The Use of Tri-party Repo Market Data

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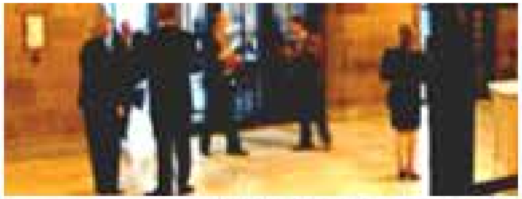


Why care about the repo market?

- The repo market is a key source of financing for dealers
  - Sharp decrease in repo financing associated with problems at Bear Stearns and Lehman Brothers
- Stress in this market could spill over to broader financial system
- Repo rates are important in price discovery for cash and derivatives instruments
- Market is critical for secondary market liquidity in Treasuries and other collateral—Key role in US Treasury's ability to fund its debt

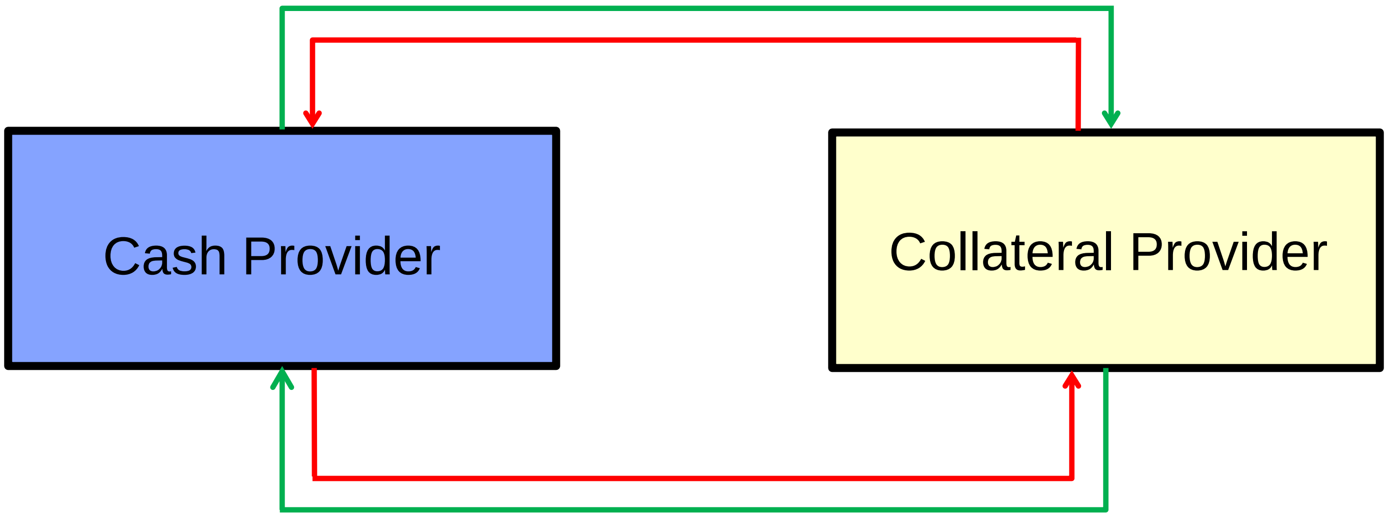
Outline

- Overview of US Tri-party Repo Market
  - What is a repo?
  - Market participants: *The clearing banks*
  - Key mechanics: Morning unwind
- What happened during the crisis?
  - Haircuts behaved differently in different market segments
- Tri-Party Repo Reform Effort
  - Policy concerns
  - Use of data to monitor progress and induce change
- Increasing Transparency and Granularity

What is a repo?

- A repo is the sale of a security, coupled with the promise to repurchase the security at a specific future date

1. Collateral provider sells $105 of securities for $100 in cash



2. Next day, collateral provider pays $100, plus “interest”, in cash to repurchase the securities

What is a tri-party repo?

- In a tri-party repo, a third party called the clearing bank provides clearing, settlement, and financing services

Clearing Bank balance sheet

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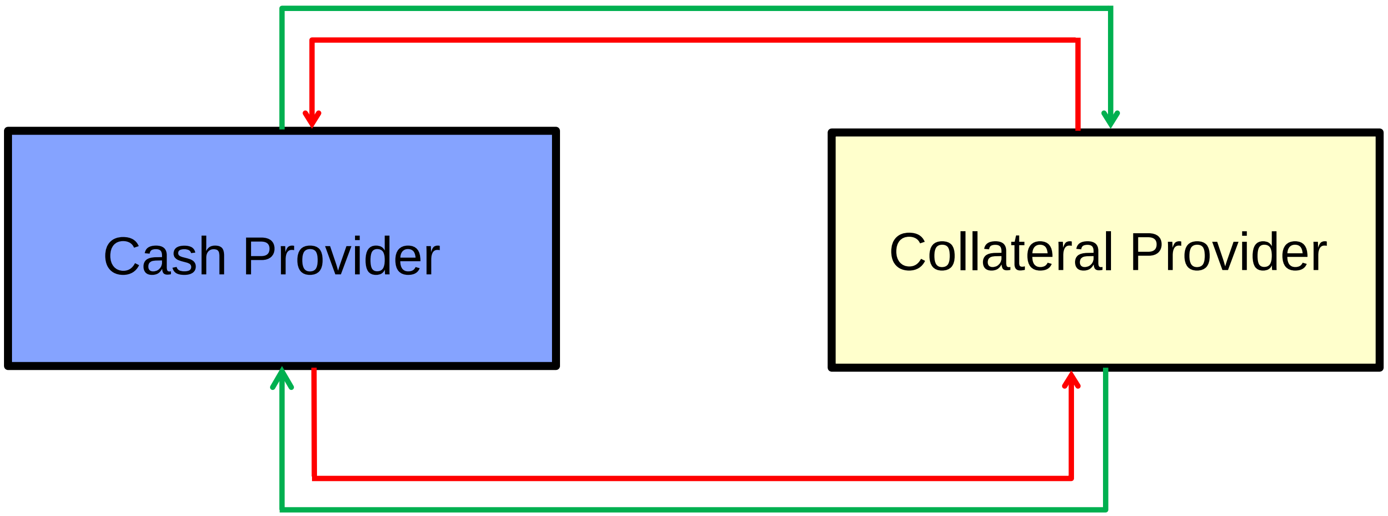

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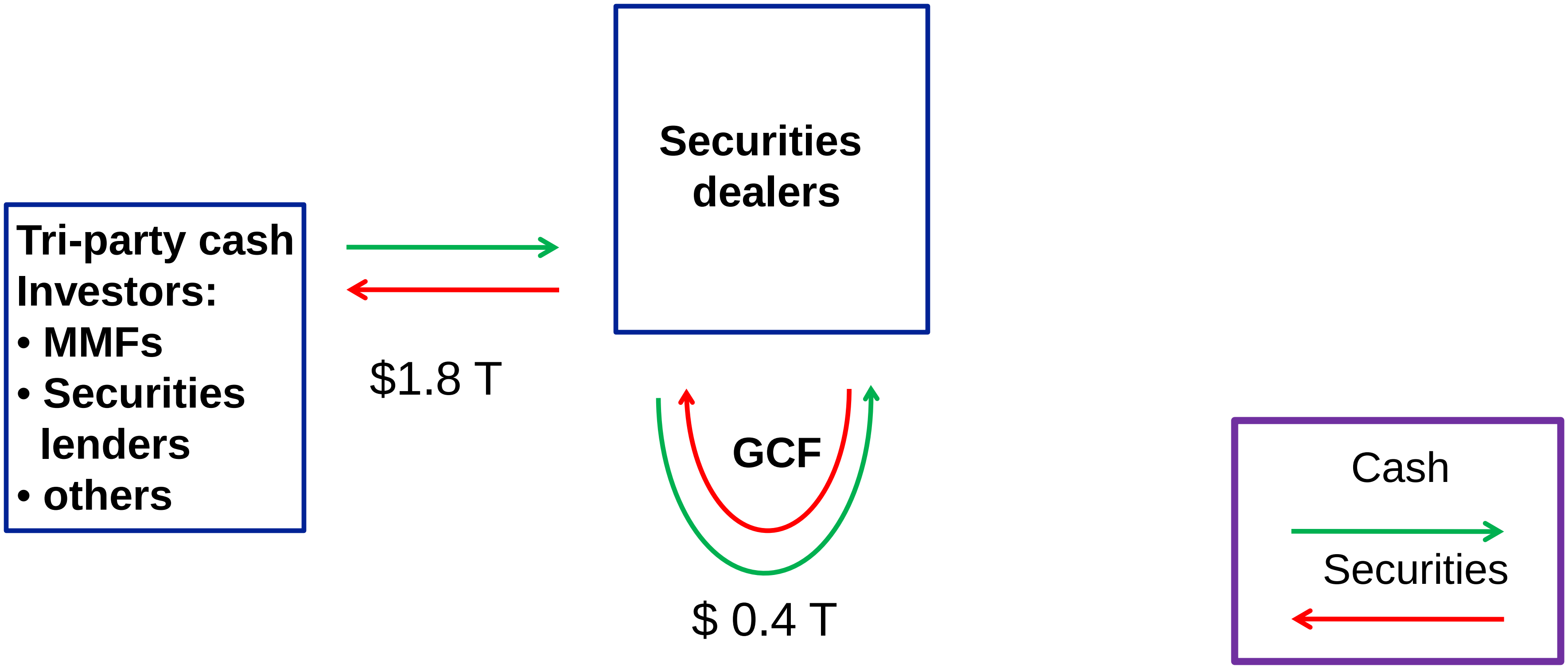
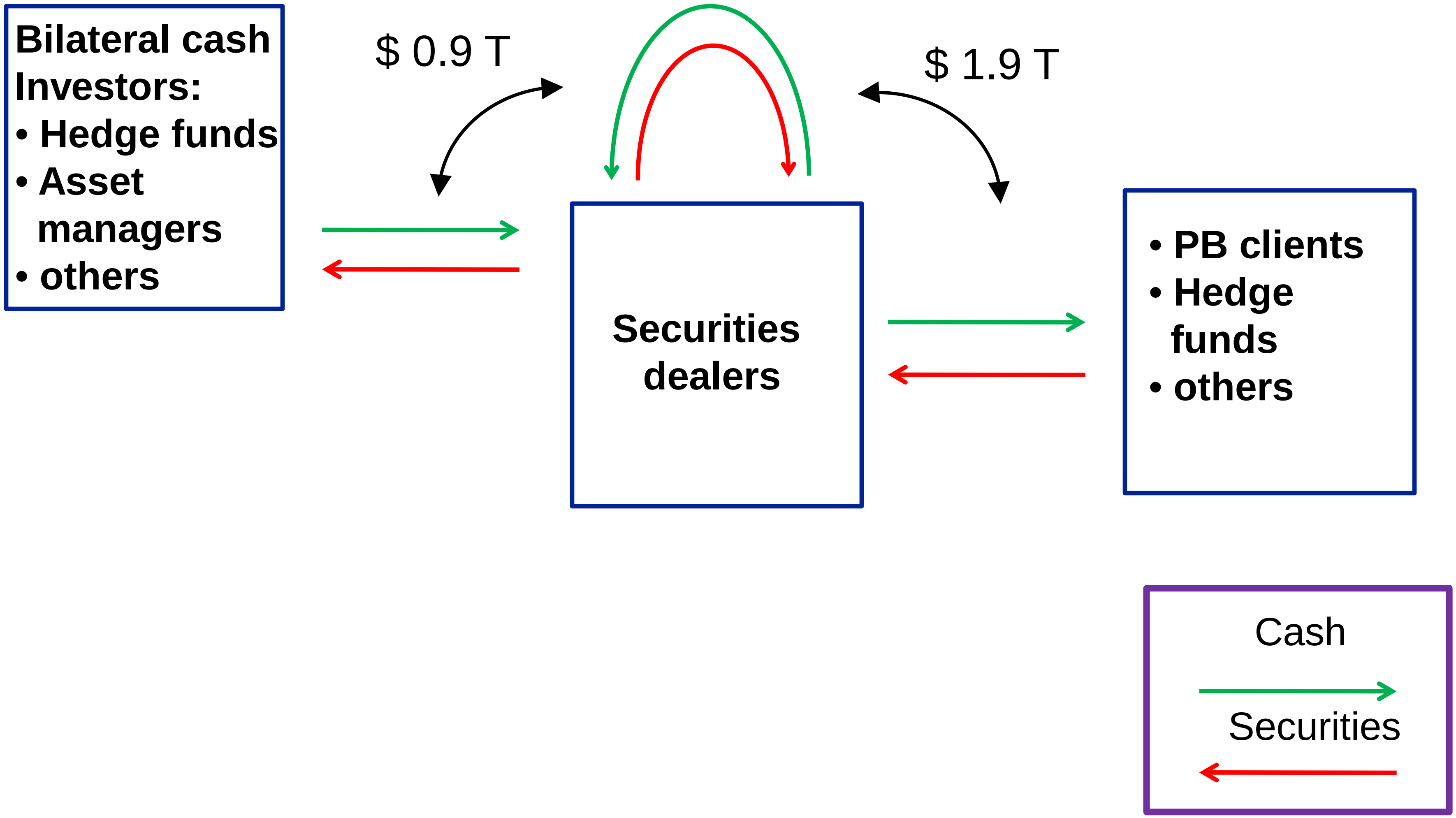
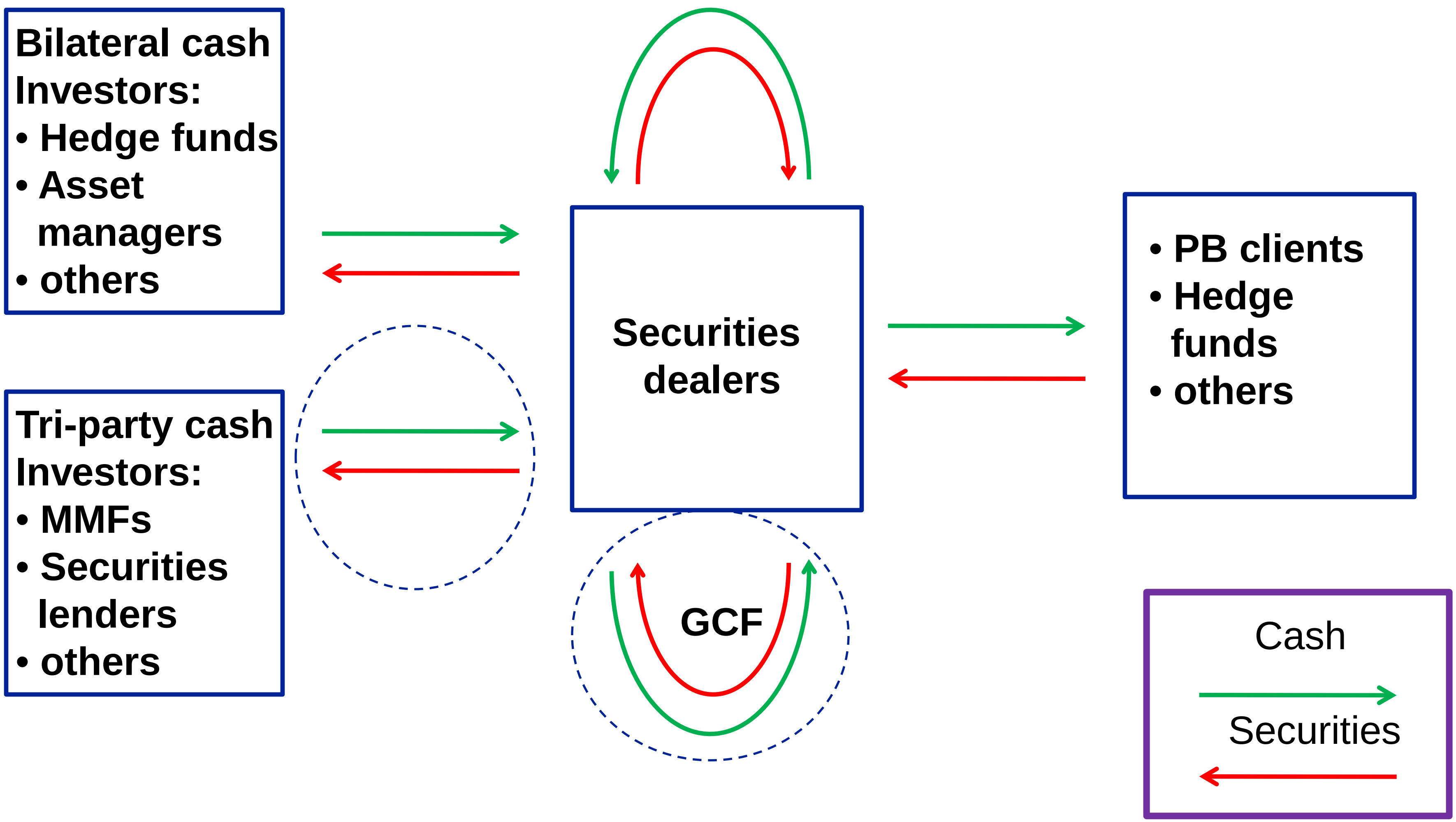
Tri-party repo market segments



Bilateral repo market segments



Tri-party and bilateral and repo markets



Tri-party Repo Borrowers (or Securities Providers)

- Who they are
  - Primarily fixed income securities dealers
- Interest in tri-party repo
  - Use tri-party repo to fund their proprietary portfolios and the portfolios of their prime brokerage and other clients; a large share of dealer borrowing is passed on to hedge funds
  - Seek a low cost, stable source of funding
- Size of market
  - Individual firms borrow hundreds of billions of dollars each day
  - Approximately 70 firms

Tri-party Repo Lenders (or Cash Providers)

- Who they are
  - Primarily mutual funds, custodial banks investing cash collateral on behalf of their securities lending clients, and other asset managers
  - Thousands of small municipalities and individual businesses participate directly, but provide relatively small sums to the market
- Interest in tri-party repo
  - Use tri-party repo to earn a return on invested funds while maximizing liquidity and preserving principal
- Size of market
  - Largest investors provide the tri-party repo market with $100+ billion each day
  - Over 4,000 firms

The Role Clearing Banks in the Tri-party repo market

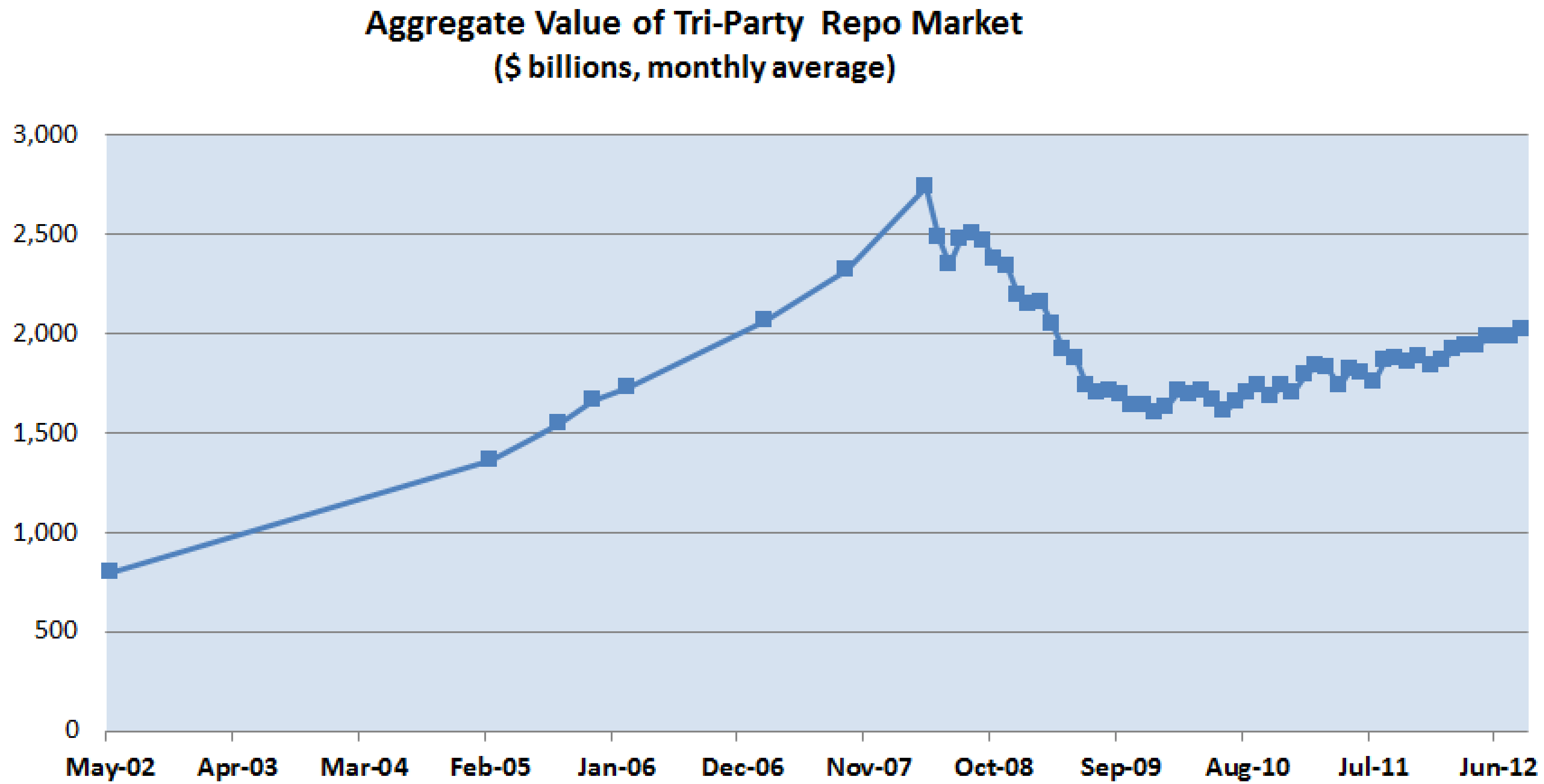
The two US government securities clearing banks (JPMorganChase and Bank of New York Mellon) play key roles:

- Role as agent:
  - Settle the repos on their books: Administer the exchange of cash and collateral between investors and dealers
  - Value and allocate the collateral
- Role as principal:
  - Finance securities during the day (the “unwind”) to facilitate clearing and settlement activity of dealers
  - The clearing banks secure their intraday exposure by asserting a lien against the dealers’ securities

Key mechanics: The "unwind"

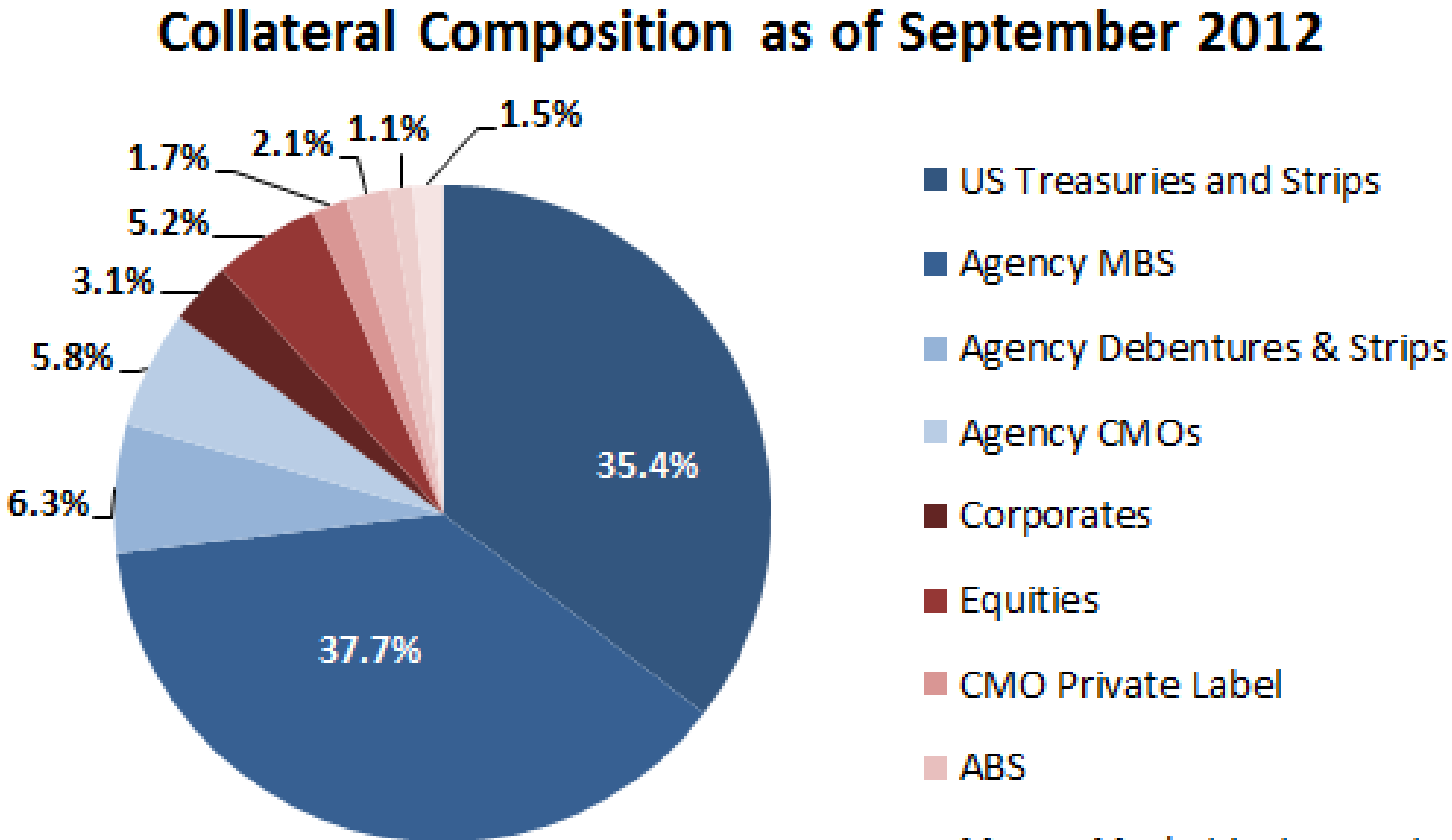
- Around 3:30 PM (moved from 8:30 AM in August), clearing banks "unwind" **all** repos, maturing or not
- The unwind sends cash back to investors and collateral back dealers
- Term and rolling repos are "rewound" in the afternoon, at the same time as new repos are settled
- Clearing banks extend intraday credit to dealers since securities are no longer financed by cash investors (huge exposure)
- Intraday credit is neither capped nor committed
  - Unwind is at the discretion of clearing banks
  - Not unwinding would likely force a dealer into bankruptcy

Size of the tri-party repo market



Source: Bank of New York Mellon and JPMorgan Chase. Limited data provided by clearing banks prior to April 2008. Graph reflects data points provided (markers) and smoothed trend line between them.

Collateral financed in the tri-party repo market



*Other inlcudes CDOs, International Securities, Whole Loans, and Municipal Debt

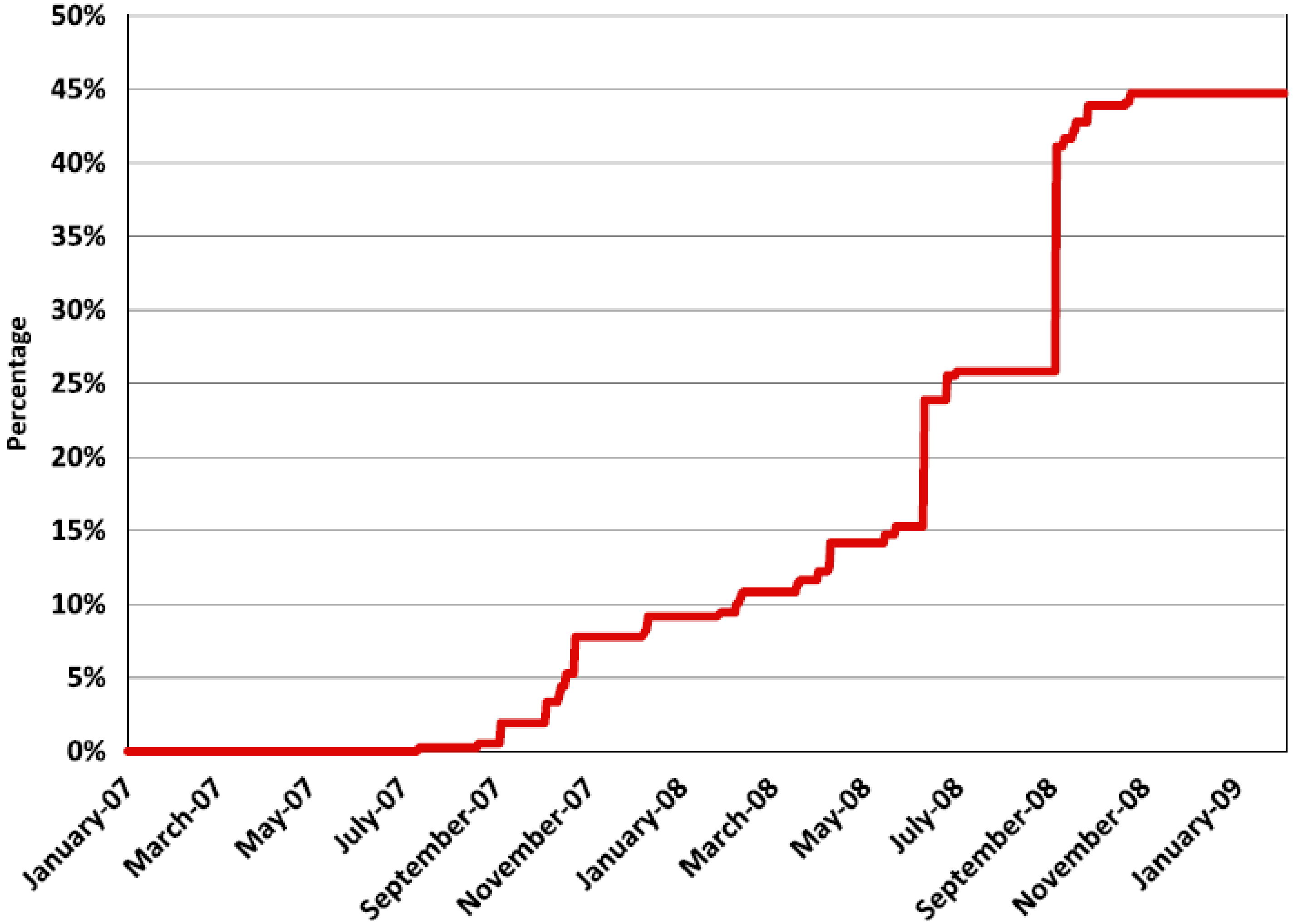
Source: TPR Task Force, BNYM, JPMC

What happened during the crisis?

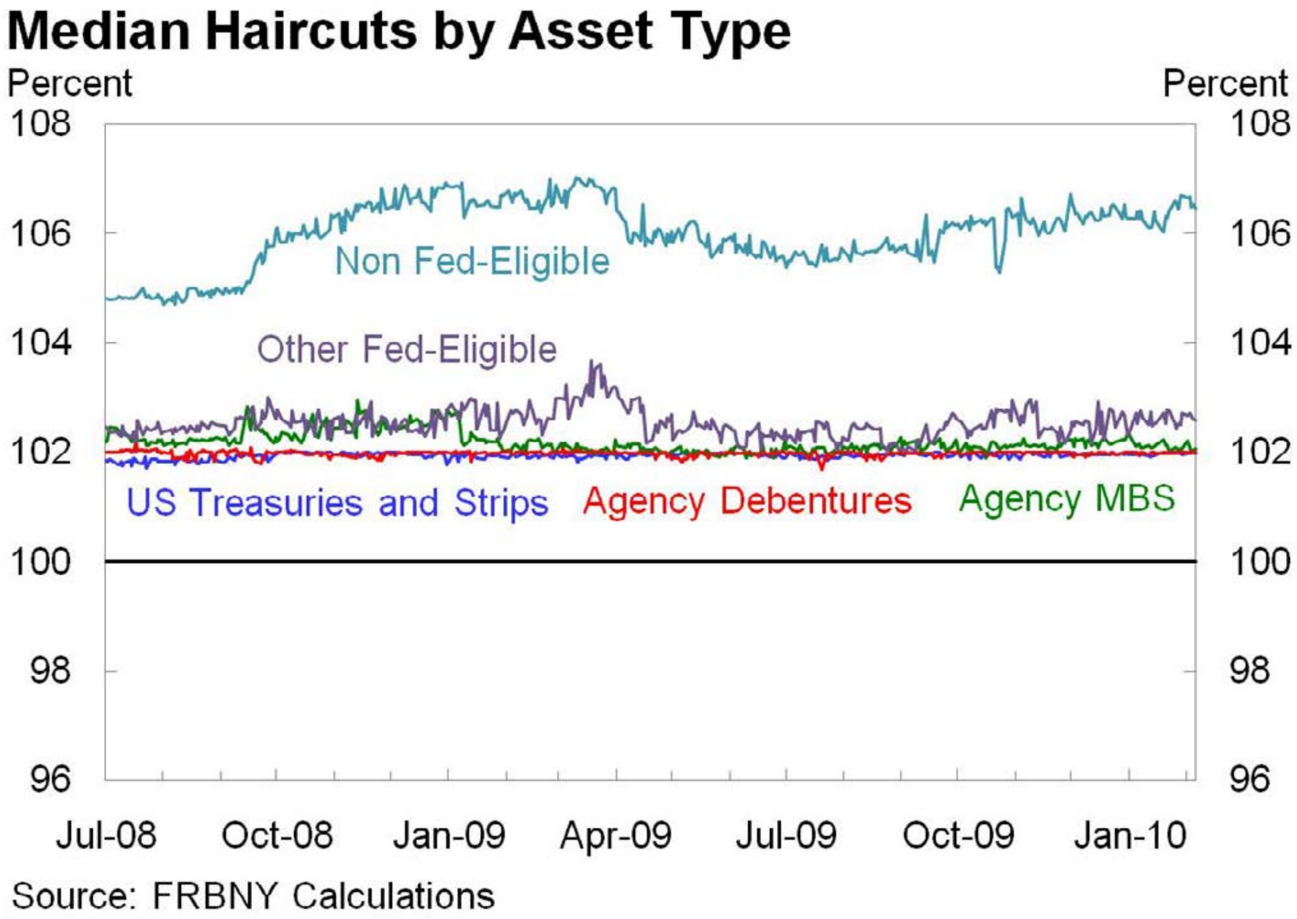
Tri-party and bilateral repo market behaved very differently

- Bilateral repo market:
  - Large increase in margins (similar to a partial run)
- Tri-party repo market:
  - Almost no change in margins
  - In some cases (Bear Stearns, Lehman) precipitous decline in quantities (similar to a run)

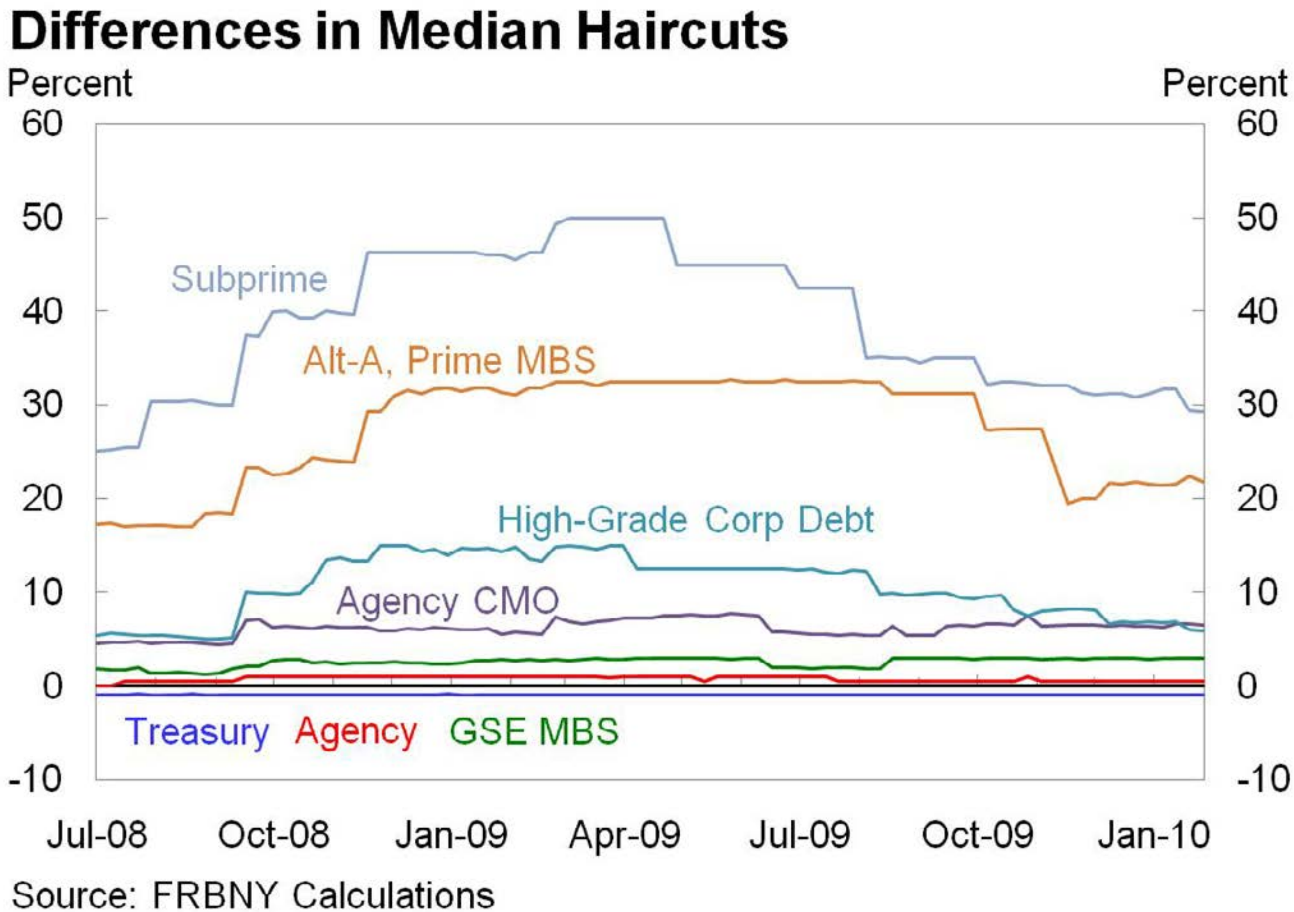
Gorton-Metrick: The (bilateral) repo-haircut index



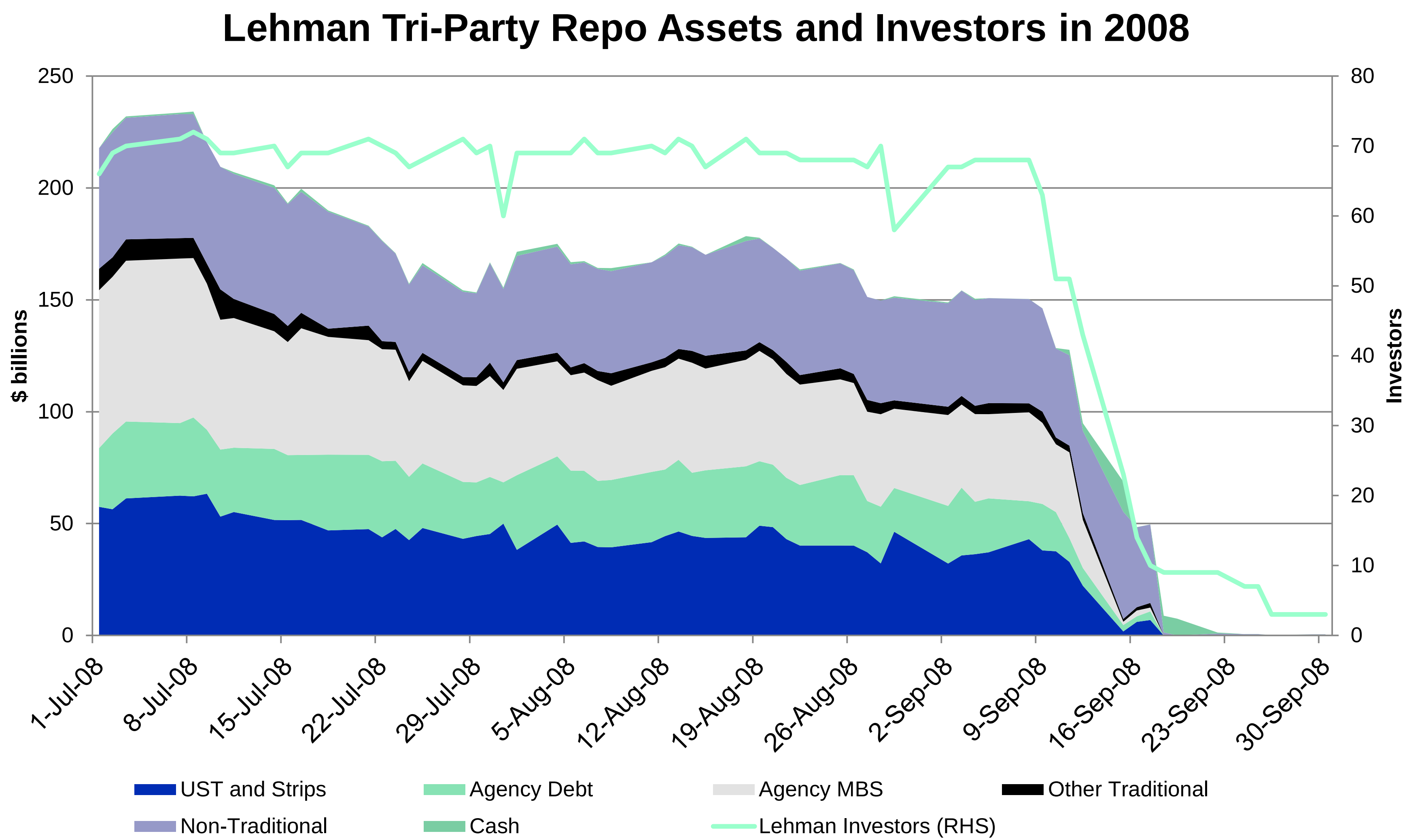
Repo haircuts: Tri-party



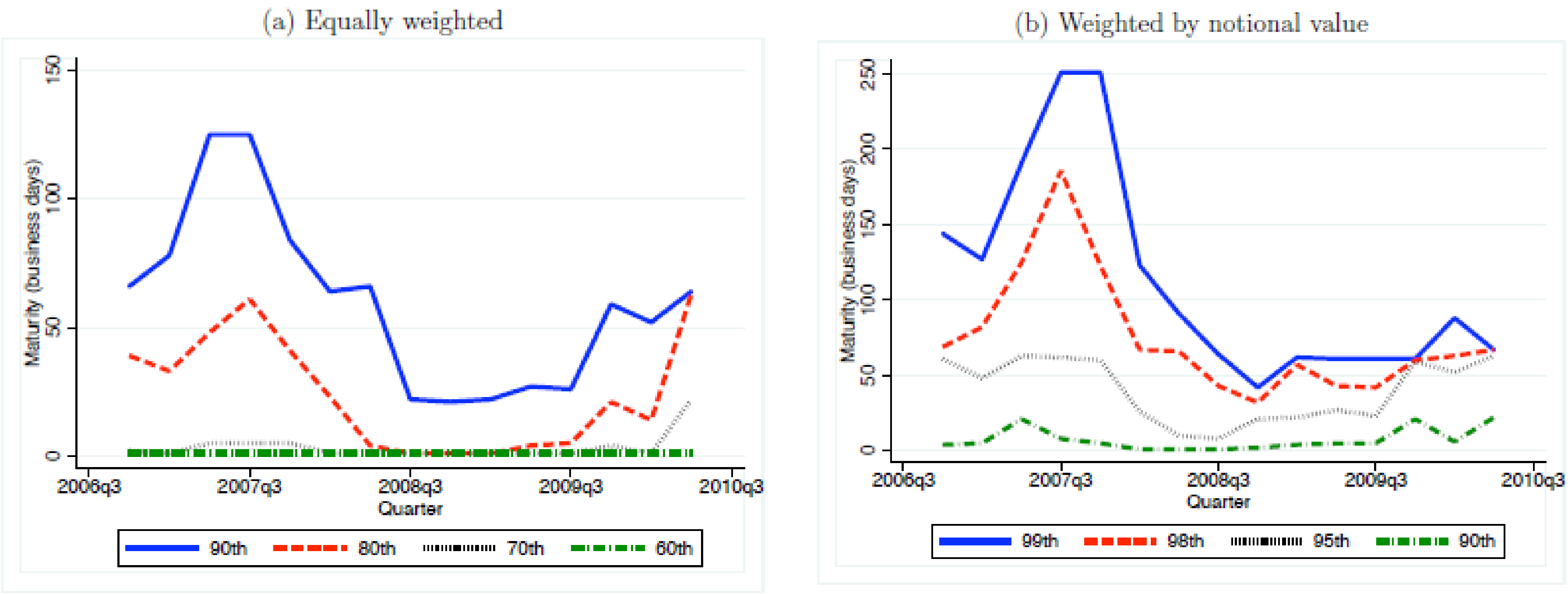
Repo haircuts: Bilateral versus Tri-party



Lehman's tri-party repo book



Evidence on maturities

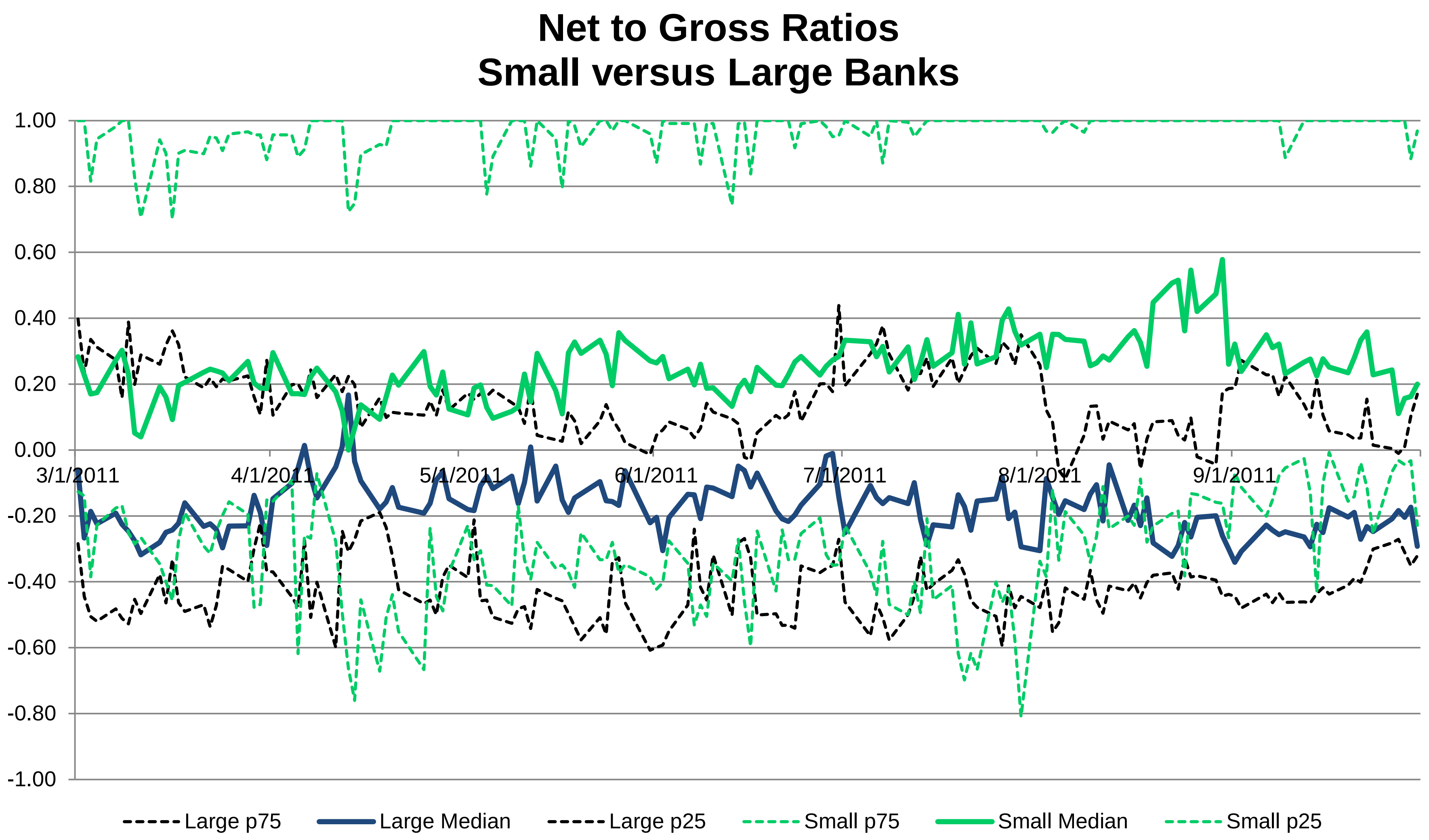


Source: Krishnamurthy, Nagel, and Orlov (2012)

Key considerations

- Flexible haircuts are a stabilizing phenomenon
  - Markets in which investors adjust haircuts should be less brittle
- Why do some investors not adjust haircuts?
  - The role of the "unwind"
  - Some tri-party investors face run risk themselves
  - Inability to value, fund, and liquidate the collateral?
- There are still many gaps in our understanding of the repo markets:
  - Role and size of bilateral market
  - Role of interdealer market

GCF repo market



Monitoring progress towards policy objectives and inducing change

TRI-PARTY REFORM EFFORT

TPR Reform Effort

- Three major market weaknesses:
  1. Market's reliance on large amounts of intraday credit made available to cash borrowers by the clearing banks that provide the operational infrastructure for the tri-party repo market
  2. Inadequate risk management practices of cash lenders and clearing banks that are subject to procyclical pressures
  3. Lack of effective plans by market participants for managing the tri-party collateral of a large securities dealer default without creating potentially destabilizing effects on the broader financial system

- Infrastructure enhancements
- Behavioral changes

TPR Reform Effort – Transparency and Public Data

- Lack of market transparency obscured understanding of risks
  - Market activity and structure
  - Risk characteristics
  - Magnitude of exposure
- Collection and publication of data began in 2010
  - Collateral value by asset type
  - Concentration by top 3 dealers by asset type
  - Cash investor margin levels by asset type (10^{th} percentile, median, 90^{th} percentile)
  - Total number of individual repo deals
  - Total number of collateral allocations

TPR Reform Effort – Transparency and Public Data

- Increased transparency gives market participants better ability to understand some of the risks

Tri-Party Repo Statistics as of 09/12/2012				Cash Investor Margin Levels		
Asset Group	**Collateral Value (billions)**	**Share of Total**	**Concentration of Top 3 Dealers**	**10th Percentile**	**Median**	**90th Percentile**
ABS Investment Grade	$20.94	1.1%	45.3%	5.0%	6.0%	10.0%
ABS Non Investment Grade	$19.32	1.0%	45.3%	2.0%	8.0%	20.6%
Agency CMOs	$109.20	5.8%	42.6%	2.0%	3.0%	5.0%
Agency Debentures & Strips	$118.36	6.3%	40.2%	0.0%	2.0%	4.0%
Agency MBS	$706.05	37.7%	29.6%	2.0%	2.0%	3.0%
CMO Private Label (Investment & Non Investment Grade)	$32.15	1.7%	44.3%	2.0%	7.0%	17.1%
Corporates (Investment & Non Investment Grade)	$57.63	3.1%	30.5%	3.0%	5.0%	15.0%
Equities	$97.69	5.2%	37.2%	5.0%	8.0%	15.0%
Money Market	$21.39	1.1%	57.0%	2.0%	4.1%	5.0%
Municipality Debt	$20.65	1.1%	57.6%	2.0%	5.0%	10.0%
US Treasuries Strips	$45.29	2.4%	43.8%	2.0%	2.0%	3.0%
US Treasuries excluding Strips	$617.40	33.0%	32.9%	0.0%	2.0%	2.0%
Other*	$7.15	0.4%				
Total	**$1,873.21**					

* Other includes, International, and Whole Loans

TPR Reform Effort – Transparency and Public Data

Concentration by asset type

Fire sale risk

Range of margining practices

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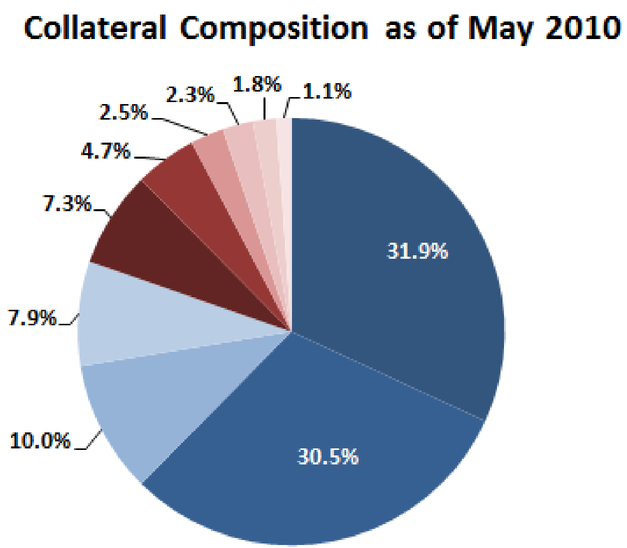
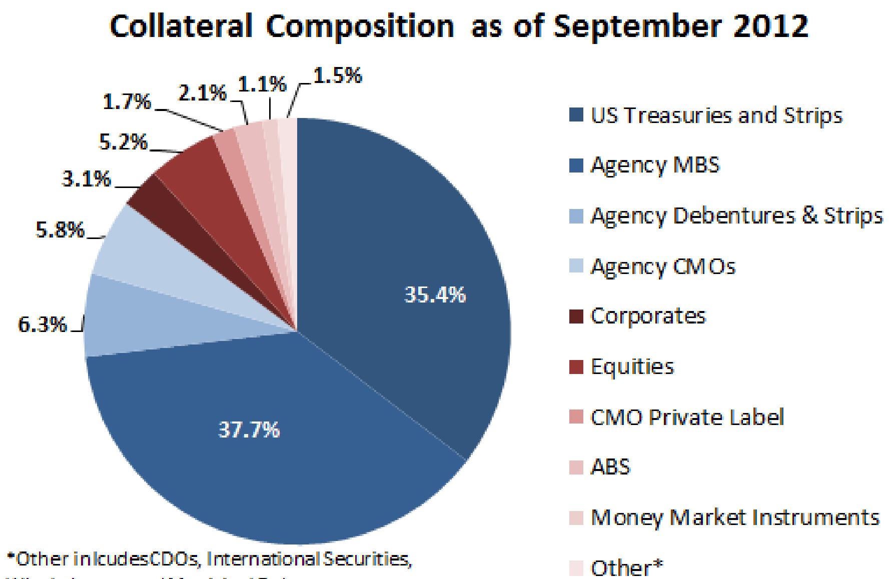


Source: TPR Task Force, BNYM, JPMC



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TPR Reform Effort – Risk Management

- Enhanced data collection (non-public) provides supervisors with view into aspects of firm specific risk management practices
  - Dealers should lengthen and stagger the maturity profile of their financing, seek to combine short-term and long-term financing with the same counterparty and should continue exploring alternative mechanisms that may be able to achieve more durable financing of certain types of securities.

TPR Reform Effort – Intraday Credit

- Lack of formalized industry-wide three-way trade confirmations as the time of trade execution was identified by the Task Force as an operational weakness that required enhancement in order to enable large reductions in intraday credit extensions by the clearing banks
- Market-wide 3-way matching
- Timely submissions allow clearing banks better estimate the size of demand intraday credit earlier in the day
- Intraday matching statistics allows supervisors to track the timeliness of the trade confirmations and identify “slow adopters”

TPR Reform Effort – Intraday Credit

- 3-way matching – 13 fields
  - seller legal entity
  - transaction type
  - trade date
  - settlement/start date
  - Currency
  - Principal
  - Rate
  - maturity date
  - collateral type ID
  - open (y/n to indicate if trade is defined as day to day TPR that is good to close)
  - structure type (put, call, evergreen, extendable)
  - minimum notice period (number of days on which a party has the ability to take action on structured TPR)

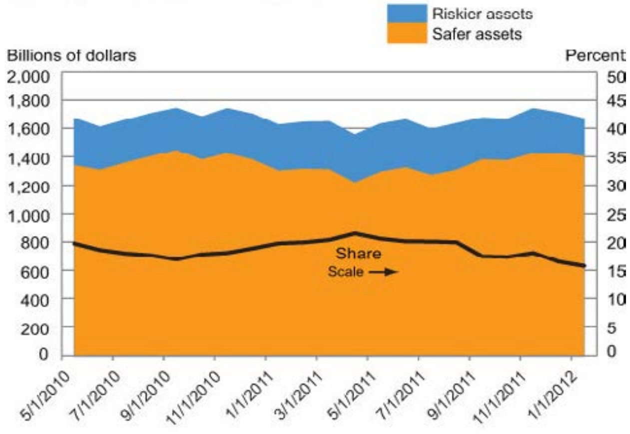
TPR Reform Effort – Intraday Credit

- One clearing bank plans to eliminate exposure to less liquid collateral
  - Pre-funding of maturing trades
- Data helps supervisors understand the market implications of the change

TPR Reform Effort – Liberty Street Blog

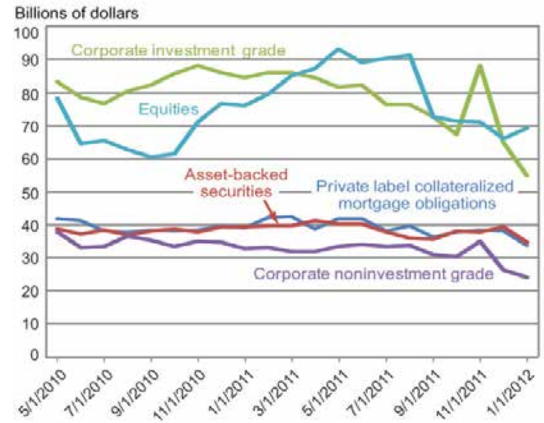
- Public communication tool facilitates public communications regarding reform efforts with data based analysis
  - Sept 17 – The Odd Behavior of Repo Haircuts during the Financial Crisis
  - August 22 – The Fed’s Emergency Liquidity Facilities during the Financial Crisis: The PDCF
  - June 25 – Mapping and Sizing the U.S. Repo Market
  - June 11 – Money Market Funds and Systemic Risk
  - February 29 – Is Risk Rising in the Tri-Party Repo Market?

Volume Financed in Tri-Party Repo Market and Share of Riskier Assets



Source: Tri-Party Repo Infrastructure Reform Task Force (http://www.newyorkfed.org/tripartyrepo/margin_data.html).

Volume of Some Riskier Asset Classes Financed in Tri-Party Repo Market



Source: Tri-Party Repo Infrastructure Reform Task Force (http://www.newyorkfed.org/tripartyrepo/margin_data.html).

Increasing Transparency and Widening the Scope

- Work is underway to enhance current data publications (industry and FRBNY)
  - Focus on producing metrics that allow market participants to gain a better understanding of risk
    - Leveraging matching data to provide maturity profiles, structure types
- The Office of Financial Research (OFR) plans to collect trade level information on all segments of the repo market
  - Rates, haircuts, tenor, type of collateral, counterparty
  - Tri-party repo data to be collected from clearing banks and FICC (GCF)
  - Bilateral repo data to be collected from large dealers

Resources

- FRBNY Tri-Party Repo Infrastructure Reform website: http://www.newyorkfed.org/banking/tpr_infr_reform.html
- Liberty Street Blog: http://libertystreeteconomics.newyorkfed.org/
- Key Mechanics of the U.S. Tri-Party Repo Market: http://www.newyorkfed.org/research/epr/2012/1210cope.html