Financial Research Advisory Committee
Liquidity and Funding Working Group

August 1, 2013

Executive Summary

Overview

- The Liquidity and Funding Working Group of the FSRM focused its work efforts around the development of a "Funding Map," which illustrates the funding risks across financial market participants
- A Funding Map is a graphical balance sheet view of the primary business activities and funding sources of a financial market participant
- The Funding Map highlights key funding risks associated with the funding sources used by financial market participants, providing key insight into potential weaknesses and risks that could affect overall market financial stability

- **Approach:**
  - The Working Group began by choosing "Bank / Dealers" as the sample financial market participant
  - First, the Working Group identified the primary business activities and funding sources for Bank / Dealers
  - Subsequently, the Working Group defined the key participants that interact with Bank / Dealers, grouping these into three categories: Cash Providers, Securities Lenders, and Leverage Takers
  - Given some activities require an intermediary between the Bank / Dealer and its counterparties, these were also identified and grouped into three categories: Triparty Agents, Repo Central Counterparties, and Clearing Exchanges
  - Directional arrows were added to connect external participants and intermediaries to the Bank / Dealer, reflecting the exchange of cash and/or securities
  - As a next step, the Working Group evaluated the durability of the Bank / Dealer's funding sources, categorizing these into less and more durable funding types
  - The risks identified with less durable funding sources were highlighted and described on the Funding Map
  - As a final step, the group recognized several stress triggers that could amplify these funding risks and graphically represented the effect of each trigger on the participants and Broker / Dealer

Executive Summary (Cont'd)

Benefits

The Funding Map identifies funding sources, potential stress points, and stress triggers / risk amplifiers

- Simple view of business activities performed by financial market participants
- Directional display of the exchange of cash or securities between participants
- Clear identification of less durable funding sources
- Defined stress triggers and amplifiers of funding risks between participants

Recommendations

- The Working Group recommends that the OFR, working in coordination with the Federal Reserve and other regulatory agencies, prioritize collecting data to complete the funding map for the Bank / Dealer channel
  - The data could be compiled from individual firm participants. For example, Bank/Dealers could provide the amount of Prime Brokerage client cash (free credits) used to fund other clients' margin loans, while securities lenders could provide the volume of securities loaned, cash and non-cash collateral accepted, and indemnified repo provided back to broker-dealers
- The group also recommends that the OFR build upon this existing work by creating a Funding Map for other key financial market participants, which would provide a comprehensive view and understanding of the funding risks within the financial market as a whole and the potential for contagion given the interrelationship of participants
  - The Funding Map can also be expanded to incorporate international linkages. For instance, the extent to which US money market participants provide sources of funds to foreign (non-US) global banks or broker dealers
- The group recommends that the following market participants take priority:
  - Money Market Funds
  - Mortgage Originators
  - Credit Insurance
- The Working Group believes that this Funding Map could be leveraged in a number of different ways and welcomes further discussion

Involved Parties

PARTICIPANTS

- Cash Providers
  - Sovereign Wealth Funds
  - Sec Lenders
  - Asset Managers
  - Insurance Co.
  - Pension Funds
  - Money Market Funds (2A7)
  - Retail and Institutional Depositors
- Securities Lenders
  - Principal
  - Agent
    - Sec Lenders
    - Asset Managers
    - Insurance Co.
    - Pension Funds
    - Money Market Funds (2A7)
- Leverage Takers
  - Hedge Funds
  - REITS
  - Bank / Dealers
  - Retail and Institutional Borrowers

INTERMEDIARIES

- Triparty Agents
  - Bank of New York
  - JP Chase
  - Euroclear
  - Clearstream
- Repo Central Counterparties
  - FICC
  - LCH
  - Eurex
- Clearing Exchanges
  - CME
  - ICE
  - LCH
  - Eurex

Funding Hierarchy

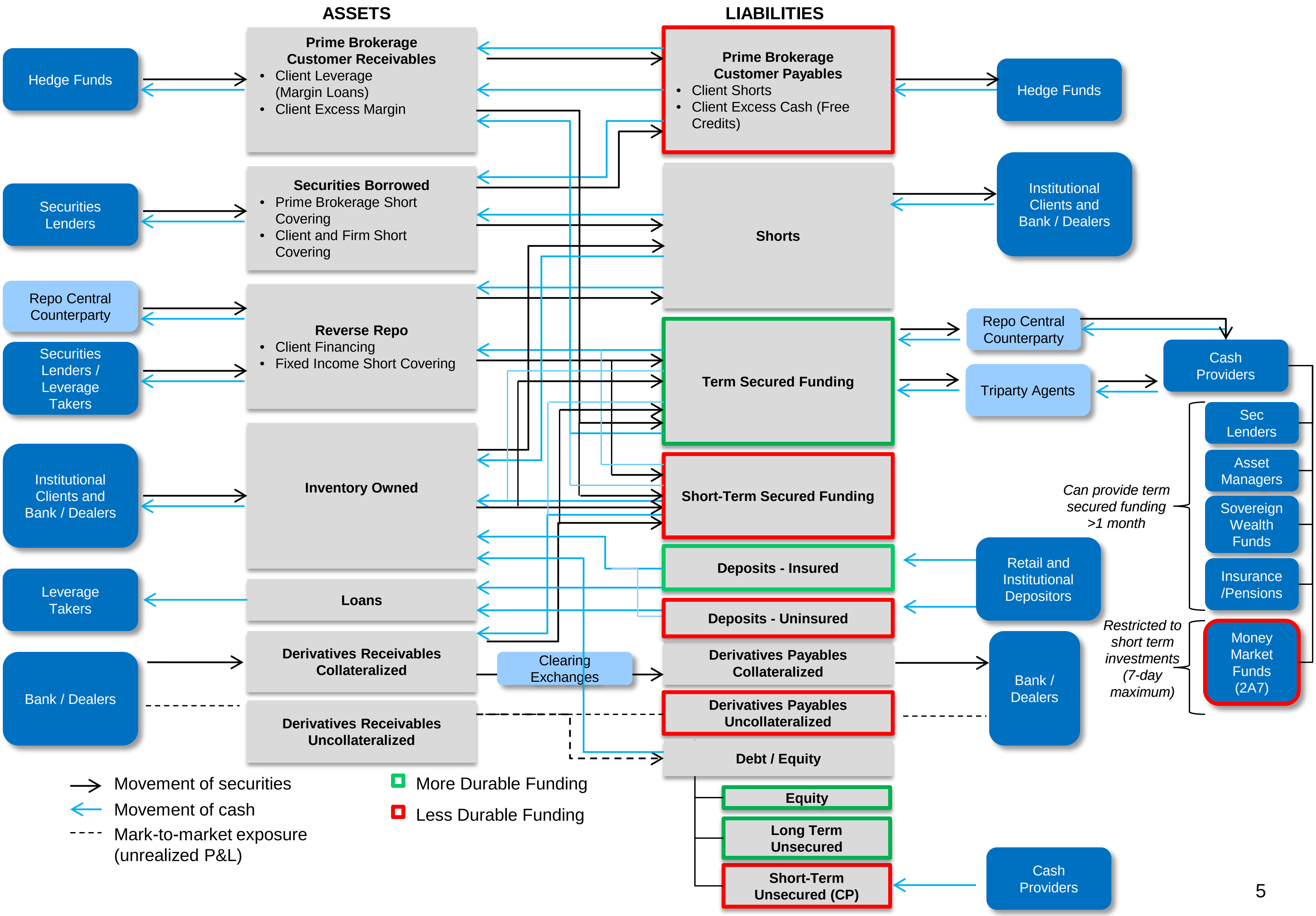
Durability

Equity	Equity investors provide the most durable source of funding. Equity has no contractual term and is actively traded in the secondary markets.
Long-Term Unsecured Debt	Long term unsecured debt is a durable source of funding as investors provide generally 5 to 10-year cash and have the ability to trade debt on the secondary market.
Term Secured Funding	Secured funding with longer term for less liquid securities is a durable source of funding, dependant on tenor. In the event that the borrower enters bankruptcy, the lender has the right to monetize the collateral, which includes a haircut to protect against market value deterioration.
Insured Deposits	Low likelihood of deposits being withdrawn in a stress event if they are insured by the FDIC
Uncollateralized Derivative Payables	Uncollateralized derivatives payables are a less durable source of funding because mark-to-market movements may result in a reduction of payable exposure based on external economic factors, such as change in interest rates. Furthermore, although payables may be contractually long term, the counterparty can request to novate or terminate the trade, which the bank/dealer will be incented to accept in order to avoid negative signaling.
Short Term Funding Sources:	
Unsecured Short Term Funding (e.g., Commercial Paper)	Commercial Paper, with normally less than 270 days in term, is a less durable source of funding, given the credit sensitivity to the borrower. In a stress event, maturities may not be able to be replaced with new issuances. Additionally, there is the risk that the borrower may have to buy back the debt from investors to avoid the risk of negative signaling to the market.
Short Term Secured Funding (e.g. funding from 2A7 Money Market Funds)	Secured funding trades for less liquid assets are less likely to roll in a stress event and therefore should be longer in tenor. Thus, money market funds should not be relied upon as providers of secured funding for less liquid assets, since under regulation 2A7 they are limited to providing a maximum of 7-day secured funding.
Other Non-Durable Funding Sources:	
Uninsured Deposits	High risk that deposits are withdrawn in the event of a stress if they are not insured by the FDIC
Prime Brokerage Client Shorts	In the event of a stress, clients with short positions may move their account to another Prime Broker. Durability is difficult to predict, as a single client may also have a combination of short and long positions.
Prime Brokerage Client Excess Cash	Unreliable funding source in the event of a stress, as clients are likely to withdraw any available cash in their Prime Brokerage accounts.

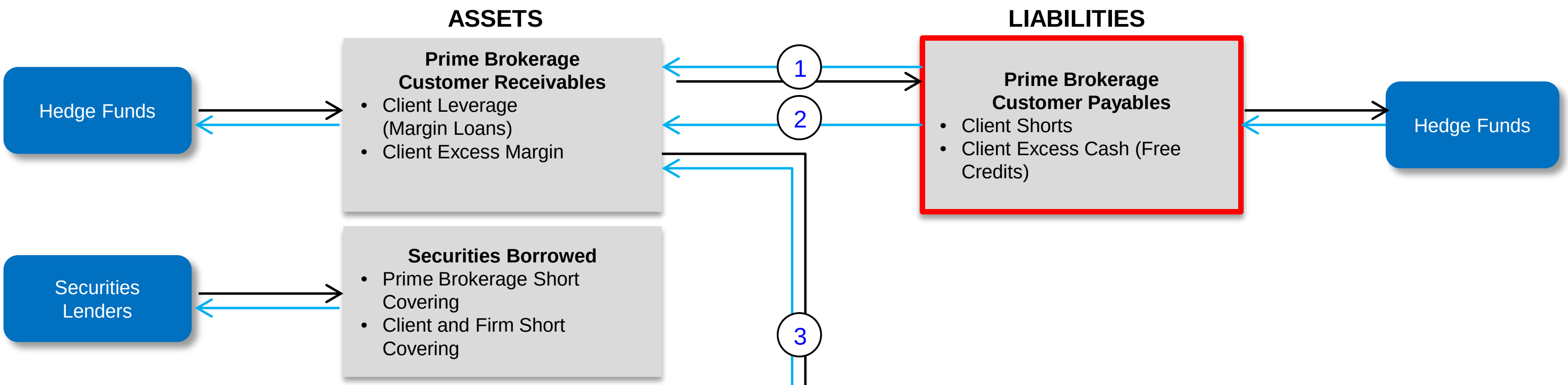
Notes:

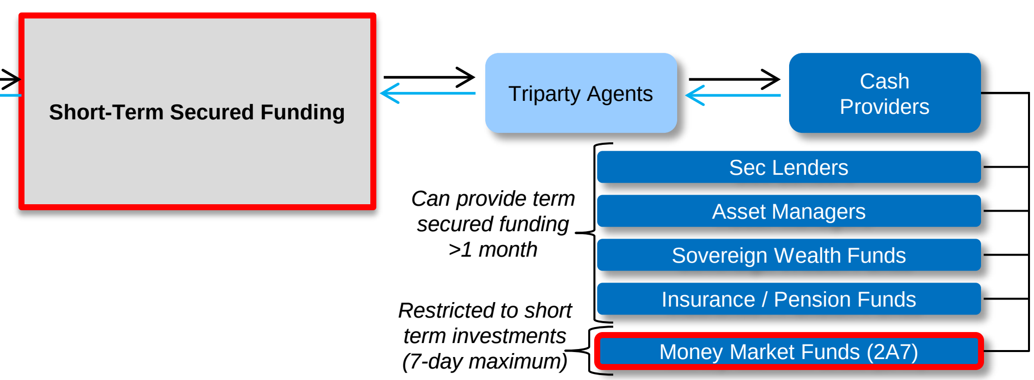
1. The funding hierarchy addresses the general risks involved with different funding sources. These risks are not associated with specific counterparties, as different counterparties may have varying degrees of risk as a source of funds.

Funding Map: Bank / Dealer



Funding Map: Bank / Dealer – Prime Brokerage Services





FUNDING RISKS:

1 **Margin Loans funded by other clients' short positions**

- Risk that clients with short positions move their accounts to another Prime Broker. The original Prime Broker would have to find alternative funding sources to support client margin loans (secured and unsecured funding markets may not be accessible).

2 **Margin Loans funded by other clients' excess cash**

- Risk that clients withdraw their excess cash, forcing the Prime Broker to seek alternative funding sources to support margin loans (secured and unsecured funding markets may not be accessible).

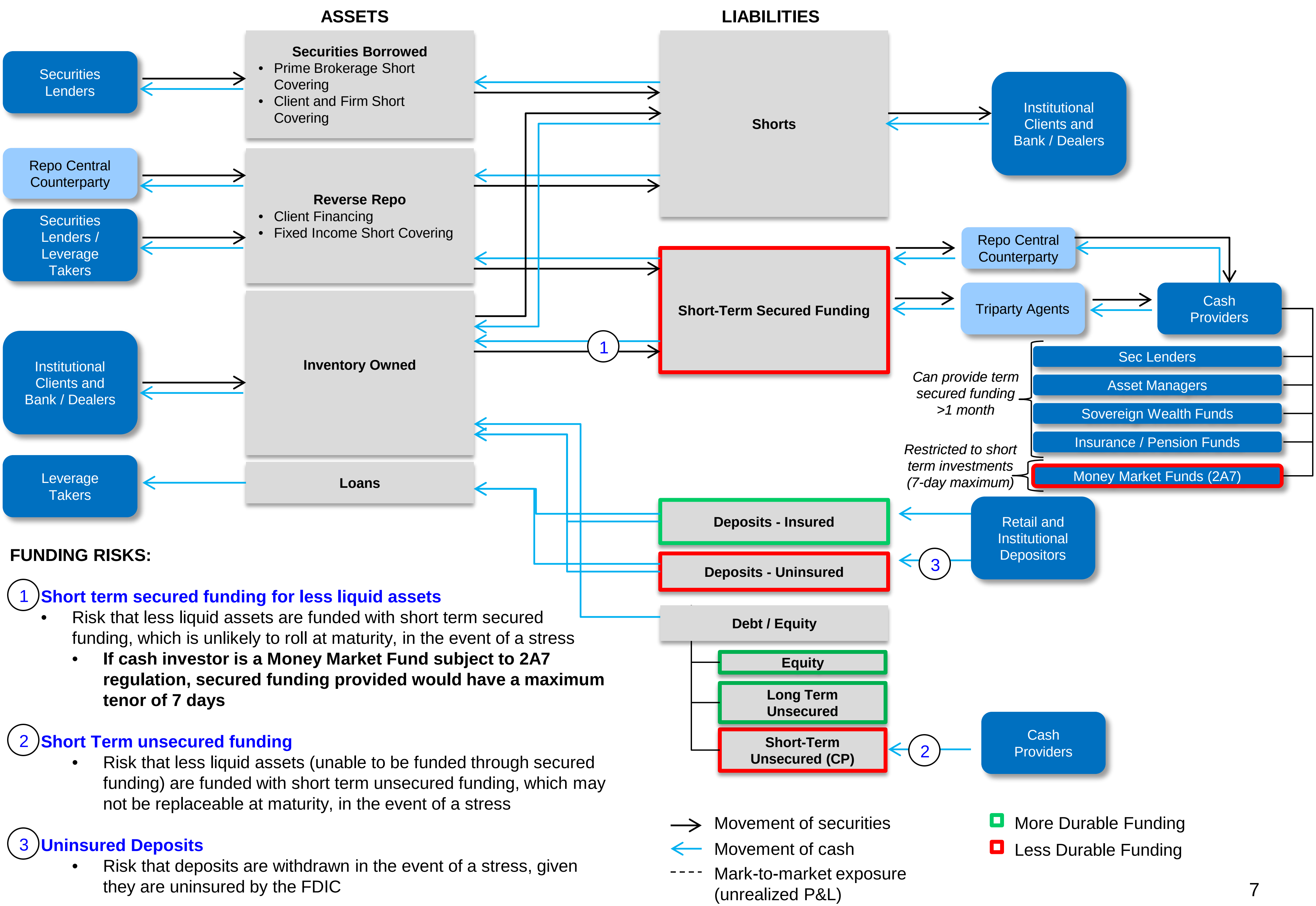
3 **Margin Loans funded by secured funding of rehypothecatable securities**

- Risk that margin loan agreement is longer in tenor than the secured funding raised. In a stress event, secured funding may not roll, forcing the Prime Broker to seek alternative funding sources to support margin loans.
  - **If cash investor is a Money Market Fund subject to 2A7 regulation, secured funding provided would have a maximum tenor of 7 days**

→ Movement of securities
← Movement of cash
- - - - Mark-to-market exposure (unrealized P&L)

More Durable Funding
Less Durable Funding

Funding Map: Bank / Dealer – Bank / Dealer Activity



FUNDING RISKS:

1 **Short term secured funding for less liquid assets**

- Risk that less liquid assets are funded with short term secured funding, which is unlikely to roll at maturity, in the event of a stress
  - **If cash investor is a Money Market Fund subject to 2A7 regulation, secured funding provided would have a maximum tenor of 7 days**

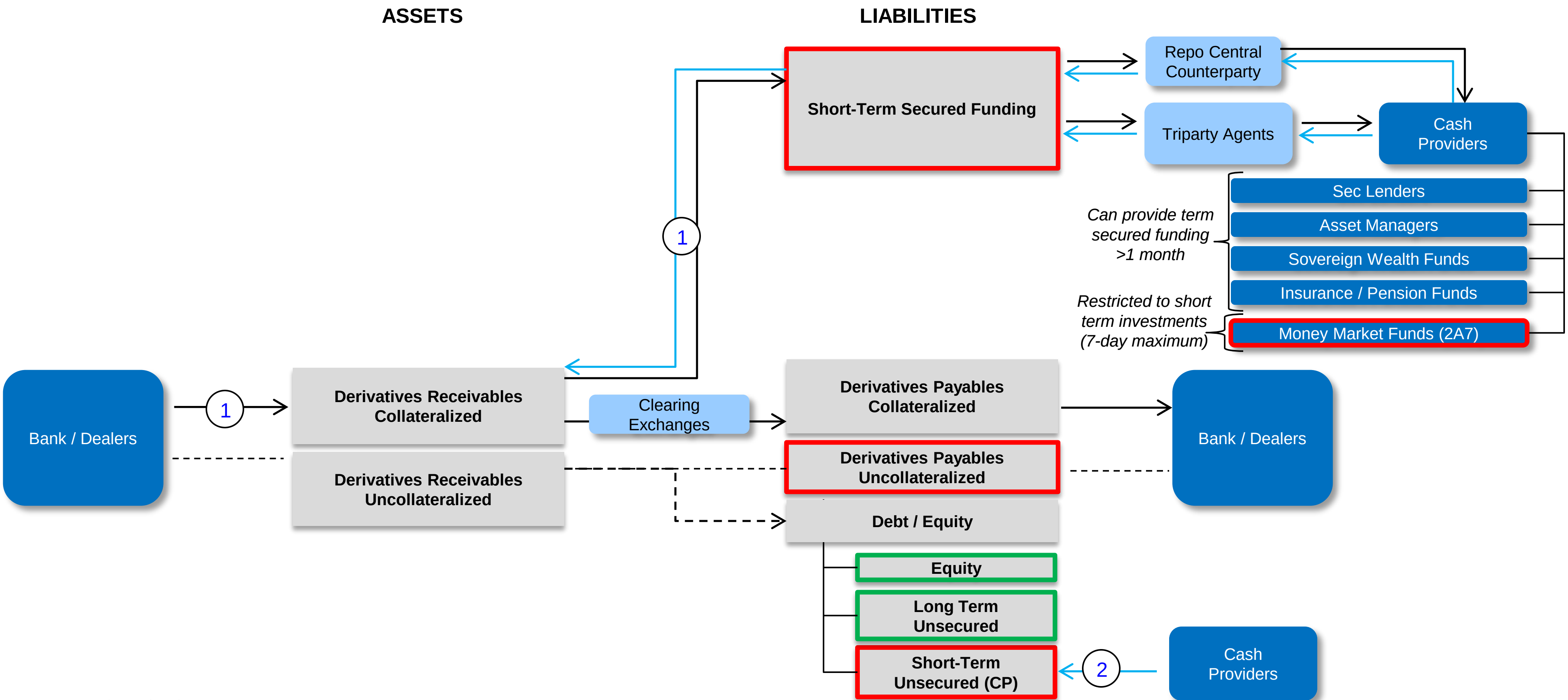
2 **Short Term unsecured funding**

- Risk that less liquid assets (unable to be funded through secured funding) are funded with short term unsecured funding, which may not be replaceable at maturity, in the event of a stress

3 **Uninsured Deposits**

- Risk that deposits are withdrawn in the event of a stress, given they are uninsured by the FDIC

Funding Map: Bank / Dealer – Derivatives Activity



FUNDING RISKS:

1 **Less liquid collateral acceptable for collateralized derivative receivables**

- Risk that these assets are funded with short term secured funding

2 **Short-term unsecured funding of net uncollateralized derivative receivables***

***Note:** *If net uncollateralized derivative positions are a payable, there is no unsecured funding requirement*

→ Movement of securities
← Movement of cash
- - - - Mark-to-market exposure (unrealized P&L)

More Durable Funding
Less Durable Funding

Stress Triggers and Amplifiers

A **Credit:** Any negative change in a borrower's credit standing or a decline in its credit rating brings into question the borrower's ability to repay debt. This change primarily affects the borrower's ability to borrow unsecured cash. However, changes in a borrower's credit worthiness may also affect its ability to raise secured cash, if the cash lender does not feel comfortable with the quality and amount of collateral securing the loan. Changes in a firm's credit rating may also trigger an obligation to post cash to derivative counterparties or allow these counterparties to terminate their trades at their side of the market.

B **Collateralization**: The collateral received by the lender in a secured debt transaction is intended to limit the lender's exposure to the borrower's credit risk. The amount of collateral received by the lender includes a haircut, which is typically based on the quality of the collateral and is meant to protect the lender in the event that the borrower defaults and the lender has to sell the collateral to recuperate his money. If there is a market or product-specific stress, lenders of secured debt may feel that the collateral they hold is insufficient to make them whole, given the expectation of price deterioration in the collateral. This may trigger lenders to request more collateral, or cause them to halt lending altogether. Haircuts can sometimes vary depending on the borrower's credit, which makes it more likely for lenders to feel uncollateralized if the borrower is experiencing credit issues.

Stress Triggers and Amplifiers (continued)

C **Collateral Quality:** Collateral quality is an important component to secured transactions. Usually, credit and liquidity stress events lead to a "flight to quality," which means investors seek to hold high quality collateral. This, in turn, means investors who have extended debt against lower quality collateral or collateral which has recently deteriorated in value, may no longer feel comfortable lending against this type of asset. However, the level of haircut received as well as the credit standing of the borrower will also play a role.

D **Collateral Price Volatility:** A secured lender may feel comfortable extending a loan in a normal environment, but in the event a product begins to experience high price volatility, it may reconsider lending against that asset. The lender may also request a higher haircut to mitigate its fears.

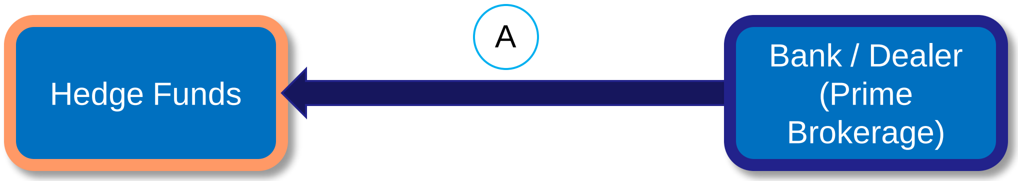
E **Market Sentiment and Risk-Reward:** In a stressed market, investors' loss of confidence may make them more risk averse. In other words, if they were previously willing to take a certain of level risk in return for a given rate, that rate may not match their newly reduced risk tolerance. Some investors may not feel comfortable investing their cash in any product, causing a reduction of liquidity and credit availability in the market.

Notes:

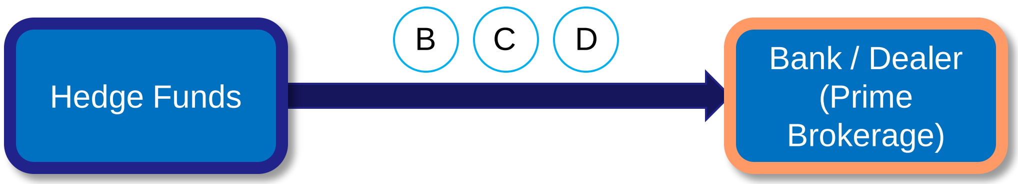
1. Regulatory changes are also a stress trigger, but the Working Group has refrained from assessing this impact, given the wide range of potential regulations that could impact market participants in different ways.

Stress Triggers and Amplifiers

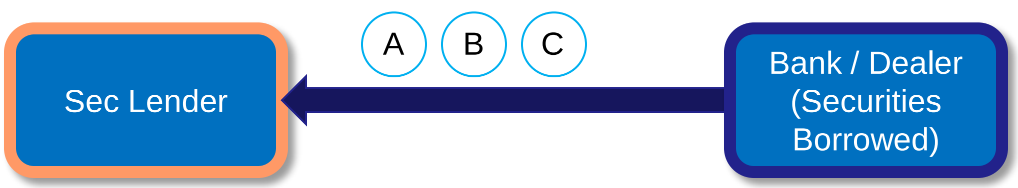
Prime Brokerage: Hedge Fund is exposed to the credit of the Prime Broker



Prime Brokerage: Bank / Dealer is exposed to the collateralization level, collateral quality, and collateral price volatility of collateral provided by the Hedge Fund



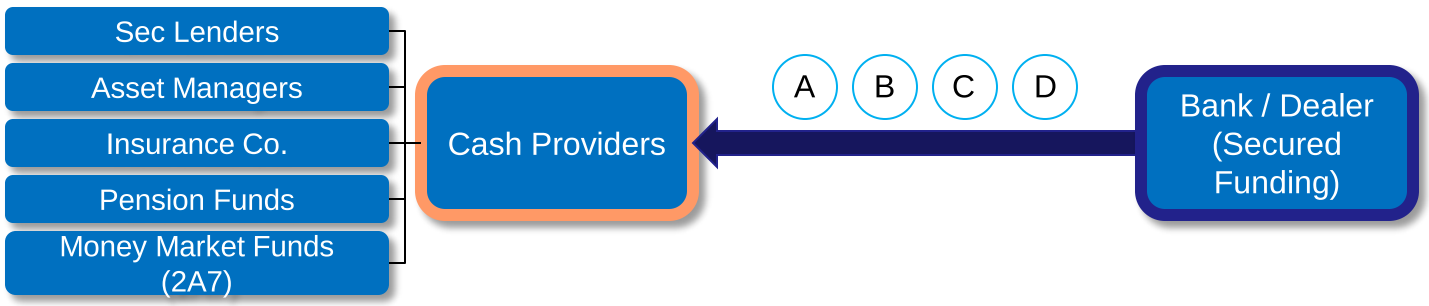
Securities Borrowed: Sec Lender is exposed to the collateralization level, collateral quality and collateral price volatility of the collateral received by the Bank / Dealer. The Sec Lender is also exposed to the credit of the Bank / Dealer.



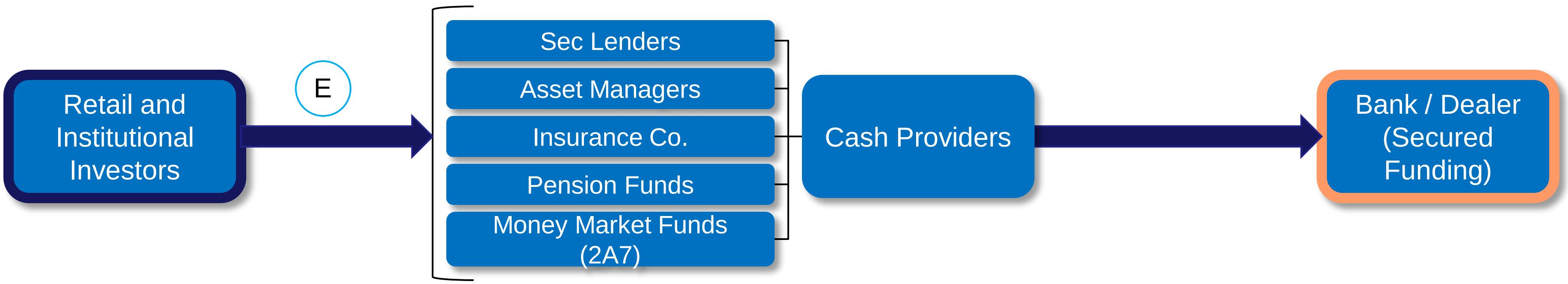
Securities Borrowed: Bank / Dealer is exposed to underlying security providers experiencing general risk-aversion due to overall market sentiment.

Stress Triggers and Amplifiers

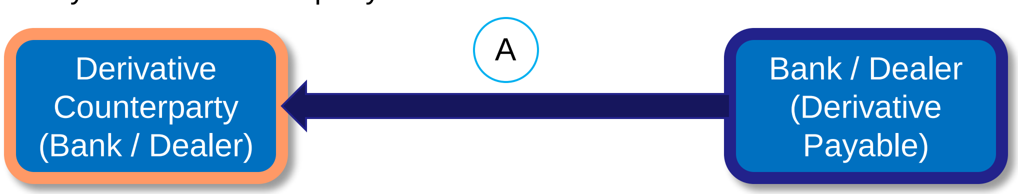
Secured Funding: Cash Provider is exposed to the collateralization level, collateral quality and collateral price volatility of the collateral received by the Bank / Dealer. Cash Provider is also exposed to the credit of the Bank / Dealer.



Secured Funding: Bank / Dealer is exposed to underlying investors experiencing general risk-aversion due to overall market sentiment.

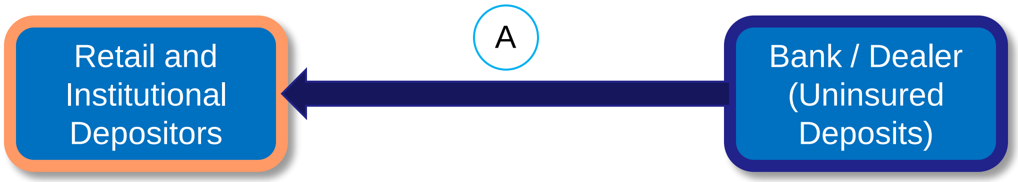


OTC Uncollateralized Derivative Payables: Derivative counterparty is exposed to the Bank / Dealer's credit rating. The derivative contract between both counterparties may include a credit rating trigger which will require the Bank / Dealer to post initial margin to the counterparty or may allow the counterparty to terminate or novate the trade at his side of the market.

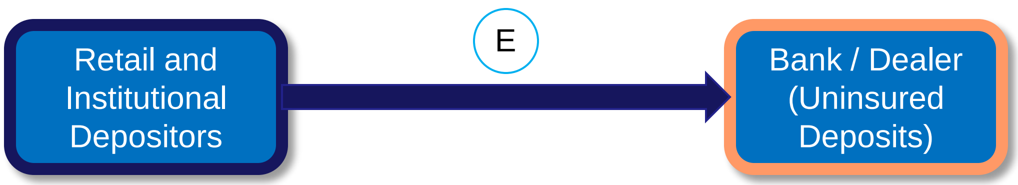


Stress Triggers and Amplifiers

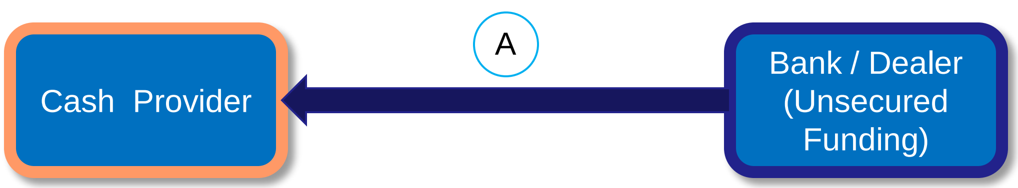
Uninsured Deposits: Retail and institutional depositors are exposed to the credit worthiness of the Bank / Dealer



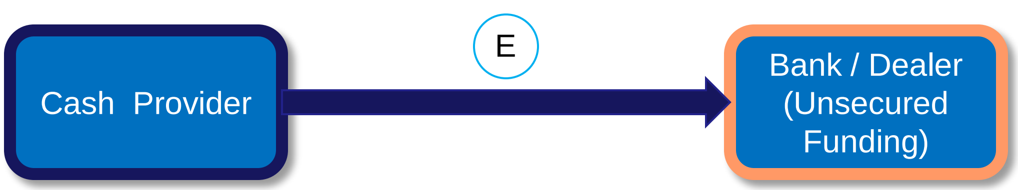
Uninsured Deposits: Bank / Dealer is exposed to uninsured depositors if they become risk-averse



Unsecured Funding: Cash Provider is exposed to the credit worthiness of the Bank / Dealer



Unsecured Funding: Bank / Dealer is exposed to underlying investors experiencing general risk-aversion due to overall market sentiment.



Appendix

Additional Description of Key Participants

Bank / Dealer

Prime Brokerage

- Prime Broker provides financial services to Hedge Funds, including leverage through margin loans and securities for short activity
- **Shorts:** A Hedge Fund looking for securities to cover their short will provide cash to the Prime Broker to source these securities. The Bank / Dealer will source the securities through their stock loan desk as collateralized borrows or will use Firm / Client long positions.
- **Margin loans:** A Hedge Fund provides securities to the Prime Broker in order to borrow cash on margin (140% margin). The Bank / Dealer can finance margin loans by:
    1. Rehypothecating securities via repo market (usually requiring <140% margined securities)
    2. Using these securities to cover other Hedge Fund clients' short covering needs
    3. Using other clients' excess cash
- **Risks**:
    1. If repo funding is short-dated, there is a risk that it may not roll in a stress event. If margin loan commitment is longer in tenor than the secured funding sourced, the Bank / Dealer must find replacement funding (new unsecured / secured funding may not be available).
    2. Clients with short positions may move their accounts to another Prime Broker, which would also create a funding need for the Bank / Dealer.
    3. Clients with excess cash in their accounts may withdraw their cash, which would also create a funding need for the Bank / Dealer.

Bank / Dealer Trading Activity

- **Client Financing:** Bank / Dealer provides leverage to clients for fixed income products. It sources securities from these clients through reverse repo and finances them in the secured funding market.
- **Firm Inventory:** Bank / Dealer participates in fixed income and equity outright purchases, which are financed in the secured funding market or through unsecured funding sources, if secured funding is unavailable.
- **Firm Shorts:** Bank / Dealer participates in fixed income and equity outright sales, which are covered by either borrowing securities from Sec Lenders or utilizing already existing outright long positions.
- **Loans:** Banks issue retail and commercial loans to retail and institutional borrowers

Secured Funding:

- Financing desk borrows cash via the secured funding market, from investors such as Banks, Asset Managers, Sec Lenders, Pensions, Insurance Companies, and Money Market Funds (MMF's).
    - MMF's under 2A7 regulation can only provide up to 7-day repo (applies to 95% of the portfolio's assets), which is a less durable source of funds for less liquid securities.
- **Risks** – During a stress event, investors are less likely to roll maturing trades funding less liquid assets. Additionally, if investors have agreed to a term contract, they may request an increase in haircut for less liquid assets. Both actions would increase unsecured funding requirements for the Broker Dealer.

Unsecured Funding:

- Bank / Dealer issues unsecured debt to cash investors to raise durable funding generally for non-securities, which can not be financed through secured funding
- **Risks -** Risk that less liquid assets, unable to be funded through secured funding, are funded with short term unsecured funding, such as Commercial Paper, which may not be replaceable at maturity, in the event of a stress.

Deposits:

- Deposits from retail and institutional investors can be either insured or uninsured by the FDIC (depending on maximum FDIC insurance)
- **Risks -** Risk that in the event of a stress, depositors withdraw their deposits if they are uninsured

Additional Description of Key Participants

Bank / Dealer (cont'd)

Derivatives

- Bank / Dealer executes derivative transactions for itself and for clients
- Derivative activity can be cleared through exchanges or executed bilaterally, but recent regulation imposed that certain products must be mandatorily cleared (adoption is in progress)
- Bilateral derivative trades can be collateralized or uncollateralized depending on the terms agreed upon by the counterparties. Mandatory clearing of derivative products will reduce the amount of derivative activity that can continue to be executed bilaterally and therefore any sub-portion that is uncollateralized
- Uncollateralized derivatives transactions require unsecured funding if there is a net receivable position (i.e., derivative uncollateralized receivable mark-to-market positions are larger than derivative uncollateralized payable mark-to-market positions)
- If uncollateralized derivatives transactions are a net payable position, then there is no unsecured funding requirement (i.e., derivative uncollateralized payable mark-to-market positions are larger than derivative uncollateralized receivable mark-to-market positions)
- **Risks –** Uncollateralized derivative payables are a funding source for uncollateralized derivative receivables, but the durability of payables is hard to determine and is dependent on external market factors. The counterparty who is in the market may request to terminate or novate his derivative trade if the Bank/Dealer is experiencing credit issues or if it has been downgraded. Similarly, the contract governing the derivative transaction, may contain specific credit rating triggers that are legally enforceable, where the counterparty may be entitled to initial margin or could break the trade at a favorable price.

  Finally, there is the risk that net uncollateralized derivative receivable positions are funded with short term sources, such as Commercial Paper.

Money Market Fund (MMF)

- Receives cash from retail and wholesale investors
- Invests in short term liquid investments, such as US Treasuries, Commercial Paper and Repo
- Investments are determined based on returns and credit/counterparty/collateral risk
- Can be subject to the 2A7 rule, which restricts the credit quality, maturity, and liquidity of investments. Under this rule, 95% of the fund's portfolio can not be invested in assets that require longer than 7 days to monetize. Therefore, repo funding provided by 2A7 MMF's has a 7-day put option.
- **Risks** – During a stress event, MMF investors may redeem their shares, which would require the MMF to liquidate/monetize its investments

Hedge Fund

- Receives cash from investors such as high net worth individuals, Middle East investors, and institutional investors
- Seeks leverage and securities from Prime Brokers to support its long/short trading positions
- Can also seek to lend their fully-paid-for long securities via the stock loan program of a s Securities Lender
- Decisions to borrow cash are influenced by rate, haircut/margin, and view of market/liquidity risk
- **Risks –** Highly leveraged. Can take large one-way positions. Largely unregulated.