
Shadow Banking

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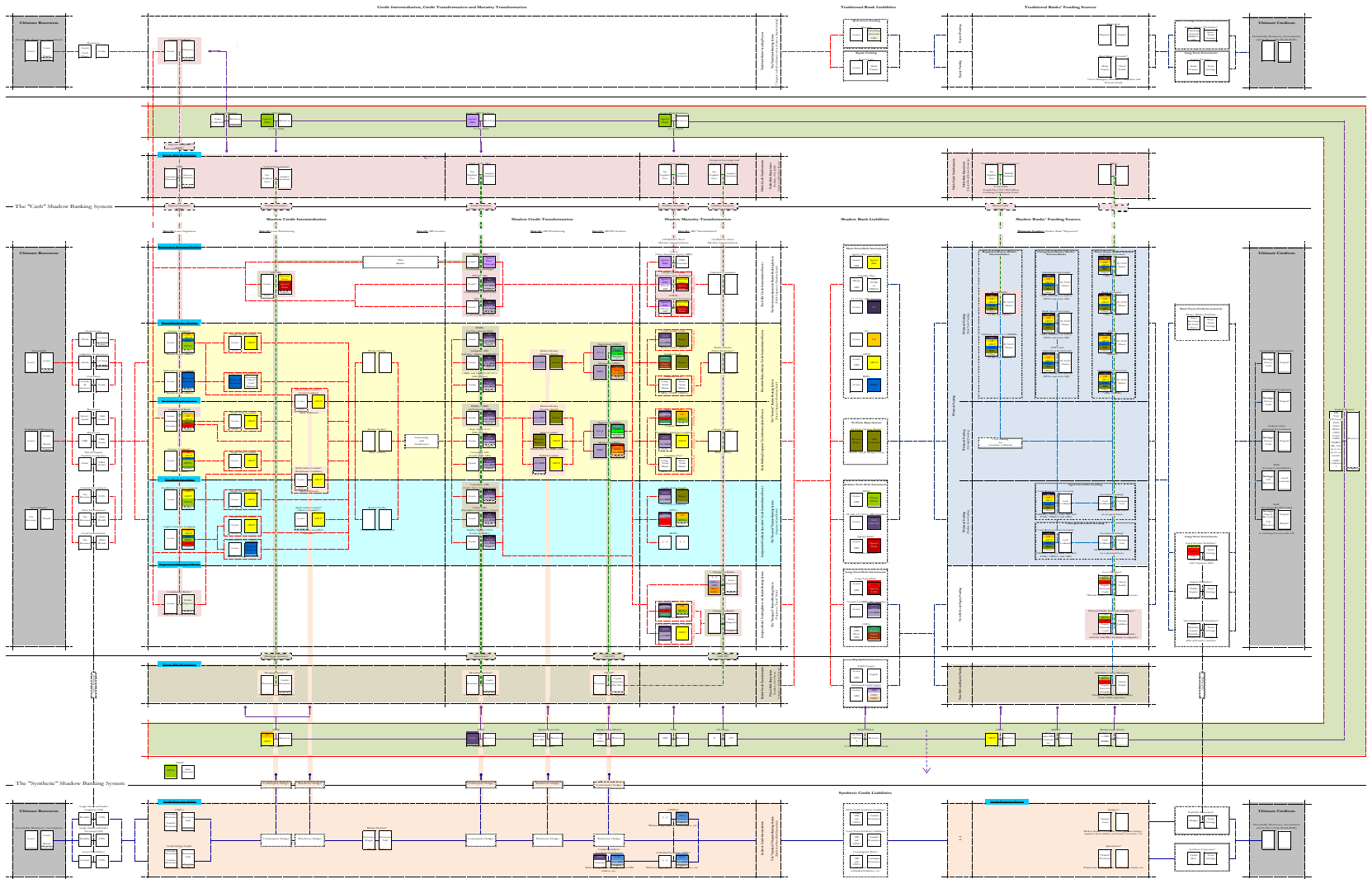
with Zoltan Pozsar, Adam Ashcraft, Hayley Boesky

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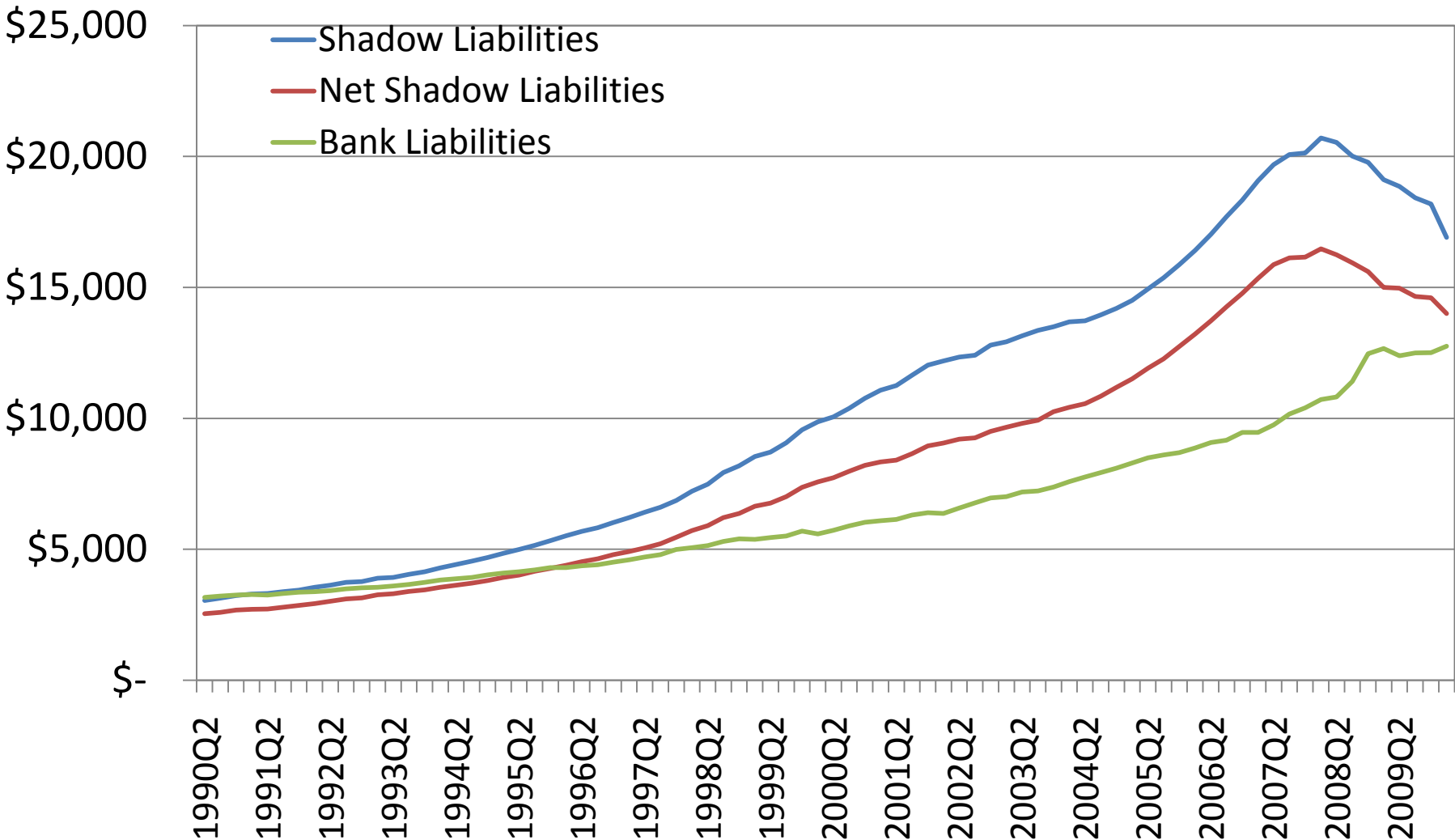
What Are Shadow Banks?

- Shadow banks are financial entities that conduct either all three or any one of the classic bank functions:
 1. credit transformation,
 2. maturity transformation,
 3. liquidity transformation...
- ...but without the liquidity and credit puts provided by the discount window and deposit insurance.
- Traditional banks did not become stable until the establishment of the Fed and FDIC in 1913 and 1933, respectively.

Shadow Banking System is a web of Specialized Financial Institutions



Shadow Banking and Banking Liabilities



Sizing of the Shadow Banking System

- With a peak of \$20 trillion and \$16 trillion today, the shadow banking system remains larger than traditional banking system.
- \$16 trillion includes:
 1. all forms of term collateral such as cash and synthetic securitizations and re-securitizations and
 2. all forms of short-term secured and unsecured forms of funding.
- These numbers are gross measures.
- The net numbers are netting away counterparty risks.

The 7 Steps of Shadow Banking

- 1. Loan Origination:** (ex: FinCos, ILCs, CBs)
- 2. Loan Warehousing:** (ex: Conduits)
- 3. ABS Issuance:** (ex: RMBS, CMBS, ABS)
- 4. ABS Warehousing:** (ex: broker-dealer warehousing)
- 5. ABS CDO Issuance:** (ex: ABSCDO, ABACUS)
- 6. ABS Intermediation:** (ex: SIV, TOB, HF, IKB)
- 7. Wholesale Funding:** (ex: 2(a)-7 fund, enhanced cash fund)

Exhibit: Shadow Credit Intermediation

Exhibit 3: The Shadow Credit Intermediation Process

The shadow credit intermediation process consists of distinct steps. These steps for a credit intermediation chain that depending on the type and quality of credit involved may involve as little as 3 steps and as much as 7 or more steps. The shadow banking system conducts these steps in a strict sequential order. Each step is conducted by specific types of financial entities, which are funded by specific types of liabilities (see Table 2).



Source: Shadow Banking (Pozsar, Adrian, Ashcraft, Boesky (2010))

Economic Functions

- **Steps 1-3: “collateral manufacturing”**
 - Loans are issued (monitoring), intermittently warehoused (capital optimization), and pooled into ABS (portfolio diversification).
- **Steps 4-5: “credit transformation”**
 - Credit CDS and wraps allow the production of AAA collateral.
- **Step 6: “collateral maturity transformation”**
 - classic maturity transformation with credit lines instead of DW.
- **Step 7: “wholesale cash intermediation”**

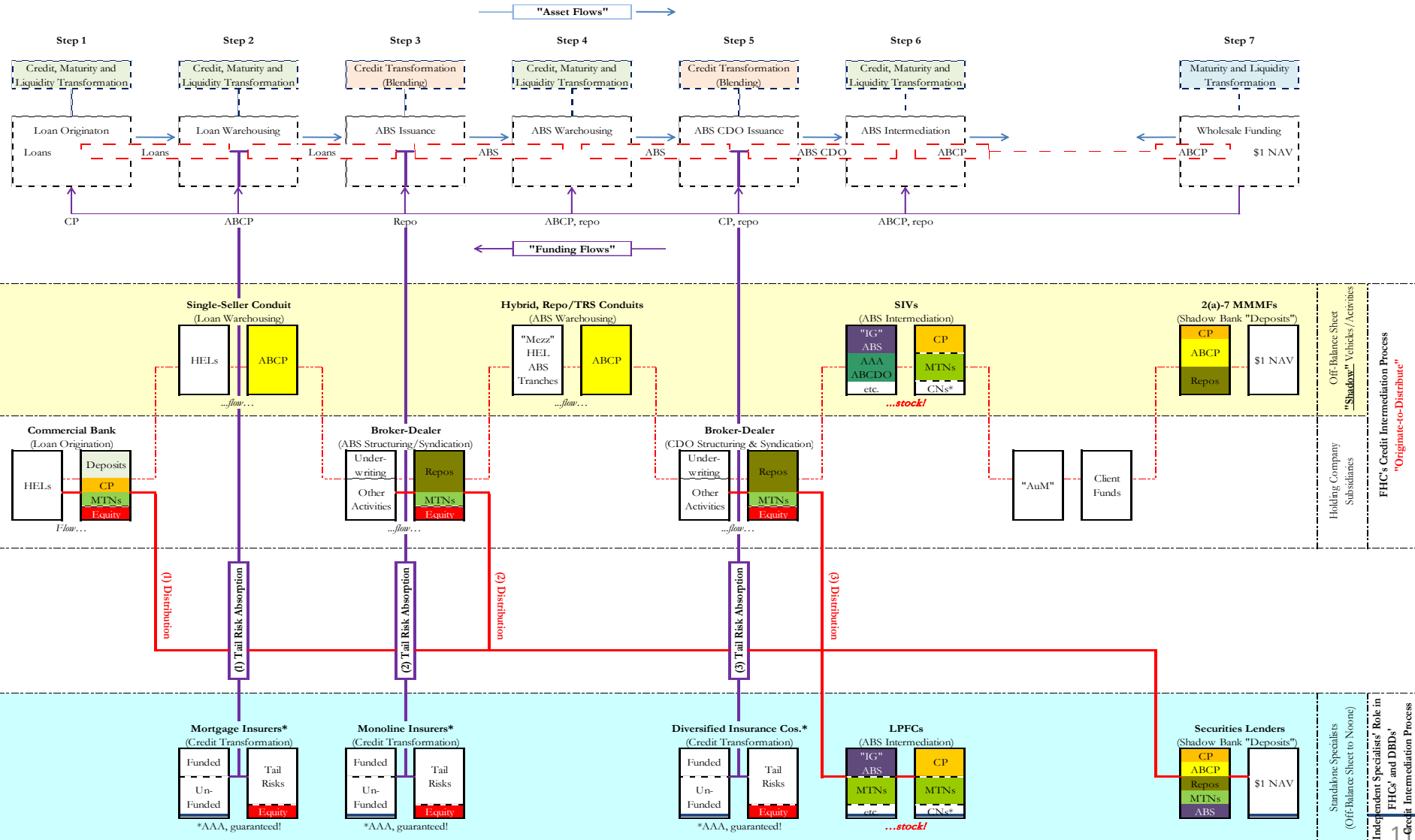
Fragility

- Shadow banking system consists of a long intermediation chain.
- The most fragile link is the pinch point of the chain.
- Determinants of the fragility of each balance sheet is amount:
 1. credit transformation,
 2. liquidity transformation,
 3. maturity transformation,
 4. leverage,
 5. credit and liquidity puts.
- CoVaR is one way to assess the fragility of each balance sheet along the intermediation chain.

Exhibit: Credit and Liquidity Puts

		Funding Type		Funding Type			
		<i>Maturity Mismatched</i>	<i>Maturity Matched</i>	<i>Maturity Mismatched</i>	<i>Maturity Matched</i>		
Collateral Type	Whole Loans/Bonds	Step 1	Step 2	Step 1	Step 2	Collateral Type	Whole Loans/Bonds
		Securitization Type: ABCP, TOB, VRDO	Securitization Type: ABS, CLO, CDO (1st order)	Securitization Type: ABCP, TOB, VRDO	Securitization Type: ABS, CLO, CDO (1st order)		
		Function: Warehousing/Term Funding of Whole Loans/Bonds	Function: Term Funding of Whole Loans	Liquidity Put: Yes	Liquidity Put: Static Pools - No Master Trusts - Yes		
		Issuers: Single and Multi-Seller Conduits, as well as TOBs and VRDOs	Issuers: SPVs	Credit Put: Yes (credit lines, wraps, asset sales)	Credit Put: Static Pools - No Master Trusts - Yes		
Collateral Type	Securitized Loans/Bonds	Step 3	Step 4	Step 3	Step 4	Collateral Type	Securitized Loans/Bonds
		Securitization Type: ABCP	Securitization Type: ABS CDOs (2nd order)	Securitization Type: ABCP	Securitization Type: ABS CDOs (2nd order)		
		Function: Warehousing/Term Funding of ABS, CLOs and CDOs	Function: Term Funding of ABS, CLOs and CDOs	Liquidity Put: Yes	Liquidity Put: No		
		Issuers: LPFCs, SIVs, Securities Arbitrage Conduits	Issuers: SPVs	Credit Put: Yes (credit lines, wraps, asset sales)	Credit Put: Yes (wraps, asset sales)		

Tail Risk Insurance



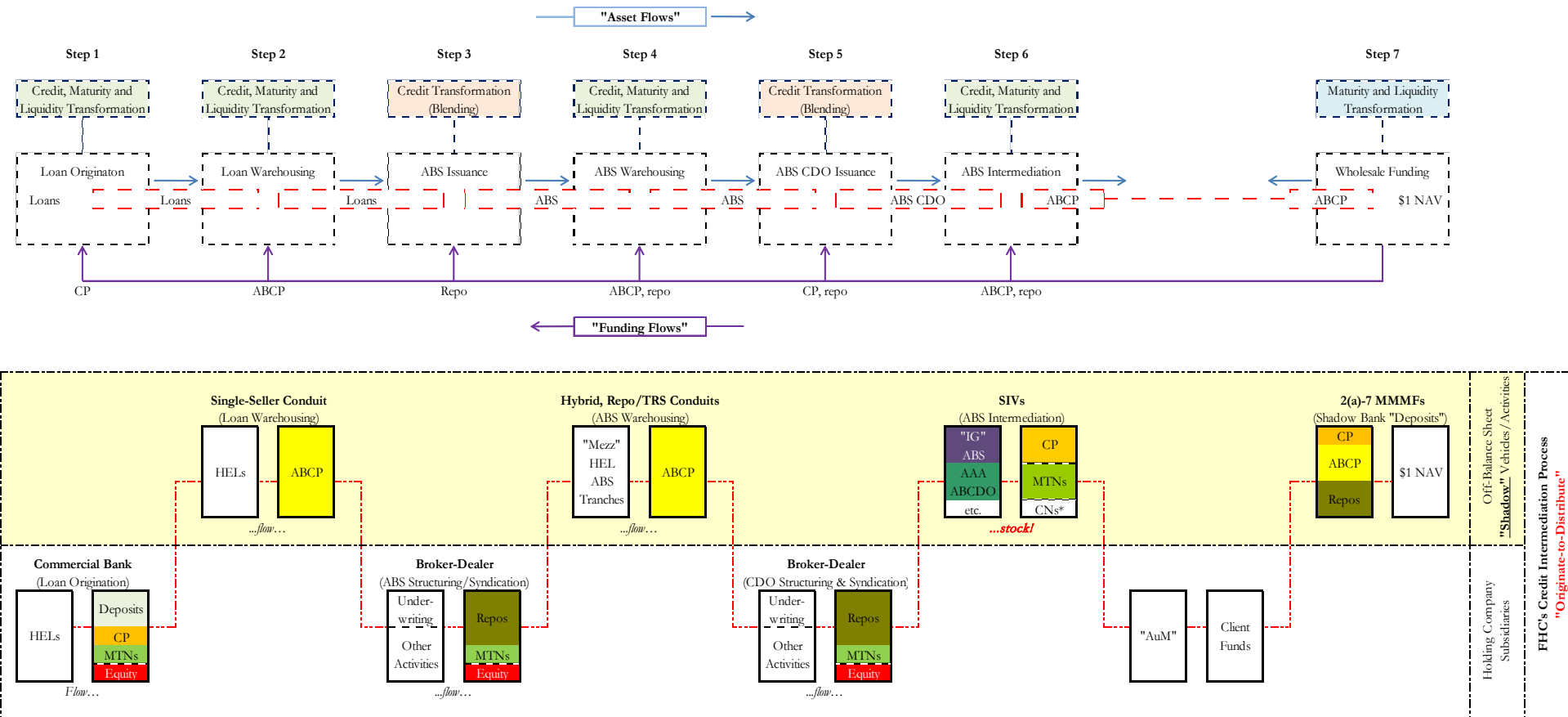
Shadow Banks and Core FI's

- Shadow banks are intertwined with core regulated institutions.
 - Commercial banks provide credit and liquidity lines.
 - Broker-dealers securitize and warehouse.
 - Insurance companies provide credit insurance.
 - Money market funds provide short term funding.
- The exposures of core regulated institutions via the shadow banking system creates systemic inter-linkages that were underappreciated prior to the crisis.
- Securitization did not achieve risk transfer.

BHCs and Shadow Banking

Exhibit 9: The Credit Intermediation Process of Bank Holding Companies

The credit intermediation process of Financial Holding Companies flows through a chain of subsidiaries and off-balance sheet vehicles (shadow banks), and is funded in capital markets. This intermediation chain enhances the efficiency of bank equity for various reasons. If markets freeze and the FHC's subsidiaries have to "onboard" their normally off-balance sheet assets and activities, capital **efficiency** can quickly become capital **deficiency**, with systemic consequences. The process described here is an **originate-to-distribute** model of non-conforming mortgages, where the originating banks and the broker-dealers that slice and dice mortgages into ABS and ABS CDOs do not retain any first loss pieces along the intermediation chain.

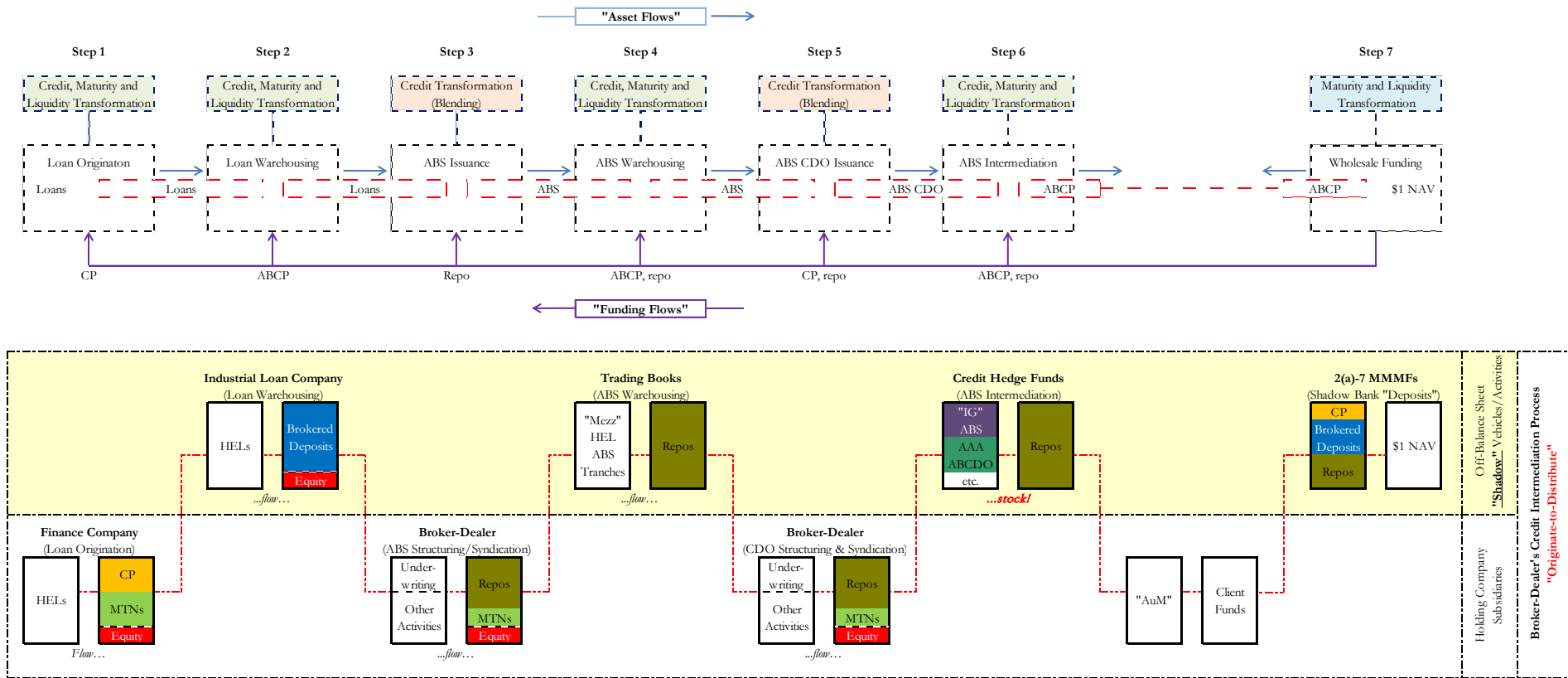


Source: Shadow Banking (Pozsar, Adrian, Ashcraft, Boesky (2010))

Broker-Dealers and Shadow Banking

Exhibit 14: The Credit Intermediation Process of Diversified Broker-Dealers

The credit intermediation process of Diversified Broker-Dealers (DBD) is similar to that of FHC's (see Figure XX), with only a few differences. First, DBDs originate loans out of finance company subsidiaries, not commercial bank subsidiaries. Second, DBDs warehouse loans not in conduits, but in industrial loan company subsidiaries; alternatively, DBDs can outsource loan warehousing to a multi-seller conduit run by an FHC. Third, ABS warehousing is also not conducted from conduits, but from trading books. Finally, ABS intermediation is not conducted through SIVs, but through internal credit hedge funds. On a funding level, DBD's intermediation process is more reliant on brokered deposits and repo, compared to the FHC process, which is more reliant on branch deposits, CP and ABCP.

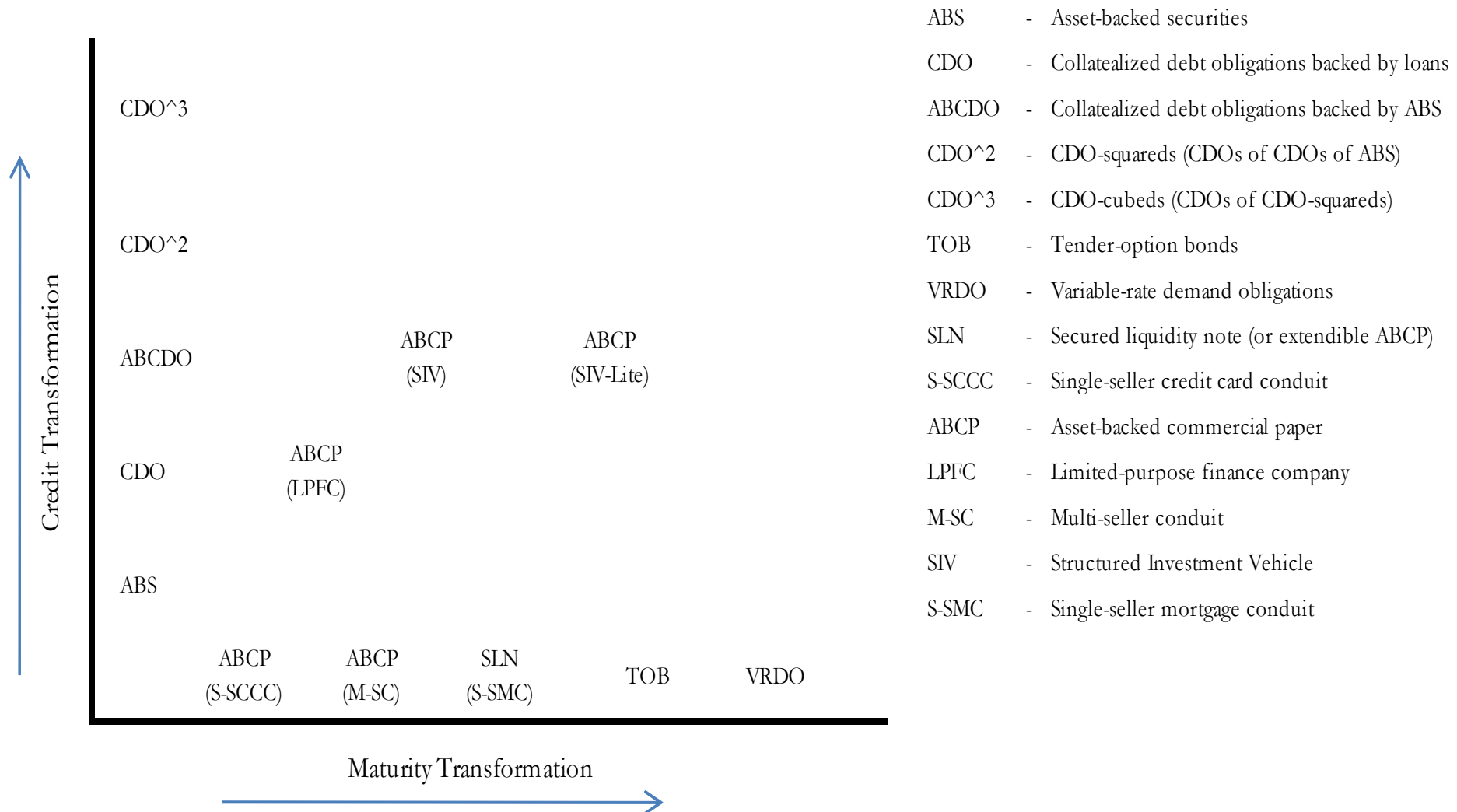


Source: Shadow Banking (Pozsar, Adrian, Ashcraft, Boesky (2010))

Short Term Shadow Liabilities

- Repo (on-balance sheet, tri-party & DVP & GCF)
- TRS (off-balance sheet, repo, bi-lateral)
- Agency discount notes
- FCP (Financial CP)
- ABCP (Asset-Backed Commercial Paper)
- SLNs (aka extendible ABCP)
- TOBs (Tender Option Bonds)
- VRDOs (Variable Rate Demand Obligations)
- MTNs (Medium-term notes)
- Re-hypothecation

Credit-Maturity Transformation Spectrum



Distance from Backstops

Increasingly "Shadow" Credit Intermediation Activities

Institution	Direct Public Enhancement		Indirect Public Enhancement		Unenhanced
	Explicit	Implicit	Explicit	Implicit	
Depository Institutions <i>(Commercial Banks, Clearing Banks, ILLCs)</i>	Insured deposits ¹ Non-deposit liabilities ²		Credit lines to shadow banks ⁹	Trust activities Tri-party clearing ¹⁰ Asset management Affiliate borrowing	
Federal Loan Programs <i>(DoE, SBA and FHA credit puts)</i>	Loan guarantees ³				
Government Sponsored Enterprises <i>(Fannie Mae, Freddie Mac, FHLLBs)</i>		Agency debt	Agency MBS		
Insurance Companies	Annuity liabilities ⁴ Insurance policies ⁵				Securities lending CDS protection sold (AIG-FP)
Pension Funds	Unfunded liabilities ⁶				Securities lending
Diversified Broker-Dealers <i>(Investment Bank Holding Companies)</i>	Brokered deposits (ILCs) ⁷		CP ¹¹	Tri-party repo ¹²	MTNs Prime brokerage customer balances Liquidity puts (ABS, TOB, VRDO, ARS)
Mortgage Insurers					Financial guarantees
Monoline Insurers					Financial guarantees CDS protection sold on CDOs Asset management (GICs, SIVs, conduits)
Shadow Banks					
Finance Companies (Standalones, Captives)	Brokered deposits (ILCs) ⁷		CP ¹¹ ABCP ¹³ ABCP ¹³ ABCP ¹³ ABCP ¹³ ABCP ¹³ ABCP ¹³ ABCP ¹³ ABCP ¹³ ABCP ¹³	Extendible ABCP ¹⁷ Extendible ABCP ¹⁷ Extendible ABCP ¹⁷ Extendible ABCP ¹⁷ MTNs, capital notes	Term ABS, MTNs Extendible ABCP ¹⁸ Extendible ABCP ¹⁸ Extendible ABCP ¹⁸ Extendible ABCP ¹⁸ Extendible ABCP ¹⁸ Extendible ABCP ¹⁸ MTNs, capital notes Bi-lateral repo ¹⁵ Bi-lateral repo ¹⁵
Single-Seller Conduits					
Multi-Seller Conduits					
Hybrid Conduits					
TRS/Repo Conduits					
Securities Arbitrage Conduits					
Structured Investment Vehicles (SIVs)					
Limited Purpose Finance Companies					
Credit Hedge Funds (Standalones)					
Money Market Intermediaries <i>(Shadow Bank "Depositors")</i>					
Money Market Mutual Funds					\$1 NAV
Overnight Sweep Agreements					\$1 NAV
Cash "Plus" Funds					\$1 NAV
Enhanced Cash Funds					\$1 NAV
Ultra-Short Bond Funds					\$1 NAV
Local Government Investment Pools (L.GIPs)					\$1 NAV
Securities Lenders					\$1 NAV
European Banks <i>(Lanteshbanks, etc.)</i>	State guarantees ⁸		Credit lines to shadow banks ¹⁶		

Shadow Banking Depositors

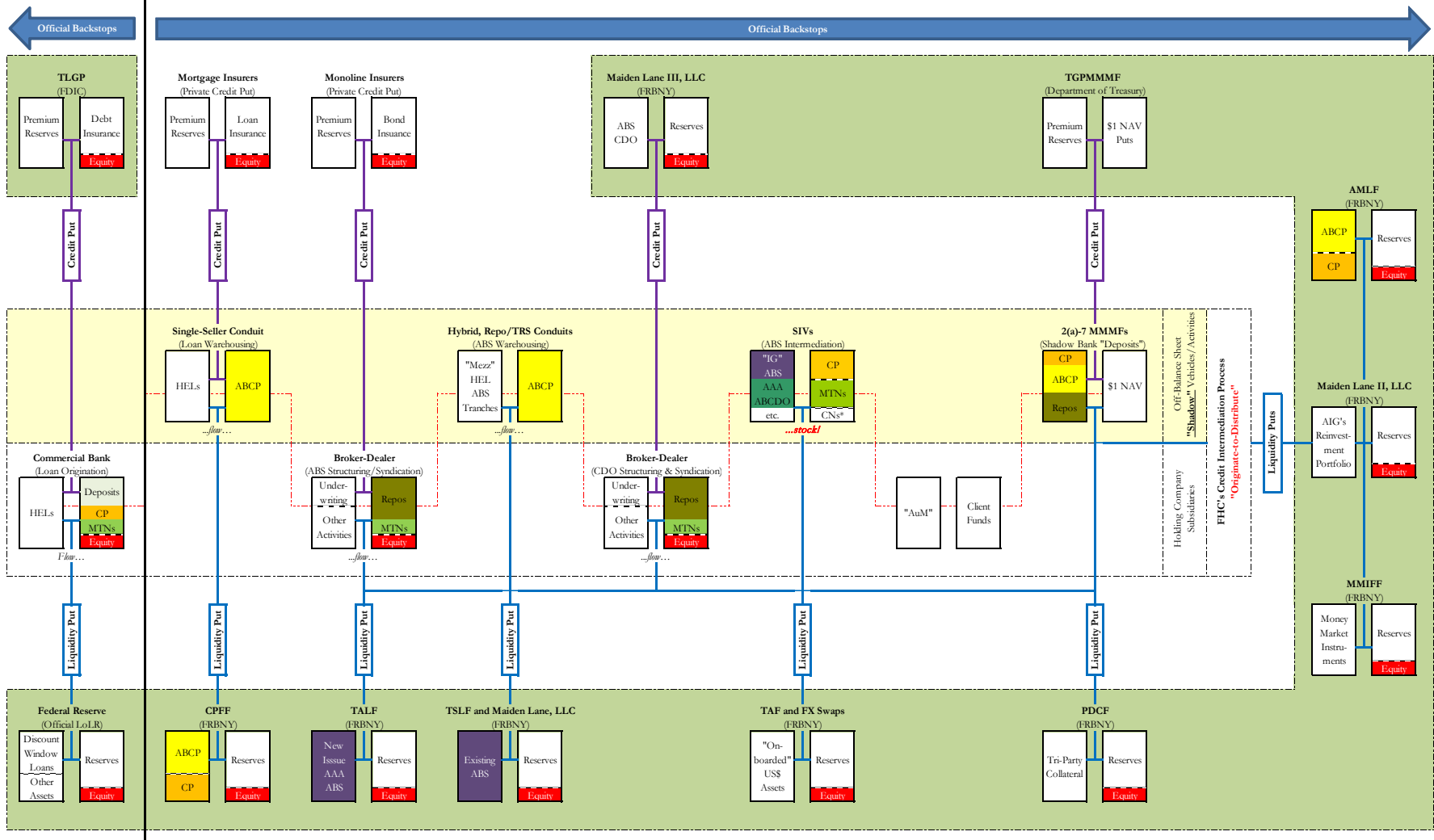
Exhibit 20: Shadow Banks and Their "Depositors"

Shadow Banks			Shadow Bank "Depositors"		
<i>Types</i>	<i>Assets</i>	<i>Liabilities</i>	<i>Assets</i>	<i>Types</i>	<i>Liabilities/Risks</i>
Finance companies	Whole loans	CP, MTN	Regulated MMIs:		
Multi-seller conduits	Whole loans	ABCP	Government only funds	\$1 NAV	Reputational risks
Single-seller conduits	Whole loans	ABCP, SLNs	Prime funds	\$1 NAV	Reputational risks
Industrial loan companies	Whole loans	Brokered deposits	Unregulated MMIs:		
Repo conduits	Whole loans, ABS	ABCP, SLNs	Cash "plus" funds	\$1 NAV	Reputational risks
Hybrid conduits	Whole loans, ABS	ABCP, SLNs	Enhanced cash funds	\$1 NAV	Reputational risks
Trading books	Whole loans, ABS	Repo/Reverse Repo*	Ultra-short bond funds	\$1 NAV	Reputational risks
LPFCs	Bank debt, ABS	CP, MTN	Overnight sweeps	\$1 NAV	Reputational risks
SIVs	Bank debt, ABS, CDOs	CP, MTN	Direct MM Investors:		
SIV-Lites	ABS, CDOs	CP, MTN	Corporate treasurers	-	Reputational risks
Securities arbitrage conduits	ABS, CDOs	ABCP, SLNs	LGIPs	\$1 NAV	Reputational risks
Credit hedge funds	ABS, CDOs	Repo/Reverse Repo*	Institutional investors	\$1 NAV	Reputational risks
ARSs	ABS, CDOs, Municipal bonds	ARS	Securities lenders	\$1 NAV	Reputational risks
TOBs	Municipal bonds	TOB			
VRDOs	Municipal bonds	VRDO			

*Shadow banks' repo liabilities are shadow bank "depositors" reverse repo assets.

Emergency Liquidity Backstops

"Funding Flows"



Managing Shadow Banking

- **Advantage:** Market forces help capital allocation
- **Disadvantage:** Systemic risk due to intermediation chains
- **Solutions:** Measure the risk of the financial system conditional on each shadow banking institution, in a stress scenario
- **CoVaR** (Adrian-Brunnermeier): Value at Risk of the financial system, conditional on the distress of a particular financial institutions
 - **Capital and liquidity requirements proportional to CoVaR**

The Shadow Banking Map

