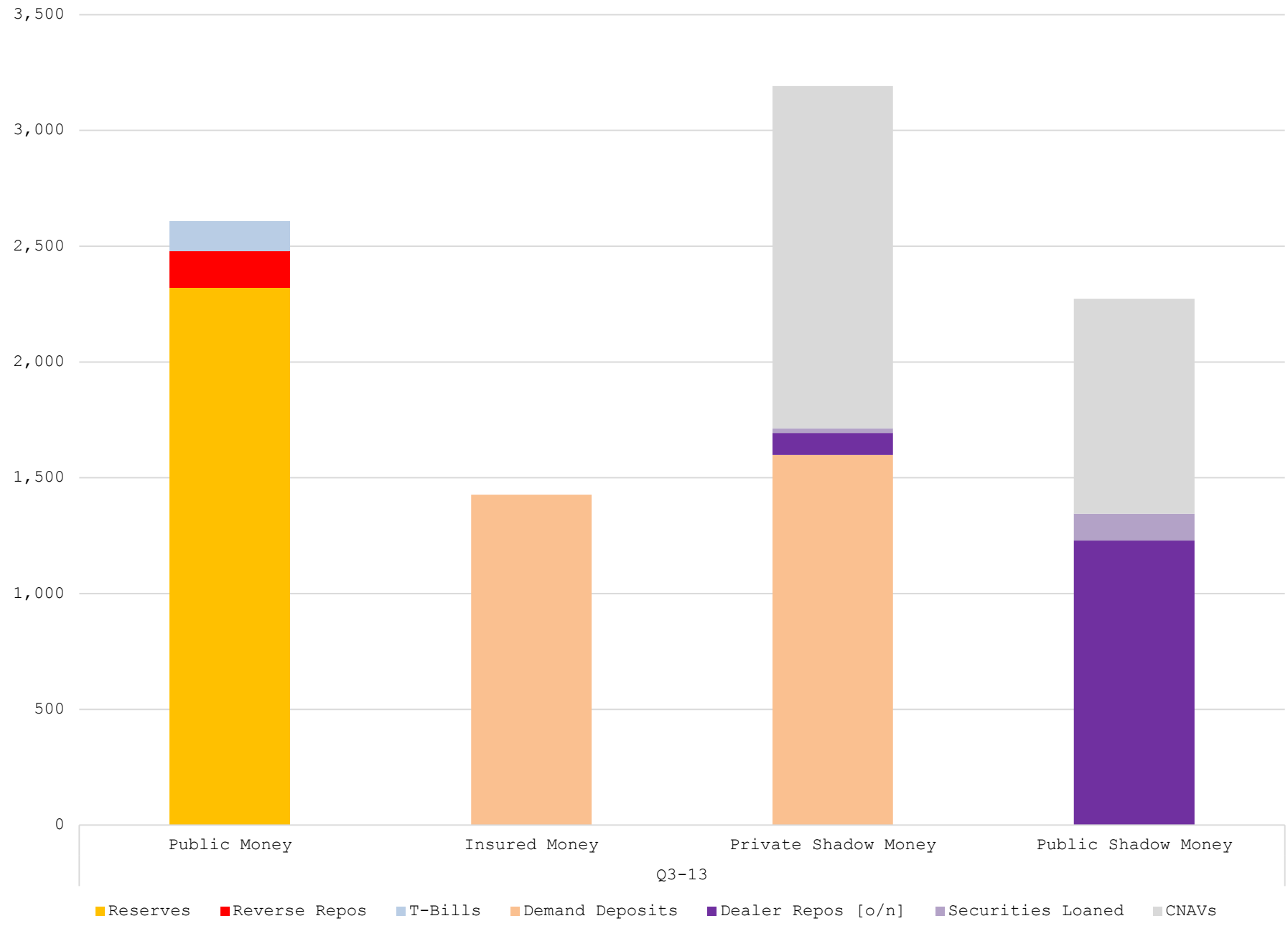
RRPs effectively give money funds and dealers, the core entities of the shadow banking system, access to a reserve account at the Fed for the very first time in U.S. monetary history. Do appreciate the **evolutionary** significance of this step and look beyond the view that the only significance of RRP's is that they will help the Fed control short rates.

RRPs are likely a **station, not a destination** (more on this shortly in Part II).



Overnight money claims by type:

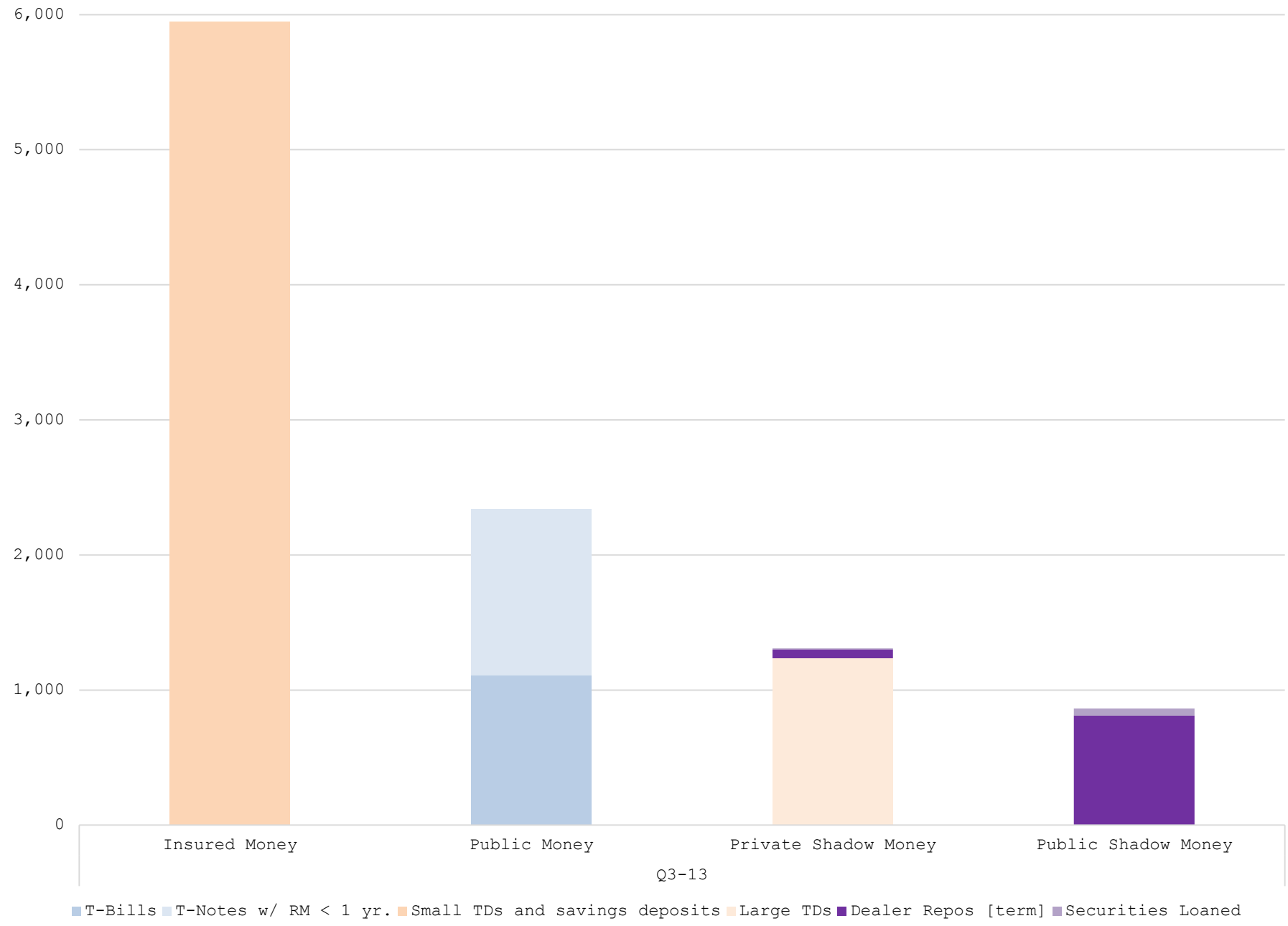
\$ billions



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

Term money claims by type:

\$ billions



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:

Mom and pop depositors.

Holdings of cash and insured bank deposits.

Assets	Public Assets	Central Bank (Federal Reserve)		Dealer Banks (government desk)			
		T-Notes	Currency Reserves (o/n)	T-Repos (o/n)	<	T-Repos (o/n)	
		:		:		:	
		T-Notes		T-Notes		T-Repos (term)	
		Sovereign (U.S. Treasury)		Money Funds (government-only)			
		Reserves (o/n)	T-Bills (o/n)	T-Repos (o/n)	<	T-CNAVs (o/n)	
		:	:	:		:	
			T-Bills (term)	T-Bills (term)			
Assets	Private Assets	Banks (insured)		Dealer Banks (credit desk)			
		Reserves (o/n)	<	Deposits (o/n)	P-Repos (o/n)	<	P-Repos (o/n)
		:		:	:		:
		P-Loans		Deposits (term)	P-Notes		P-Repos (term)
		Banks (wholesale)		Money Funds (prime)			
		Reserves (o/n)	<	T-Repos (o/n)	P-Repos (o/n)	<	P-CNAVs (o/n)
		:		:	:		:
		P-Loans		Deposits (term)	P-Bills (term)		P-Bills (term)
		Public Backstops		Private Backstops			
		Liabilities					

Institutional cash pools:

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

Cash portfolio managers (PM)

Mandate: **“Do not lose”**.

Restricted to invest mostly
in money market instruments.

Public Assets	Central Bank (Federal Reserve)		Dealer Banks (government desk)	
	T-Notes	Currency Reserves (o/n)	T-Repos (o/n)	T-Repos (o/n)
			⋮	⋮
			T-Notes	T-Repos (term)
Public Assets	Sovereign (U.S. Treasury)		Money Funds (government-only)	
	Reserves (o/n)	T-Bills (o/n)	T-Repos (o/n)	T-CNAVs (o/n)
		⋮	⋮	
		T-Bills (term)	T-Bills (term)	
Private Assets	Banks (retail)		Dealer Banks (credit desk)	
	Reserves (o/n)	Deposits (o/n)	P-Repos (o/n)	P-Repos (o/n)
	⋮	⋮	⋮	⋮
	P-Loans	Deposits (term)	P-Notes	P-Repos (term)
Private Assets	Banks (wholesale)		Money Funds (prime)	
	Reserves (o/n)	T-Repos (o/n)	P-Repos (o/n)	P-CNAVs (o/n)
	⋮	⋮	⋮	
	P-Loans	Deposits (term)	P-Bills (term)	
	Public Backstops		Private Backstops	
	<u>Liabilities</u>			

Institutional cash pools:

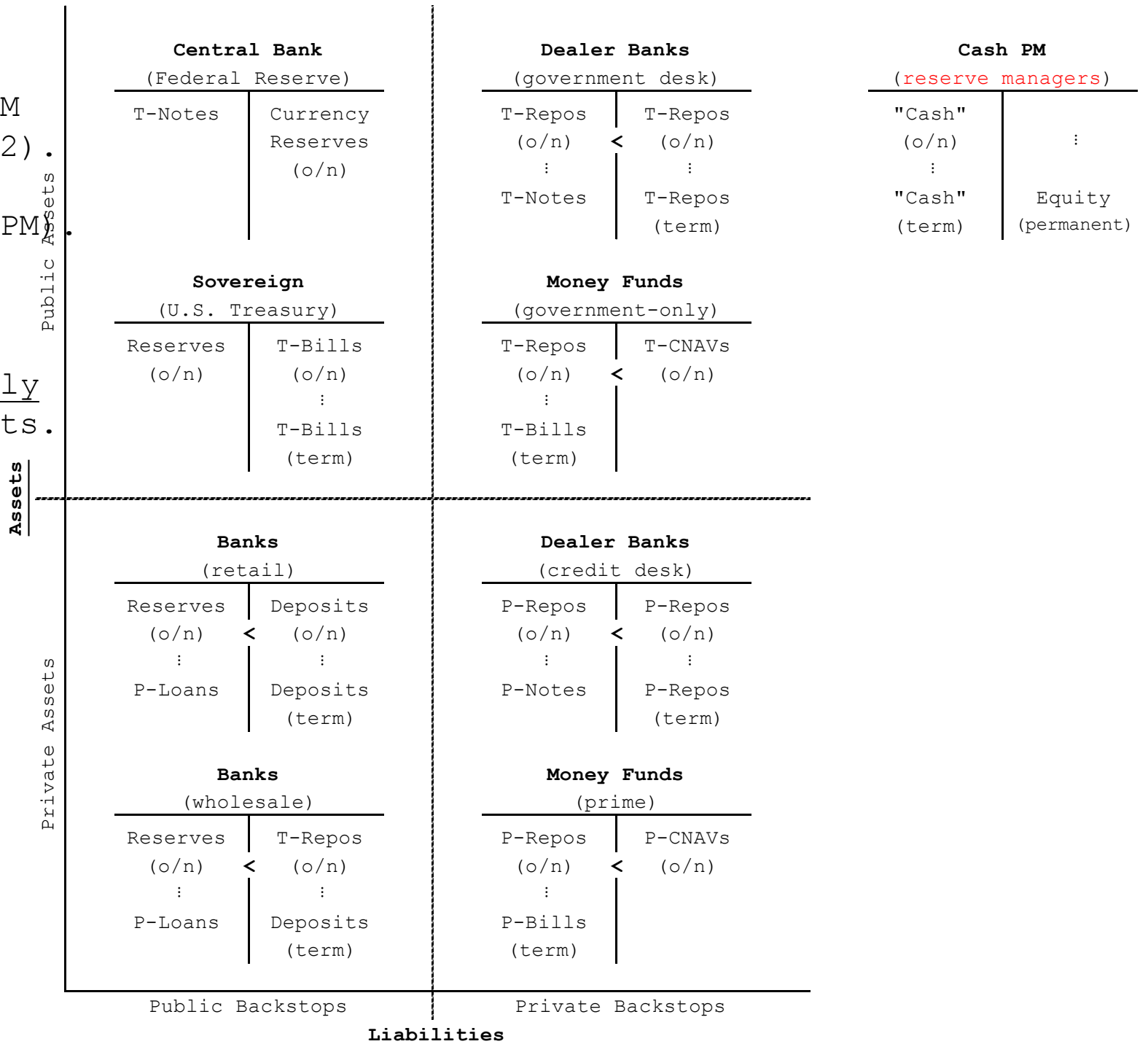
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(see Pozsar, 2011 and 2012).

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[1] FX reserve managers'
liquidity tranches.



Source: Pozsar (2014)

Institutional cash pools:

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(see Pozsar, 2011 and 2012).

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[1] FX reserve managers'
liquidity tranches.

[2] Global corporate cash
balances (on and offshore).

Public Assets

Assets

Private Assets

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

Dealer Banks (government desk)	
T-Repos (o/n)	T-Repos (o/n)
:	:
T-Notes	T-Repos (term)

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

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

Money Funds (government-only)	
T-Repos (o/n)	T-CNAVs (o/n)
:	:
T-Bills (term)	

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

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

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

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

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

Public Backstops

Private Backstops

Liabilities

Institutional cash pools:

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

Cash portfolio managers (PM)

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[1] FX reserve managers'
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[2] Global corporate cash
balances (on and offshore).

[3] Institutional investors
pooled cash balances.

Public Assets

Assets

Private Assets

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

Dealer Banks (government desk)	
T-Repos (o/n)	T-Repos (o/n)
⋮	⋮
T-Notes	T-Repos (term)

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

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

Money Funds (government-only)	
T-Repos (o/n)	T-CNAVs (o/n)
⋮	⋮
T-Bills (term)	⋮

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

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

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

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

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

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

Public Backstops

Private Backstops

Liabilities

Institutional cash pools:

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

Cash portfolio managers (PM)

Mandate: **Do not lose**.

Restricted to invest mostly
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[1] FX reserve managers'
liquidity tranches.

[2] Global corporate cash
balances (on and offshore).

[3] Institutional investors
pooled cash balances.

[4] Sec lenders' cash colla-
teral reinvestment accounts.

Public Assets

Assets

Private Assets

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

Dealer Banks (government desk)	
T-Repos (o/n)	< T-Repos (o/n)
⋮	⋮
T-Notes	T-Repos (term)

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

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

Money Funds (government-only)	
T-Repos (o/n)	< T-CNAVs (o/n)
⋮	⋮
T-Bills (term)	

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

Banks (retail)	
Reserves (o/n)	< Deposits (o/n)
⋮	⋮
P-Loans	Deposits (term)

Dealer Banks (credit desk)	
P-Repos (o/n)	< P-Repos (o/n)
⋮	⋮
P-Notes	P-Repos (term)

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

Banks (wholesale)	
Reserves (o/n)	< T-Repos (o/n)
⋮	⋮
P-Loans	Deposits (term)

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

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

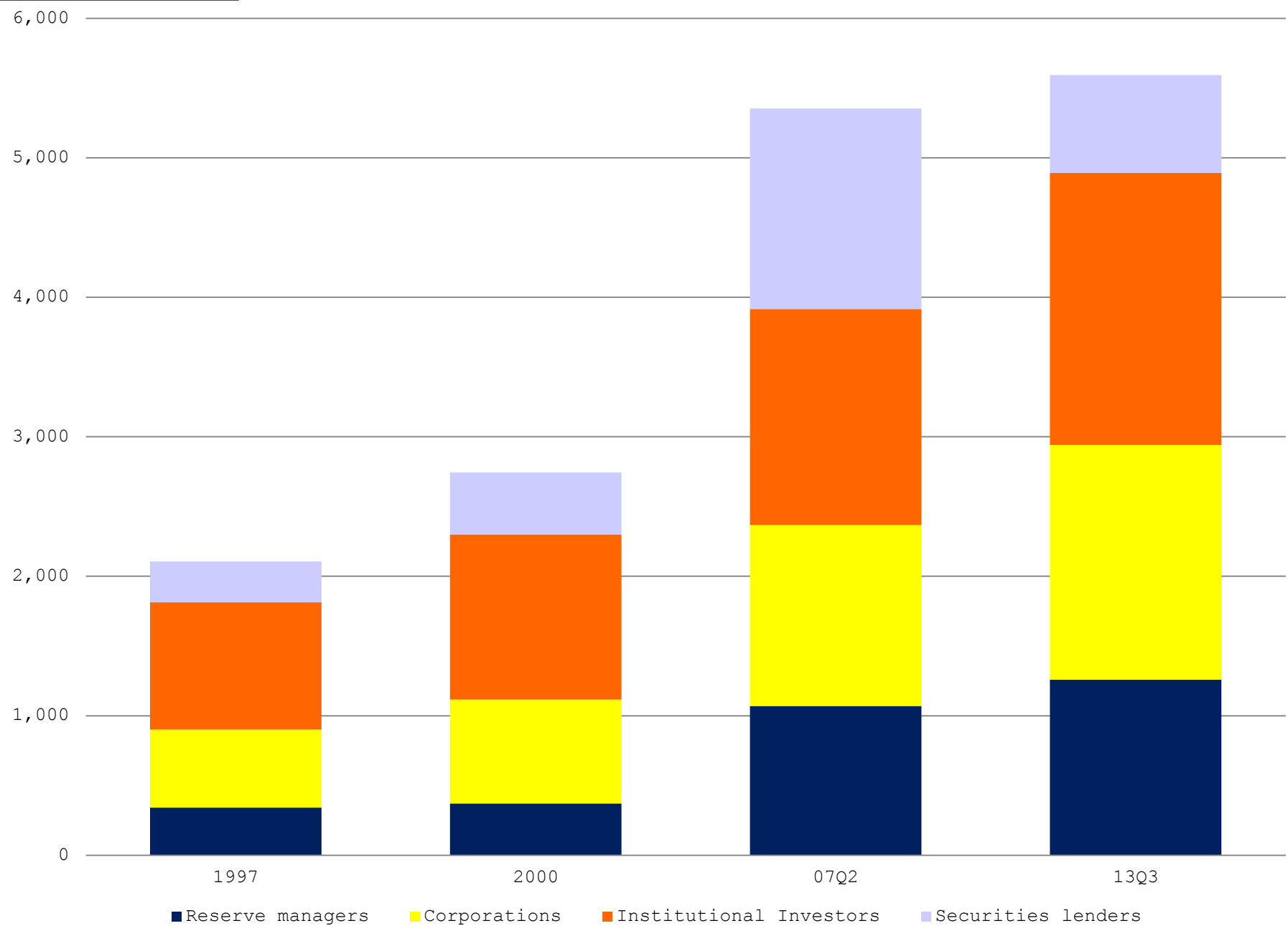
Public Backstops

Private Backstops

Liabilities

Institutional cash pools:

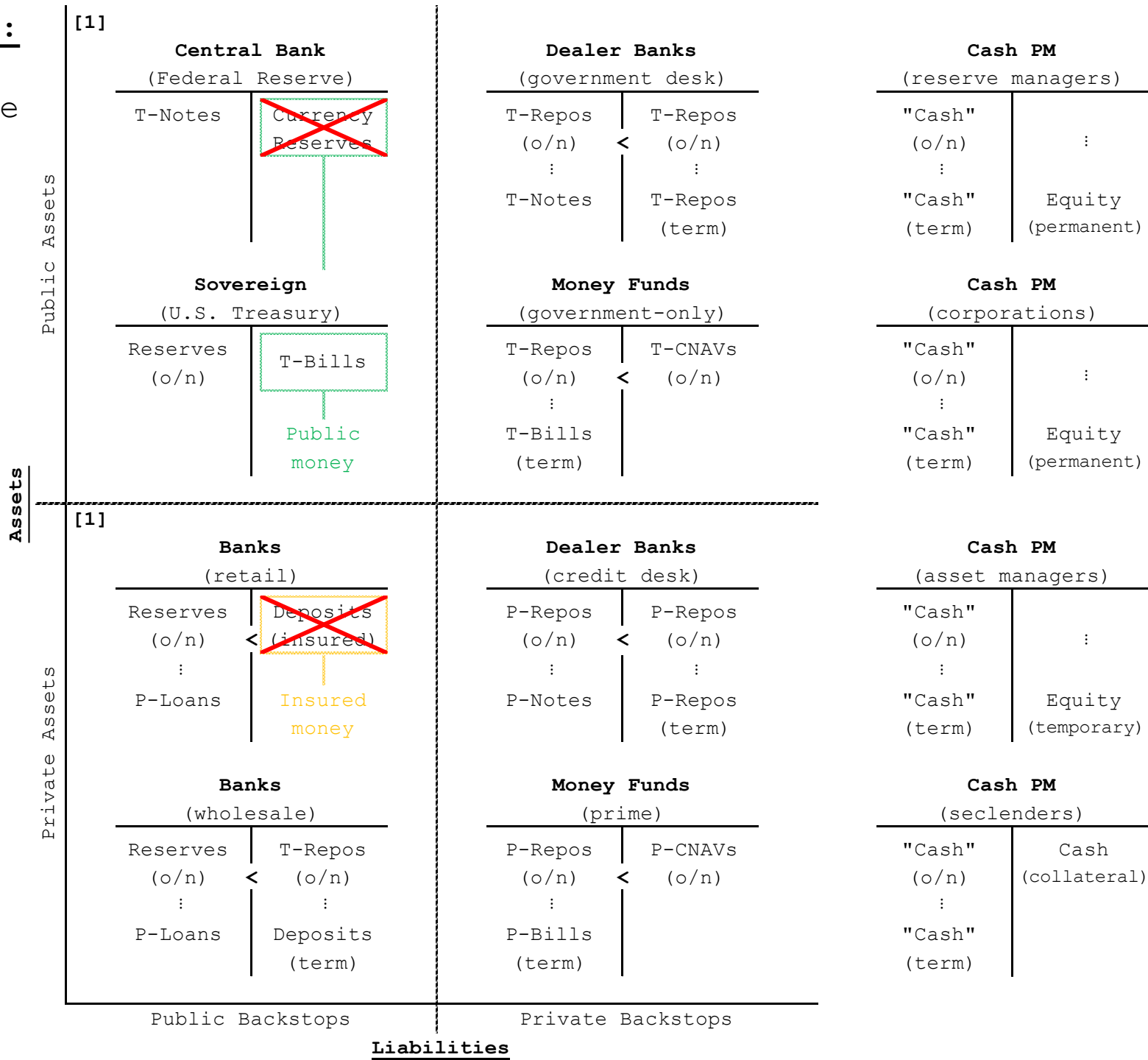
\$ billions



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

Tough to be safe on scale:

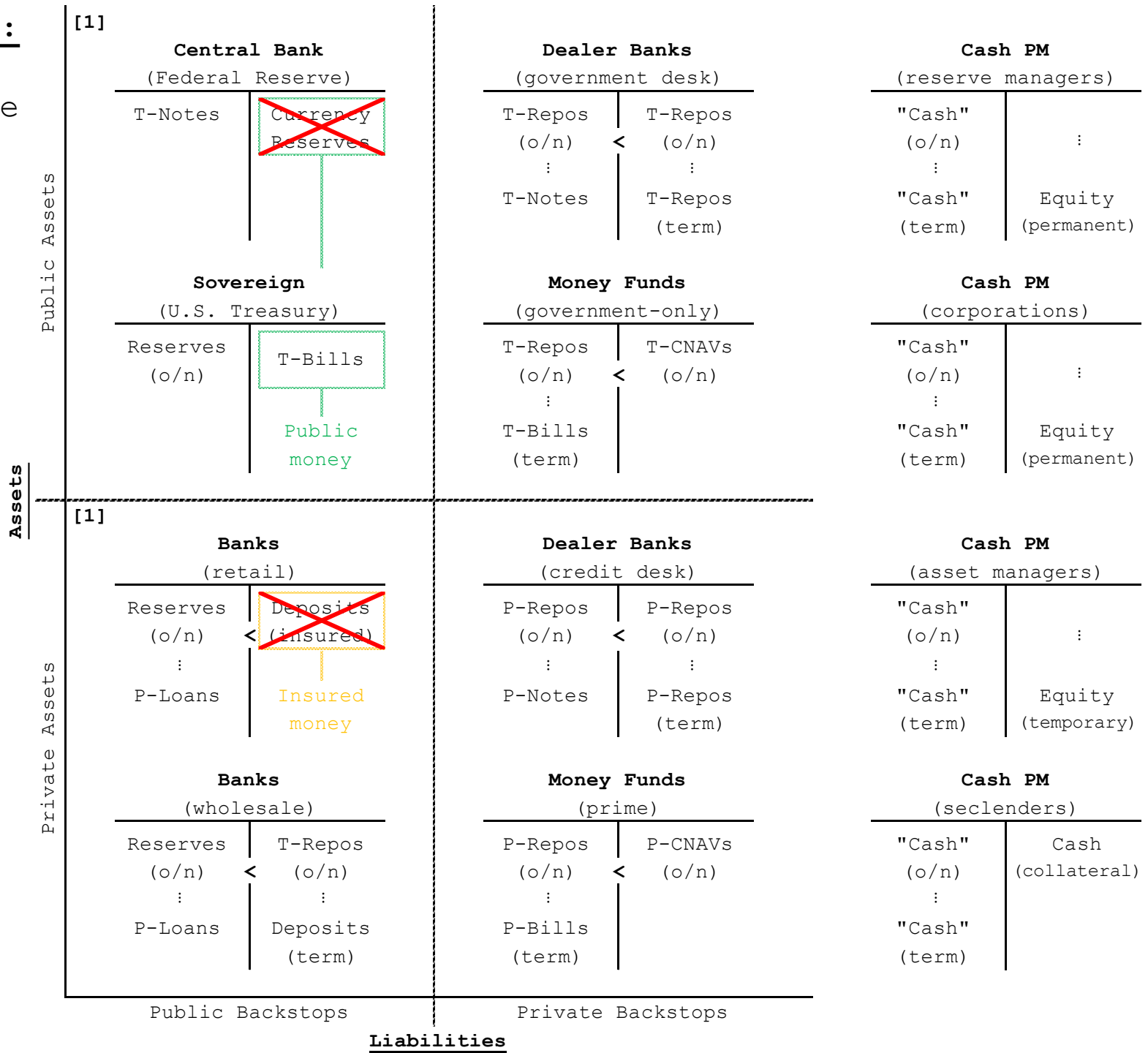
[1] Cash pools do not have access to M0, M1 or M2.



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.

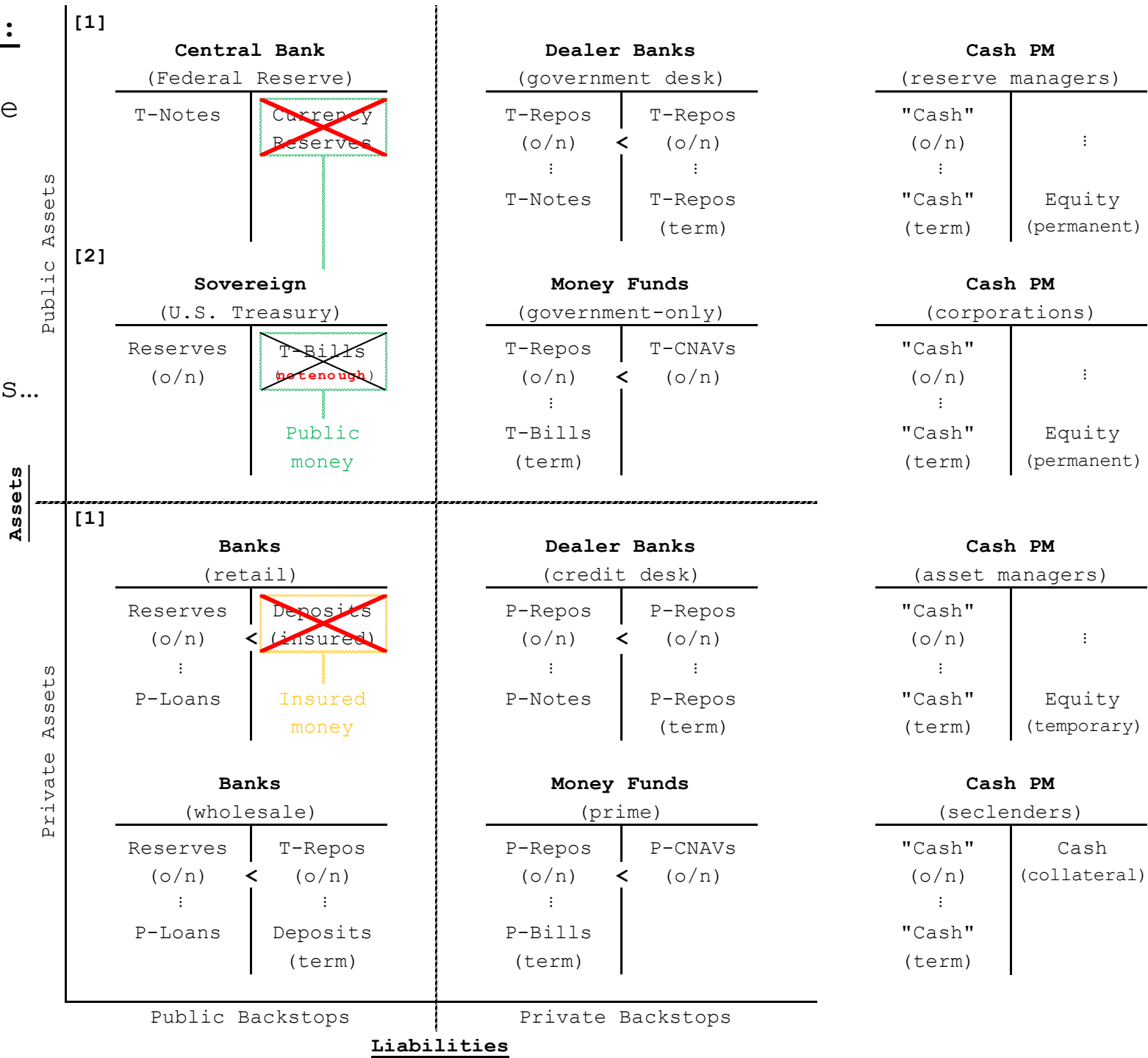


Tough to be safe on scale:

[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...



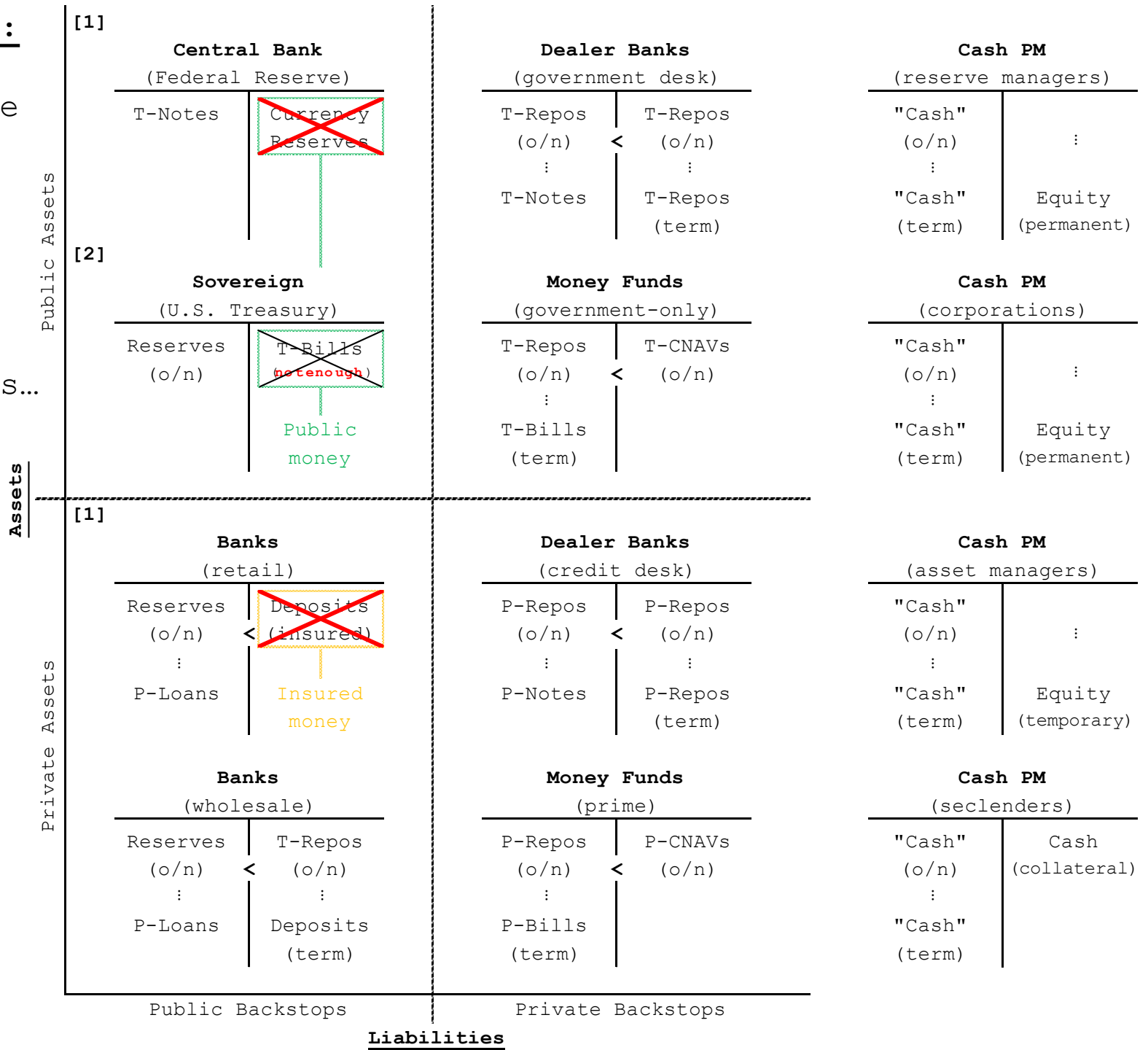
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[2] Cash pools cannot get enough U.S. Treasury bills...

⇒ ...inelastic supply of public money claims.



Tough to be safe on scale:

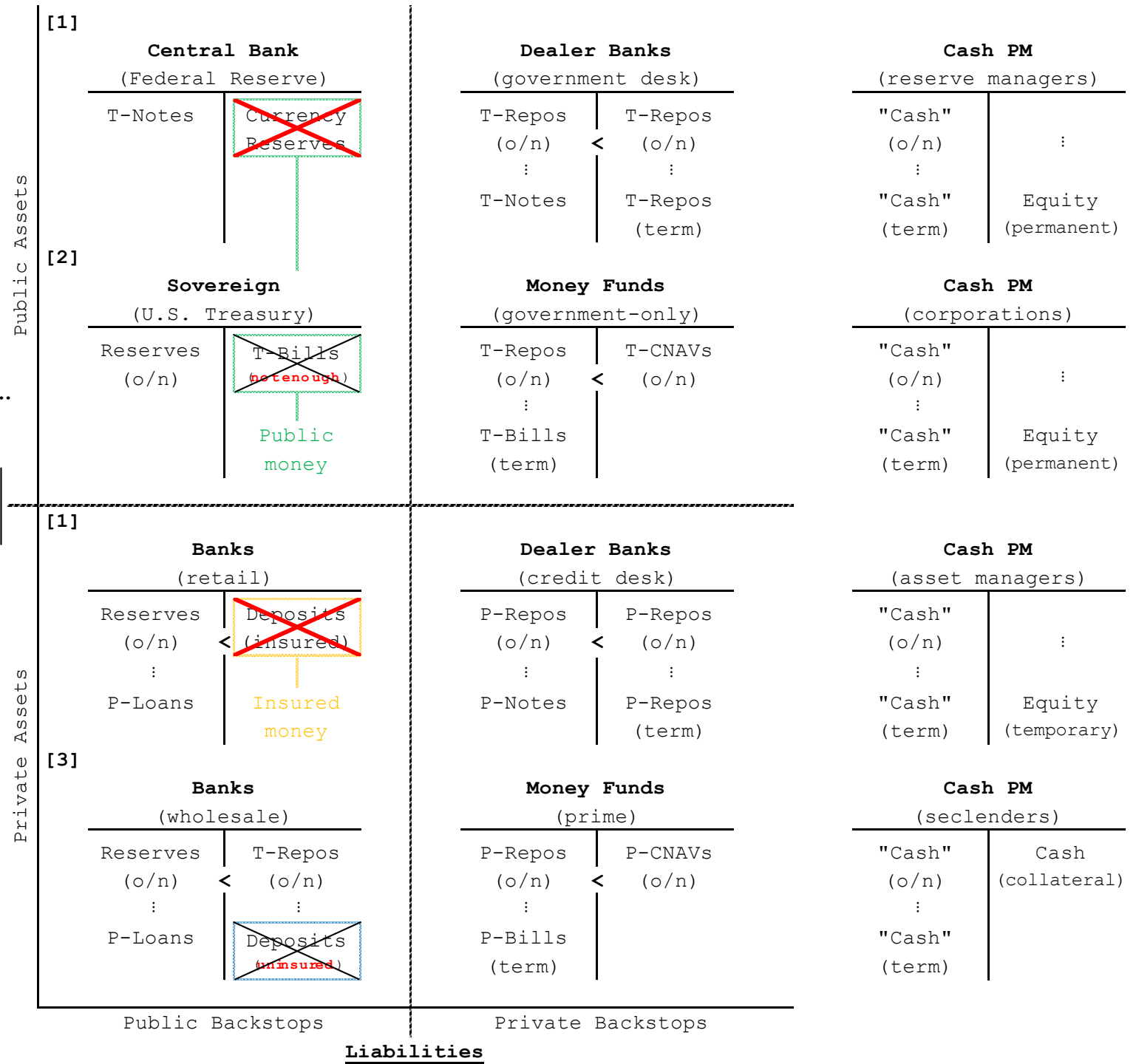
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⇒ ...inelastic supply of public money claims.

[3] Cash pools have limits on un-secured credit risk...



Tough to be safe on scale:

[1] Cash pools do not have access to M0, M1 or M2.

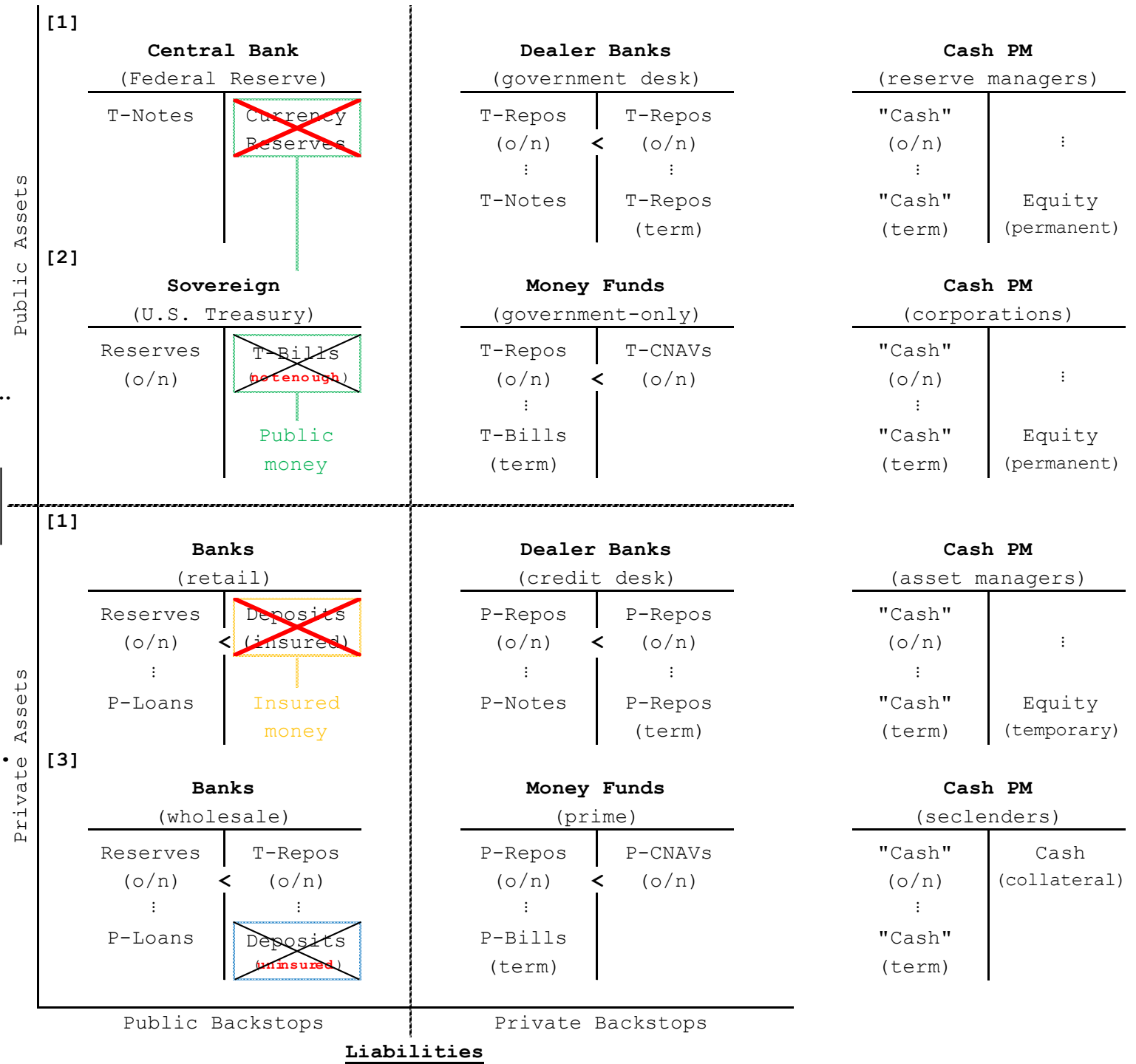
⇒ For cash pools, money begins where M2 ends.

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

⇒ ...inelastic supply of public money claims.

[3] Cash pools have limits on un-secured credit risk...

⇒ ...inelastic demand for un-secured bank deposits.



Tough to be safe on scale:

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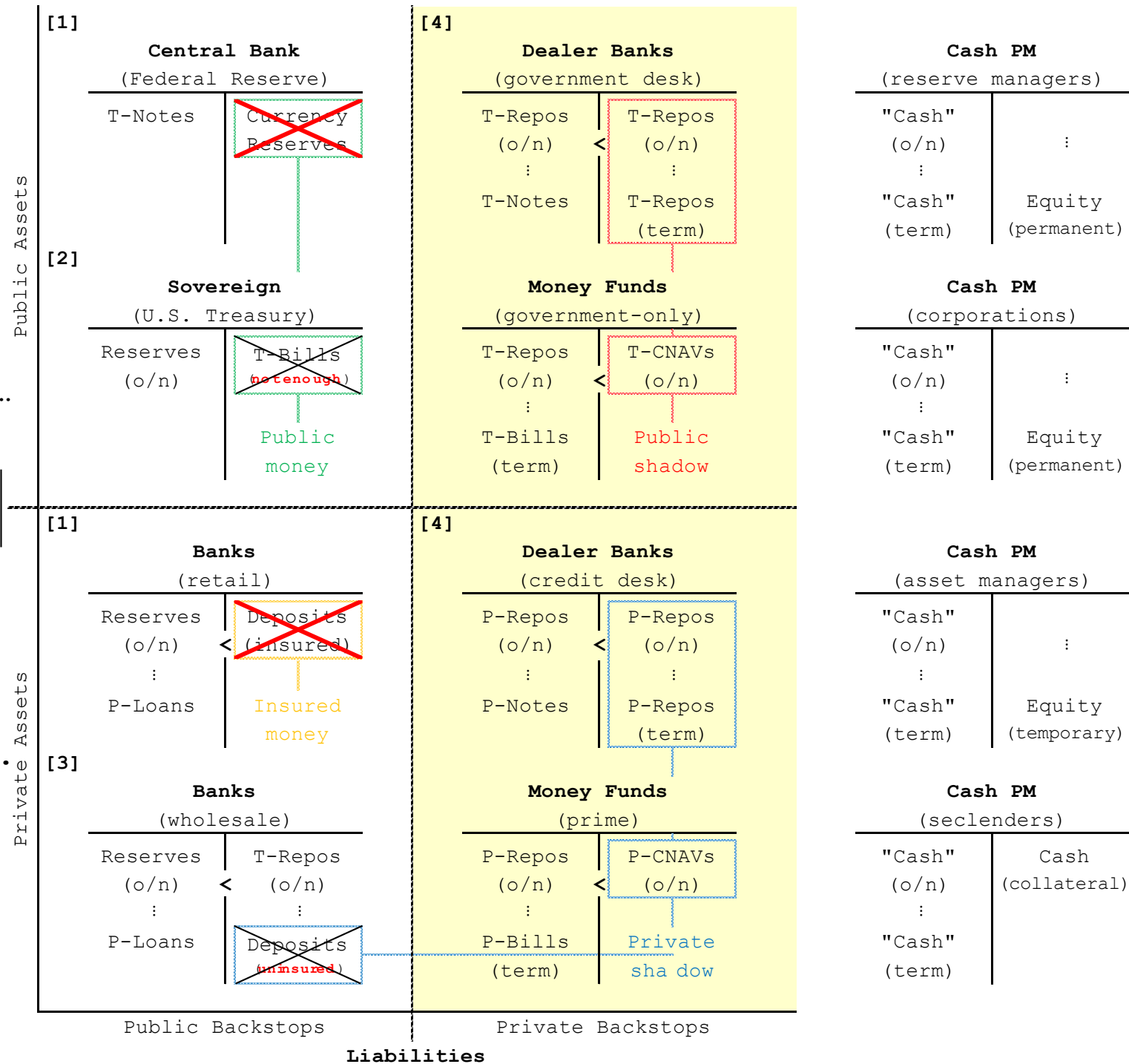
[2] Cash pools cannot get enough U.S. Treasury bills...

⇒ ...inelastic supply of public money claims.

[3] Cash pools have limits on un-secured credit risk...

⇒ ...inelastic demand for un-secured bank deposits.

[4] Cash pools opt for second best alternatives...



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...

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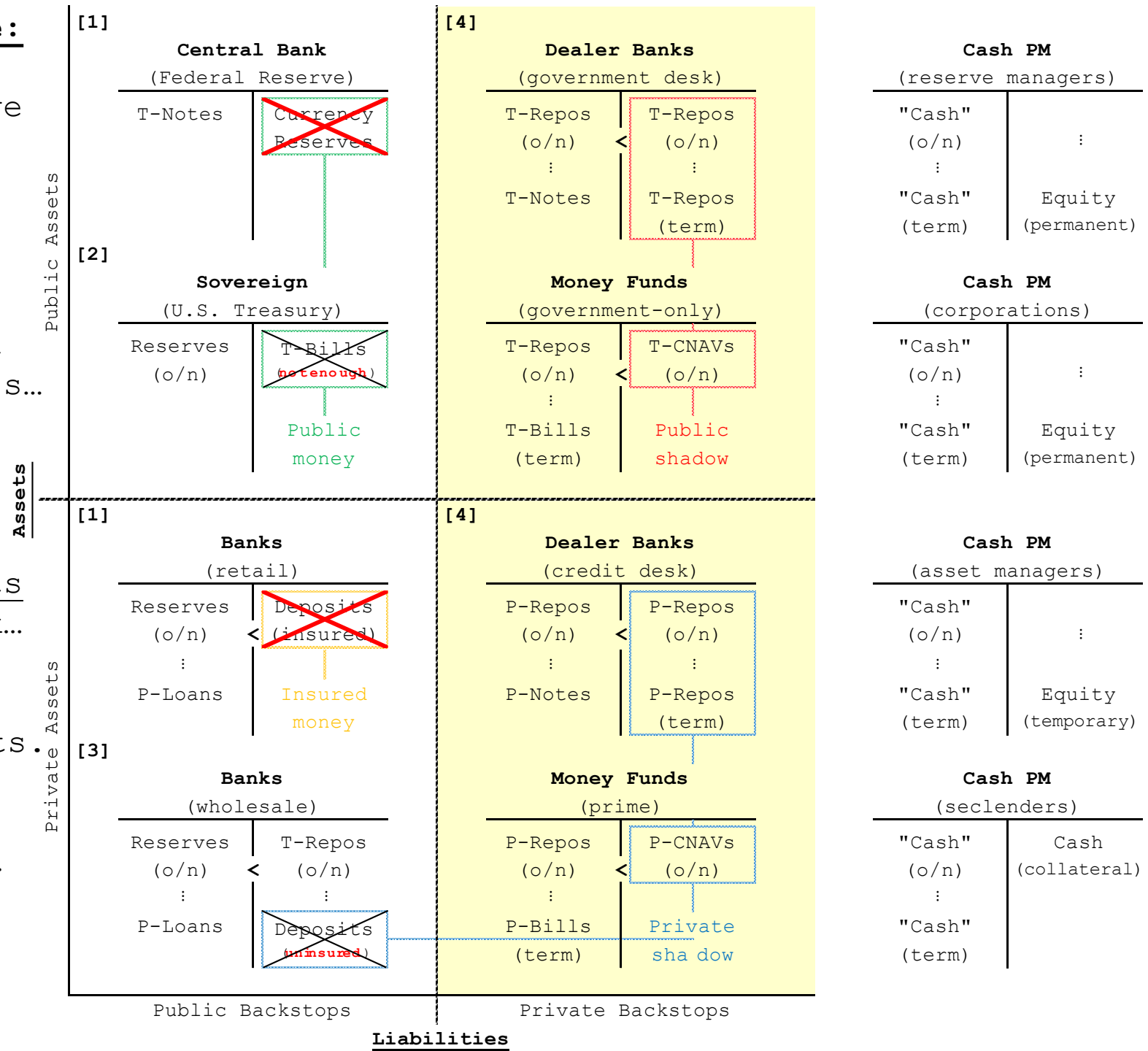
[3] Cash pools have limits on un-secured credit risk...

⇒ ...inelastic demand for un-insured bank deposits.

[4] Cash pools opt for second best alternatives...

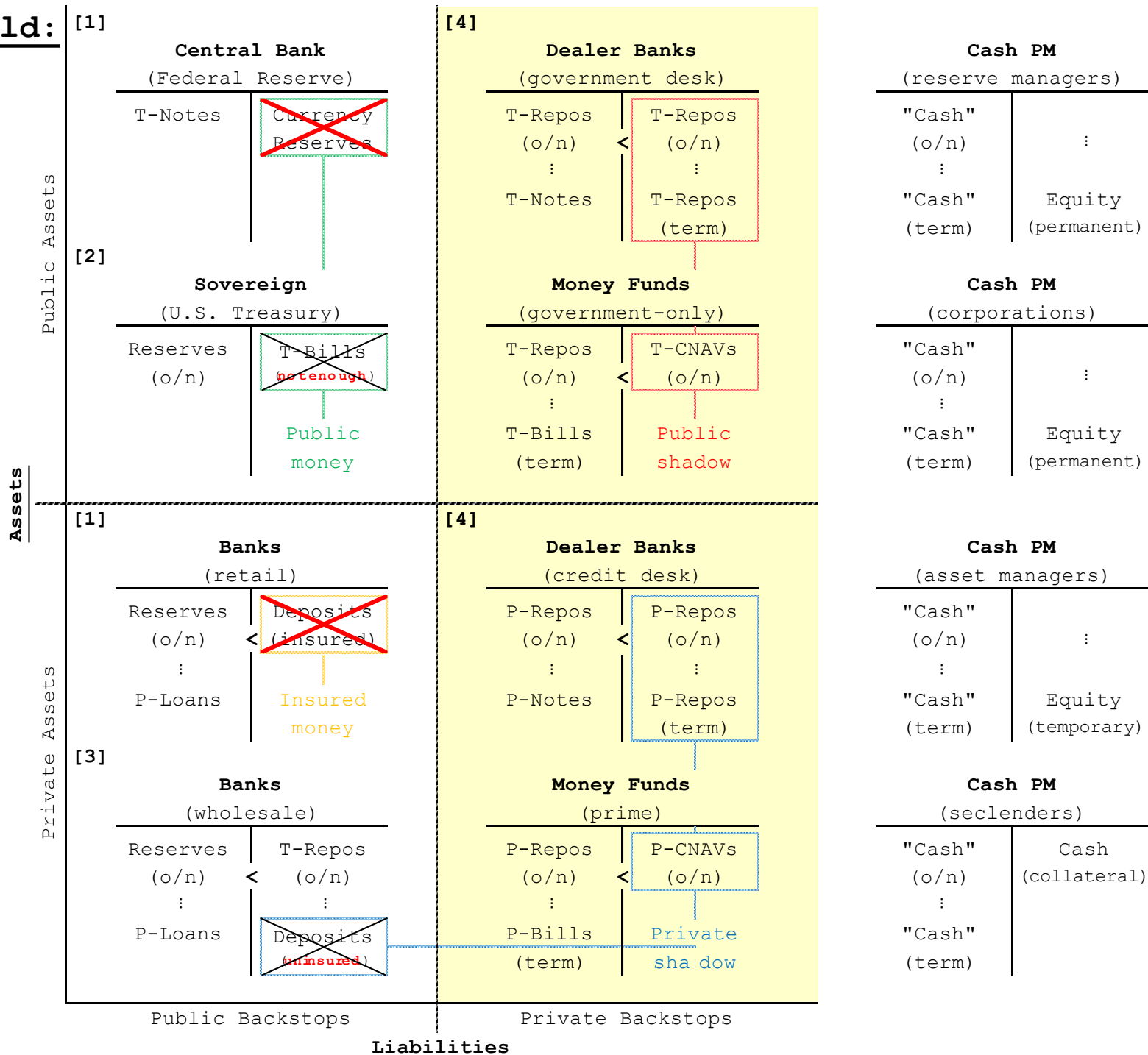
⇒ ...the elastic middle of shadow money claims.

Source: Pozsar (2014)



Search for safety vs. yield:

Search for yield begins where the matrix ends...



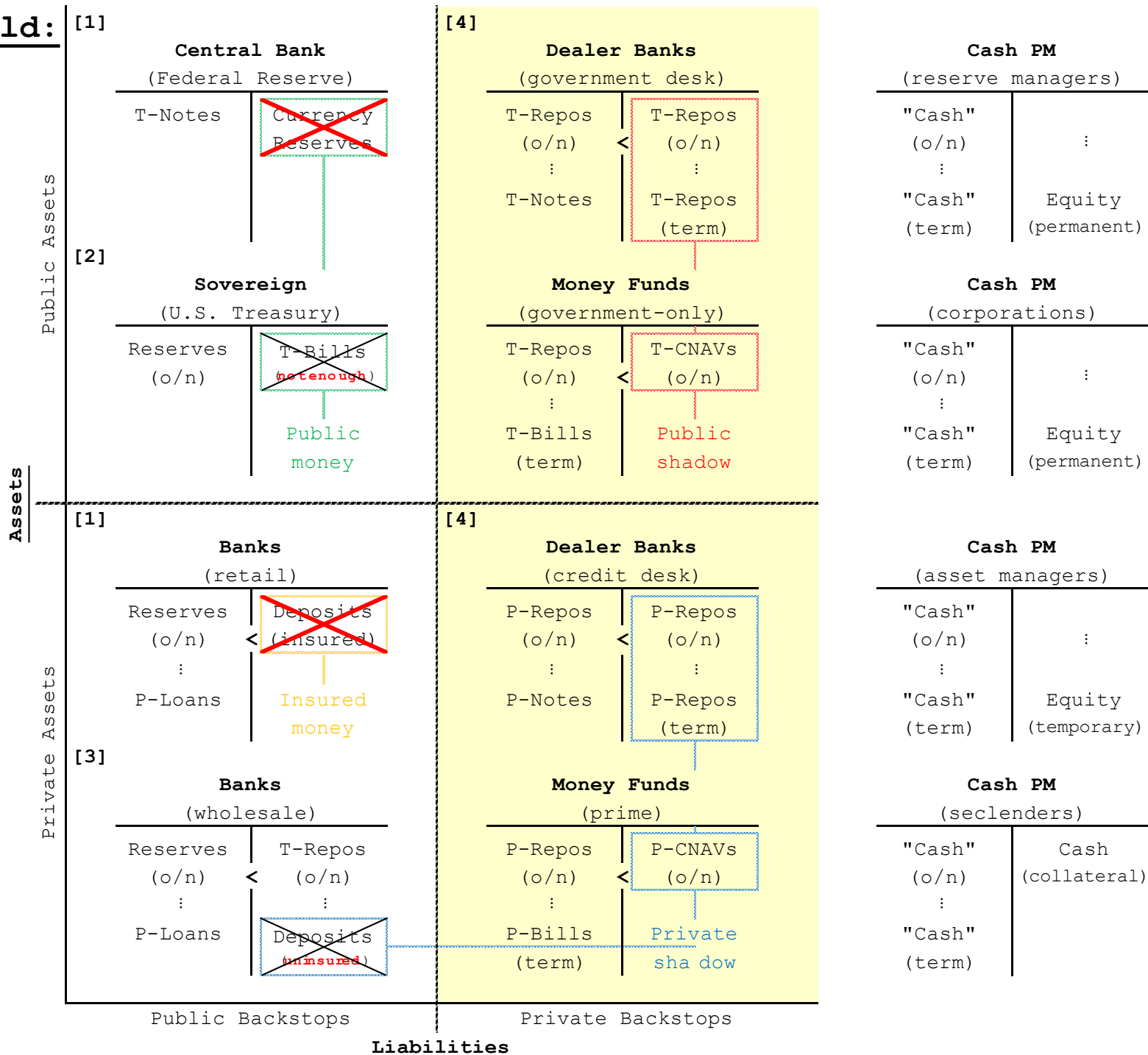
Onshore:

[5] CD

[6] CP

Search for safety vs. yield:

Search for yield begins where the matrix ends...



Onshore:

Offshore:

[5] CD

[7] ECD

[6] CP

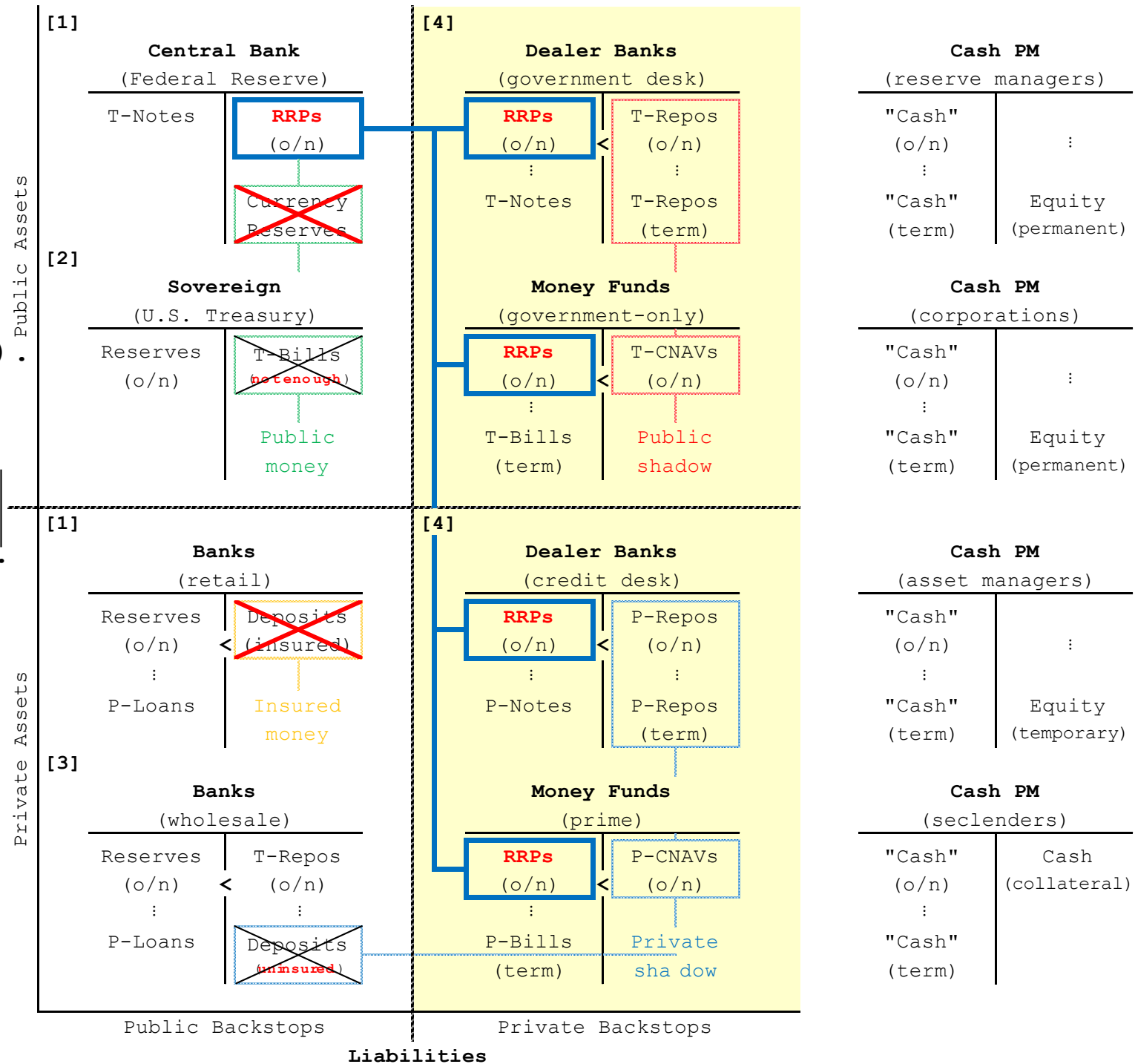
[8] ECP

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 safest of 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.



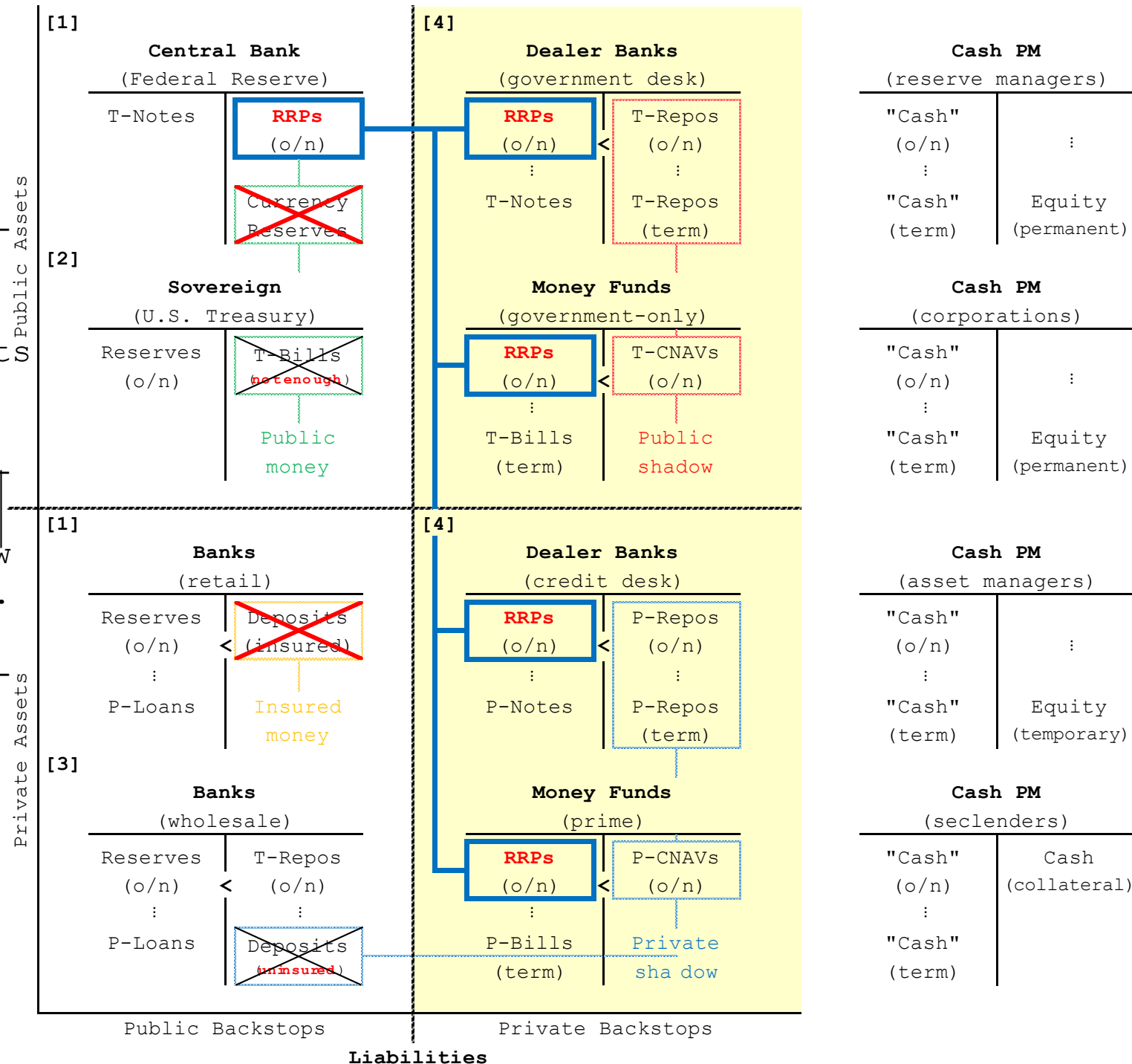
RRPs and cash pools:

Consider RRP's potential as a macro-prudential tool.

Required minimum RRP balances for shadow banks could become equivalent to what minimum reserve requirements are for traditional banks.

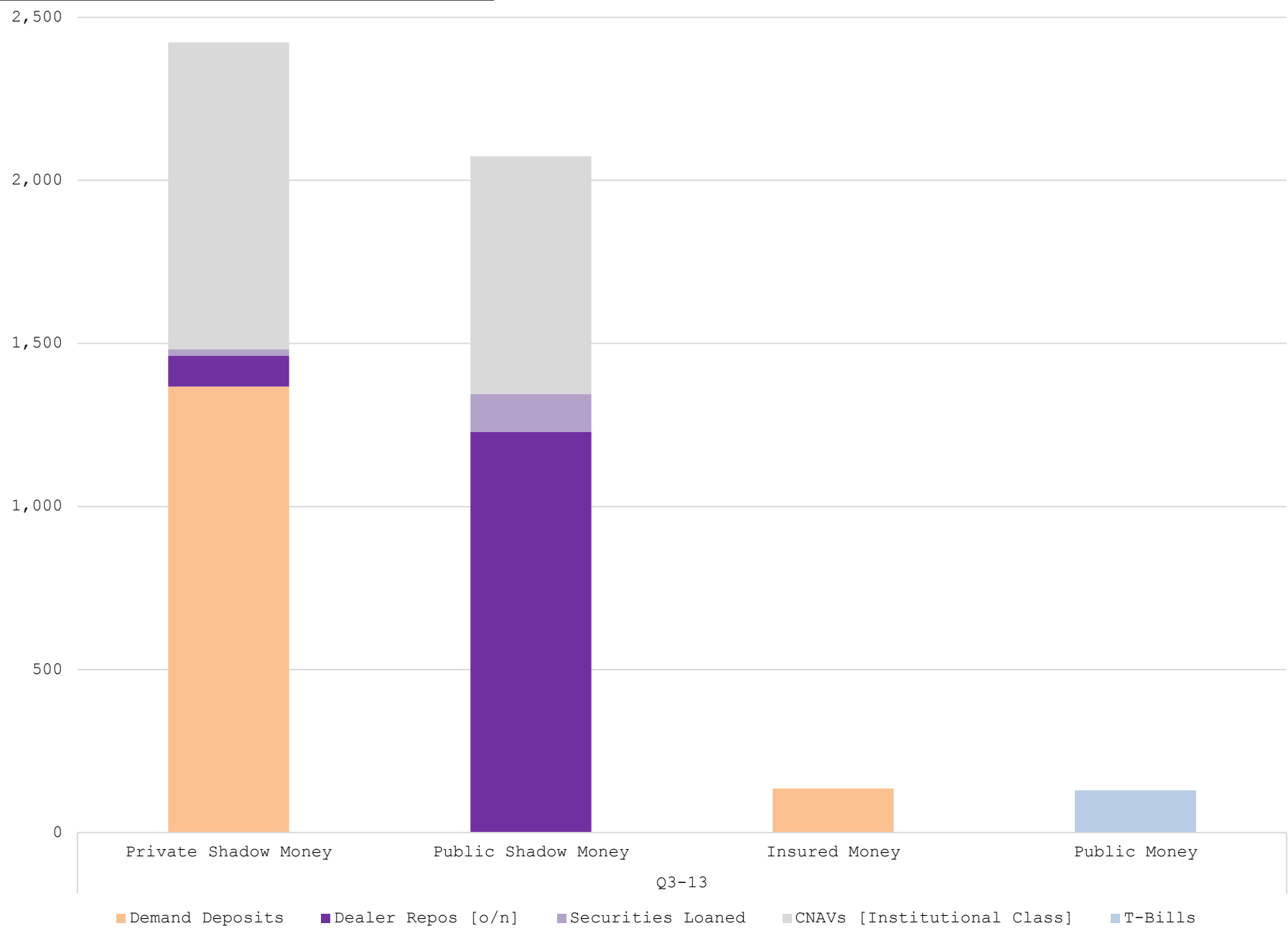
The implementation of minimum RRP balances would increase the safety of shadow money claims further still.

This could be an evolutionary step toward Mehrling's "dealer of last resort" in Bagehot 21st century sense.



Cash pools' access to overnight money:

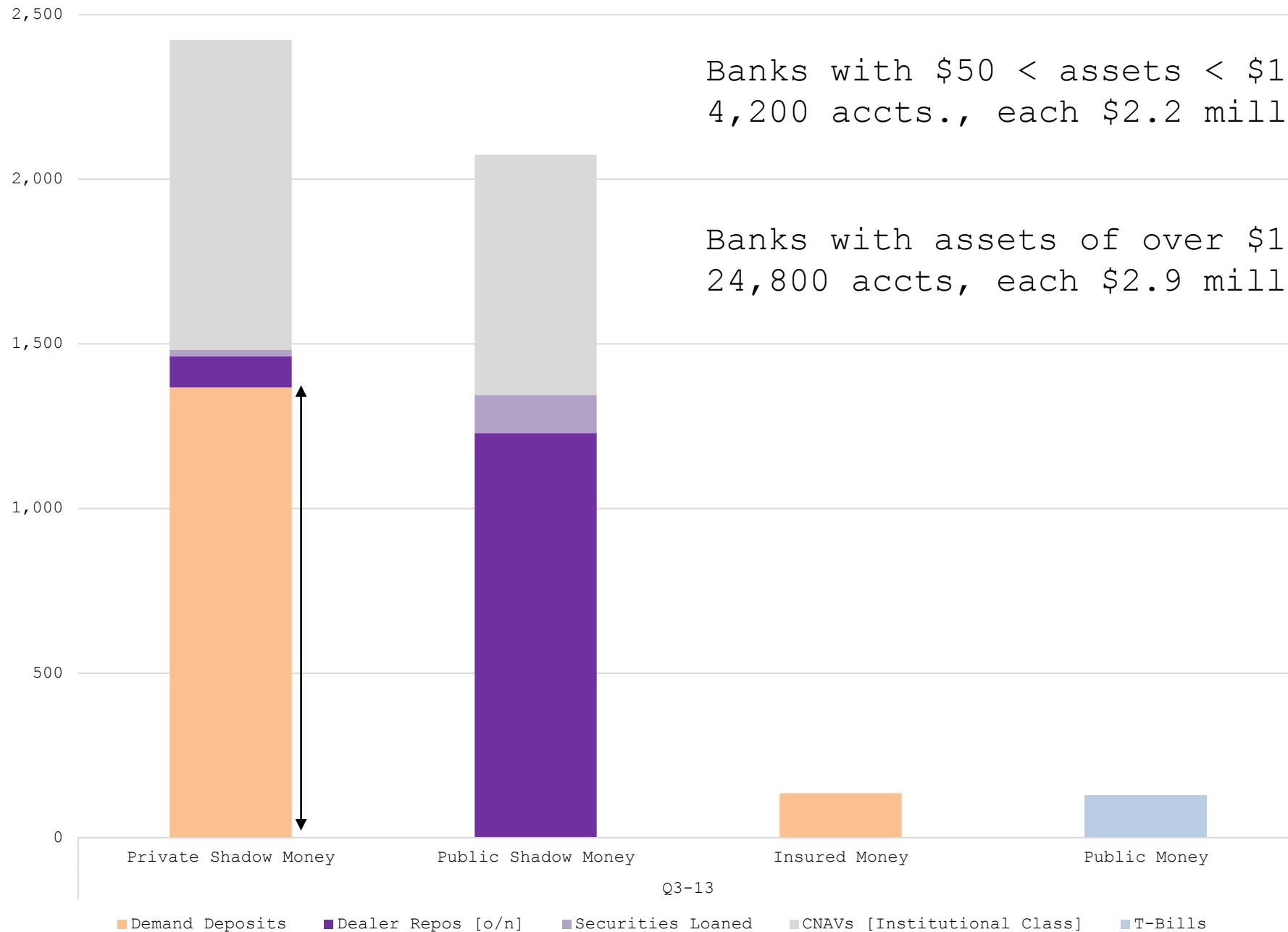
\$ billions



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

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

\$ billions

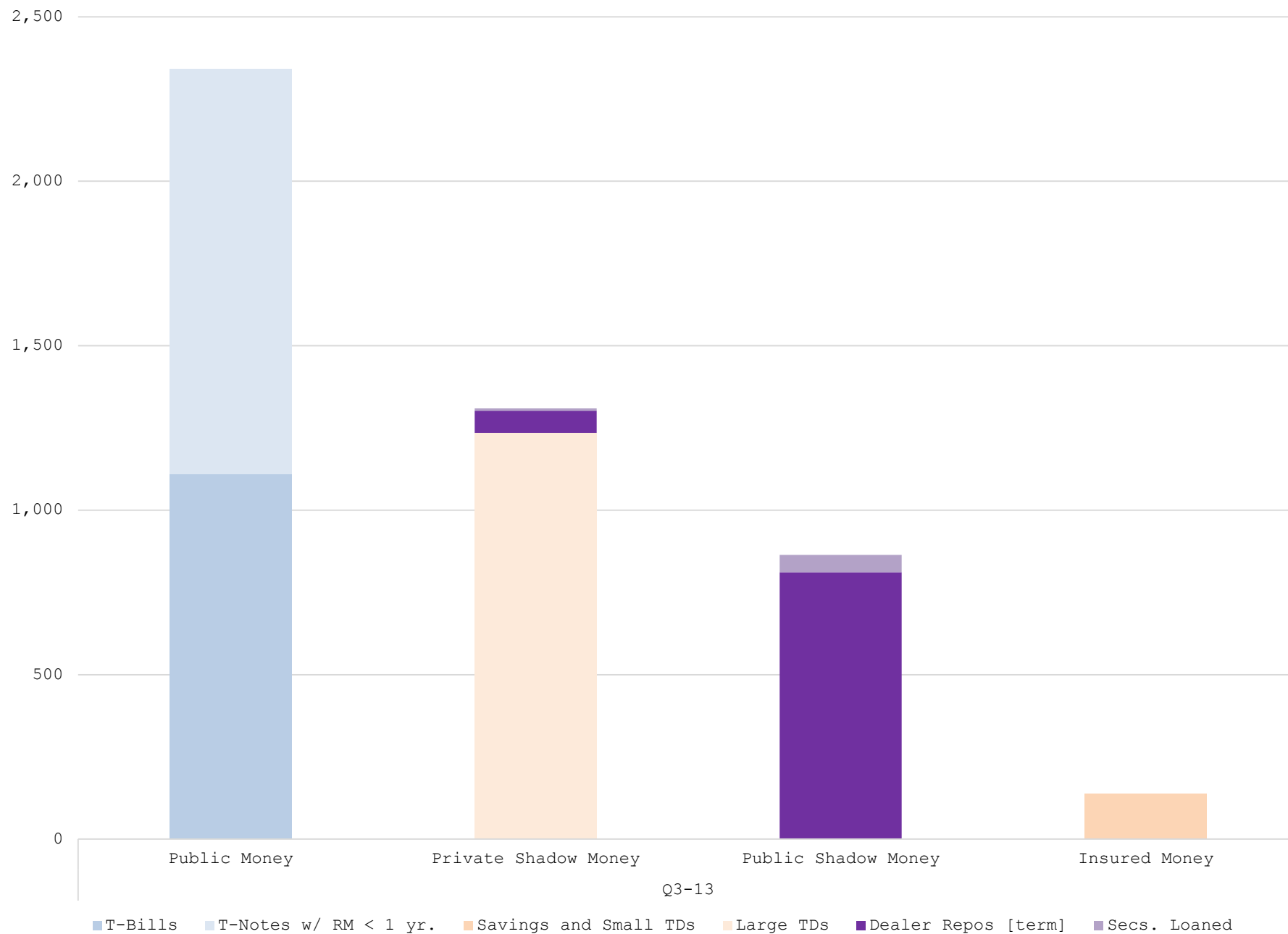


Banks with \$50 < assets < \$100 billion:
4,200 accts., each \$2.2 million on avg.

Banks with assets of over \$100 billion:
24,800 accts, each \$2.9 million on avg.

Cash pools' access to term money:

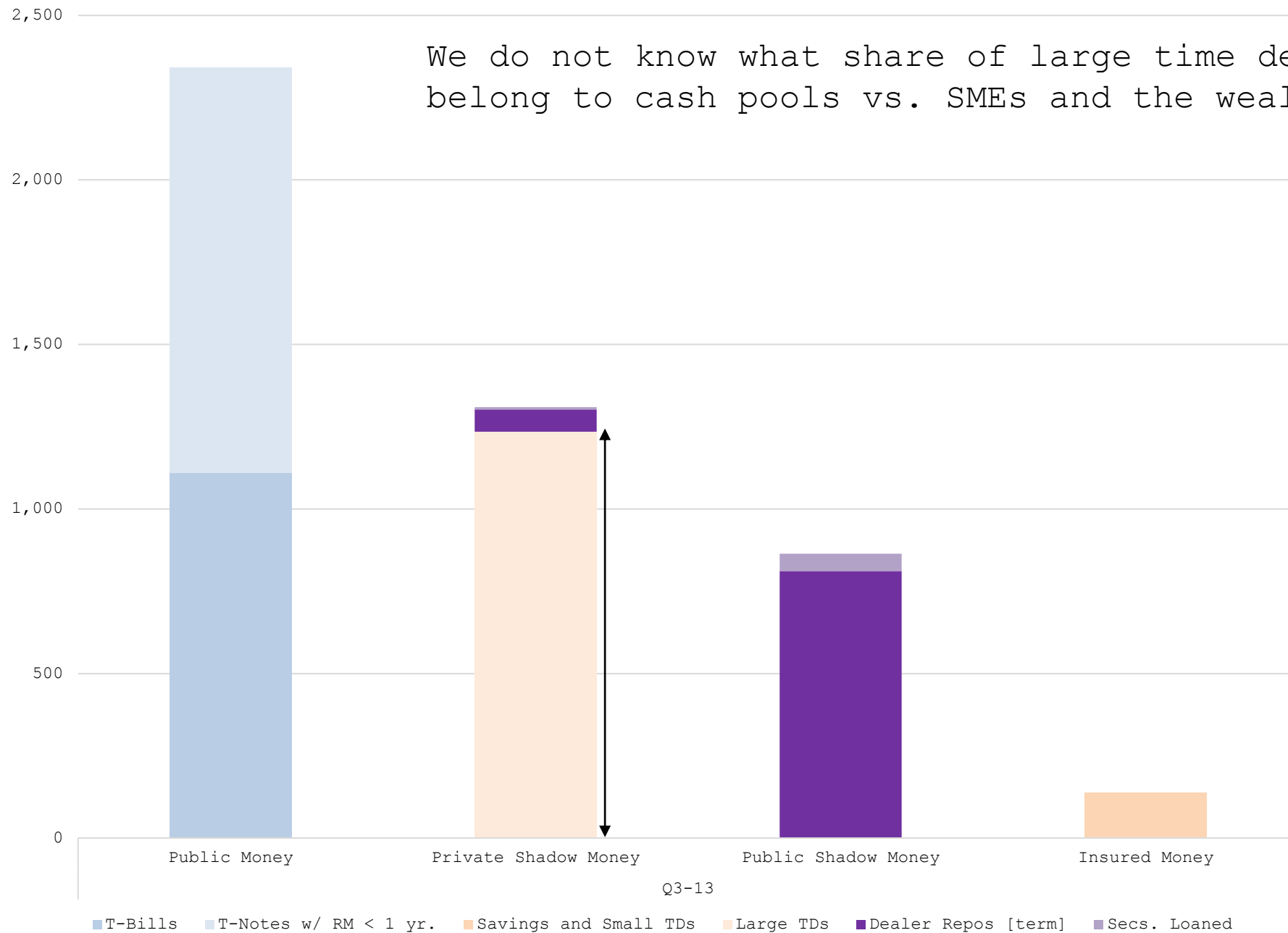
\$ billions



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

Not all large time deposits belong to cash pools:

\$ billions



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:

Retail banks **create money** and credit *ex nihilo* (see for example Turner, 2013)

Clear links to the real economy through loans.

Assets	Public Assets	<table border="1"> <tr><th colspan="2">Central Bank (Federal Reserve)</th></tr> <tr> <td>T-Notes</td> <td>Currency Reserves (o/n)</td> </tr> </table>	Central Bank (Federal Reserve)		T-Notes	Currency Reserves (o/n)	<table border="1"> <tr><th colspan="2">Dealer Banks (government desk)</th></tr> <tr> <td>T-Repos (o/n)</td> <td>T-Repos (o/n)</td> </tr> <tr> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>T-Notes</td> <td>T-Repos (term)</td> </tr> </table>	Dealer Banks (government desk)		T-Repos (o/n)	T-Repos (o/n)	⋮	⋮	T-Notes	T-Repos (term)	<table border="1"> <tr><th colspan="2">Cash PM (reserve managers)</th></tr> <tr> <td>"Cash" (o/n)</td> <td>⋮</td> </tr> <tr> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>"Cash" (term)</td> <td>Equity (permanent)</td> </tr> </table>	Cash PM (reserve managers)		"Cash" (o/n)	⋮	⋮	⋮	"Cash" (term)	Equity (permanent)				
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⋮	⋮																											
"Cash" (term)																												
		Public Backstops	Private Backstops																									
		Liabilities																										

Source: Pozsar (2014)

Money dealing:

Money dealing is borrowing and lending of short-term money in the unsecured and secured and local and global (Eurodollar) money markets.

There are at least six forms of money dealing...

Public Assets	Central Bank (Federal Reserve)	Dealer Banks (government desk)	Cash PM (reserve managers)																								
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	Liabilities																										

Money dealing:

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

Assets	Public Assets	Central Bank (Federal Reserve)	T-Notes Currency Reserves (o/n)	T-Repos (o/n) < T-Repos (o/n) : T-Notes T-Repos (term)	"Cash" (o/n) : "Cash" (term)	Equity (permanent)		
		Sovereign (U.S. Treasury)	Reserves (o/n) T-Bills (o/n) : T-Bills (term)	Money Funds (government-only)	T-Repos (o/n) < T-CNAVs (o/n) : T-Bills (term)	Cash PM (corporations)	"Cash" (o/n) : "Cash" (term)	Equity (permanent)
	Private Assets	Banks (retail)	Reserves (o/n) < FF (o/n) : P-Loans (local) Deposits (term)	Dealer Banks (credit desk)	P-Repos (o/n) < P-Repos (o/n) : P-Notes P-Repos (term)	Cash PM (asset managers)	"Cash" (o/n) : "Cash" (term)	Equity (temporary)
		Banks (wholesale)	[1] FF (o/n) < FF (o/n) : P-Loans (local) Deposits (term)	Money Funds (prime)	P-Repos (o/n) < P-CNAVs (o/n) : P-Bills (term)	Cash PM (seclenders)	"Cash" (o/n) : "Cash" (term)	Cash (collateral)
		Public Backstops		Private Backstops				
			Liabilities					

Money dealing:

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

[2] Interdealer money dealing in the GCF repo market.

Public Assets	Central Bank (Federal Reserve)	Dealer Banks (government desk)	Cash PM (reserve managers)											
	<table border="1"> <tr><td>T-Notes</td><td>Currency Reserves (o/n)</td></tr> </table>	T-Notes	Currency Reserves (o/n)	<table border="1"> <tr><td>T-Notes</td><td>T-Repos (term)</td></tr> </table>	T-Notes	T-Repos (term)	<table border="1"> <tr><td>"Cash" (o/n)</td><td>:</td></tr> <tr><td>"Cash" (term)</td><td>Equity (permanent)</td></tr> </table>	"Cash" (o/n)	:	"Cash" (term)	Equity (permanent)			
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Reserves (o/n)	FF (o/n)													
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FF (o/n)	FF (o/n)													
P-Loans (local)	Deposits (term)													
P-Repos (o/n)	P-CNAVs (o/n)													
P-Bills (term)														
"Cash" (o/n)	Cash (collateral)													
"Cash" (term)														
Assets	Liabilities													
	Public Backstops	Private Backstops												

Money dealing:

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

[2] Interdealer money dealing in the GCF repo market

[3] Interlinked money dealing in the TRP repo market (cash PM -> MMF -> dealer).

Public Assets	Central Bank (Federal Reserve)	Dealer Banks (government desk)	Cash PM (reserve managers)
	T-Notes Currency Reserves (o/n)	[2] T-Repos (o/n) < T-Repos (o/n) : T-Notes T-Repos (term)	"Cash" (o/n) : : "Cash" (term) Equity (permanent)
	Sovereign (U.S. Treasury)	Money Funds (government-only)	Cash PM (corporations)
	Reserves (o/n) T-Bills (o/n) : T-Bills (term)	[3] T-Repos (o/n) < T-CNAVs (o/n) : T-Bills (term)	"Cash" (o/n) : : "Cash" (term) Equity (permanent)
Private Assets	Banks (retail)	Dealer Banks (credit desk)	Cash PM (asset managers)
	Reserves (o/n) < FF (o/n) : P-Loans (local) Deposits (term)	P-Repos (o/n) < P-Repos (o/n) : P-Notes P-Repos (term)	"Cash" (o/n) : : "Cash" (term) Equity (temporary)
	Banks (wholesale)	Money Funds (prime)	Cash PM (seclenders)
	[1] FF (o/n) < FF (o/n) : P-Loans (local) Deposits (term)	[3] P-Repos (o/n) < P-CNAVs (o/n) : P-Bills (term)	"Cash" (o/n) Cash (collateral) : "Cash" (term)
	Public Backstops	Private Backstops	
	Liabilities		

Money dealing:

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

[2] Interdealer money dealing in the GCF repo market

[3] Interlinked 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).

Public Assets	Central Bank (Federal Reserve)	Dealer Banks (government desk)	Cash PM (reserve managers)																						
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<table border="1"> <tr> <td>[1] FF (o/n)</td> <td><</td> <td>FF (o/n)</td> </tr> <tr> <td>⋮</td> <td></td> <td>⋮</td> </tr> <tr> <td>[4] P-Loans (global)</td> <td></td> <td>Deposits (term)</td> </tr> </table>	[1] FF (o/n)	<	FF (o/n)	⋮		⋮	[4] P-Loans (global)		Deposits (term)	<table border="1"> <tr> <td>[3] P-Repos (o/n)</td> <td><</td> <td>P-CNAVs (o/n)</td> </tr> <tr> <td>⋮</td> <td></td> <td>⋮</td> </tr> <tr> <td>P-Bills (term)</td> <td></td> <td></td> </tr> </table>	[3] P-Repos (o/n)	<	P-CNAVs (o/n)	⋮		⋮	P-Bills (term)			<table border="1"> <tr> <td>"Cash" (o/n)</td> <td>Cash (collateral)</td> </tr> <tr> <td>"Cash" (term)</td> <td></td> </tr> </table>	"Cash" (o/n)	Cash (collateral)	"Cash" (term)		
[1] FF (o/n)	<	FF (o/n)																							
⋮		⋮																							
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⋮		⋮																							
P-Bills (term)																									
"Cash" (o/n)	Cash (collateral)																								
"Cash" (term)																									
	Public Backstops	Private Backstops																							
	Liabilities																								

Money dealing:

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

[2] Interdealer money dealing in the GCF repo market

[3] Interlinked 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).

[5] Crossborder money dealing via the headquarters of foreign banks selling Eurodollar CD and CP to prime money market funds.

Public Assets	Central Bank (Federal Reserve)	Dealer Banks (government desk)	Cash PM (reserve managers)
	T-Notes Currency Reserves (o/n)	[2] T-Repos (o/n) < T-Repos (o/n) : T-Notes T-Repos (term)	"Cash" (o/n) : : "Cash" (term) Equity (permanent)
	Sovereign (U.S. Treasury)	Money Funds (government-only)	Cash PM (corporations)
	Reserves (o/n) T-Bills (o/n) : T-Bills (term)	[3] T-Repos (o/n) < T-CNAVs (o/n) : T-Bills (term)	"Cash" (o/n) : : "Cash" (term) Equity (permanent)
Assets			
Private Assets	Banks (retail)	Dealer Banks (credit desk)	Cash PM (asset managers)
	Reserves (o/n) FF (o/n) : P-Loans (local) Deposits (term)	P-Repos (o/n) < P-Repos (o/n) : P-Notes P-Repos (term)	"Cash" (o/n) : : "Cash" (term) Equity (temporary)
	Banks (wholesale)	Money Funds (prime)	Cash PM (seclenders)
	[1] FF (o/n) FF (o/n) : [4] P-Loans (<u>global</u>) Deposits (term)	[3] P-Repos (o/n) < P-CNAVs (o/n) : [5] P-Bills (<u>global</u>) P-CNAVs (o/n)	"Cash" (o/n) Cash (collateral) : "Cash" (term)
	Public Backstops	Private Backstops	
	Liabilities		

Money dealing:

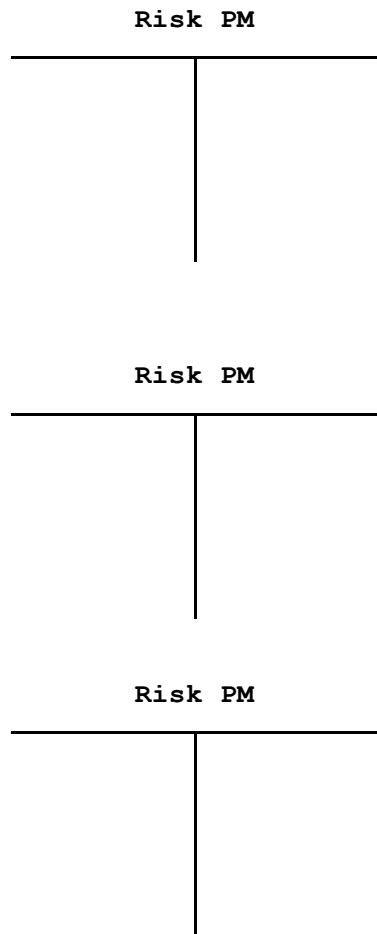
[6] Client-driven money dealing in the DvP repo market.

Assets	Public Assets	Central Bank (Federal Reserve)	Dealer Banks (government desk)	Cash PM (reserve managers)																							
		<table border="1"> <tr> <td>T-Notes</td> <td>Currency Reserves (o/n)</td> </tr> </table>	T-Notes	Currency Reserves (o/n)	<table border="1"> <tr> <td>[2] T-Repos (o/n)</td> <td><</td> <td>T-Repos (o/n)</td> </tr> <tr> <td>⋮</td> <td></td> <td>⋮</td> </tr> <tr> <td>T-Notes</td> <td></td> <td>T-Repos (term)</td> </tr> </table>	[2] T-Repos (o/n)	<	T-Repos (o/n)	⋮		⋮	T-Notes		T-Repos (term)	<table border="1"> <tr> <td>"Cash" (o/n)</td> <td>:</td> </tr> <tr> <td>⋮</td> <td></td> </tr> <tr> <td>"Cash" (term)</td> <td>Equity (permanent)</td> </tr> </table>	"Cash" (o/n)	:	⋮		"Cash" (term)	Equity (permanent)						
	T-Notes	Currency Reserves (o/n)																									
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Reserves (o/n)	T-Bills (o/n)																										
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⋮		⋮																									
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"Cash" (term)	Equity (permanent)																										
Private Assets	Public Backstops	Banks (retail)	Dealer Banks (credit desk)	Cash PM (asset managers)																							
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	⋮		⋮																								
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⋮																											
"Cash" (term)																											
	Public Backstops	Private Backstops																									
	Liabilities																										

Money dealing:

[6] Client-driven money dealing in the DvP repo market.

Dealers' buy-side clients: risk portfolio managers (PM)



Public Assets

Assets

Private Assets

Central Bank
(Federal Reserve)

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

Sovereign
(U.S. Treasury)

Reserves (o/n)	T-Bills (o/n)
	⋮
	T-Bills (term)

Banks
(retail)

Reserves (o/n)	FF (o/n)
⋮	⋮
P-Loans (local)	Deposits (term)

Banks
(wholesale)

FF (o/n)	FF (o/n)
⋮	⋮
P-Loans (<u>global</u>)	Deposits (term)

Dealer Banks
(government desk)

T-Repos (o/n)	<	T-Repos (o/n)
⋮		⋮
T-Notes		T-Repos (term)

Money Funds
(government-only)

T-Repos (o/n)	<	T-CNAVs (o/n)
⋮		⋮
T-Bills (term)		

Dealer Banks
(credit desk)

P-Repos (o/n)	<	P-Repos (o/n)
⋮		⋮
P-Notes		P-Repos (term)

Money Funds
(prime)

P-Repos (o/n)	<	P-CNAVs (o/n)
⋮		⋮
P-Bills (<u>global</u>)		

Cash PM
(reserve managers)

"Cash" (o/n)	⋮
⋮	
"Cash" (term)	Equity (permanent)

Cash PM
(corporations)

"Cash" (o/n)	⋮
⋮	
"Cash" (term)	Equity (permanent)

Cash PM
(asset managers)

"Cash" (o/n)	⋮
⋮	
"Cash" (term)	Equity (temporary)

Cash PM
(seclenders)

"Cash" (o/n)	Cash (collateral)
⋮	
"Cash" (term)	

Public Backstops

Private Backstops

Liabilities

Money dealing:

[6] Client-driven money dealing in the DvP repo market.

Mandate: "Beat benchmark".

Three forms of leverage...

Risk PM

--	--

Risk PM

--	--

Risk PM

--	--

Public Assets

Assets

Private Assets

Central Bank
(Federal Reserve)

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

Sovereign
(U.S. Treasury)

Reserves (o/n)	T-Bills (o/n)
	⋮
	T-Bills (term)

Banks
(retail)

Reserves (o/n)	FF (o/n)
	⋮
P-Loans (local)	Deposits (term)

Banks
(wholesale)

FF (o/n)	FF (o/n)
	⋮
P-Loans (<u>global</u>)	Deposits (term)

Dealer Banks
(government desk)

T-Repos (o/n)	T-Repos (o/n)
⋮	⋮
T-Notes	T-Repos (term)

Money Funds
(government-only)

T-Repos (o/n)	T-CNAVs (o/n)
	⋮
T-Bills (term)	

Dealer Banks
(credit desk)

P-Repos (o/n)	P-Repos (o/n)
⋮	⋮
P-Notes	P-Repos (term)

Money Funds
(prime)

P-Repos (o/n)	P-CNAVs (o/n)
	⋮
P-Bills (<u>global</u>)	

Cash PM
(reserve managers)

"Cash" (o/n)	⋮
⋮	
"Cash" (term)	Equity (permanent)

Cash PM
(corporations)

"Cash" (o/n)	⋮
⋮	
"Cash" (term)	Equity (permanent)

Cash PM
(asset managers)

"Cash" (o/n)	⋮
⋮	
"Cash" (term)	Equity (temporary)

Cash PM
(seclenders)

"Cash" (o/n)	Cash (collateral)
⋮	
"Cash" (term)	

Public Backstops

Private Backstops

Liabilities

Money dealing:

[6] Client-driven money dealing in the DvP repo market.

Mandate: "Beat benchmark".

Three forms of leverage...

Type 1:

Risk PM	
(cash for funding)	

Risk PM	

Risk PM	

Public Assets

Assets

Private Assets

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

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

Banks (retail)	
Reserves (o/n)	FF (o/n)
P-Loans (local)	Deposits (term)

Banks (wholesale)	
FF (o/n)	FF (o/n)
P-Loans (<u>global</u>)	Deposits (term)

Dealer Banks (government desk)	
T-Repos (o/n)	T-Repos (o/n)
T-Notes	T-Repos (term)

Money Funds (government-only)	
T-Repos (o/n)	T-CNAVs (o/n)
T-Bills (term)	

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

Money Funds (prime)	
P-Repos (o/n)	P-CNAVs (o/n)
P-Bills (<u>global</u>)	

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

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

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

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

Public Backstops

Private Backstops

Liabilities

Money dealing:

[6] Client-driven money dealing in the DvP repo market.

Mandate: "Beat benchmark".

Three forms of leverage...

Type 1:

Risk PM (cash for funding)	

Type 2:

Risk PM (cash for shorting)	
Risk PM	

Public Assets	<table border="1"> <tr><th colspan="2">Central Bank (Federal Reserve)</th></tr> <tr> <td>T-Notes</td> <td>Currency Reserves (o/n)</td> </tr> </table>	Central Bank (Federal Reserve)		T-Notes	Currency Reserves (o/n)	<table border="1"> <tr><th colspan="2">Dealer Banks (government desk)</th></tr> <tr> <td>T-Repos (o/n)</td> <td>T-Repos (o/n)</td> </tr> <tr> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>T-Notes</td> <td>T-Repos (term)</td> </tr> </table>	Dealer Banks (government desk)		T-Repos (o/n)	T-Repos (o/n)	⋮	⋮	T-Notes	T-Repos (term)	<table border="1"> <tr><th colspan="2">Cash PM (reserve managers)</th></tr> <tr> <td>"Cash" (o/n)</td> <td>⋮</td> </tr> <tr> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>"Cash" (term)</td> <td>Equity (permanent)</td> </tr> </table>	Cash PM (reserve managers)		"Cash" (o/n)	⋮	⋮	⋮	"Cash" (term)	Equity (permanent)				
	Central Bank (Federal Reserve)																										
T-Notes	Currency Reserves (o/n)																										
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Sovereign (U.S. Treasury)																											
Reserves (o/n)	T-Bills (o/n)																										
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Private Assets	<table border="1"> <tr><th colspan="2">Banks (retail)</th></tr> <tr> <td>Reserves (o/n)</td> <td>FF (o/n)</td> </tr> <tr> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>P-Loans (local)</td> <td>Deposits (term)</td> </tr> </table>	Banks (retail)		Reserves (o/n)	FF (o/n)	⋮	⋮	P-Loans (local)	Deposits (term)	<table border="1"> <tr><th colspan="2">Dealer Banks (credit desk)</th></tr> <tr> <td>P-Repos (o/n)</td> <td>P-Repos (o/n)</td> </tr> <tr> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>P-Notes</td> <td>P-Repos (term)</td> </tr> </table>	Dealer Banks (credit desk)		P-Repos (o/n)	P-Repos (o/n)	⋮	⋮	P-Notes	P-Repos (term)	<table border="1"> <tr><th colspan="2">Cash PM (asset managers)</th></tr> <tr> <td>"Cash" (o/n)</td> <td>⋮</td> </tr> <tr> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>"Cash" (term)</td> <td>Equity (temporary)</td> </tr> </table>	Cash PM (asset managers)		"Cash" (o/n)	⋮	⋮	⋮	"Cash" (term)	Equity (temporary)
	Banks (retail)																										
Reserves (o/n)	FF (o/n)																										
⋮	⋮																										
P-Loans (local)	Deposits (term)																										
Dealer Banks (credit desk)																											
P-Repos (o/n)	P-Repos (o/n)																										
⋮	⋮																										
P-Notes	P-Repos (term)																										
Cash PM (asset managers)																											
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⋮	⋮																										
"Cash" (term)	Equity (temporary)																										
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Banks (wholesale)																											
FF (o/n)	FF (o/n)																										
⋮	⋮																										
P-Loans (<u>global</u>)	Deposits (term)																										
Money Funds (prime)																											
P-Repos (o/n)	P-CNAVs (o/n)																										
⋮	⋮																										
P-Bills (<u>global</u>)																											
Cash PM (seclenders)																											
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⋮	⋮																										
"Cash" (term)																											
	Public Backstops	Private Backstops																									
	<u>Liabilities</u>																										

Money dealing:

[6] Client-driven money dealing in the DvP repo market.

Mandate: "Beat benchmark".

Three forms of leverage...

Type 1:

Risk PM (cash for funding)	

Type 2:

Risk PM (cash for shorting)	

Type 3:

Risk PM (cash for margining)	

Public Assets	<table border="1"> <tr> <th colspan="2">Central Bank (Federal Reserve)</th> </tr> <tr> <td>T-Notes</td> <td>Currency Reserves (o/n)</td> </tr> </table>	Central Bank (Federal Reserve)		T-Notes	Currency Reserves (o/n)	<table border="1"> <tr> <th colspan="2">Dealer Banks (government desk)</th> </tr> <tr> <td>T-Repos (o/n)</td> <td>T-Repos (o/n)</td> </tr> <tr> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>T-Notes</td> <td>T-Repos (term)</td> </tr> </table>	Dealer Banks (government desk)		T-Repos (o/n)	T-Repos (o/n)	⋮	⋮	T-Notes	T-Repos (term)	<table border="1"> <tr> <th colspan="2">Cash PM (reserve managers)</th> </tr> <tr> <td>"Cash" (o/n)</td> <td>⋮</td> </tr> <tr> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>"Cash" (term)</td> <td>Equity (permanent)</td> </tr> </table>	Cash PM (reserve managers)		"Cash" (o/n)	⋮	⋮	⋮	"Cash" (term)	Equity (permanent)				
	Central Bank (Federal Reserve)																										
T-Notes	Currency Reserves (o/n)																										
Dealer Banks (government desk)																											
T-Repos (o/n)	T-Repos (o/n)																										
⋮	⋮																										
T-Notes	T-Repos (term)																										
Cash PM (reserve managers)																											
"Cash" (o/n)	⋮																										
⋮	⋮																										
"Cash" (term)	Equity (permanent)																										
Assets	<table border="1"> <tr> <th colspan="2">Sovereign (U.S. Treasury)</th> </tr> <tr> <td>Reserves (o/n)</td> <td>T-Bills (o/n)</td> </tr> <tr> <td> </td> <td>⋮</td> </tr> <tr> <td> </td> <td>T-Bills (term)</td> </tr> </table>	Sovereign (U.S. Treasury)		Reserves (o/n)	T-Bills (o/n)		⋮		T-Bills (term)	<table border="1"> <tr> <th colspan="2">Money Funds (government-only)</th> </tr> <tr> <td>T-Repos (o/n)</td> <td>T-CNAVs (o/n)</td> </tr> <tr> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>T-Bills (term)</td> <td> </td> </tr> </table>	Money Funds (government-only)		T-Repos (o/n)	T-CNAVs (o/n)	⋮	⋮	T-Bills (term)		<table border="1"> <tr> <th colspan="2">Cash PM (corporations)</th> </tr> <tr> <td>"Cash" (o/n)</td> <td>⋮</td> </tr> <tr> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>"Cash" (term)</td> <td>Equity (permanent)</td> </tr> </table>	Cash PM (corporations)		"Cash" (o/n)	⋮	⋮	⋮	"Cash" (term)	Equity (permanent)
Sovereign (U.S. Treasury)																											
Reserves (o/n)	T-Bills (o/n)																										
	⋮																										
	T-Bills (term)																										
Money Funds (government-only)																											
T-Repos (o/n)	T-CNAVs (o/n)																										
⋮	⋮																										
T-Bills (term)																											
Cash PM (corporations)																											
"Cash" (o/n)	⋮																										
⋮	⋮																										
"Cash" (term)	Equity (permanent)																										
Private Assets	<table border="1"> <tr> <th colspan="2">Banks (retail)</th> </tr> <tr> <td>Reserves (o/n)</td> <td>FF (o/n)</td> </tr> <tr> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>P-Loans (local)</td> <td>Deposits (term)</td> </tr> </table>	Banks (retail)		Reserves (o/n)	FF (o/n)	⋮	⋮	P-Loans (local)	Deposits (term)	<table border="1"> <tr> <th colspan="2">Dealer Banks (credit desk)</th> </tr> <tr> <td>P-Repos (o/n)</td> <td>P-Repos (o/n)</td> </tr> <tr> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>P-Notes</td> <td>P-Repos (term)</td> </tr> </table>	Dealer Banks (credit desk)		P-Repos (o/n)	P-Repos (o/n)	⋮	⋮	P-Notes	P-Repos (term)	<table border="1"> <tr> <th colspan="2">Cash PM (asset managers)</th> </tr> <tr> <td>"Cash" (o/n)</td> <td>⋮</td> </tr> <tr> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>"Cash" (term)</td> <td>Equity (temporary)</td> </tr> </table>	Cash PM (asset managers)		"Cash" (o/n)	⋮	⋮	⋮	"Cash" (term)	Equity (temporary)
	Banks (retail)																										
Reserves (o/n)	FF (o/n)																										
⋮	⋮																										
P-Loans (local)	Deposits (term)																										
Dealer Banks (credit desk)																											
P-Repos (o/n)	P-Repos (o/n)																										
⋮	⋮																										
P-Notes	P-Repos (term)																										
Cash PM (asset managers)																											
"Cash" (o/n)	⋮																										
⋮	⋮																										
"Cash" (term)	Equity (temporary)																										
Private Assets	<table border="1"> <tr> <th colspan="2">Banks (wholesale)</th> </tr> <tr> <td>FF (o/n)</td> <td>FF (o/n)</td> </tr> <tr> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>P-Loans (<u>global</u>)</td> <td>Deposits (term)</td> </tr> </table>	Banks (wholesale)		FF (o/n)	FF (o/n)	⋮	⋮	P-Loans (<u>global</u>)	Deposits (term)	<table border="1"> <tr> <th colspan="2">Money Funds (prime)</th> </tr> <tr> <td>P-Repos (o/n)</td> <td>P-CNAVs (o/n)</td> </tr> <tr> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>P-Bills (<u>global</u>)</td> <td> </td> </tr> </table>	Money Funds (prime)		P-Repos (o/n)	P-CNAVs (o/n)	⋮	⋮	P-Bills (<u>global</u>)		<table border="1"> <tr> <th colspan="2">Cash PM (seclenders)</th> </tr> <tr> <td>"Cash" (o/n)</td> <td>Cash (collateral)</td> </tr> <tr> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>"Cash" (term)</td> <td> </td> </tr> </table>	Cash PM (seclenders)		"Cash" (o/n)	Cash (collateral)	⋮	⋮	"Cash" (term)	
Banks (wholesale)																											
FF (o/n)	FF (o/n)																										
⋮	⋮																										
P-Loans (<u>global</u>)	Deposits (term)																										
Money Funds (prime)																											
P-Repos (o/n)	P-CNAVs (o/n)																										
⋮	⋮																										
P-Bills (<u>global</u>)																											
Cash PM (seclenders)																											
"Cash" (o/n)	Cash (collateral)																										
⋮	⋮																										
"Cash" (term)																											
	Public Backstops	Private Backstops																									
	<u>Liabilities</u>																										

Money dealing:

[6] Client-driven money dealing in the DvP repo market.

Mandate: "Beat benchmark".

Three forms of leverage...

Type 1:

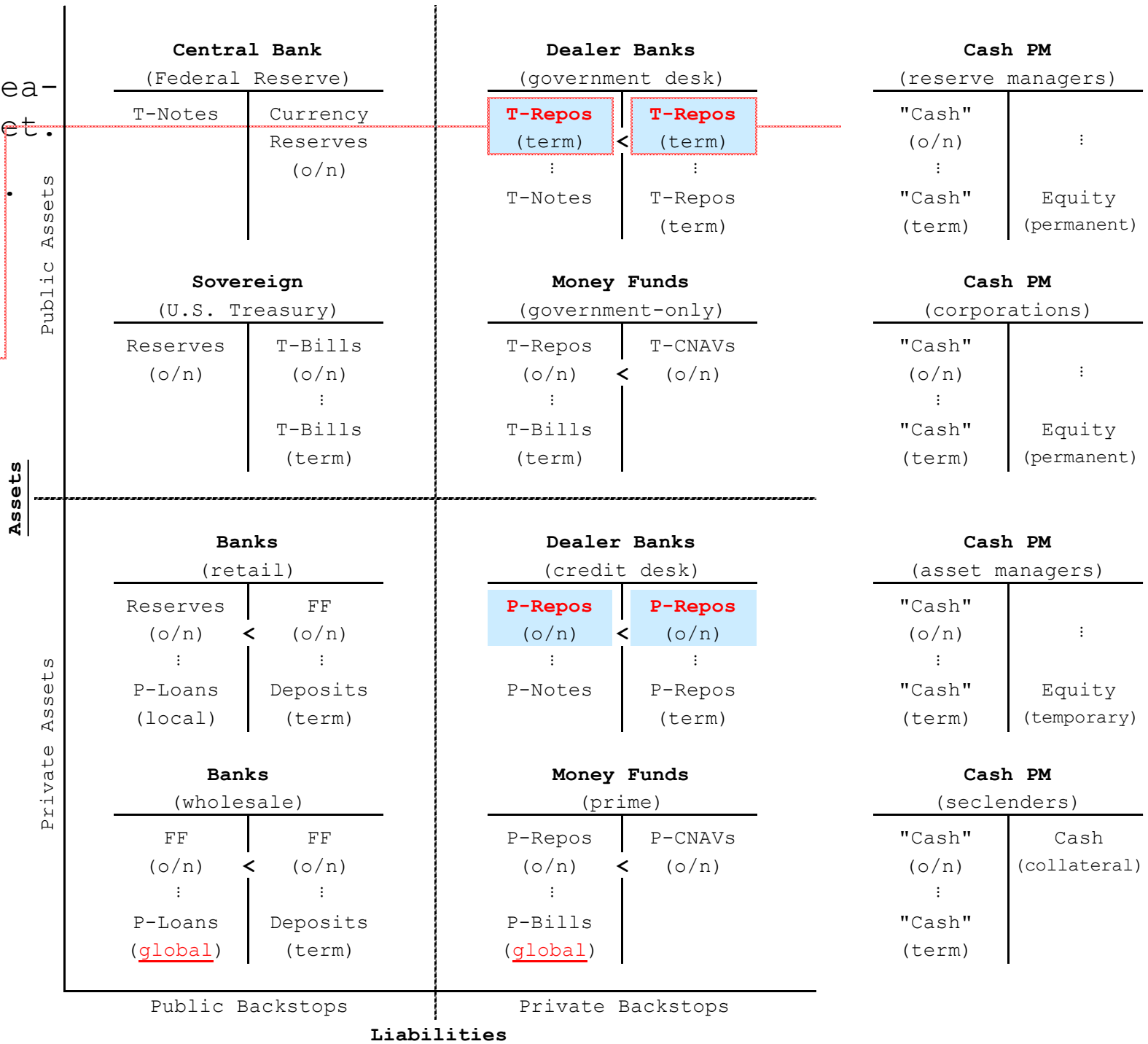
Risk PM (M-REIT)	
T-Notes (RMBS)	T-Repos (term)
	⋮
	Equity (temporary)

Type 2:

Risk PM (cash for shorting)	

Type 3:

Risk PM (cash for margining)	



Money dealing:

[6] Client-driven money dealing in the DvP repo market.

Mandate: "Beat benchmark".

Three forms of leverage...

Type 1:

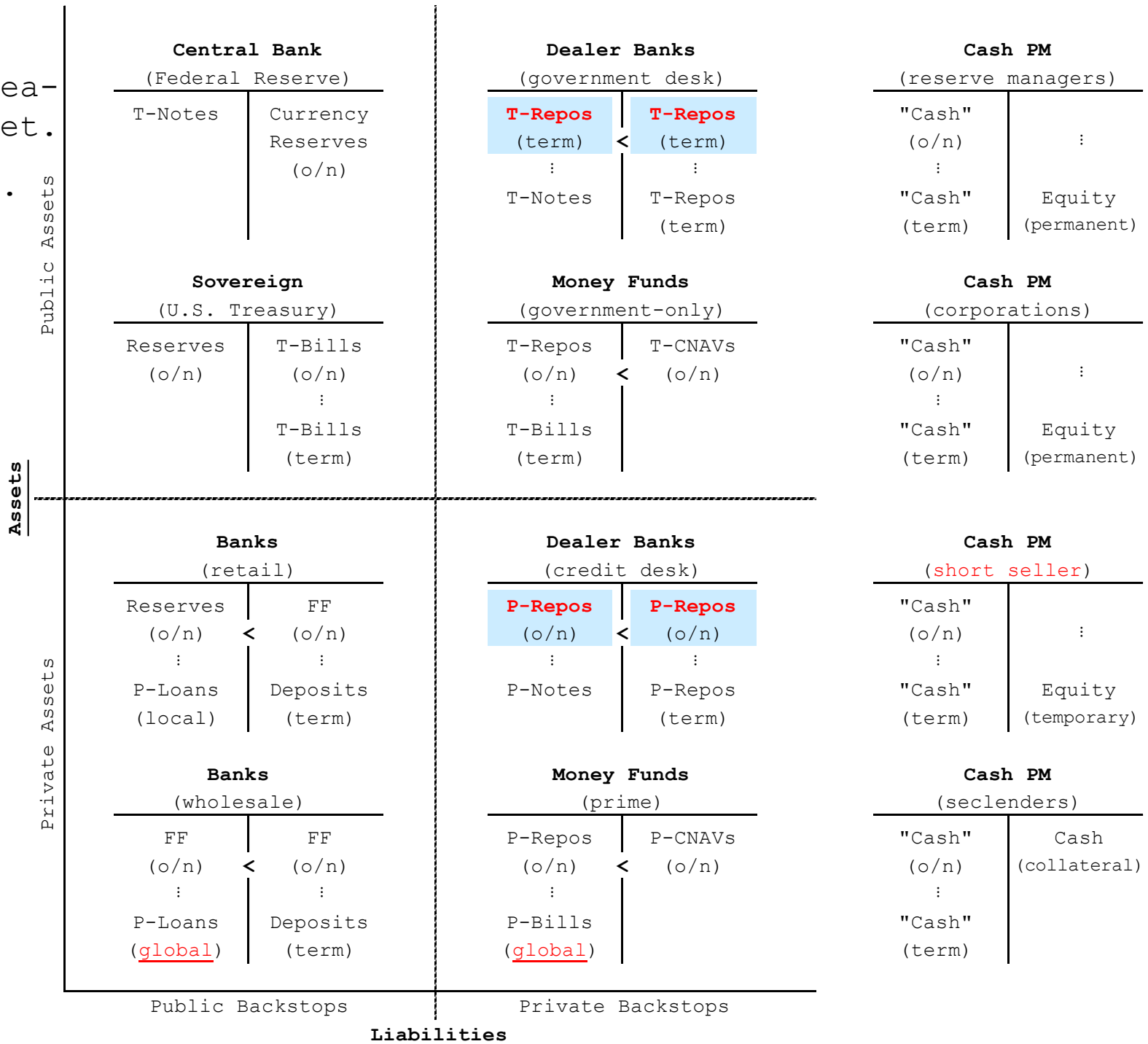
Risk PM (cash for funding)	
T-Notes	T-Repos (term)
	⋮
	Equity (temporary)

Type 2:

Risk PM ("real money")	
T-Notes	Equity
P-Notes	(temporary)

Type 3:

Risk PM (cash for margining)	



Money dealing:

[6] Client-driven money dealing in the DvP repo market.

Mandate: "**Beat benchmark**".

Three forms of leverage...

Type 1:

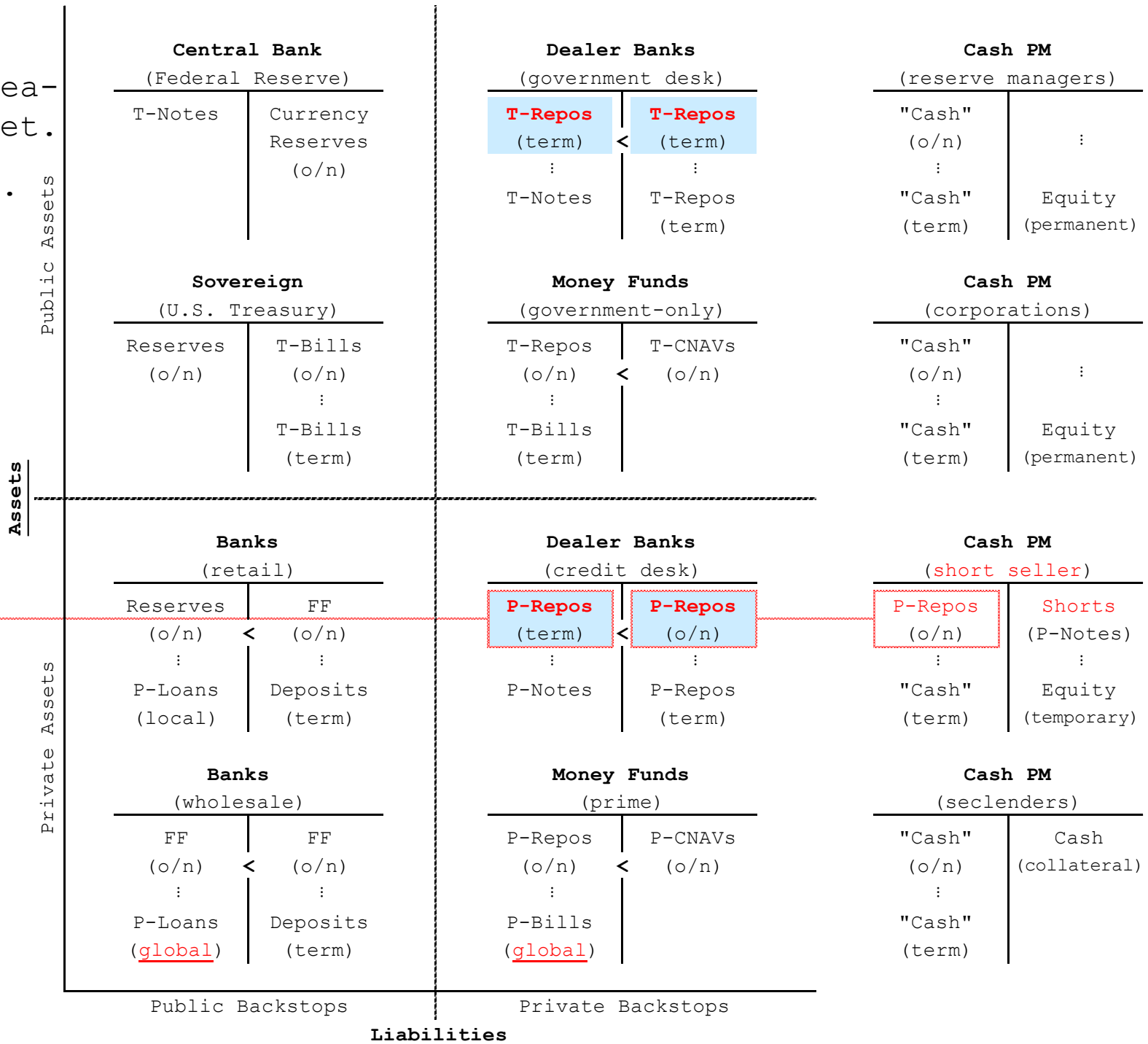
Risk PM (cash for funding)	
T-Notes	T-Repos (term)
	⋮
	Equity (temporary)

Type 2:

Risk PM (seclender)	
Cash (collat.)	P-Repos (term) [A]
⋮	⋮
T-Notes	Equity (temporary)
P-Notes	

Type 3:

Risk PM (cash for margining)	



Money dealing:

[6] Client-driven money dealing in the DvP repo market.

Mandate: "**Beat benchmark**".

Three forms of leverage...

Type 1:

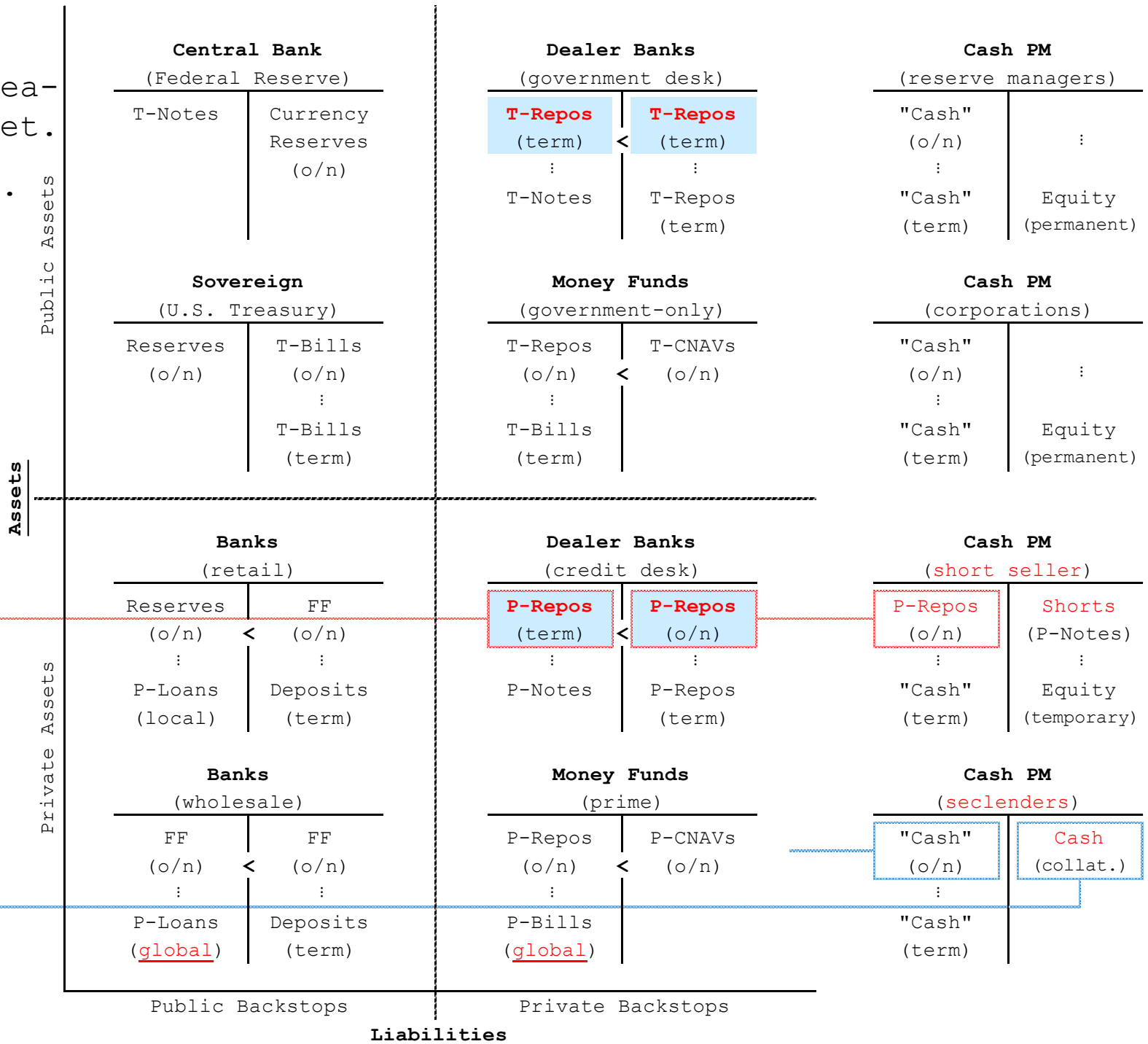
Risk PM (cash for funding)	
T-Notes	T-Repos (term)
	⋮
	Equity (temporary)

Type 2:

Risk PM (seclender)	
Cash (collat.)	P-Repos (term)
	⋮
T-Notes	Equity (temporary)
P-Notes	

Type 3:

Risk PM (cash for margining)	



Money dealing:

[6] Client-driven money dealing in the DvP repo market.

Mandate: "**Beat benchmark**".

Three forms of leverage...

Type 1:

Risk PM (cash for funding)	
T-Notes	T-Repos (term)
	⋮
	Equity (temporary)

Type 2:

Risk PM (cash for shorting)	
Cash (collat.)	P-Repos (term)
⋮	⋮
T-Notes	Equity
P-Notes	(temporary)

Type 3:

Risk PM (tactical hedger)	
CDS	⋮
IRS	
FXS	
T-Notes	Equity
P-Notes	(temporary)



Money dealing:

[6] Client-driven money dealing in the DvP repo market.

Mandate: "**Beat benchmark**".

Three forms of leverage...

Type 1:

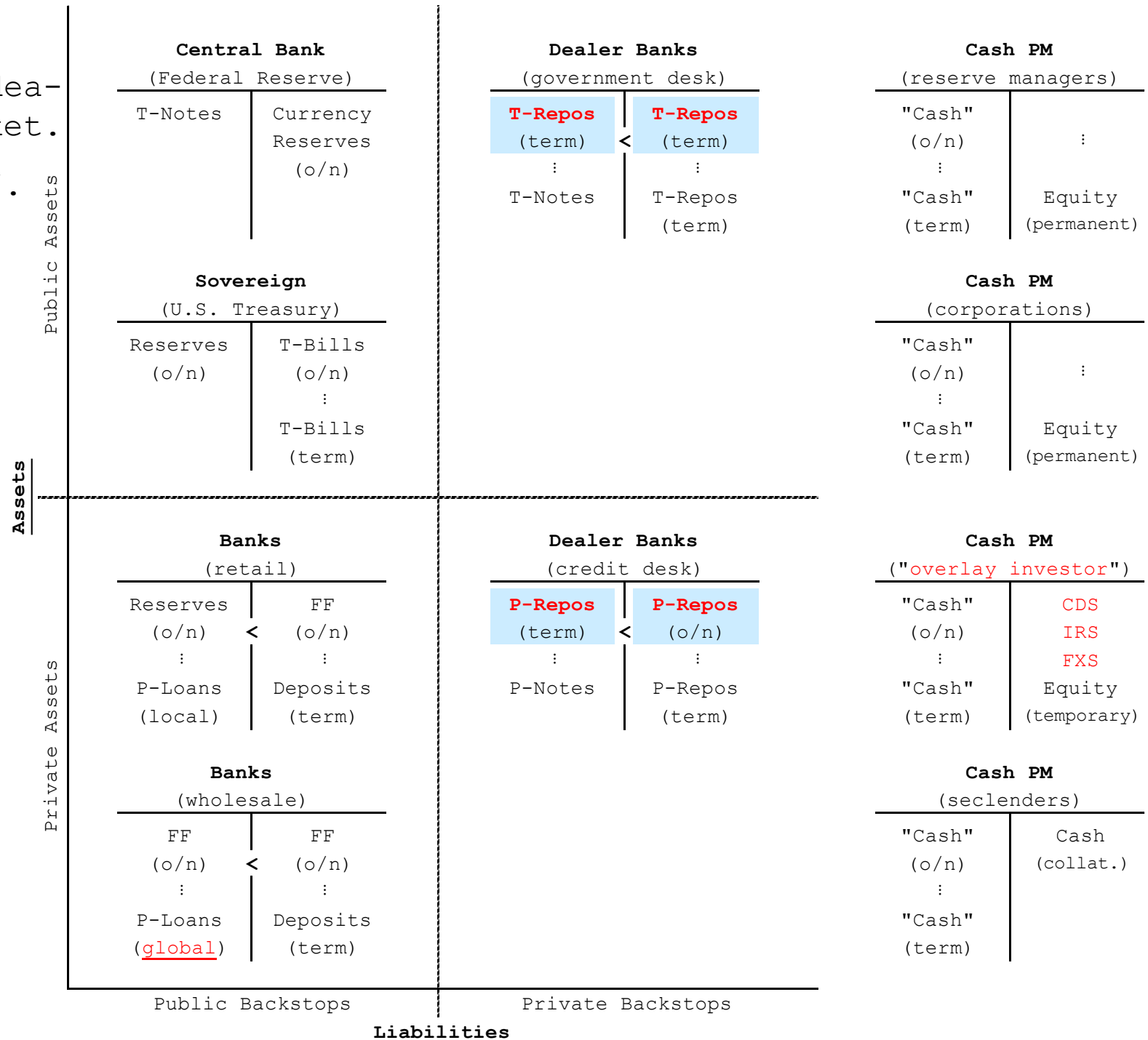
Risk PM (cash for funding)	
T-Notes	T-Repos (term)
	⋮
	Equity (temporary)

Type 2:

Risk PM (cash for shorting)	
Cash (collat.)	P-Repos (term)
⋮	⋮
T-Notes	Equity
P-Notes	(temporary)

Type 3:

Risk PM (tactical hedger)	
CDS	⋮
IRS	
FXS	
T-Notes	Equity
P-Notes	(temporary)



Money dealing:

[6] Client-driven money dealing in the DvP repo market.

Mandate: "**Beat benchmark**".

Three forms of leverage...

Type 1:

Risk PM (cash for funding)	
T-Notes	T-Repos (term)
	⋮
	Equity (temporary)

Type 2:

Risk PM (cash for shorting)	
Cash (collat.)	P-Repos (term)
⋮	⋮
T-Notes	Equity
P-Notes	(temporary)

Type 3:

Risk PM (tactical hedger)	
CDS	⋮
IRS	
FXS	
T-Notes	Equity
P-Notes	(temporary)



Money dealing:

[6] Client-driven money dealing in the DvP repo market.

Mandate: "**Beat benchmark**".

Three forms of leverage...

Type 1:

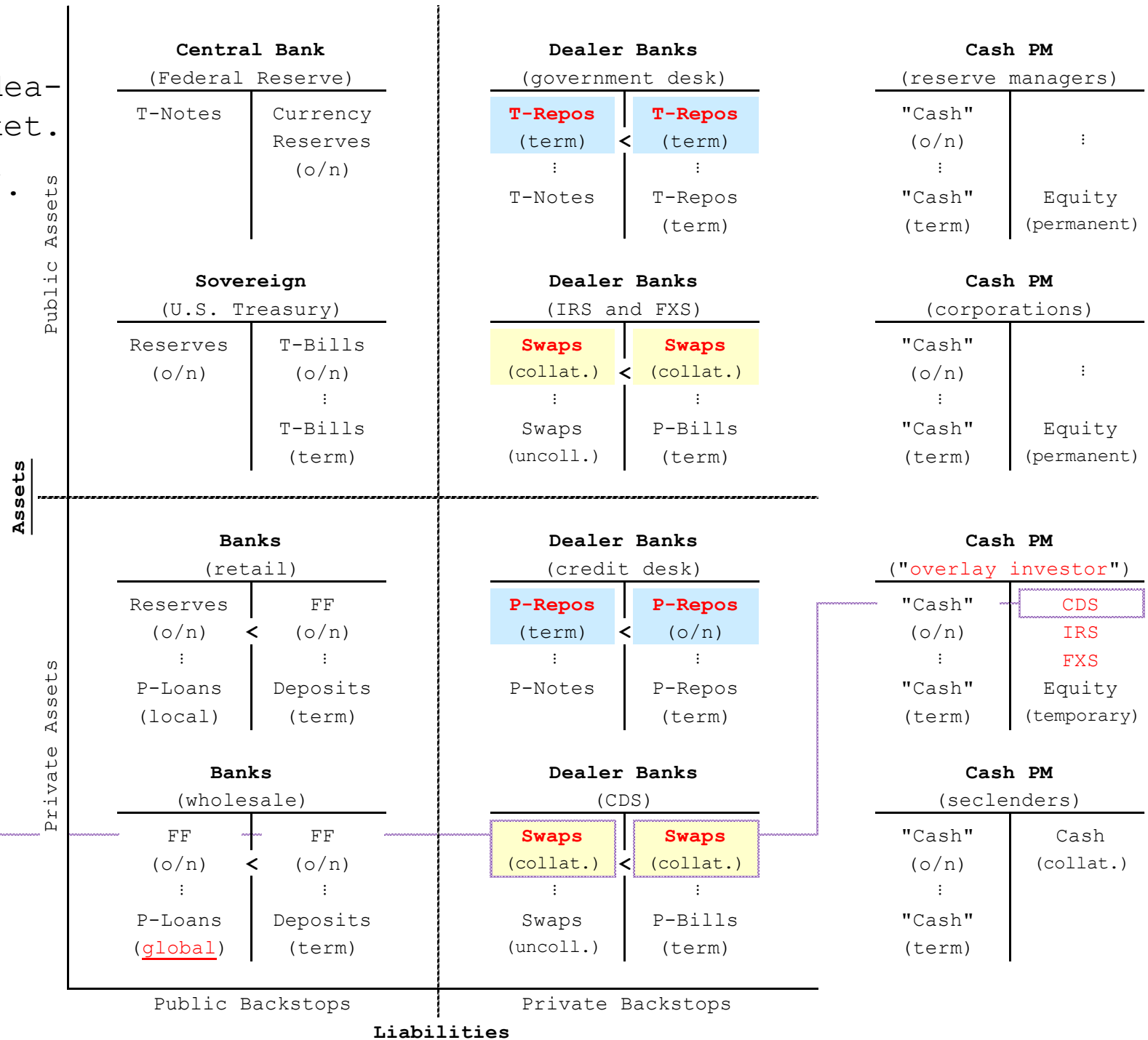
Risk PM (cash for funding)	
T-Notes	T-Repos (term)
	⋮
	Equity (temporary)

Type 2:

Risk PM (cash for shorting)	
Cash (collat.)	P-Repos (term)
⋮	⋮
T-Notes	Equity
P-Notes	(temporary)

Type 3:

Risk PM (tactical hedger)	
CDS	⋮
IRS	
FXS	
T-Notes	Equity
P-Notes	(temporary)



Money dealing:

[6] Client-driven money dealing in the DvP repo market.

Mandate: "**Beat benchmark**".

Three forms of leverage...

Type 1:

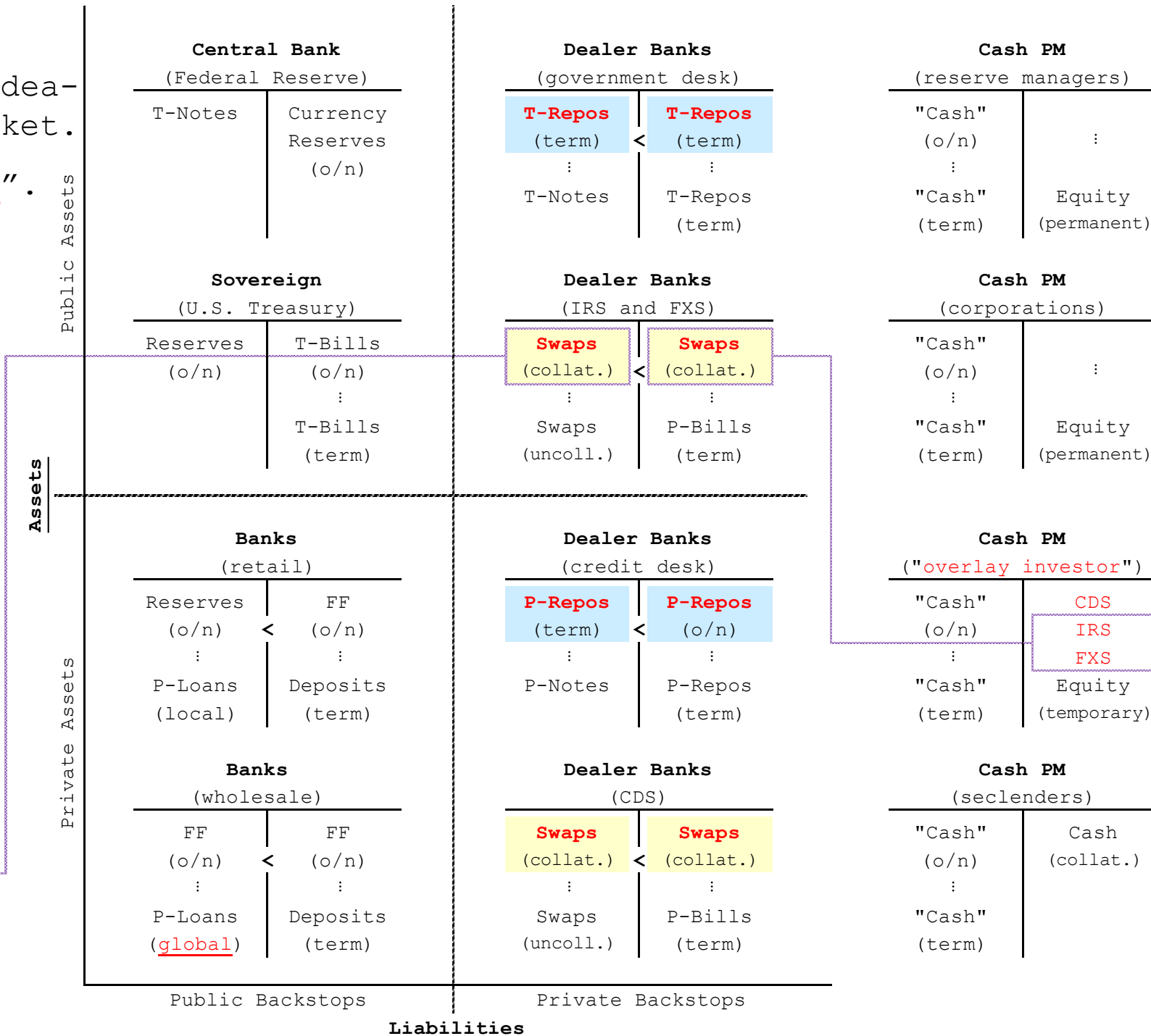
Risk PM (cash for funding)	
T-Notes	T-Repos (term)
⋮	⋮
	Equity (temporary)

Type 2:

Risk PM (cash for shorting)	
Cash (collat.)	P-Repos (term)
⋮	⋮
T-Notes	Equity
P-Notes	(temporary)

Type 3:

Risk PM (tactical hedger)	
CDS	⋮
IRS	
FXS	
T-Notes	Equity
P-Notes	(temporary)



Money dealing:

[6] Client-driven money dealing in the DvP repo market.

Mandate: "**Beat benchmark**".

Three forms of leverage...

Type 1:

Risk PM (cash for funding)	
T-Notes	T-Repos (term)
	⋮
	Equity (temporary)

Type 2:

Risk PM (cash for shorting)	
Cash (collat.)	P-Repos (term)
⋮	⋮
T-Notes	Equity
P-Notes	(temporary)

Type 3:

Risk PM (tactical hedger)	
Margin call	Swap payables
CDS	⋮
IRS	Equity
FXS	(temporary)



Money dealing:

[6] Client-driven money dealing in the DvP repo market.

Mandate: "**Beat benchmark**".

Three forms of leverage...

Type 1:

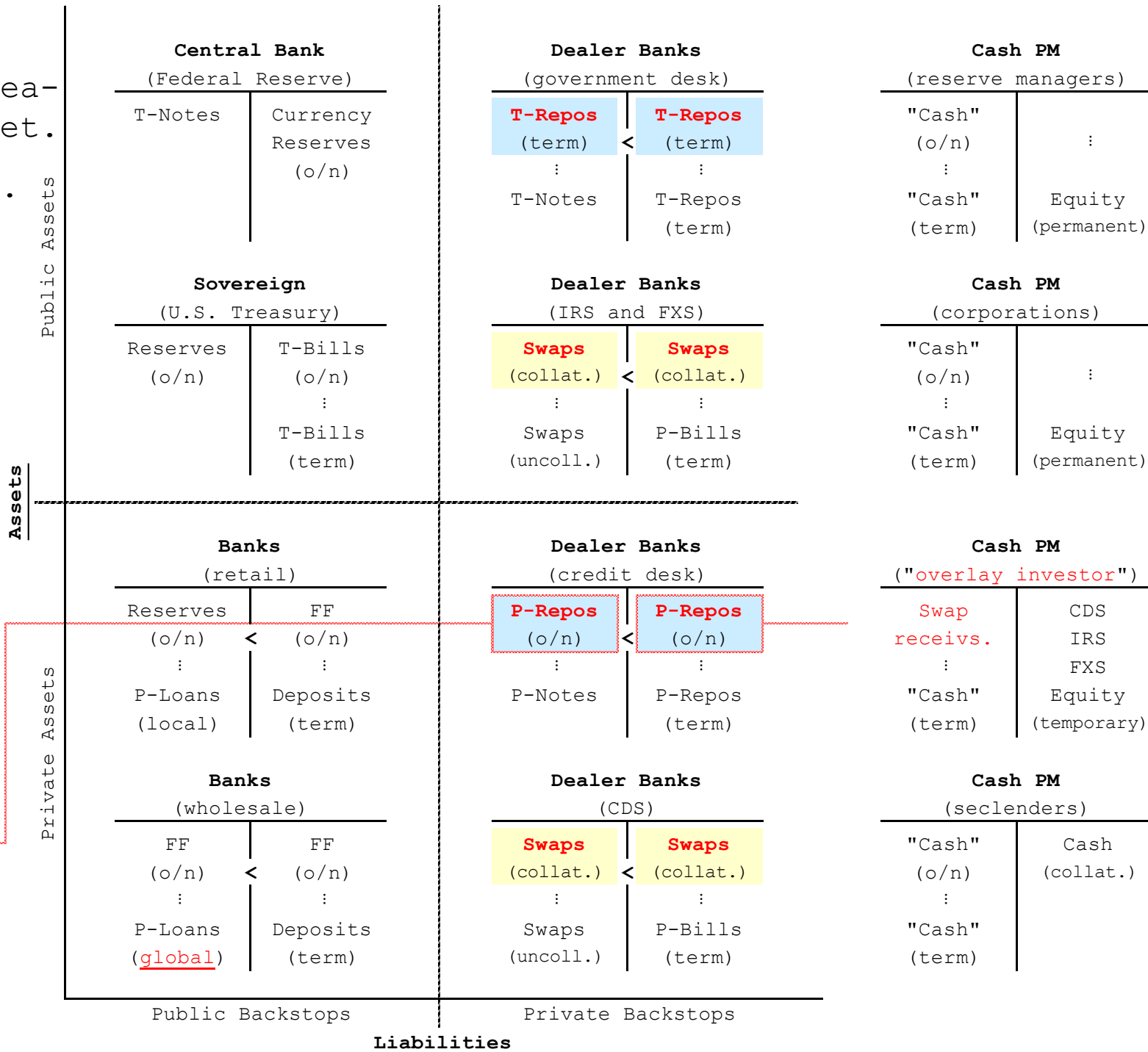
Risk PM (cash for funding)	
T-Notes	T-Repos (term)
	⋮
	Equity (temporary)

Type 2:

Risk PM (cash for shorting)	
Cash (collat.)	P-Repos (term)
⋮	⋮
T-Notes	Equity
P-Notes	(temporary)

Type 3:

Risk PM (tactical hedger)	
Cash (margin)	P-Repos (o/n) [A]
CDS	⋮
IRS	Equity
FXS	(temporary)



Money dealing:

[6] Client-driven money dealing in the DvP repo market.

Mandate: "**Beat benchmark**".

Three forms of leverage...

Type 1:

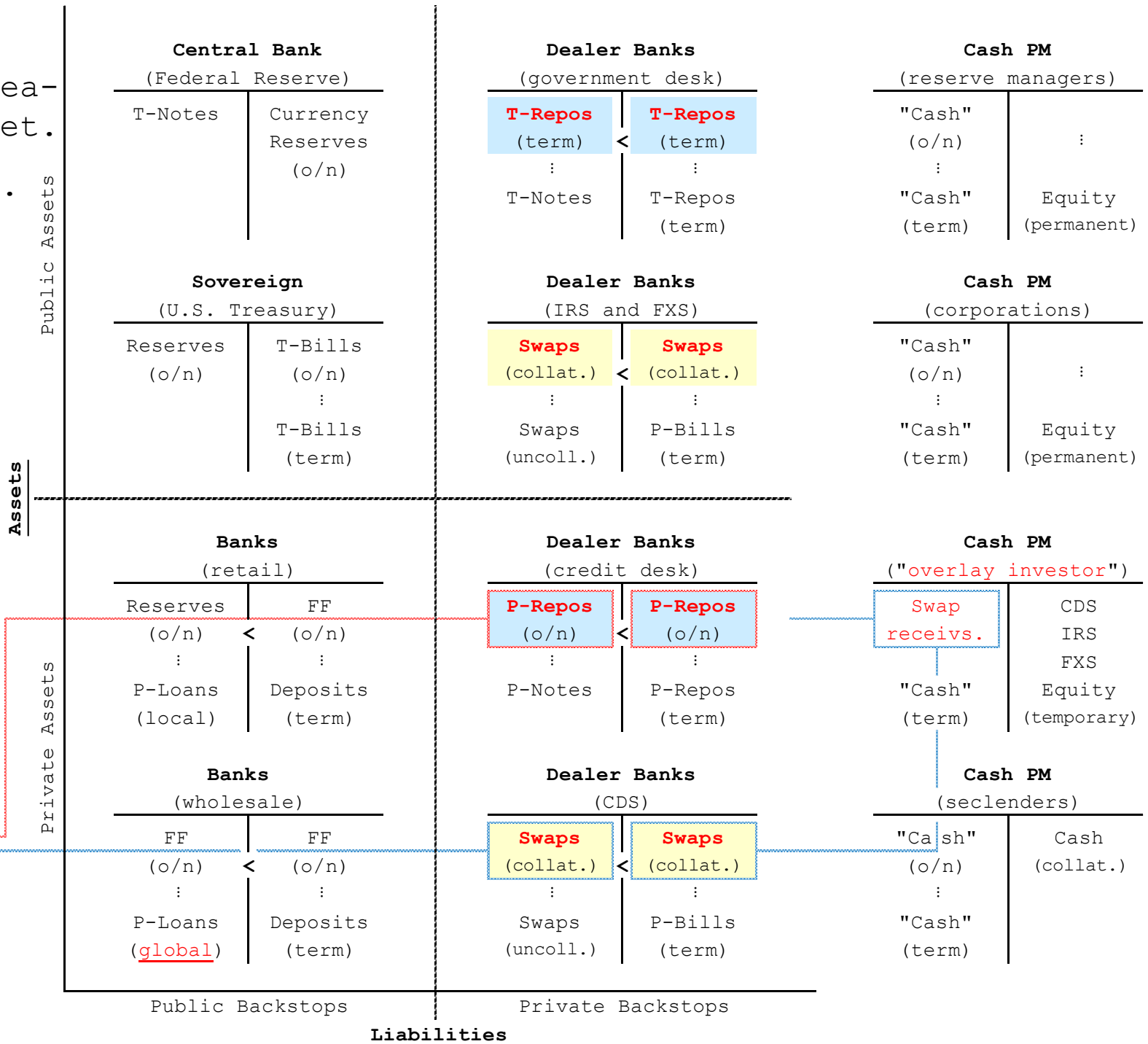
Risk PM (cash for funding)	
T-Notes	T-Repos (term)
	⋮
	Equity (temporary)

Type 2:

Risk PM (cash for shorting)	
Cash (collat.)	P-Repos (term)
⋮	⋮
T-Notes	Equity (temporary)
P-Notes	

Type 3:

Risk PM (tactical hedger)	
Cash (margin)	P-Repos (o/n)
CDS	⋮
IRS	Equity (temporary)
FXS	



Where is the real economy?

Money market funding of capital market lending (see Mehrling et al, 2013).

Risk PM (cash for funding)	
T-Notes	T-Repos (term)
	⋮
	Equity (temporary)

Risk PM (cash for shorting)	
Cash (collat.)	P-Repos (term)
⋮	⋮
T-Notes	Equity
P-Notes	(temporary)

Risk PM (cash for margining)	
Cash (margin)	P-Repos (o/n)
CDS	⋮
IRS	Equity
FXS	(temporary)

Public Assets

Assets

Private Assets

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

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

Dealer Banks (government desk)	
T-Repos (term)	< T-Repos (term)
⋮	⋮
T-Notes	T-Repos (term)

Dealer Banks (IRS and FXS)	
Swaps (collat.)	< Swaps (collat.)
⋮	⋮
Swaps (uncoll.)	P-Bills (term)

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

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

Banks (retail)	
Reserves (o/n)	< FF (o/n)
⋮	⋮
P-Loans (local)	Deposits (term)

Dealer Banks (credit desk)	
P-Repos (o/n)	< P-Repos (o/n)
⋮	⋮
P-Notes	P-Repos (term)

Cash PM (asset managers)	
"Cash" (o/n)	CDS
⋮	IRS
⋮	FXS
"Cash" (term)	Equity (temporary)

Banks (wholesale)	
FF (o/n)	< FF (o/n)
⋮	⋮
P-Loans (<u>global</u>)	Deposits (term)

Dealer Banks (CDS)	
Swaps (collat.)	< Swaps (collat.)
⋮	⋮
Swaps (uncoll.)	P-Bills (term)

Cash PM (seclenders)	
"Cash" (o/n)	Cash (collat.)
⋮	⋮
"Cash" (term)	

Public Backstops

Private Backstops

Liabilities

Where is the real economy?

Money market funding of capital market lending...

[1] Funded risk PMs' securities portfolios, ...

Risk PM (cash for funding)	
[1] T-Notes (global)	T-Repos (term)
	⋮
	Equity (temporary)

Risk PM (cash for shorting)	
Cash (collat.)	P-Repos (term)
⋮	⋮
T-Notes	Equity
P-Notes	(temporary)

Risk PM (cash for margining)	
Cash (margin)	P-Repos (o/n)
CDS	⋮
IRS	Equity
FXS	(temporary)

Public Assets

Assets

Private Assets

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

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

Dealer Banks (government desk)	
T-Repos (term)	T-Repos (term)
⋮	⋮
T-Notes	T-Repos (term)

Dealer Banks (IRS and FXS)	
Swaps (collat.)	Swaps (collat.)
⋮	⋮
Swaps (uncoll.)	P-Bills (term)

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

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

Banks (retail)	
Reserves (o/n)	FF (o/n)
⋮	⋮
P-Loans (local)	Deposits (term)

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

Cash PM (asset managers)	
"Cash" (o/n)	CDS
⋮	IRS
⋮	FXS
"Cash" (term)	Equity (temporary)

Banks (wholesale)	
FF (o/n)	FF (o/n)
⋮	⋮
P-Loans (global)	Deposits (term)

Dealer Banks (CDS)	
Swaps (collat.)	Swaps (collat.)
⋮	⋮
Swaps (uncoll.)	P-Bills (term)

Cash PM (seclenders)	
"Cash" (o/n)	Cash (collat.)
⋮	
"Cash" (term)	

Public Backstops

Private Backstops

Liabilities

Where is the real economy?

Money market funding of capital market lending...

[2] Foreign banks' USD securities portfolios, ...

Risk PM
(cash for funding)

[1] T-Notes (<u>global</u>)	T-Repos (term)
	⋮
	Equity (temporary)

Risk PM
(cash for shorting)

Cash (collat.)	P-Repos (term)
⋮	⋮
T-Notes	Equity
P-Notes	(temporary)

Risk PM
(cash for margining)

Cash (margin)	P-Repos (o/n)
CDS	⋮
IRS	Equity
FXS	(temporary)

Public Assets

Assets

Private Assets

Central Bank
(Federal Reserve)

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

Sovereign
(U.S. Treasury)

Reserves (o/n)	T-Bills (o/n)
	⋮
	T-Bills (term)

Dealer Banks
(government desk)

T-Repos (term)	<	T-Repos (term)
⋮		⋮
T-Notes		T-Repos (term)

Dealer Banks
(IRS and FXS)

Swaps (collat.)	<	Swaps (collat.)
⋮		⋮
Swaps (uncoll.)		P-Bills (term)

Cash PM
(reserve managers)

"Cash" (o/n)	⋮
⋮	
"Cash" (term)	Equity (permanent)

Cash PM
(corporations)

"Cash" (o/n)	⋮
⋮	
"Cash" (term)	Equity (permanent)

Banks
(retail)

Reserves (o/n)	<	FF (o/n)
⋮		⋮
P-Loans (local)		Deposits (term)

Dealer Banks
(credit desk)

P-Repos (o/n)	<	P-Repos (o/n)
⋮		⋮
P-Notes		P-Repos (term)

Cash PM
(asset managers)

"Cash" (o/n)	CDS
⋮	IRS
⋮	FXS
"Cash" (term)	Equity (temporary)

Banks
(wholesale)

FF (o/n)	<	FF (o/n)
⋮		⋮
[2] P-Loans (<u>global</u>)		Deposits (term)

Dealer Banks
(CDS)

Swaps (collat.)	<	Swaps (collat.)
⋮		⋮
Swaps (uncoll.)		P-Bills (term)

Cash PM
(seclenders)

"Cash" (o/n)	Cash (collat.)
⋮	
"Cash" (term)	

Public Backstops

Private Backstops

Liabilities

Where is the real economy?

Money market funding of capital market lending...

[3] Large U.S. banks' securities portfolios, ...

Risk PM
(cash for funding)

[1] T-Notes (<u>global</u>)	T-Repos (term)
	⋮
	Equity (temporary)

Risk PM
(cash for shorting)

Cash (collat.)	P-Repos (term)
⋮	⋮
T-Notes	Equity
P-Notes	(temporary)

Risk PM
(cash for margining)

Cash (margin)	P-Repos (o/n)
CDS	⋮
IRS	Equity
FXS	(temporary)

Public Assets

Assets

Private Assets

Central Bank
(Federal Reserve)

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

Sovereign
(U.S. Treasury)

Reserves (o/n)	T-Bills (o/n)
	⋮
	T-Bills (term)

Dealer Banks
(government desk)

T-Repos (term)	<	T-Repos (term)
⋮		⋮
T-Notes		T-Repos (term)

Dealer Banks
(IRS and FXS)

Swaps (collat.)	<	Swaps (collat.)
⋮		⋮
Swaps (uncoll.)		P-Bills (term)

Cash PM
(reserve managers)

"Cash" (o/n)	⋮
⋮	
"Cash" (term)	Equity (permanent)

Cash PM
(corporations)

"Cash" (o/n)	⋮
⋮	
"Cash" (term)	Equity (permanent)

Banks
(retail)

Reserves (o/n)	<	FF (o/n)
⋮		⋮
P-Loans (local)		Deposits (term)

Dealer Banks
(credit desk)

P-Repos (o/n)	<	P-Repos (o/n)
⋮		⋮
P-Notes		P-Repos (term)

Cash PM
(asset managers)

"Cash" (o/n)	CDS
⋮	IRS
⋮	FXS
"Cash" (term)	Equity (temporary)

Banks
(wholesale)

FF (o/n)	<	FF (o/n)
⋮		⋮
[2] P-Notes (<u>global</u>)		[3] Deposits (term)

Dealer Banks
(CDS)

Swaps (collat.)	<	Swaps (collat.)
⋮		⋮
Swaps (uncoll.)		P-Bills (term)

Cash PM
(seclenders)

"Cash" (o/n)	Cash (collat.)
⋮	
"Cash" (term)	

Public Backstops

Private Backstops

Liabilities

Where is the real economy?

Money market funding of capital market lending...

[4] Dealer banks' securities inventories (net financing)

[1] Risk PM (cash for funding)

T-Notes (global)	T-Repos (term)
	⋮
	Equity (temporary)

Risk PM (cash for shorting)

Cash (collat.)	P-Repos (term)
⋮	⋮
T-Notes	Equity
P-Notes	(temporary)

Risk PM (cash for margining)

Cash (margin)	P-Repos (o/n)
CDS	⋮
IRS	Equity
FXS	(temporary)

Public Assets

Assets

Private Assets

Central Bank (Federal Reserve)

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

Sovereign (U.S. Treasury)

Reserves (o/n)	T-Bills (o/n)
	⋮
	T-Bills (term)

Banks (retail)

Reserves (o/n)	FF (o/n)
⋮	⋮
P-Loans (local)	Deposits (term)

Banks (wholesale)

FF (o/n)	FF (o/n)
⋮	⋮
[2] P-Notes (global)	Deposits (term)

[4]

[4]

[2]

[3]

Dealer Banks (government desk)

T-Repos (term)	<	T-Repos (term)
⋮		⋮
T-Notes (global)		T-Repos (term)

Dealer Banks (IRS and FXS)

Swaps (collat.)	<	Swaps (collat.)
⋮		⋮
Swaps (uncoll.)		P-Bills (term)

Dealer Banks (credit desk)

P-Repos (o/n)	<	P-Repos (o/n)
⋮		⋮
P-Notes (global)		P-Repos (term)

Dealer Banks (CDS)

Swaps (collat.)	<	Swaps (collat.)
⋮		⋮
Swaps (uncoll.)		P-Bills (term)

Cash PM (reserve managers)

"Cash" (o/n)	⋮
"Cash" (term)	Equity (permanent)

Cash PM (corporations)

"Cash" (o/n)	⋮
"Cash" (term)	Equity (permanent)

Cash PM (asset managers)

"Cash" (o/n)	CDS
⋮	IRS
"Cash" (term)	FXS
	Equity (temporary)

Cash PM (seclenders)

"Cash" (o/n)	Cash (collat.)
⋮	
"Cash" (term)	

Public Backstops

Private Backstops

Liabilities

Not all repos are equal:

Most repos are responsible for facilitating price discovery in a market making context, but not funding the real economy directly.

Risk PM
(cash for funding)

[1] T-Notes (<u>global</u>)	T-Repos (term)
	⋮
	Equity (temporary)

Risk PM
(cash for shorting)

[∅] Cash (collat.)	P-Repos (term)
	⋮
T-Notes	Equity
P-Notes	(temporary)

Risk PM
(cash for margining)

[∅] Cash (margin)	P-Repos (o/n)
	⋮
CDS	
IRS	Equity
FXS	(temporary)

Public Assets

Assets

Private Assets

Central Bank
(Federal Reserve)

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

Sovereign
(U.S. Treasury)

Reserves (o/n)	T-Bills (o/n)
	⋮
	T-Bills (term)

Banks
(retail)

Reserves (o/n)	FF (o/n)
	⋮
P-Loans (local)	Deposits (term)

Banks
(wholesale)

FF (o/n)	FF (o/n)
	⋮
[2] P-Notes [3] (<u>global</u>)	Deposits (term)

[4]

[4]

[2]

[3]

Dealer Banks
(government desk)

T-Repos (term)	<	T-Repos (term)
⋮		⋮
T-Notes (<u>global</u>)		T-Repos (term)

Dealer Banks
(IRS and FXS)

Swaps (collat.)	<	Swaps (collat.)
⋮		⋮
Swaps (uncoll.)		P-Bills (term)

Dealer Banks
(credit desk)

P-Repos (o/n)	<	P-Repos (o/n)
⋮		⋮
P-Notes (<u>global</u>)		P-Repos (term)

Dealer Banks
(CDS)

Swaps (collat.)	<	Swaps (collat.)
⋮		⋮
Swaps (uncoll.)		P-Bills (term)

Cash PM
(reserve managers)

"Cash" (o/n)	⋮
⋮	
"Cash" (term)	Equity (permanent)

Cash PM
(corporations)

"Cash" (o/n)	⋮
⋮	
"Cash" (term)	Equity (permanent)

Cash PM
(asset managers)

"Cash" (o/n)	CDS
⋮	IRS
⋮	FXS
"Cash" (term)	Equity (temporary)

Cash PM
(seclenders)

"Cash" (o/n)	Cash (collat.)
⋮	
"Cash" (term)	

Public Backstops

Private Backstops

Liabilities

RRPs and risk PMs:

Through RRP, the Fed will have direct control over haircuts and leverage. Fed haircuts will be the floor.

Risk PM
(cash for funding)

T-Notes (<u>global</u>)	T-Repos (term)
	⋮
	Equity (temporary)

Risk PM
(cash for shorting)

Cash (collat.)	P-Repos (term)
⋮	⋮
T-Notes	Equity (temporary)
P-Notes	

Risk PM
(cash for margining)

Cash (margin)	P-Repos (o/n)
CDS	⋮
IRS	Equity (temporary)
FXS	

Public Assets

Assets

Private Assets

Central Bank
(Federal Reserve)

T-Notes	RRPs (o/n)
⋮	⋮
Currency Reserves	

Sovereign
(U.S. Treasury)

Reserves (o/n)	T-Bills (o/n)
	⋮
	T-Bills (term)

Banks
(retail)

Reserves (o/n)	<	FF (o/n)
⋮		⋮
P-Loans (local)		Deposits (term)

Banks
(wholesale)

FF (o/n)	<	FF (o/n)
⋮		⋮
P-Notes (<u>global</u>)		Deposits (term)

Dealer Banks
(government desk)

RRPs (o/n)	<	T-Repos (o/n)
⋮		⋮
T-Notes (<u>global</u>)		T-Repos (term)

Money Funds
(government-only)

RRPs (o/n)	<	T-CNAVs (o/n)
⋮		⋮
T-Bills (term)		

Dealer Banks
(credit desk)

RRPs (o/n)	<	P-Repos (o/n)
⋮		⋮
P-Notes (<u>global</u>)		P-Repos (term)

Money Funds
(prime)

RRPs (o/n)	<	P-CNAVs (o/n)
⋮		⋮
P-Bills (term)		

Cash PM
(reserve managers)

"Cash" (o/n)	⋮
⋮	
"Cash" (term)	Equity (permanent)

Cash PM
(corporations)

"Cash" (o/n)	⋮
⋮	
"Cash" (term)	Equity (permanent)

Cash PM
(asset managers)

"Cash" (o/n)	CDS
⋮	IRS
⋮	FXS
"Cash" (term)	Equity (temporary)

Cash PM
(seclenders)

"Cash" (o/n)	Cash (collat.)
⋮	
"Cash" (term)	

Public Backstops

Private Backstops

Liabilities

RRPs and risk PMs:

Fed will have control over market-based credit cycles. This will raise the cost of leverage for risk PMs and reduce seclending volumes.

Risk PM (cash for funding)

T-Notes (<u>global</u>)	T-Repos (term)
	⋮
	Equity (temporary)

Risk PM (cash for shorting)

Cash (collat.)	P-Repos (term)
⋮	⋮
T-Notes	Equity
P-Notes	(temporary)

Risk PM (cash for margining)

Cash (margin)	P-Repos (o/n)
CDS	⋮
IRS	Equity
FXS	(temporary)

Public Assets

Assets

Private Assets

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

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

Banks (retail)	
Reserves (o/n)	FF (o/n)
⋮	⋮
P-Loans (local)	Deposits (term)

Banks (wholesale)	
FF (o/n)	FF (o/n)
⋮	⋮
P-Notes (<u>global</u>)	Deposits (term)

Dealer Banks (government desk)	
RRPs (o/n)	T-Repos (o/n)
⋮	⋮
T-Notes (<u>global</u>)	T-Repos (term)

Money Funds (government-only)	
RRPs (o/n)	T-CNAVs (o/n)
⋮	⋮
T-Bills (term)	

Dealer Banks (credit desk)	
RRPs (o/n)	P-Repos (o/n)
⋮	⋮
P-Notes (<u>global</u>)	P-Repos (term)

Money Funds (prime)	
RRPs (o/n)	P-CNAVs (o/n)
⋮	⋮
P-Bills (term)	

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

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

Cash PM (asset managers)	
"Cash" (o/n)	CDS
⋮	IRS
⋮	FXS
"Cash" (term)	Equity (temporary)

Cash PM (seclenders)	
"Cash" (o/n)	Cash (collat.)
⋮	⋮
"Cash" (term)	

Public Backstops

Private Backstops

Liabilities

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

Albert Einstein

Risk PM
(cash for funding)

T-Notes (<u>global</u>)	T-Repos (term)
:	:
	Equity (temporary)

Risk PM
(cash for shorting)

Cash (collat.)	P-Repos (term)
:	:
T-Notes	Equity
P-Notes	(temporary)

Risk PM
(cash for margining)

Cash (margin)	P-Repos (o/n)
CDS	:
IRS	Equity
FXS	(temporary)

Public Assets

Assets

Private Assets

Central Bank
(Federal Reserve)

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

Sovereign
(U.S. Treasury)

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

Dealer Banks
(government desk)

T-Repos (term)	<	T-Repos (term)
:		:
T-Notes (<u>global</u>)		T-Repos (term)

Dealer Banks
(IRS and FXS)

Swaps (collat.)	<	Swaps (collat.)
:		:
Swaps (uncoll.)		P-Bills (term)

Cash PM
(reserve managers)

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

Cash PM
(corporations)

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

Banks
(retail)

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

Banks
(wholesale)

FF (o/n)	<	FF (o/n)
:		:
P-Notes (<u>global</u>)		Deposits (term)

Dealer Banks
(credit desk)

P-Repos (o/n)	<	P-Repos (o/n)
:		:
P-Notes (<u>global</u>)		P-Repos (term)

Dealer Banks
(CDS)

Swaps (collat.)	<	Swaps (collat.)
:		:
Swaps (uncoll.)		P-Bills (term)

Cash PM
(asset managers)

"Cash" (o/n)	CDS
:	IRS
:	FXS
"Cash" (term)	Equity (temporary)

Cash PM
(seclenders)

"Cash" (o/n)	Cash (collat.)
:	:
"Cash" (term)	

Public Backstops

Private Backstops

Liabilities

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

Albert Einstein

Risk PM
(cash for funding)

T-Notes (<u>global</u>)	T-Repos (term)
:	:
	Equity (temporary)

Risk PM
(cash for shorting)

Cash (collat.)	P-Repos (term)
:	:
T-Notes	Equity
P-Notes	(temporary)

Risk PM
(cash for margining)

Cash (margin)	P-Repos (o/n)
CDS	:
IRS	Equity
FXS	(temporary)

Public Assets

Assets

Private Assets

Central Bank
(Federal Reserve)

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

Sovereign
(U.S. Treasury)

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

Dealer Banks
(government desk)

T-Repos (term)	<	T-Repos (term)
:		:
T-Notes (<u>global</u>)		T-Repos (term)

Dealer Banks
(IRS and FXS)

Swaps (collat.)	<	Swaps (collat.)
:		:
Swaps (uncoll.)		P-Bills (term)

Cash PM
(search for safety)

"Cash"	CDS
	IRS
	FXS
	Equity (temporary)

Banks
(retail)

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

Dealer Banks
(credit desk)

P-Repos (o/n)	<	P-Repos (o/n)
:		:
P-Notes (<u>global</u>)		P-Repos (term)

Banks
(wholesale)

FF (o/n)	<	FF (o/n)
:		:
P-Notes (<u>global</u>)		Deposits (term)

Dealer Banks
(CDS)

Swaps (collat.)	<	Swaps (collat.)
:		:
Swaps (uncoll.)		P-Bills (term)

Public Backstops

Private Backstops

Liabilities

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

Albert Einstein

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

Public Assets

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

Dealer Banks (government desk)	
T-Repos (term)	< T-Repos (term)
:	:
T-Notes (global)	T-Repos (term)

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

Dealer Banks (IRS and FXS)	
Swaps (collat.)	< Swaps (collat.)
:	:
Swaps (uncoll.)	P-Bills (term)

Cash PM (search for safety)	
"Cash"	CDS
	IRS
	FXS
	Equity (temporary)

Assets

Private Assets

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

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

Banks (wholesale)	
FF (o/n)	< FF (o/n)
:	:
P-Notes (global)	Deposits (term)

Dealer Banks (CDS)	
Swaps (collat.)	< Swaps (collat.)
:	:
Swaps (uncoll.)	P-Bills (term)

Public Backstops

Private Backstops

Liabilities

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

Albert Einstein

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

Public Assets

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

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

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

Dealer Banks (IRS and FXS)	
Swaps (collat.)	< Swaps (collat.)
:	:
Swaps (uncoll.)	P-Bills (term)

Cash PM (search for safety)	
"Cash"	CDS
	IRS
	FXS
	Equity (temporary)

Assets

Private Assets

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

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

Banks (wholesale)	
FF (o/n)	< FF (o/n)
:	:
P-Notes (<u>global</u>)	Deposits (term)

Dealer Banks (CDS)	
Swaps (collat.)	< Swaps (collat.)
:	:
Swaps (uncoll.)	P-Bills (term)

Public Backstops

Private Backstops

Liabilities

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

Albert Einstein

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

Public Assets

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

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

Money Dealers (cash for collateral)	
Matched books	< Matched books
⋮	⋮
Trading inventory	Financing (net)

Risk Dealers (risk for collateral)	
Matched books	< Matched books
⋮	⋮
Trading inventory	Financing (net)

Cash PM (search for safety)	
"Cash"	CDS
	IRS
	FXS
	Equity (temporary)

Assets

Private Assets

Banks (retail)	
Reserves (o/n)	< FF (o/n)
⋮	⋮
P-Loans (local)	Deposits (term)

Banks (wholesale)	
FF (o/n)	< FF (o/n)
⋮	⋮
P-Notes (<u>global</u>)	Deposits (term)

Money Dealers (cash for collateral)	
Matched books	< Matched books
⋮	⋮
Trading inventory	Financing (net)

Risk Dealers (risk for collateral)	
Matched books	< Matched books
⋮	⋮
Trading inventory	Financing (net)

Public Backstops

Private Backstops

Liabilities

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

Albert Einstein

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

Public Assets

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

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

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

Cash PM (search for safety)	
"Cash"	CDS
	IRS
	FXS
	Equity (temporary)

Assets

Private Assets

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

Risk Dealers (risk for collateral)	
Matched books	< Matched books
:	:
Trading inventory	Financing (net)

Banks (wholesale)	
FF (o/n)	< FF (o/n)
:	:
P-Notes (<u>global</u>)	Deposits (term)

Public Backstops

Private Backstops

Liabilities

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

Albert Einstein

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

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

Cash PM	
(search for safety)	
"Cash"	CDS
	IRS
	FXS
	Equity (temporary)

Risk Dealers	
(risk for collateral)	
Matched books	< Matched books
:	:
Trading inventory	Financing (net)

The dealer eco-system:

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

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

Cash PM	
(search for safety)	
"Cash"	CDS
	IRS
	FXS
	Equity
	(temporary)

Risk Dealer	
(risk for collateral)	
Matched books	< Matched books
⋮	⋮
Trading inventory	Financing (net)

The dealer eco-system:

Risk and cash PMs...

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

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

Cash PM	
(search for safety)	
"Cash"	CDS
	IRS
	FXS
	Equity
	(temporary)

Risk Dealer	
(risk for collateral)	
Matched books	< Matched books
:	:
Trading inventory	Financing (net)

The dealer eco-system:

Risk and cash PMs and money and risk dealers.

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

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

Cash PM	
(search for safety)	
"Cash"	CDS
	IRS
	FXS
	Equity
	(temporary)

Risk Dealer	
(risk for collateral)	
Matched books	< Matched books
:	:
Trading inventory	Financing (net)

The dealer eco-system:

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

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

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

Cash PM	
(search for safety)	
"Cash"	CDS
	IRS
	FXS
	Equity
	(temporary)

Risk Dealer	
(risk for collateral)	
Matched books	Matched books
:	:
Trading inventory	Financing (net)

The dealer eco-system:

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)

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

Cash PM	
(search for safety)	
"Cash"	CDS
	IRS
	FXS
	Equity
	(temporary)

Risk Dealer	
(risk for collateral)	
Matched books	< Matched books
:	:
Trading inventory	Financing (net)

Search for yield versus search for safety:

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

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

Money Dealer	
<i>(cash for collateral)</i>	
Matched books	< Matched books
:	:
Trading inventory	Financing (net)

Cash PM	
<i>(search for safety)</i>	
"Cash"	CDS
	IRS
	FXS
	Equity
	(temporary)

Risk Dealer	
<i>(risk for collateral)</i>	
Matched books	< Matched books
:	:
Trading inventory	Financing (net)

Natural complements:

Risk PMs repo securities out and cash in.

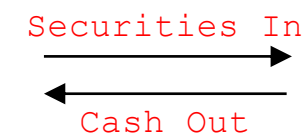
Cash PMs repo cash out and securities in.

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

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

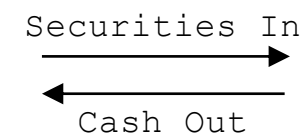
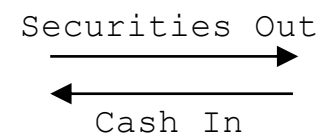
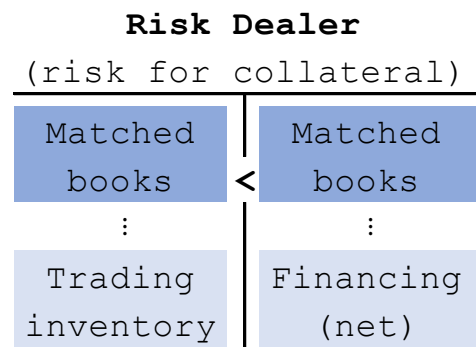
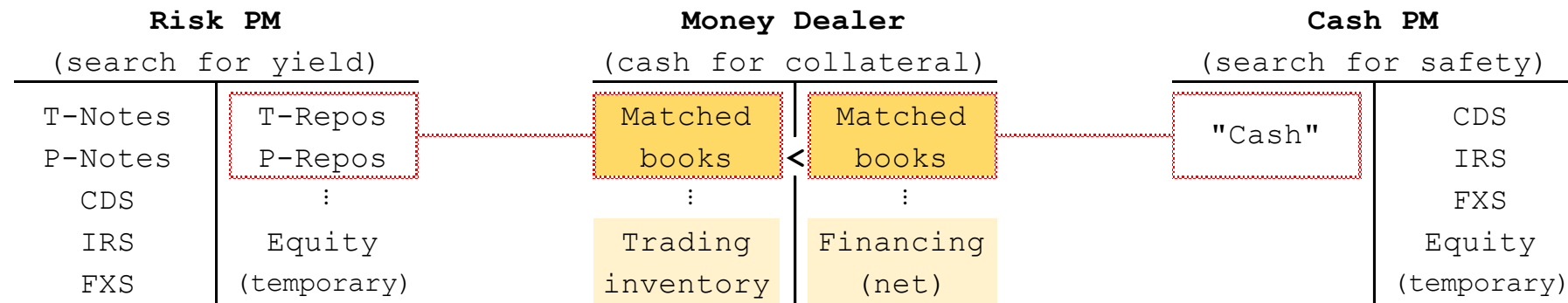
Cash PM	
(search for safety)	
"Cash"	CDS
	IRS
	FXS
	Equity
	(temporary)

Risk Dealer	
(risk for collateral)	
Matched books	< Matched books
:	:
Trading inventory	Financing (net)



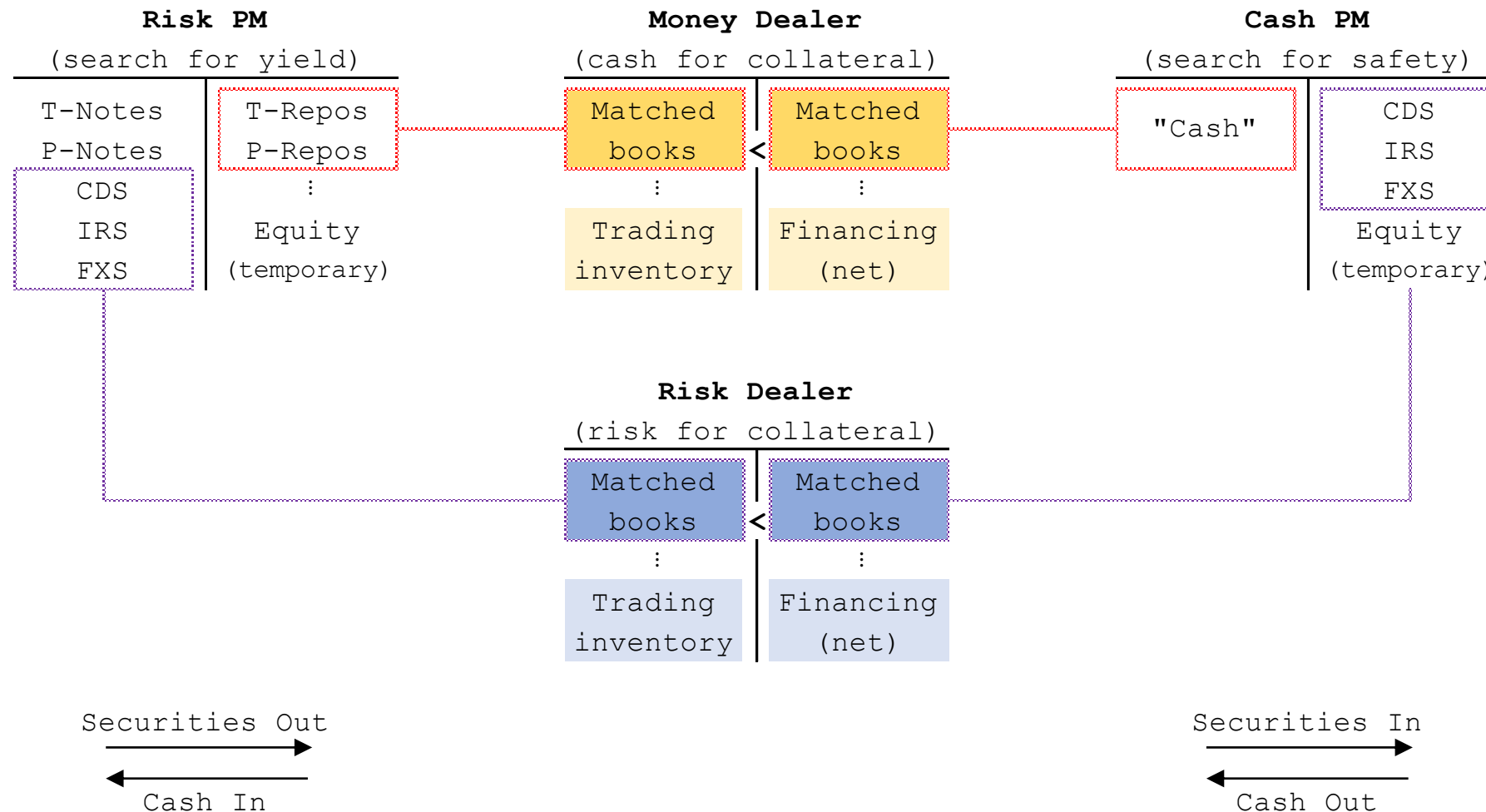
The role of collateral:

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



The role of collateral:

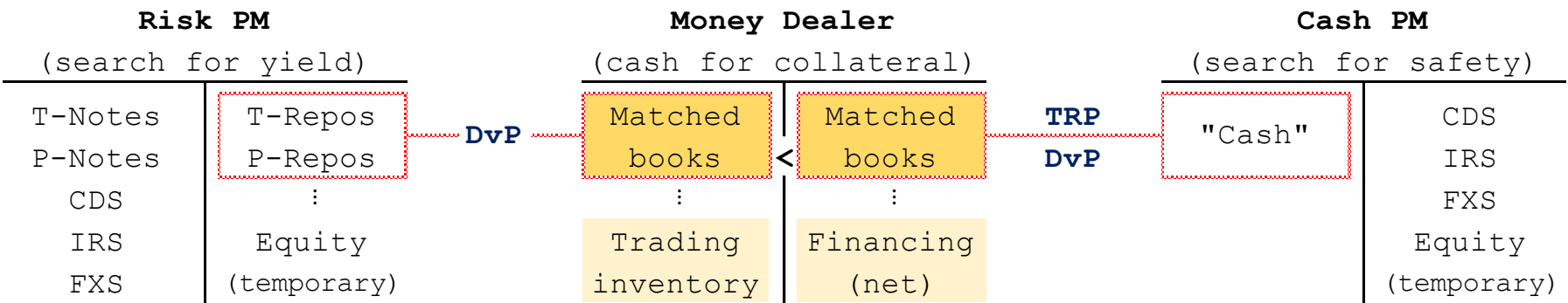
Swaps positions give rise to un-secured derivatives receivables for those in the money. Collateral gives sense of safety for those in the money, who are *de facto* cash lenders.



Sizing the U.S. repo market:

\$ trillions as of 2012Q2

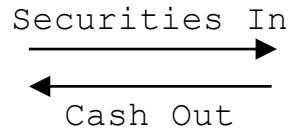
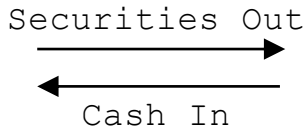
Cash PMs placed over \$3 trillion in cash with dealers. Of this, \$2.5 trillion were lent on, with the difference used to finance inventories. Risk PMs absorbed **\$2 trillion** in funding.



GCF

(inter-dealer)

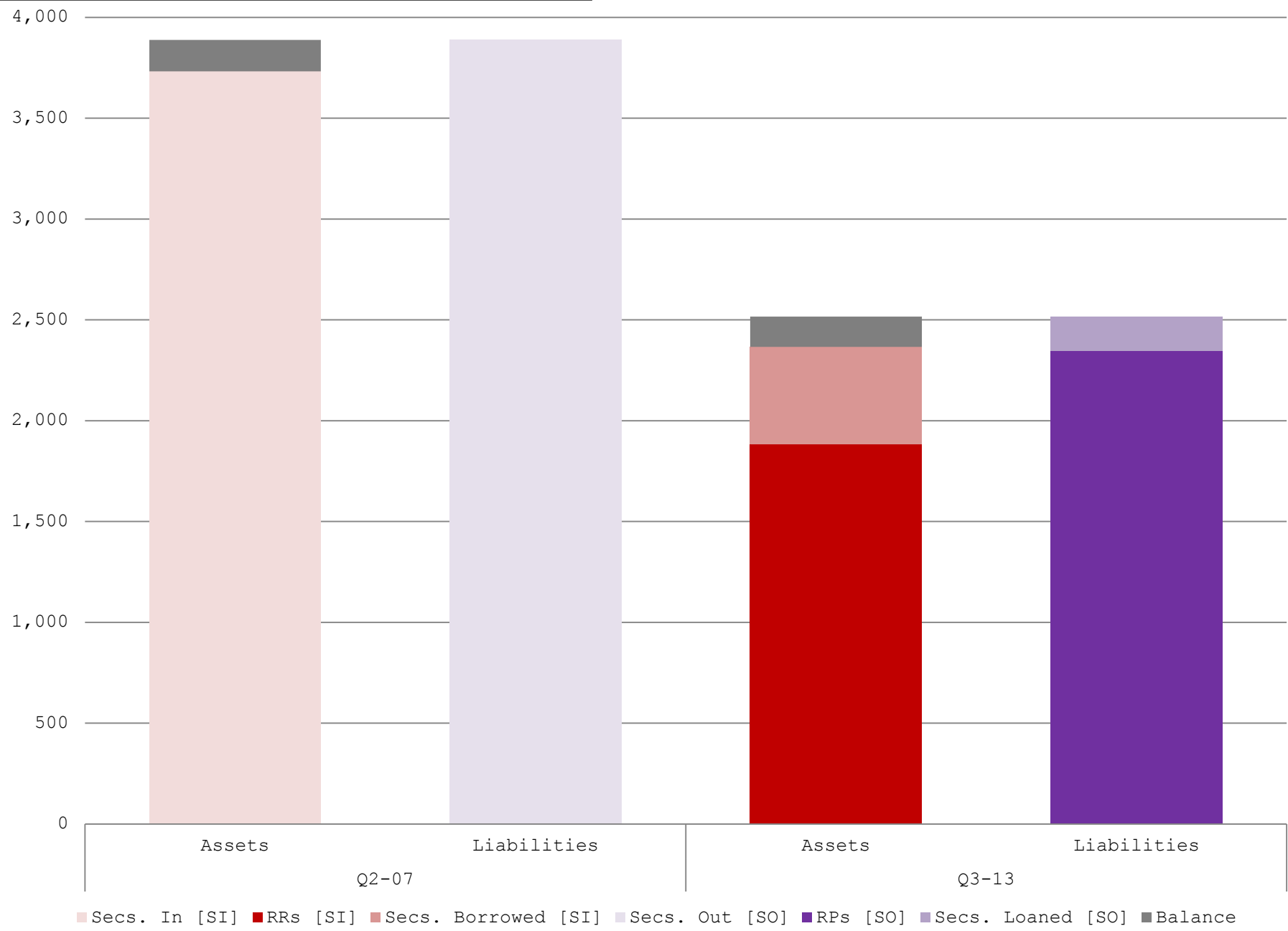
Reverse Repo Transactions			Repo Transactions		
\$2,446	Total	\$2,446	\$3,035	Total	\$3,035
\$463	GCF	\$463	\$463	GCF	\$463
-	-	-	\$1,608	TRP	\$1,608
\$1,983	DvP	\$1,983	\$964	DvP	\$964
-	Net	\$589	-	-	-



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

Money dealing using public bonds by motive:

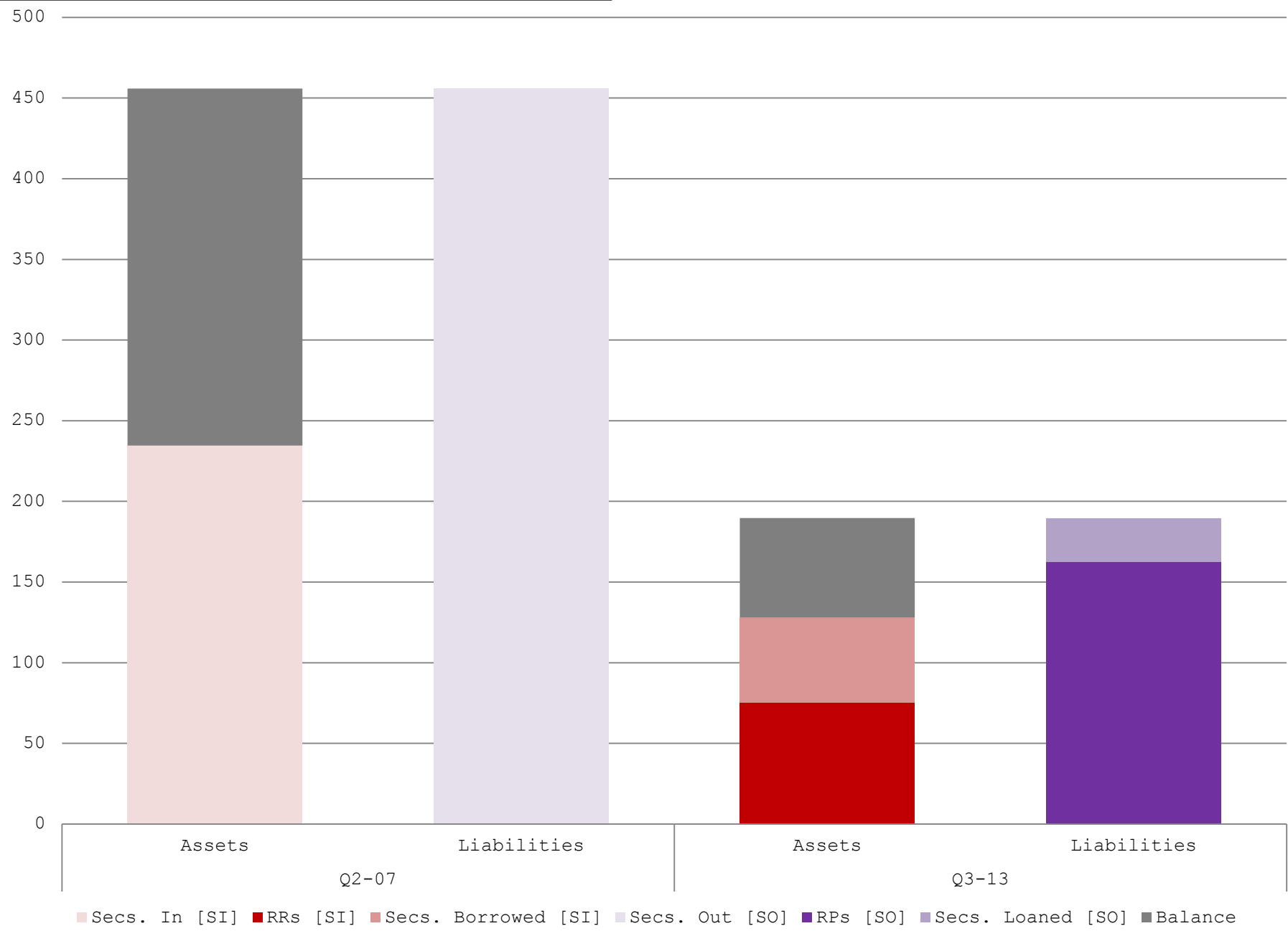
\$ trillions



Source: Haver, Federal Reserve Bank of New York

Money dealing using private bonds by motive:

\$ trillions

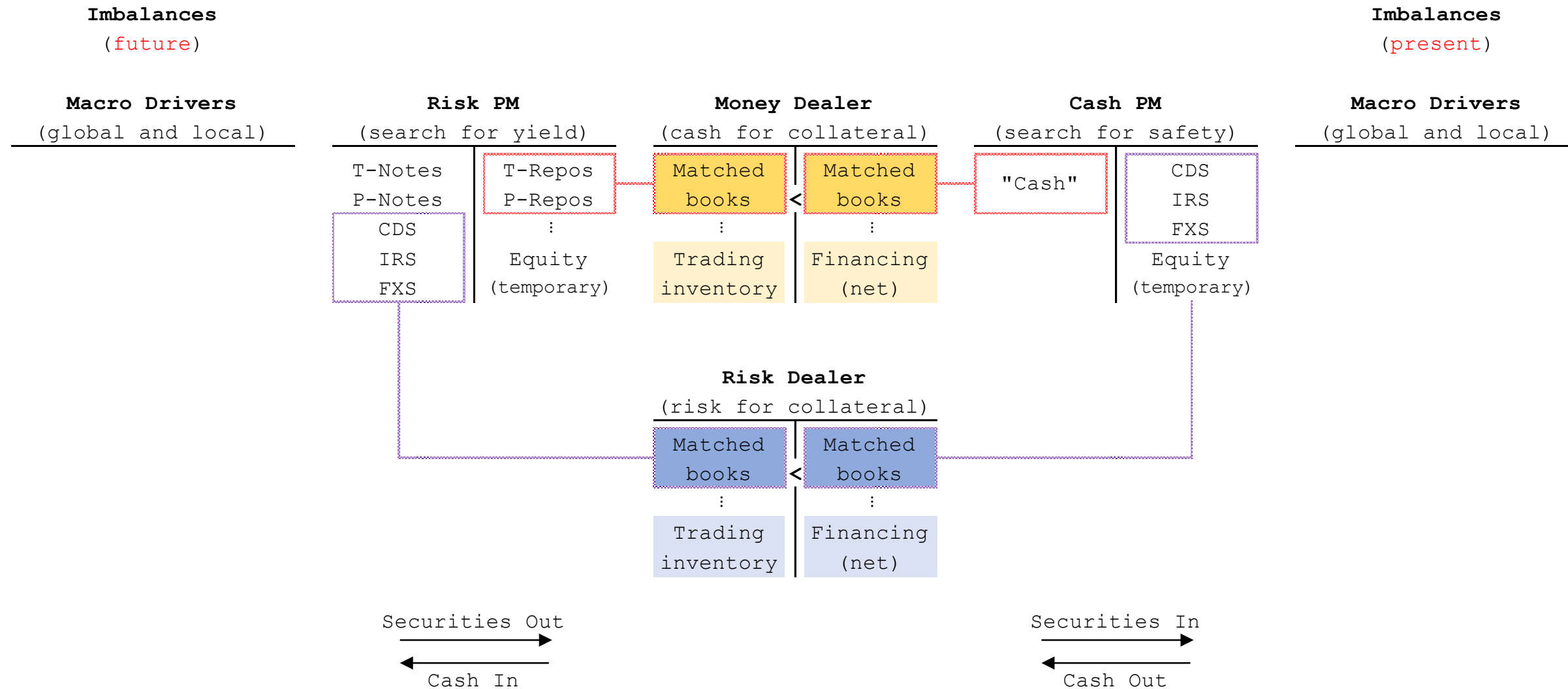


Source: Haver, Federal Reserve Bank of New York

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.

Macro imbalances shaping the eco-system:

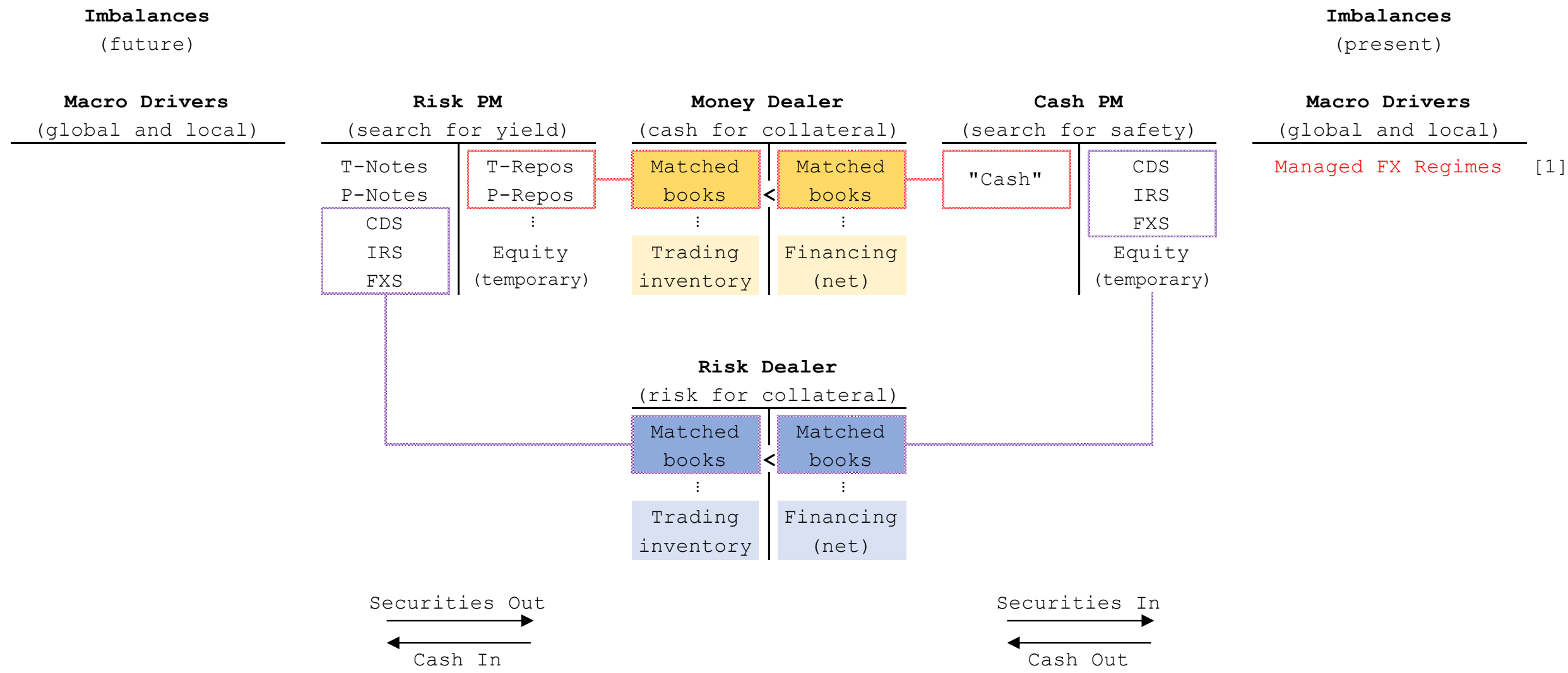
Present and future macro imbalances shape the contours of the global financial eco-system. What dealer banks do is a reflection of the eco-system they inhabit.



Macro imbalances shaping the eco-system:

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

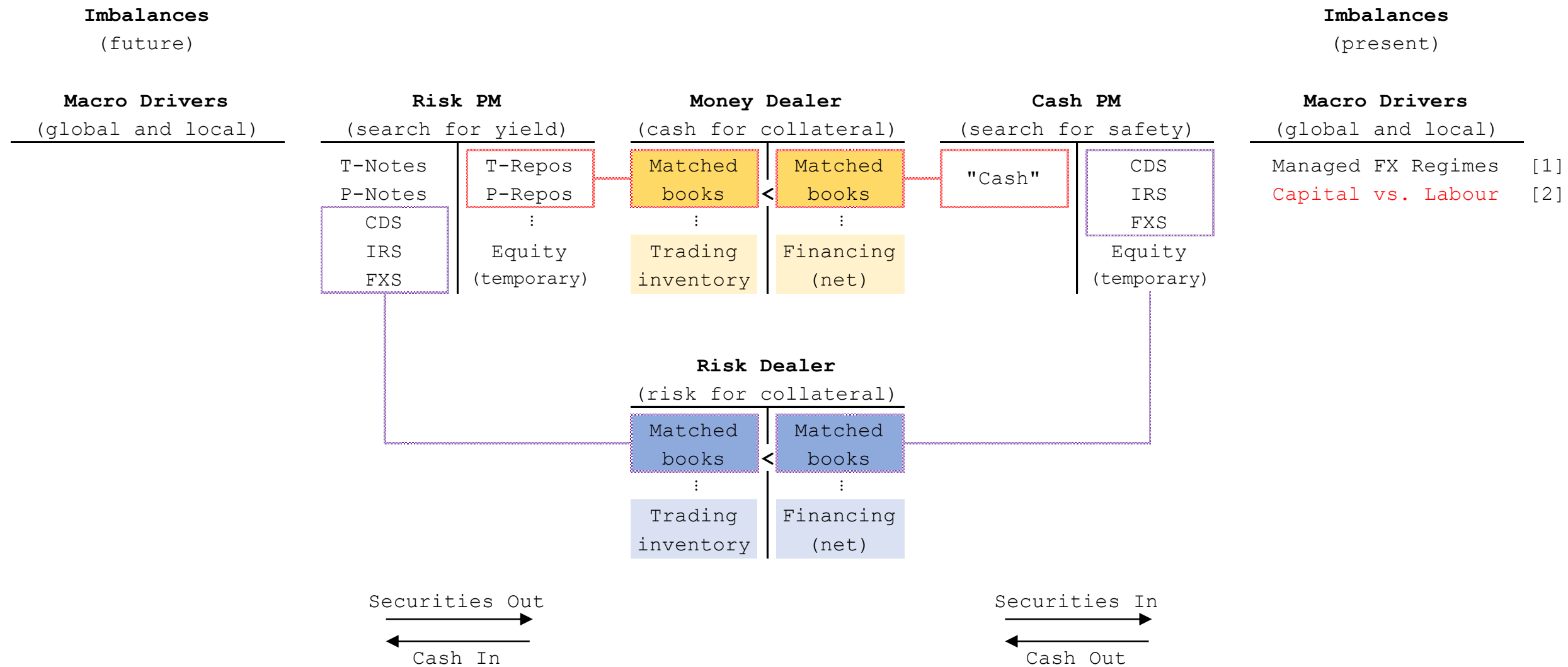
[1] the secular rise of managed FX regimes and FX reserves' so-called "liquidity tranches".



Macro imbalances shaping the eco-system:

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

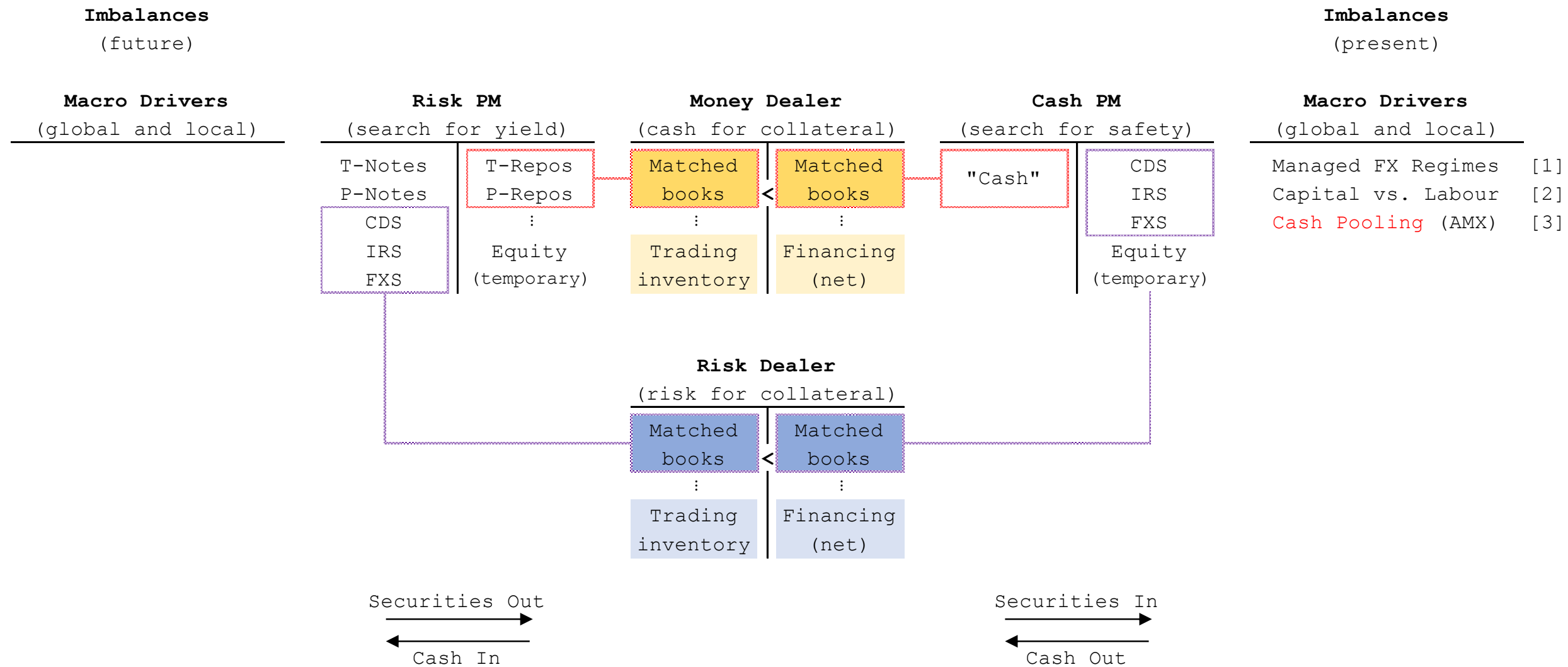
[2] the secular rise of corporate profits vs. stagnant wages and capex (see Summers, 2013).



Macro imbalances shaping the eco-system:

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

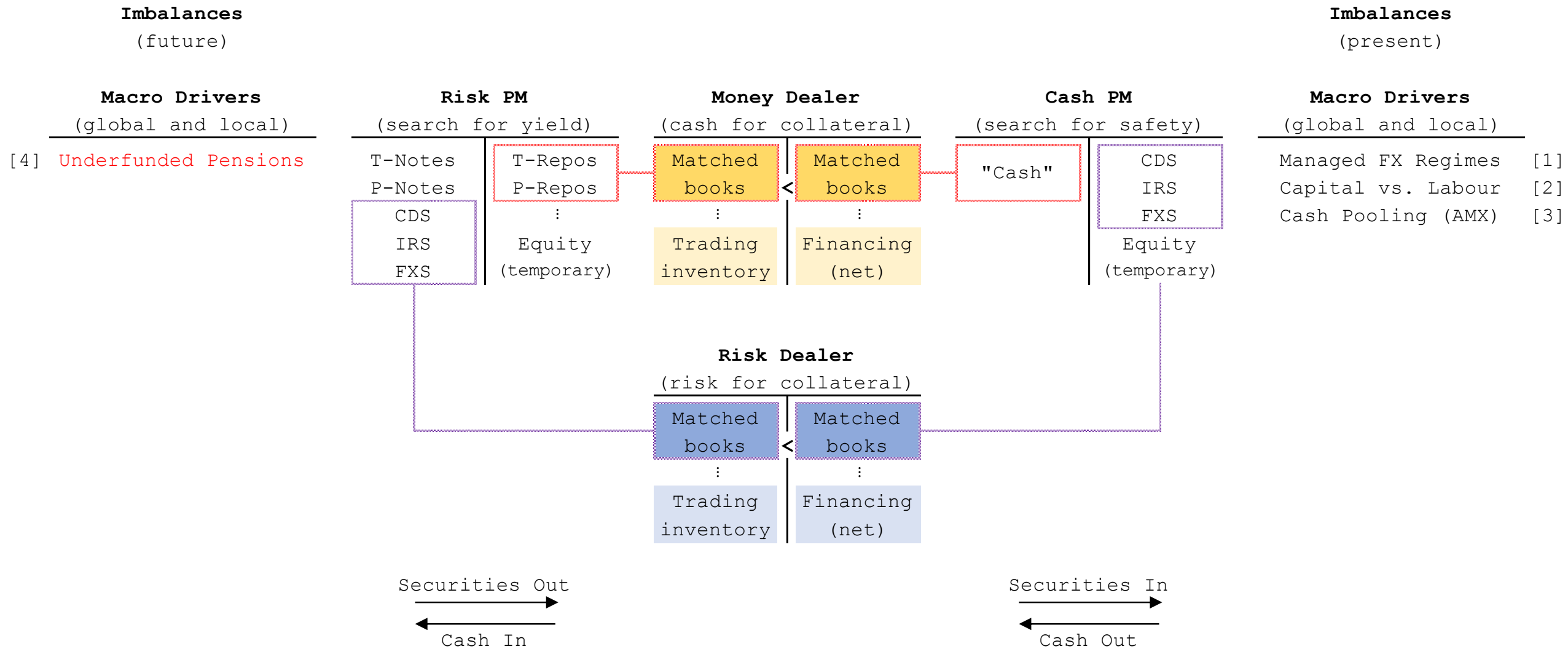
[3] the secular rise of a highly concentrated asset management complex (see OFR, 2013).



Macro imbalances shaping the eco-system:

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

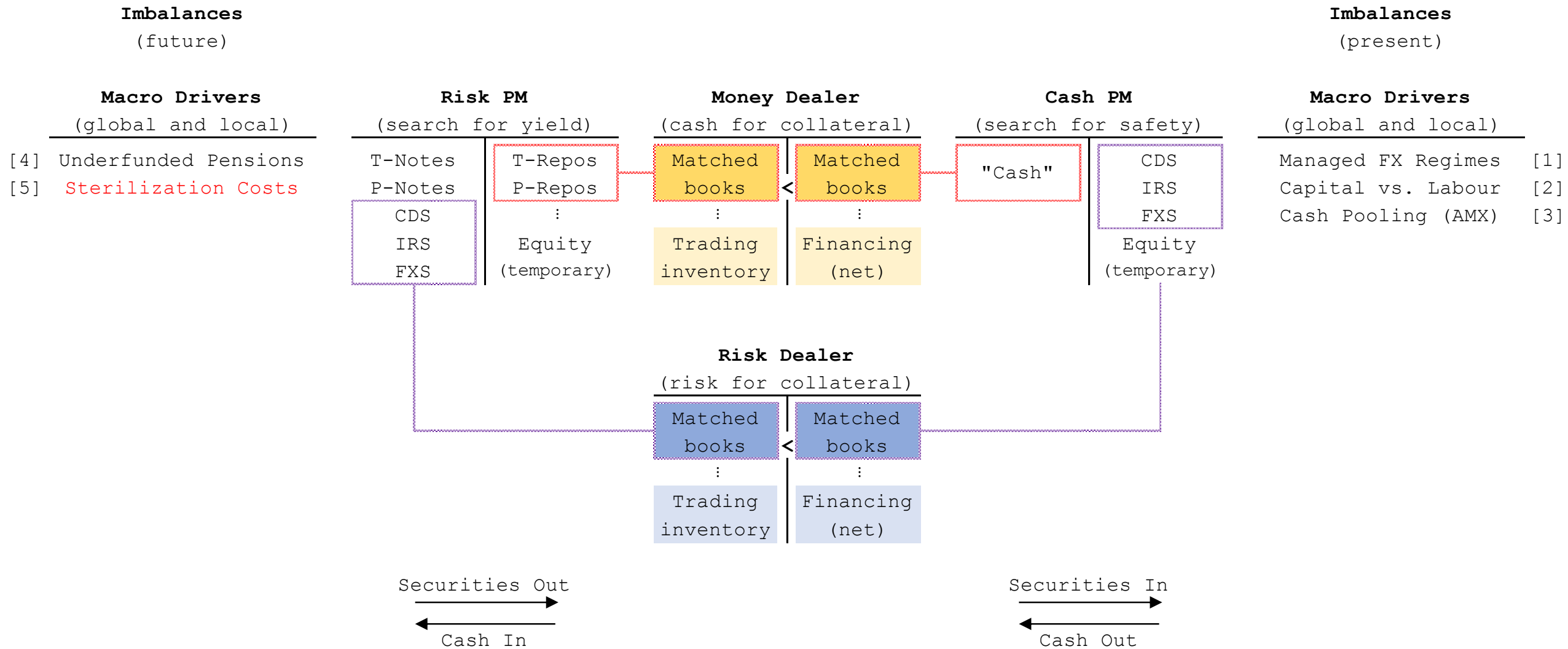
[4] the secular rise in underfunded pension promises (see Caballero, 2013).



Macro imbalances shaping the eco-system:

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

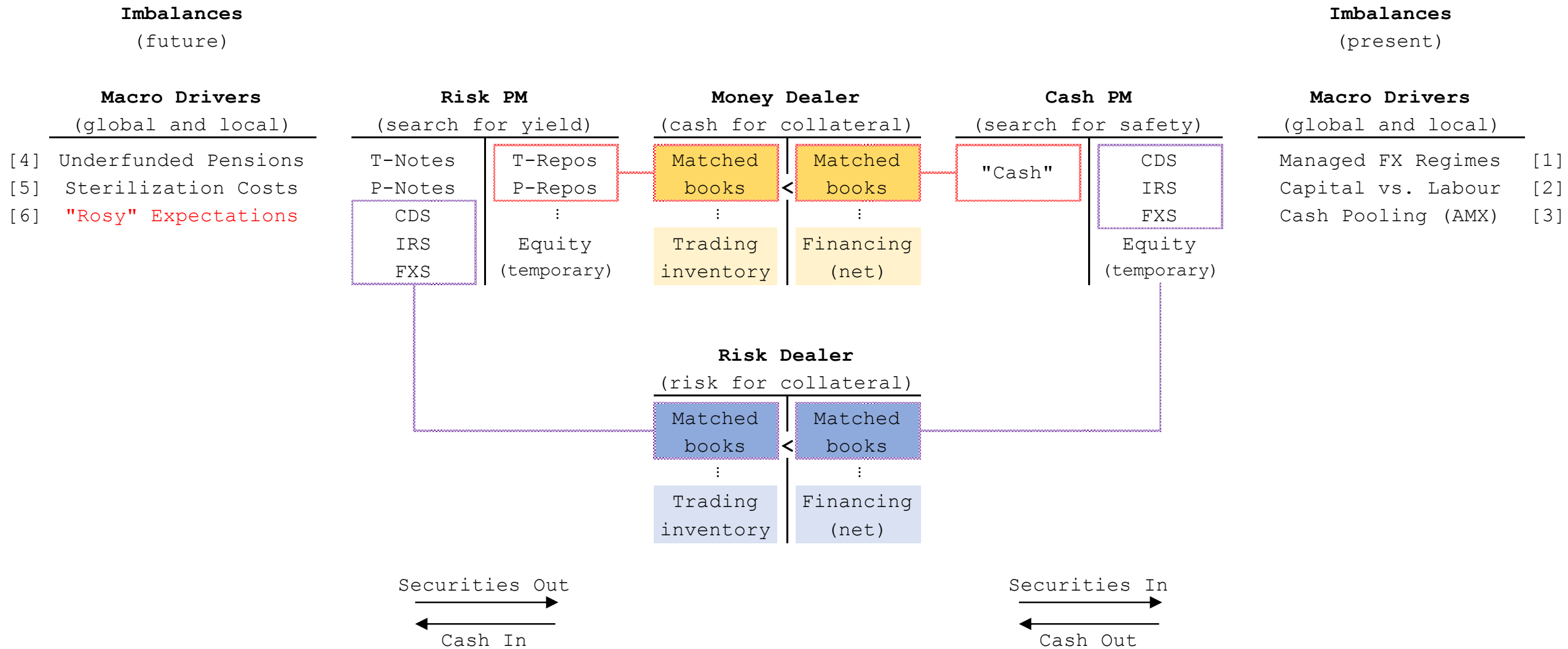
[5] the secular rise in FX reserves' sterilization costs (see Borio et al, 2008).



Macro imbalances shaping the eco-system:

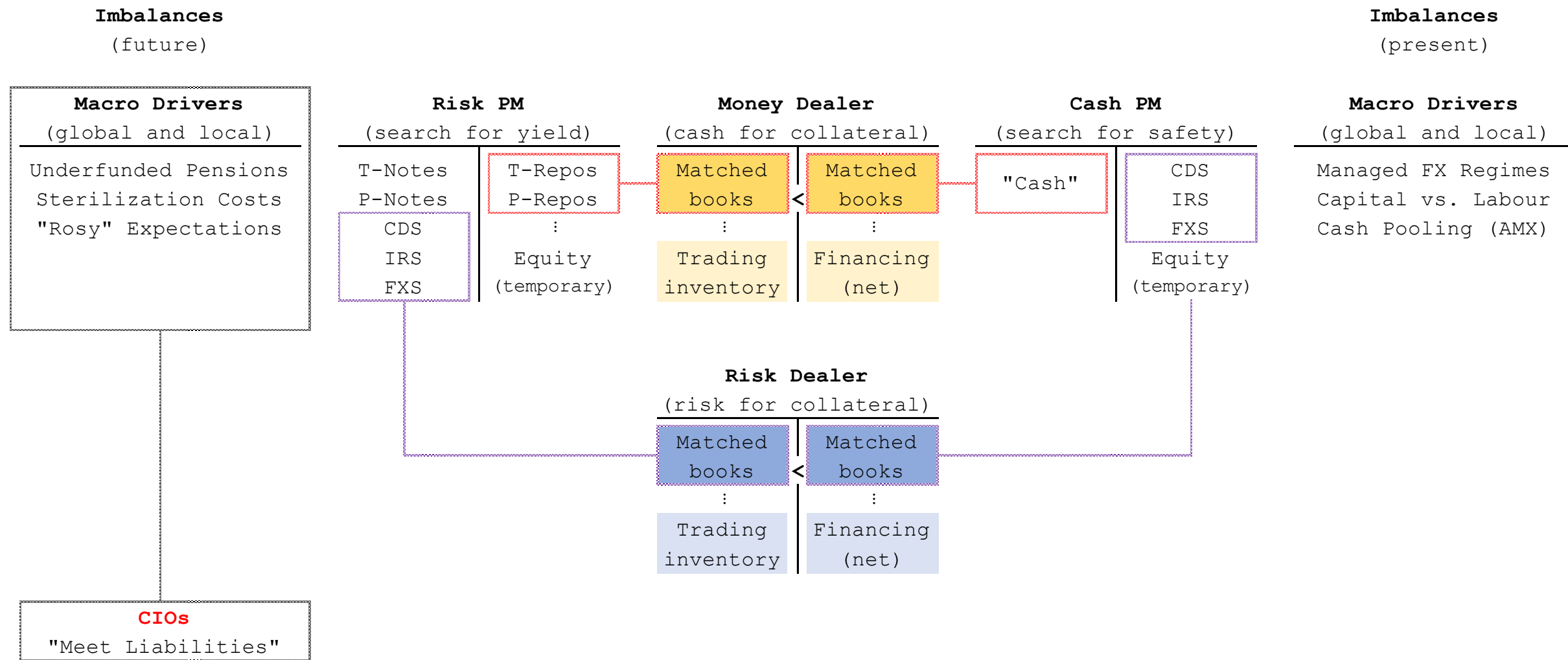
The secular rise of risk PMs has been driven by...

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



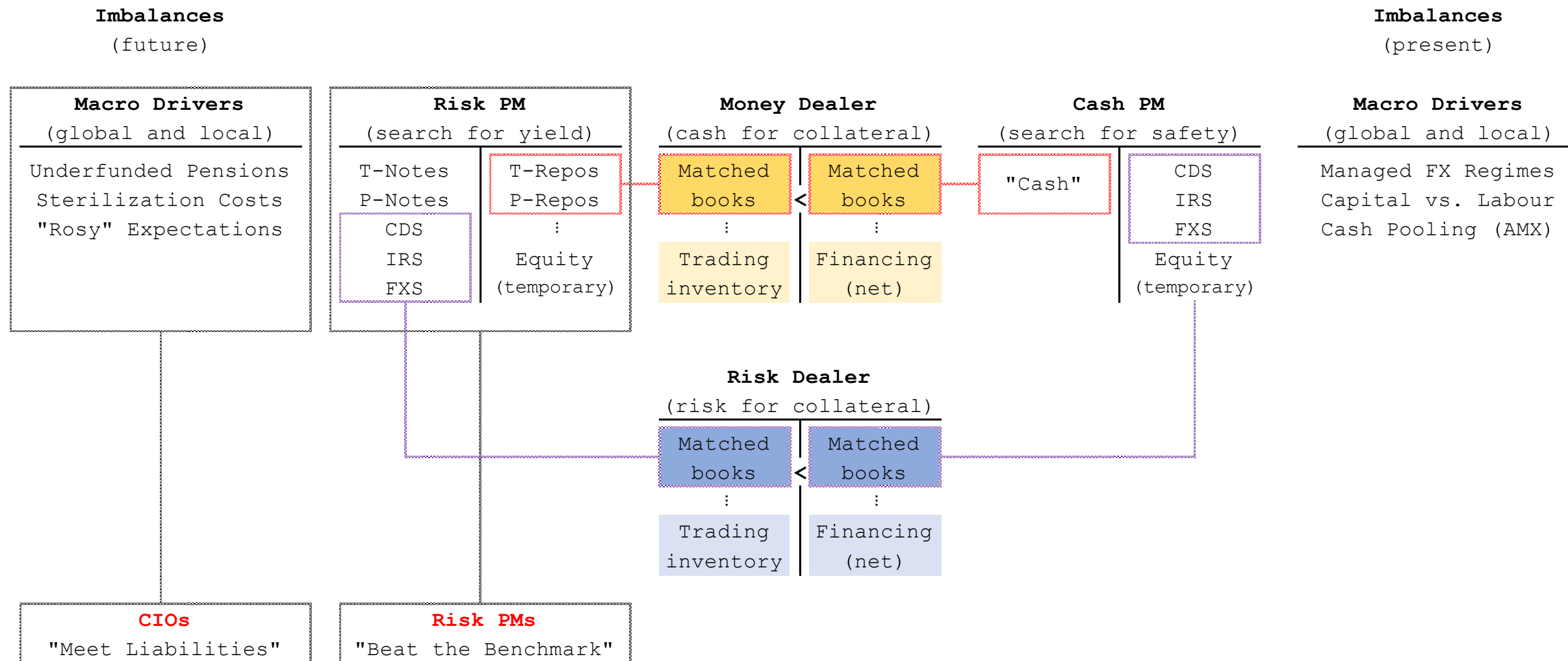
Four simple goals that make the eco-system go 'round:

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



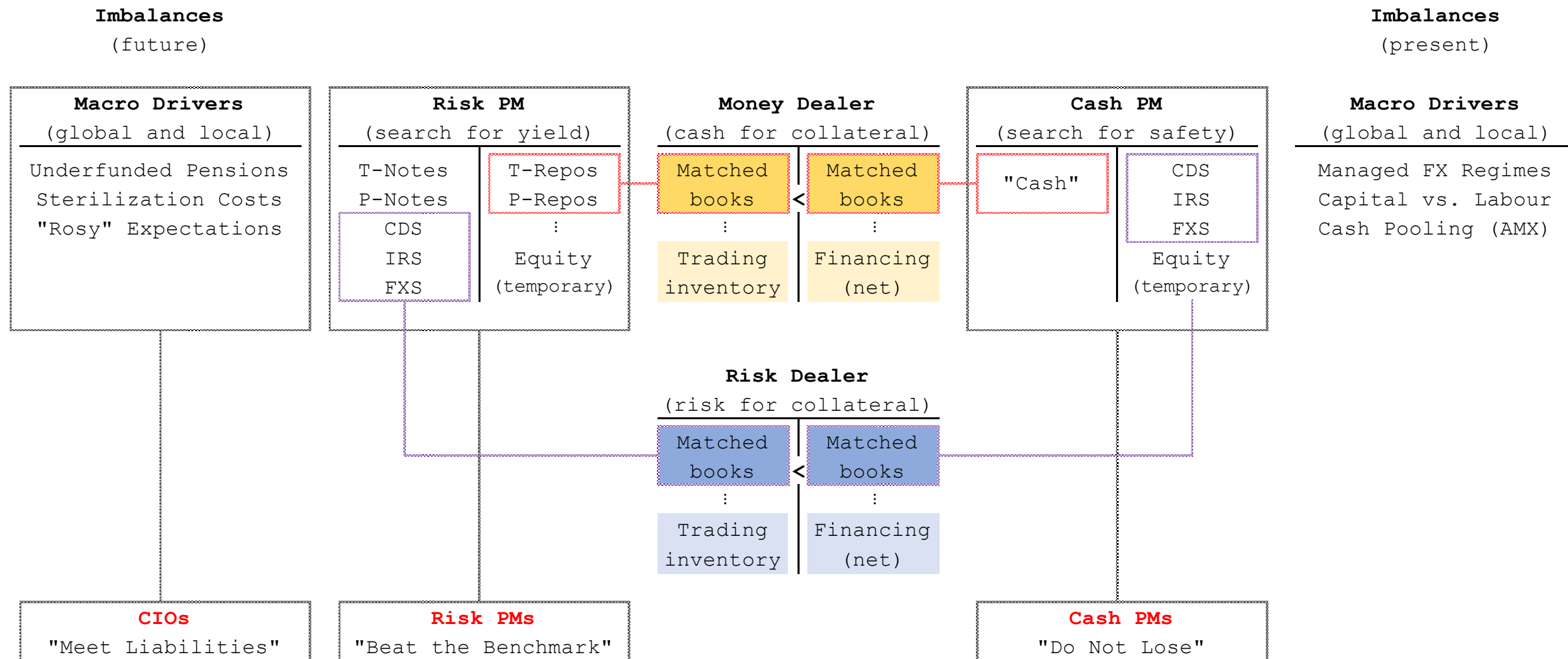
Four simple goals that make the eco-system go 'round:

[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.



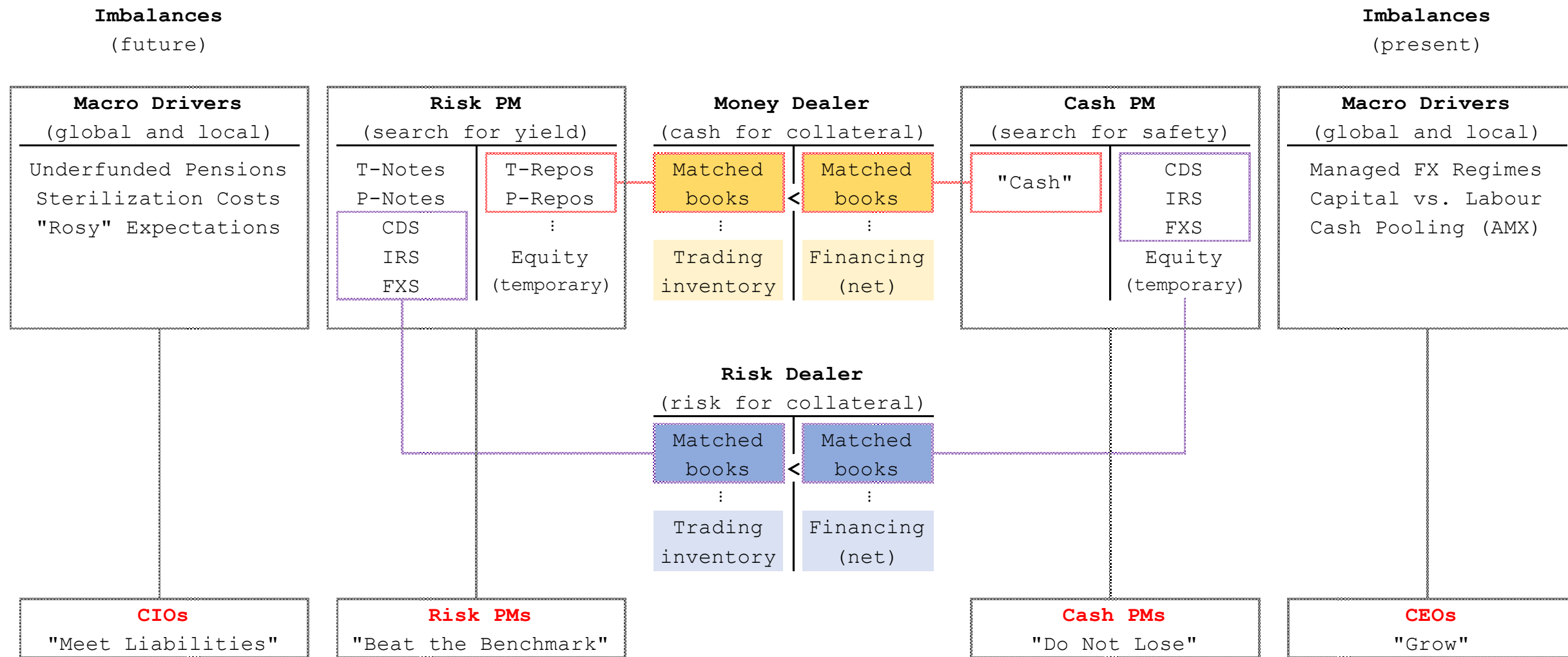
Four simple goals that make the eco-system go 'round:

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



Four simple goals that make the eco-system go 'round:

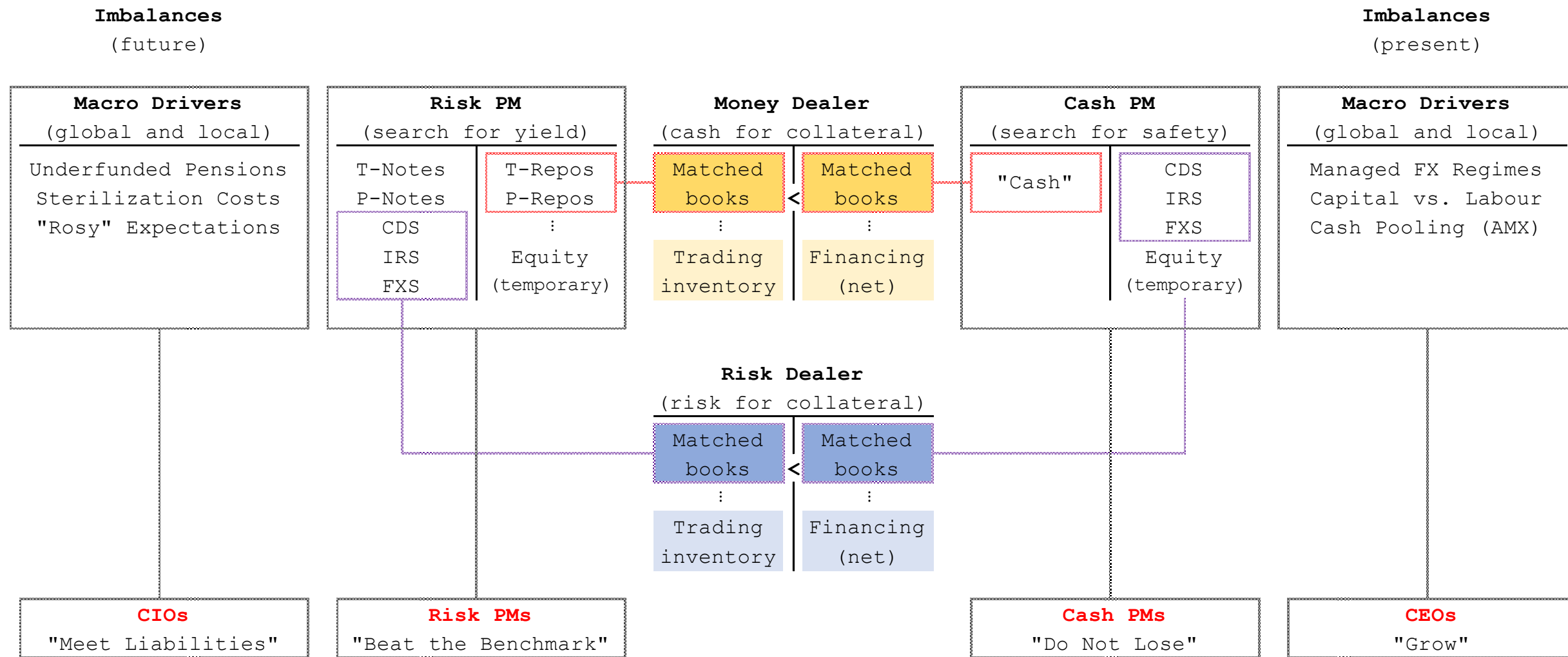
[4] CEOs at both the corporate and national levels are mandated to "grow" their profits and economies, respectively and this contributes to the skewed distribution of present incomes.



1. The Hierarchy of Money.
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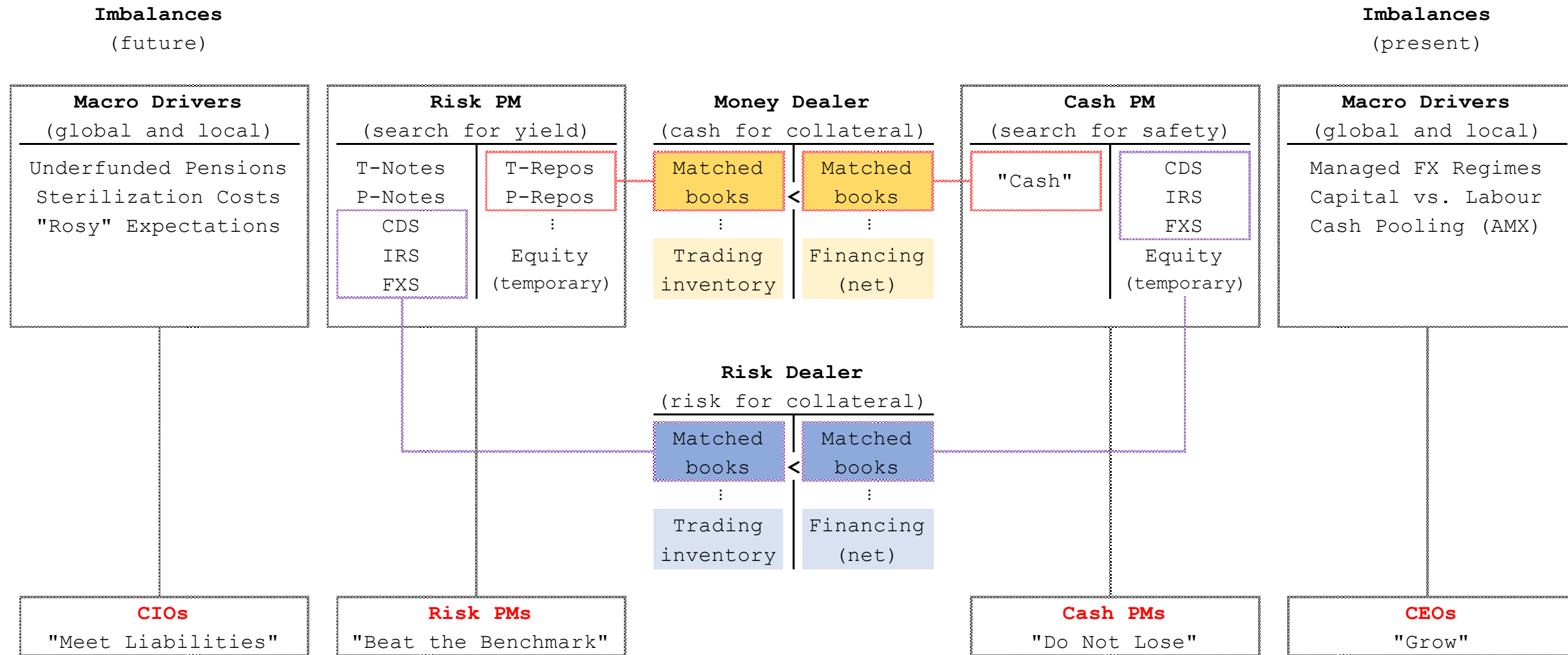
Implications for macro and asset price models:

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.

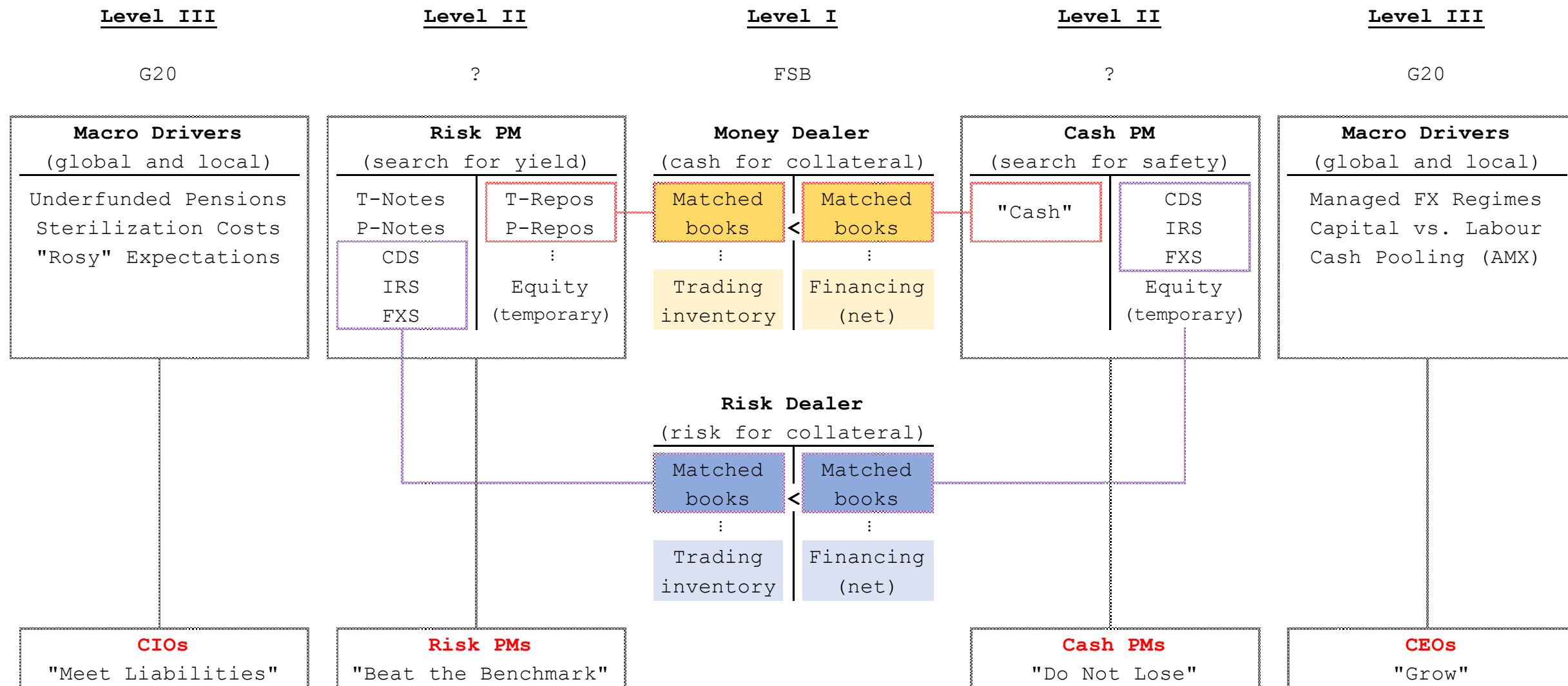


Implications for global macro-financial accounting:

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.



Implications for governance:



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. RRP 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 :

Pozsar, Zoltan, 2014, "**Shadow Banking: The Money View**," Office of Financial Research (OFR) Working Paper (forthcoming).

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Mehrling, Perry, Pozsar, Zoltan, Sweeney, James, Neilson, Dan, 2013, "**Bagehot Was a Shadow Banker: Shadow Banking, Central Banking and the Future of Global Finance**," INET Working Paper.

Claessens, Stijn, Pozsar, Zoltan, Singh, Manmohan, Lev, Ratnovski 2013, "**Shadow Banking: Economics and Policy**," IMF SDN 12/12.

Pozsar, Zoltan and McCulley, Paul, 2012, "**Why Banking Works One Large Confidence Trick**," Financial Times.

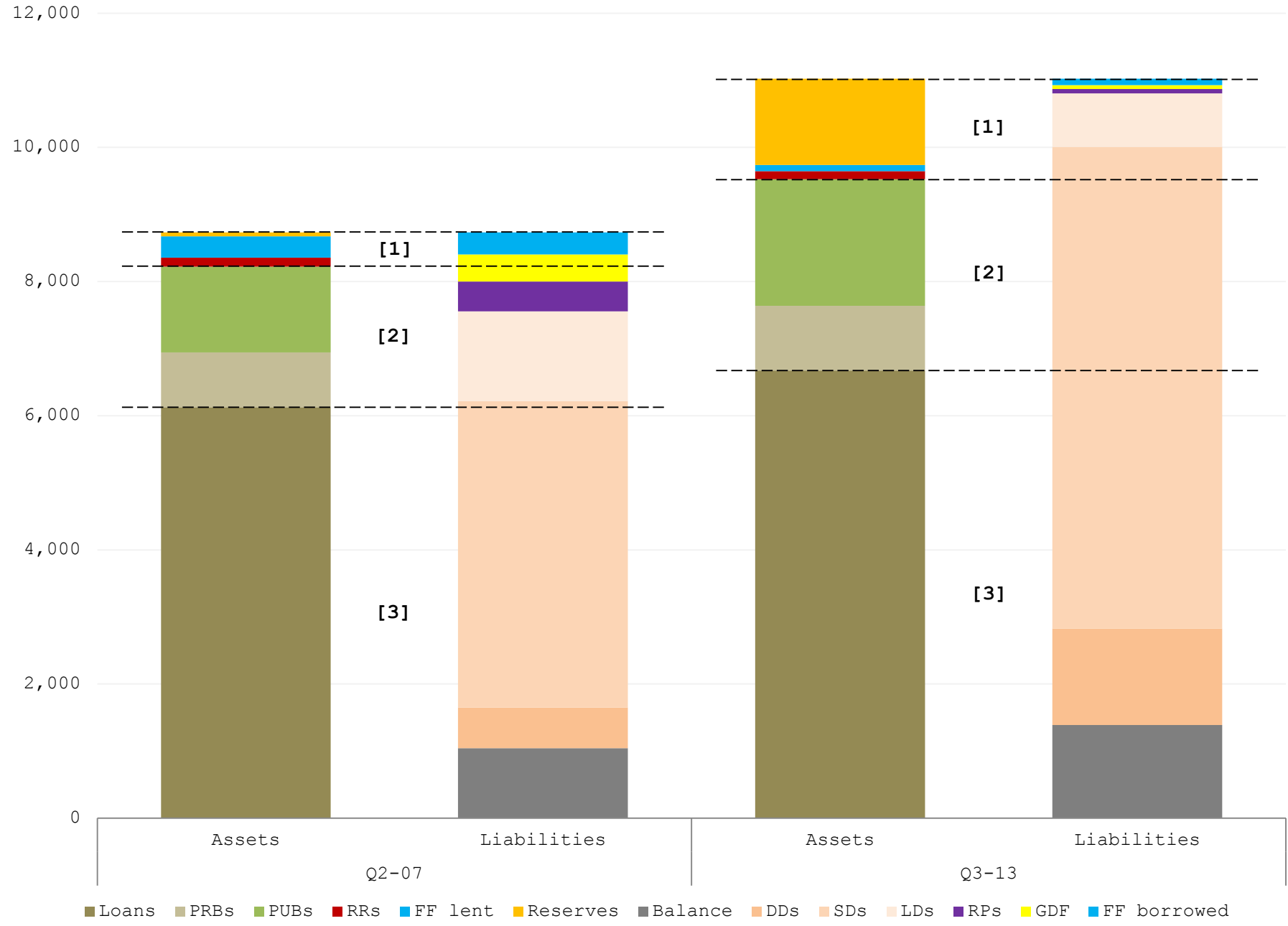
Pozsar, Zoltan and Singh, Manmohan, 2011, "**The Nonbank-Bank Nexus and the Shadow Banking System**," IMF WP 11/289.

Pozsar, Zoltan, 2011, "**Institutional Cash Pools and the Triffin Dilemma of the U.S. Banking System**," IMF WP 11/190.

Data Appendix:

U.S. Chartered Banks:

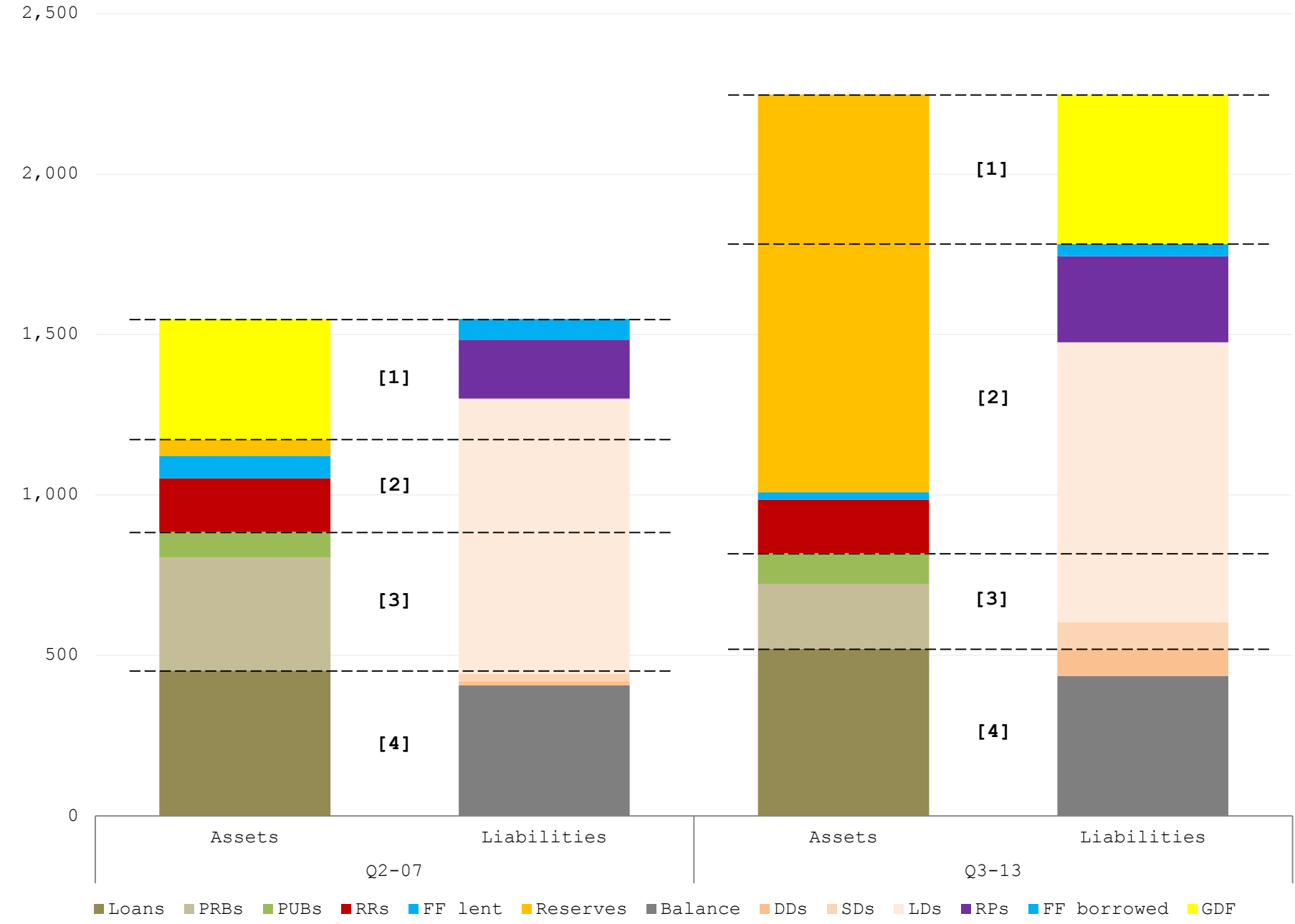
\$ billions



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

New York Branches of Foreign Banks:

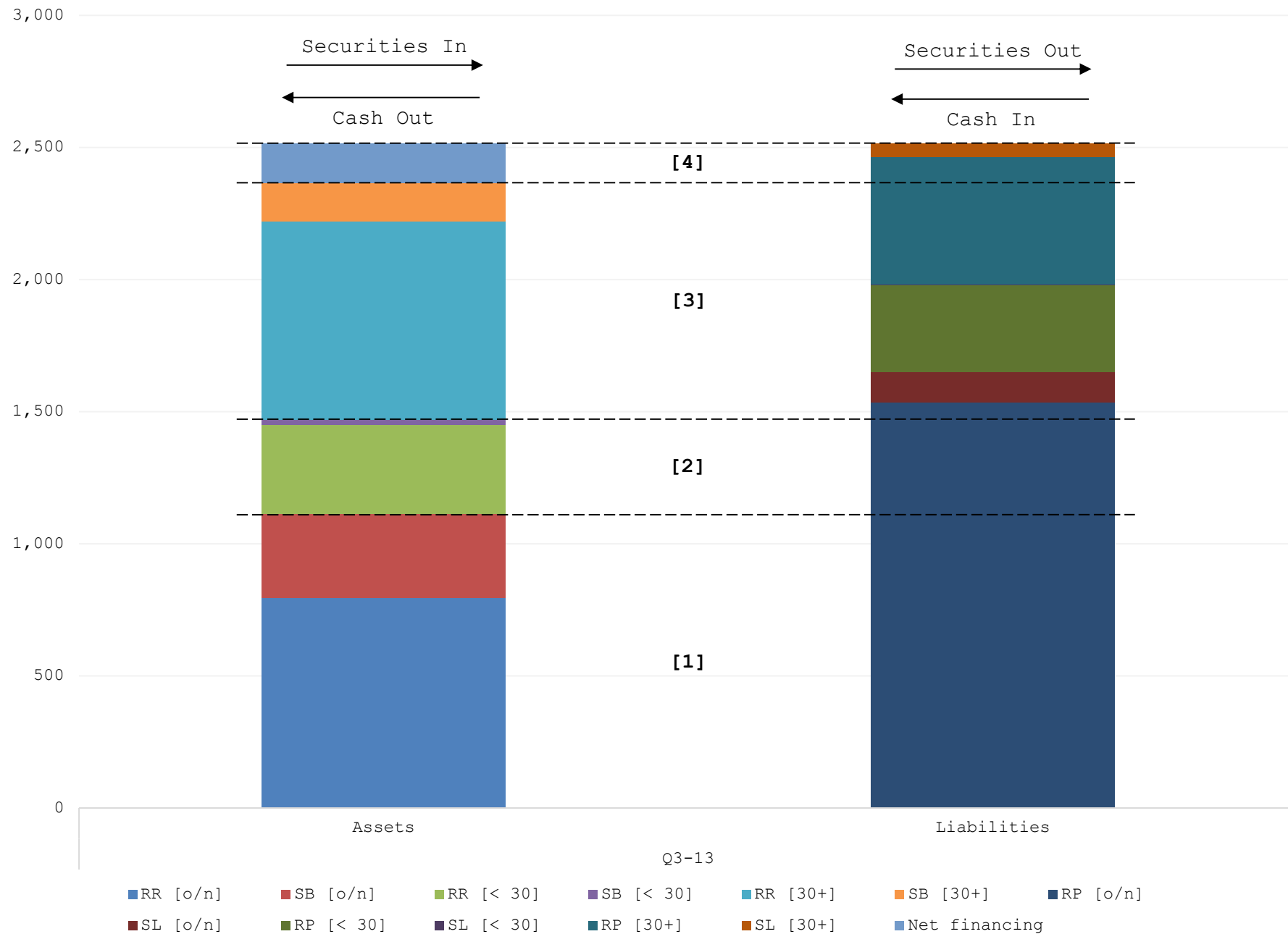
\$ billions



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

Dealer Banks' "Government" Trading Desks:

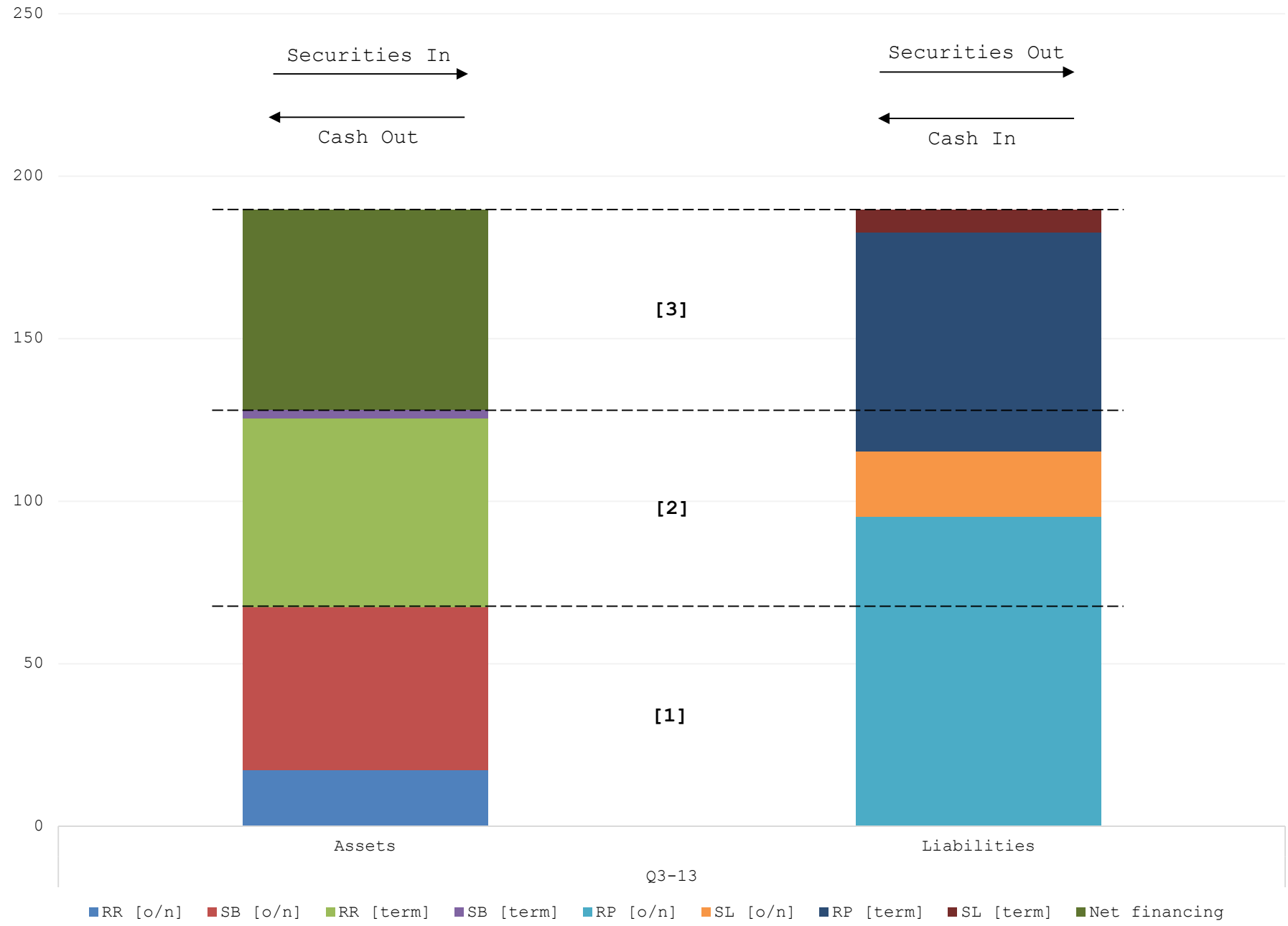
\$ billions



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

Dealer Banks' "Credit" Trading Desks:

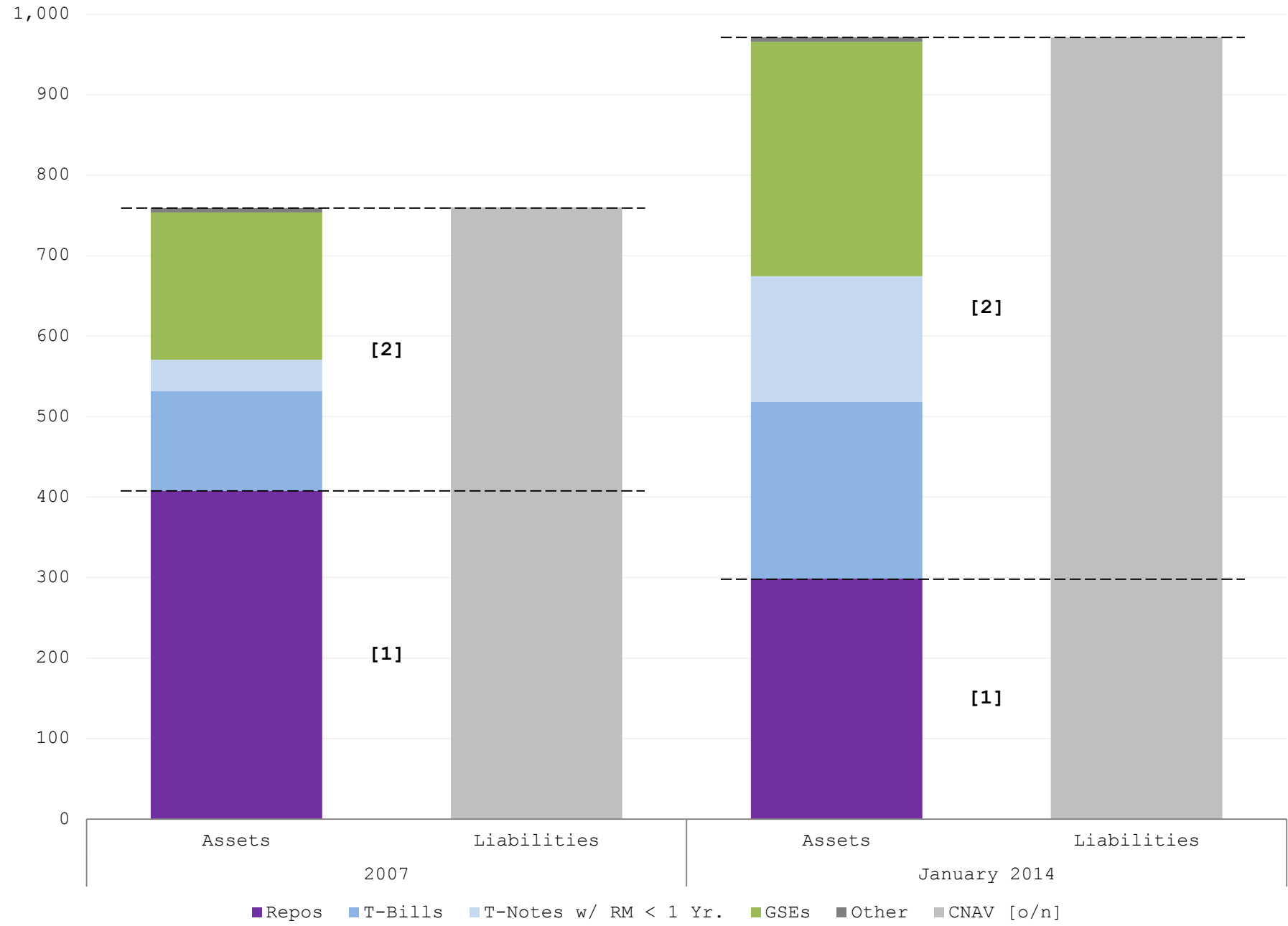
\$ billions



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

Government-Only Money Funds:

\$ billions

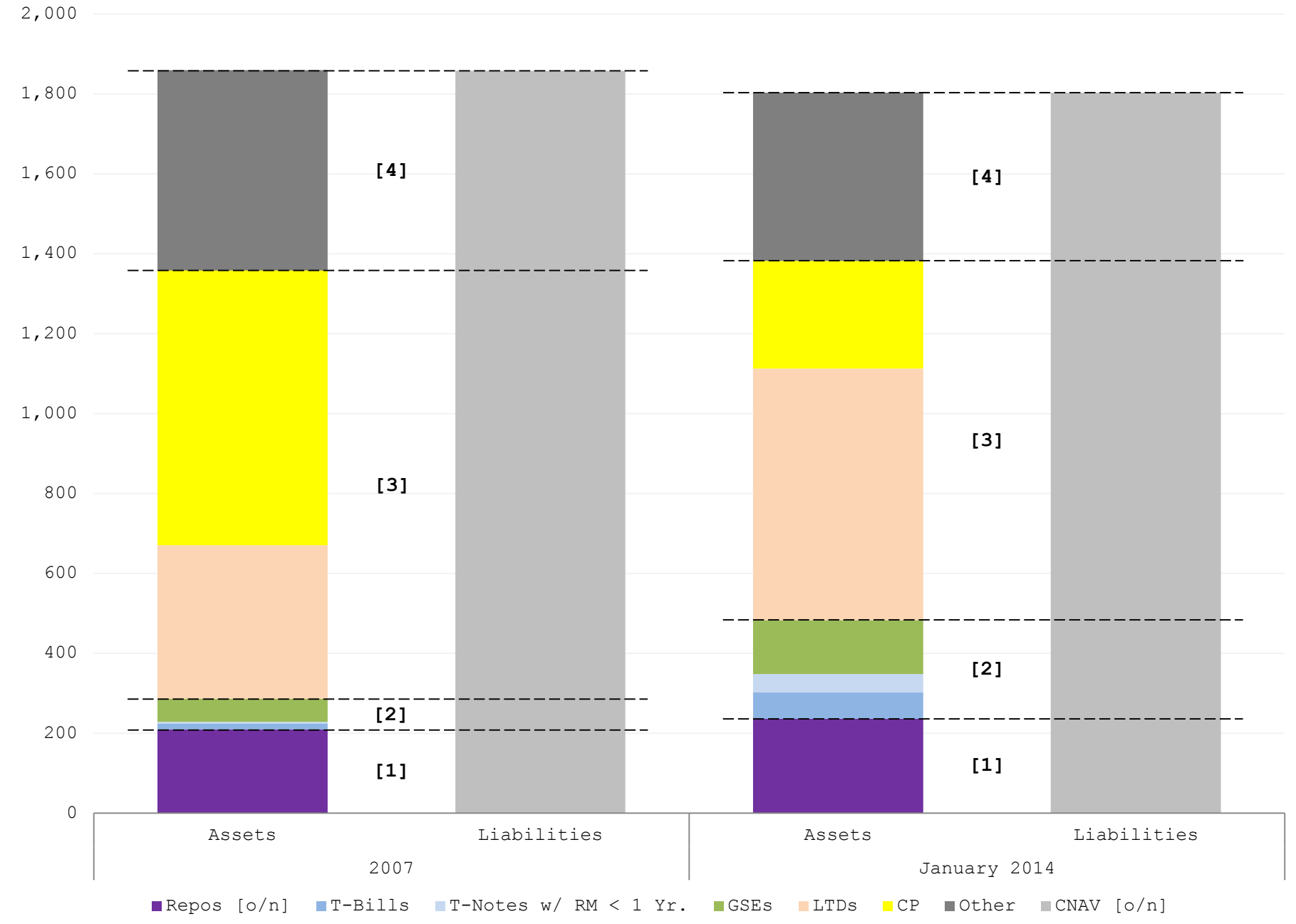


■ Repos ■ T-Bills ■ T-Notes w/ RM < 1 Yr. ■ GSEs ■ Other ■ CNAV [o/n]

Source: Haver, SEC and author's calculations

Prime Money Funds:

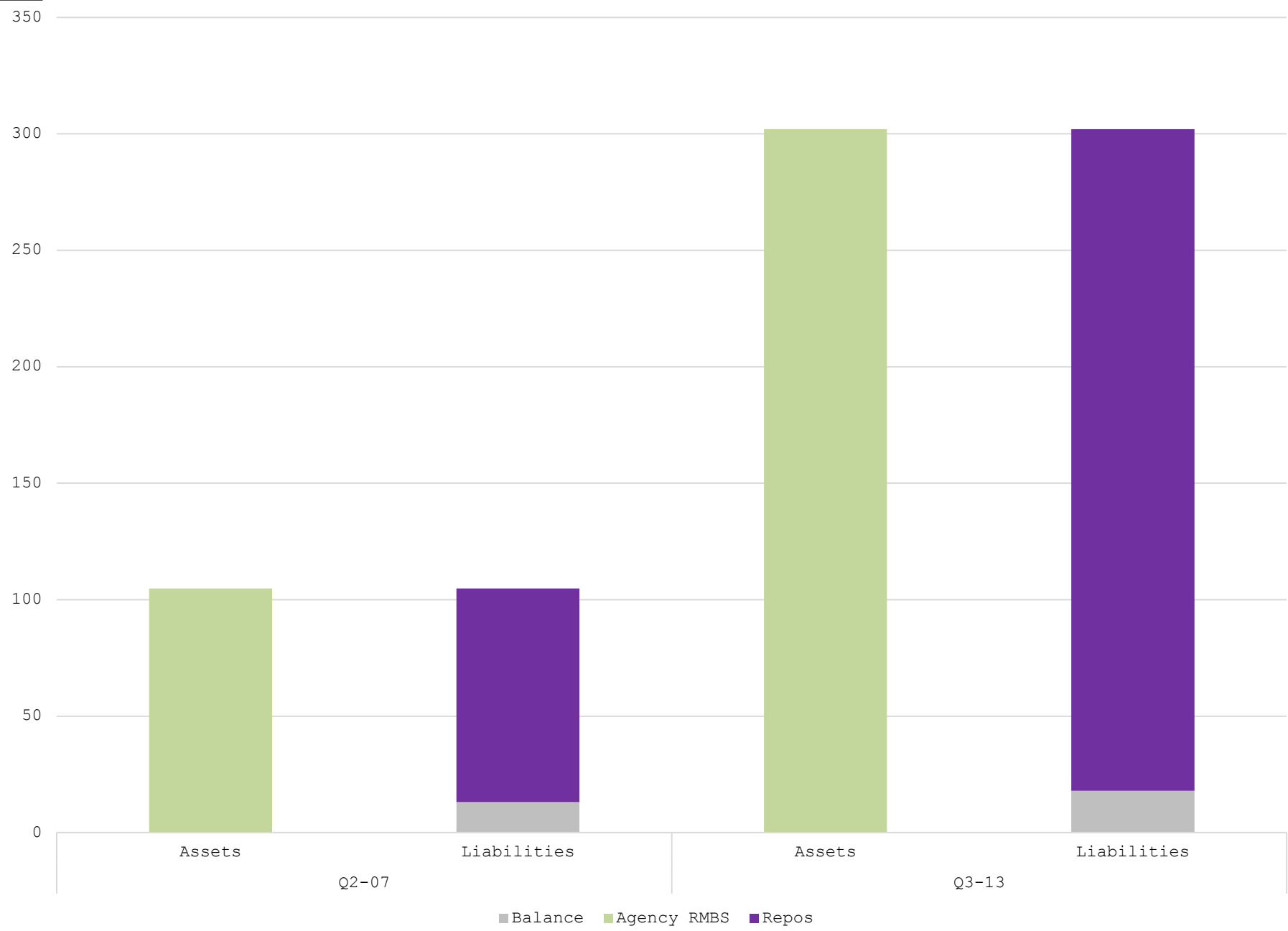
\$ billions



Source: Haver, SEC and author's calculations

Mortgage REITs:

\$ billions



Source: Haver, Federal Reserve Z.1

Offshore Dollar Banking:

\$ trillions

