The Failure Mechanics of Dealer Banks

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A Large Bank Holding Group's Lines of Business

- Commercial banking (lending, deposit taking).
- Securities dealing (including securities lending and repo).
- Over-the-counter derivatives dealing.
- Proprietary trading (securities, derivatives).
- Prime brokerage.
- Asset management, including internal hedge funds.
- Merchant banking (oil, metals, foodstuffs, ...).
- Investment banking (underwriting, merger-acquisition, ...).

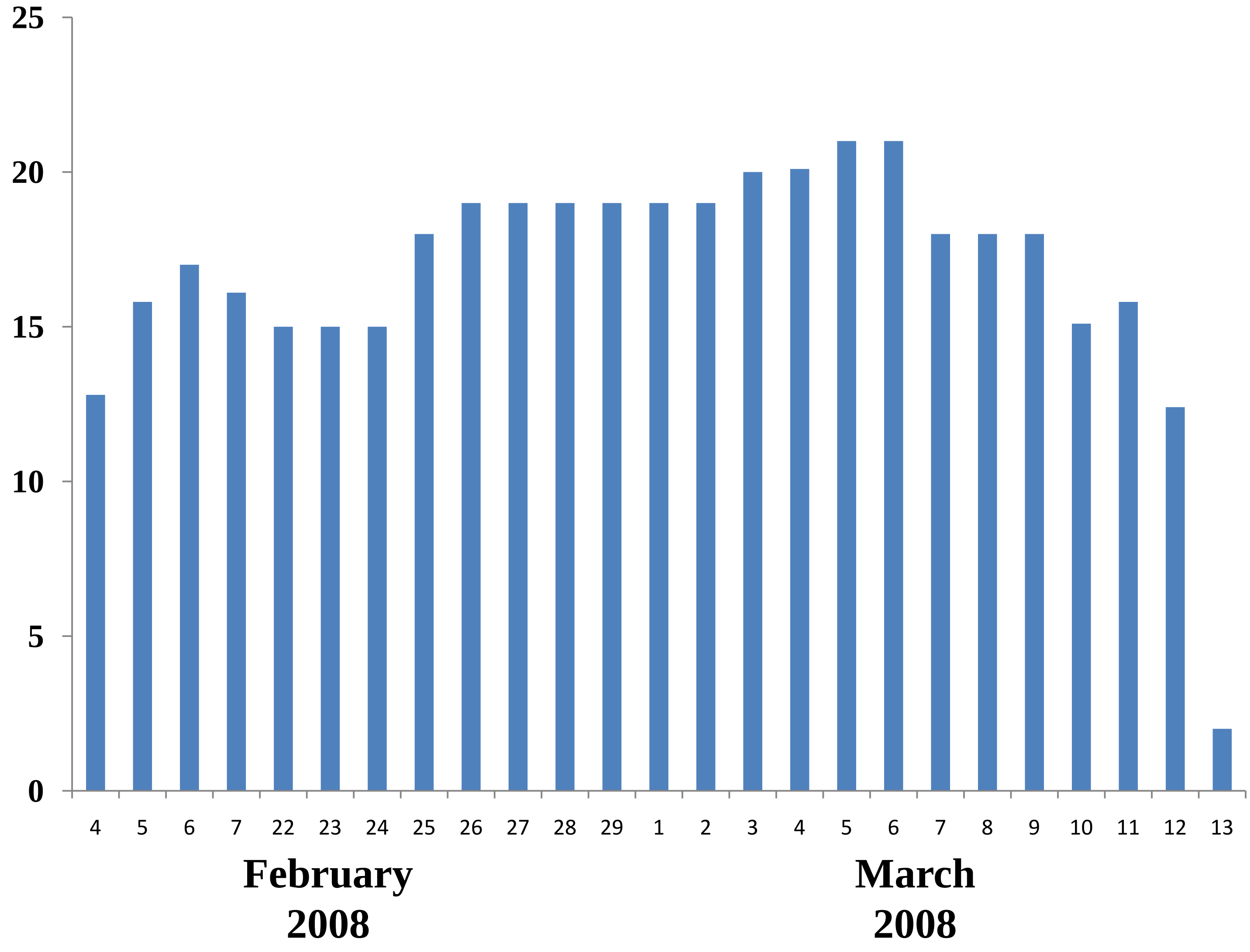
Table: Dealers invited to an April 1, 2009 meeting on over-the-counter derivatives hosted by the New York Federal Reserve Bank. Source: New York Federal Reserve Bank.

Bank of America, N.A.
Barclays Capital
BNP Paribas
Citigroup
Credit Suisse
Deutsche Bank AG
Dresdner Kleinwort
Goldman, Sachs & Co.
HSBC Group
JPMorgan Chase
Morgan Stanley
The Royal Bank of Scotland Group
Société Générale
UBS AG
Wachovia Bank N.A., a Wells Fargo company

Distress Incentives

- **Asset Substitution:** (Jensen and Meckling)
  - Leverage.
  - Maturity transformation and credit risk retention.
  - Voluntary compensation of clients to protect franchise value.
- **Debt overhang:** (Myers) Reducing the present value of distress costs is a positive NPV project, but new capital will not be offered because it will go instead to improving the position of creditors.
- **Adverse selection:** (Akerlof) Providers of equity and debt financing charge a lemon's premium against balance-sheet opaqueness.
- **Bank run:** (Diamond and Dybvig) Self-fulfilling run by creditors, counterparties, and prime brokerage clients.

Bear Stearns' Liquidity Pool Over its Last Days ($ billions)



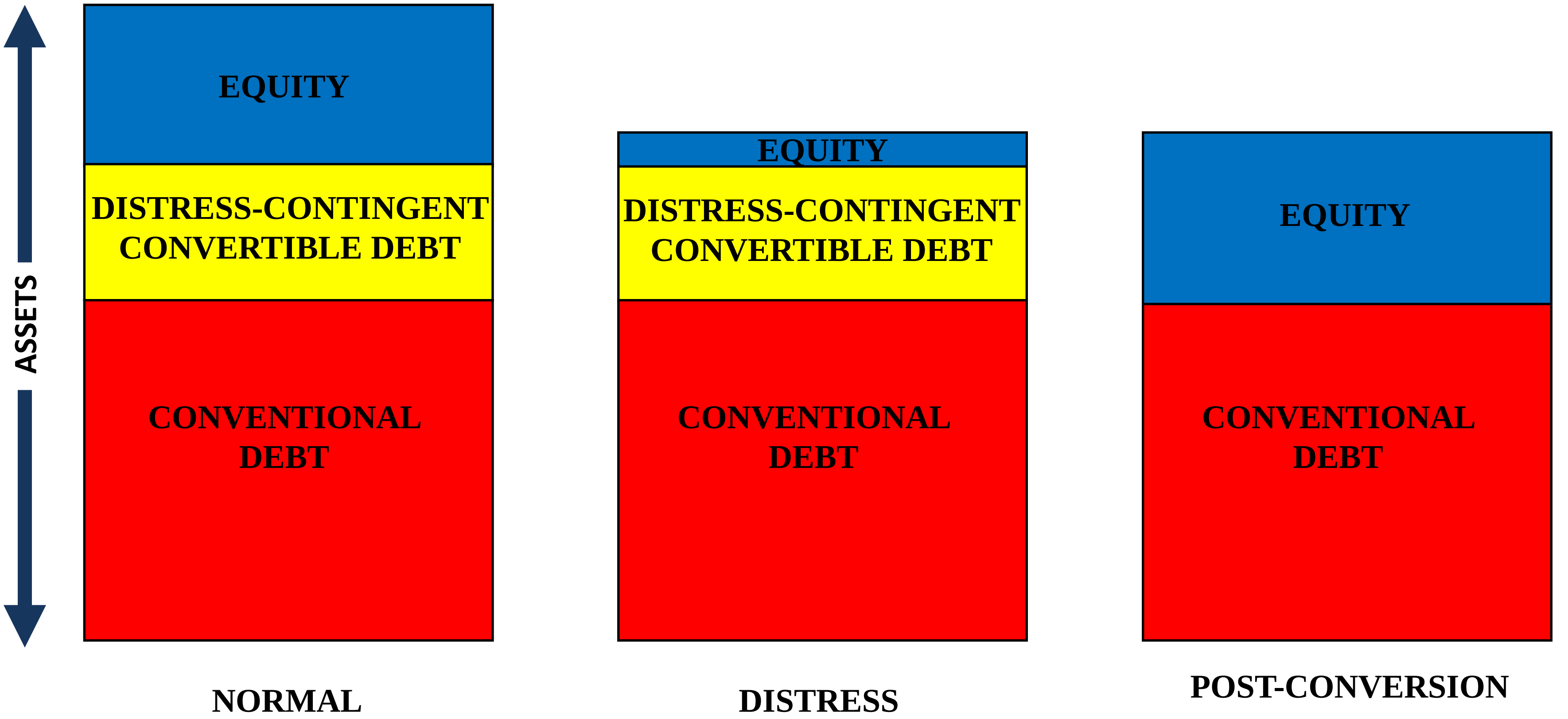
Data Source: Cox (2008)

Short-Run Failure Accelerators

- Exit of prime brokerage clients.
- Run by over-the-counter (OTC) derivatives counterparties.
- Run by short-term creditors, especially repo.
- Lost access to clearing and settlement, including daylight overdraft privileges.

Policy Implications

- New resolution mechanisms to mitigate disruptive firesales.
  - Powers of receiver and conservator apply only to regulated banks.
  - Automatic stays do not apply to executory contracts (swaps, repo).
  - Firesales would be immediate if repo counterparties fail to renew financing.
- Lender of last resort for a wide range of collateral (Tucker).
- Effective central clearing of OTC derivatives (Duffie and Zhu).
- Dedicated repo “utilities” (Bernanke) or other repo market infrastructure measures (BONY).
- Dependence of capital requirements on liability maturity structure.
- Distress-contingent convertible debt (Flannery, Squam Lake Group).


ASSETS
EQUITY
DISTRESS-CONTINGENT CONVERTIBLE DEBT
CONVENTIONAL DEBT
NORMAL
EQUITY
DISTRESS-CONTINGENT CONVERTIBLE DEBT
CONVENTIONAL DEBT
DISTRESS
EQUITY
CONVENTIONAL DEBT
POST-CONVERSION

Speculating on Franchise Value: Asset Substitution Weakens Liquidity

Support to distressed off-balance-sheet creditors

- November, 2007, HSBC commits $35 billion to bring the assets of its off-balance structured investment vehicles onto its balance sheet.
- December, 2007, Citigroup brings $49 billion in SIV assets and liabilities onto its own balance sheet.

Speculating on Franchise Value: Asset Substitution Weakens Liquidity

Support to distressed internal hedge funds

- June, 2007, Bear Stearns lends $3.2 billion to its High-Grade Structured Credit Fund.
- August, 2007, Goldman Sachs injects capital into its Global Equity Opportunities Fund.
- February 2008, Citigroup provides $500 million to Falcon, expanding Citi's balance sheet by $10 billion.

Speculating on Franchise Value: Asset Substitution Weakens Liquidity

Signaling strength when weak

- Avoiding the stigma of the discount window.
- Continuing to make loans, re-strike derivatives, and make two-sided markets as though healthy.

Liquidity Drain by OTC Derivatives Counterparties

- Leveling exposure by entering new positions with up-fronts, or re-striking options, or drawing on lines of credit.
- Novation (asking a different dealer to stand in between the counterparty and distressed dealer) causes cash collateral to depart from prime broker's control.
- IMF data: Citibank's OTC derivatives payable exposure (after netting and collateral) decreased from $126 billion in March 2008 to $17 billion as of end-March 2009. Compare to Goldman's estimated drawdown, from $100 billion to $91 billion.
- Collateral on downgrade. Example: Morgan Stanley, approximately $1 billion per notch.

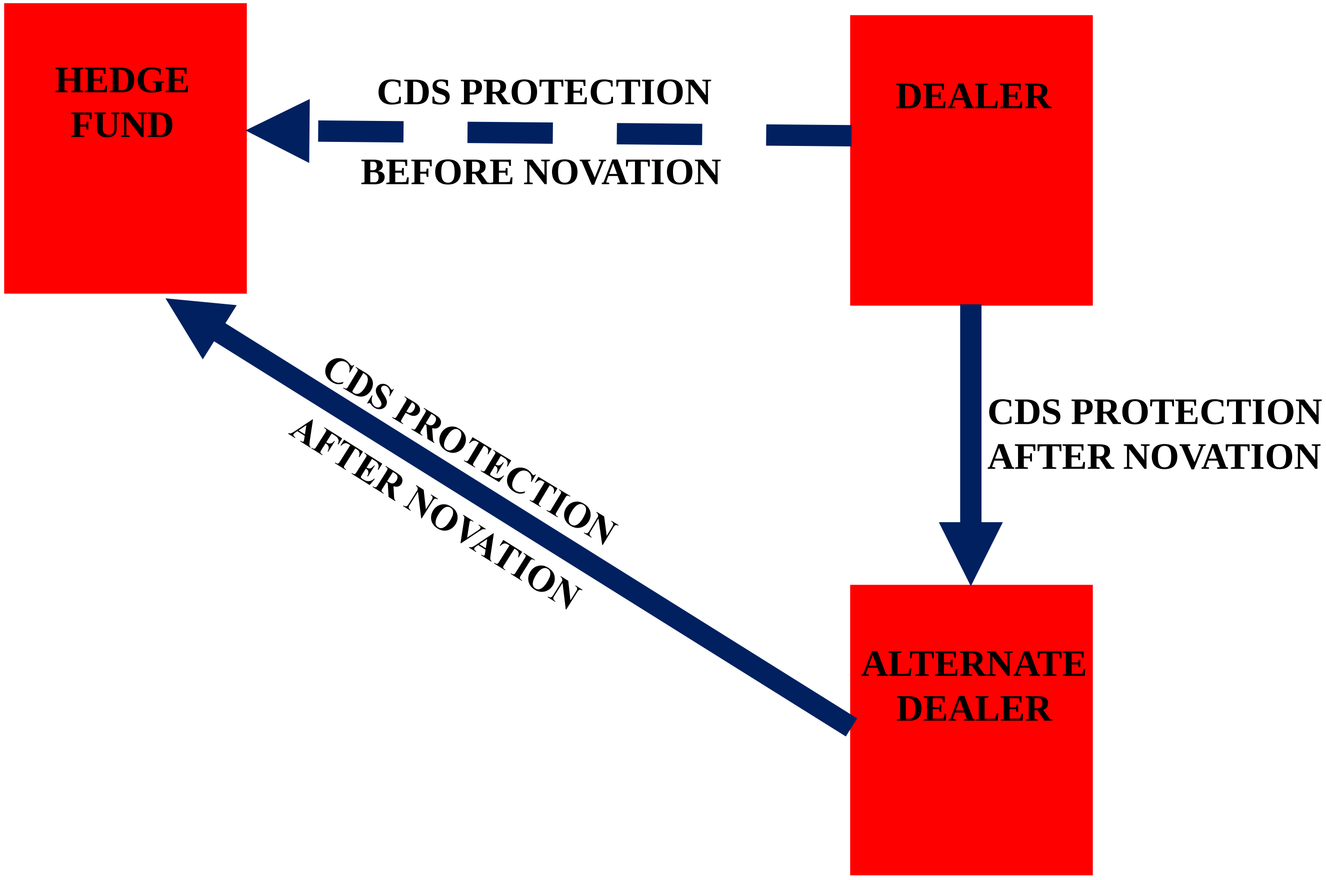
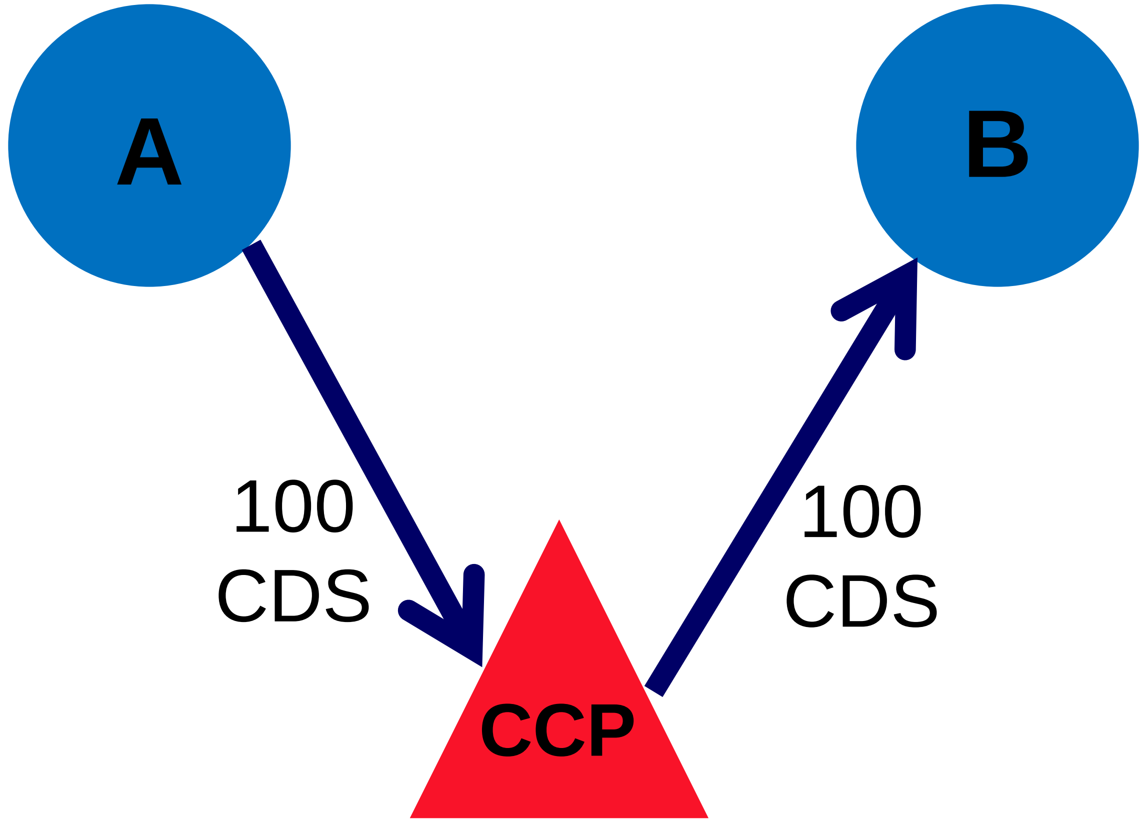
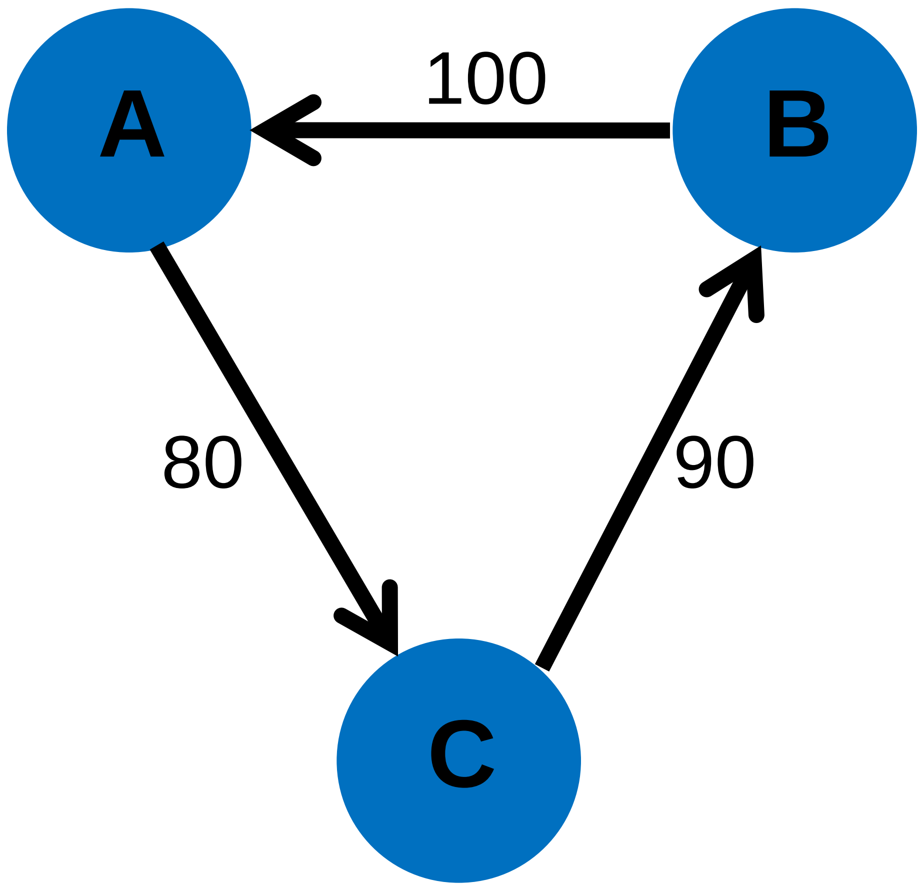

HEDGE FUND
DEALER
CDS PROTECTION
BEFORE NOVATION
CDS PROTECTION
AFTER NOVATION
CDS PROTECTION
AFTER NOVATION
ALTERNATE DEALER

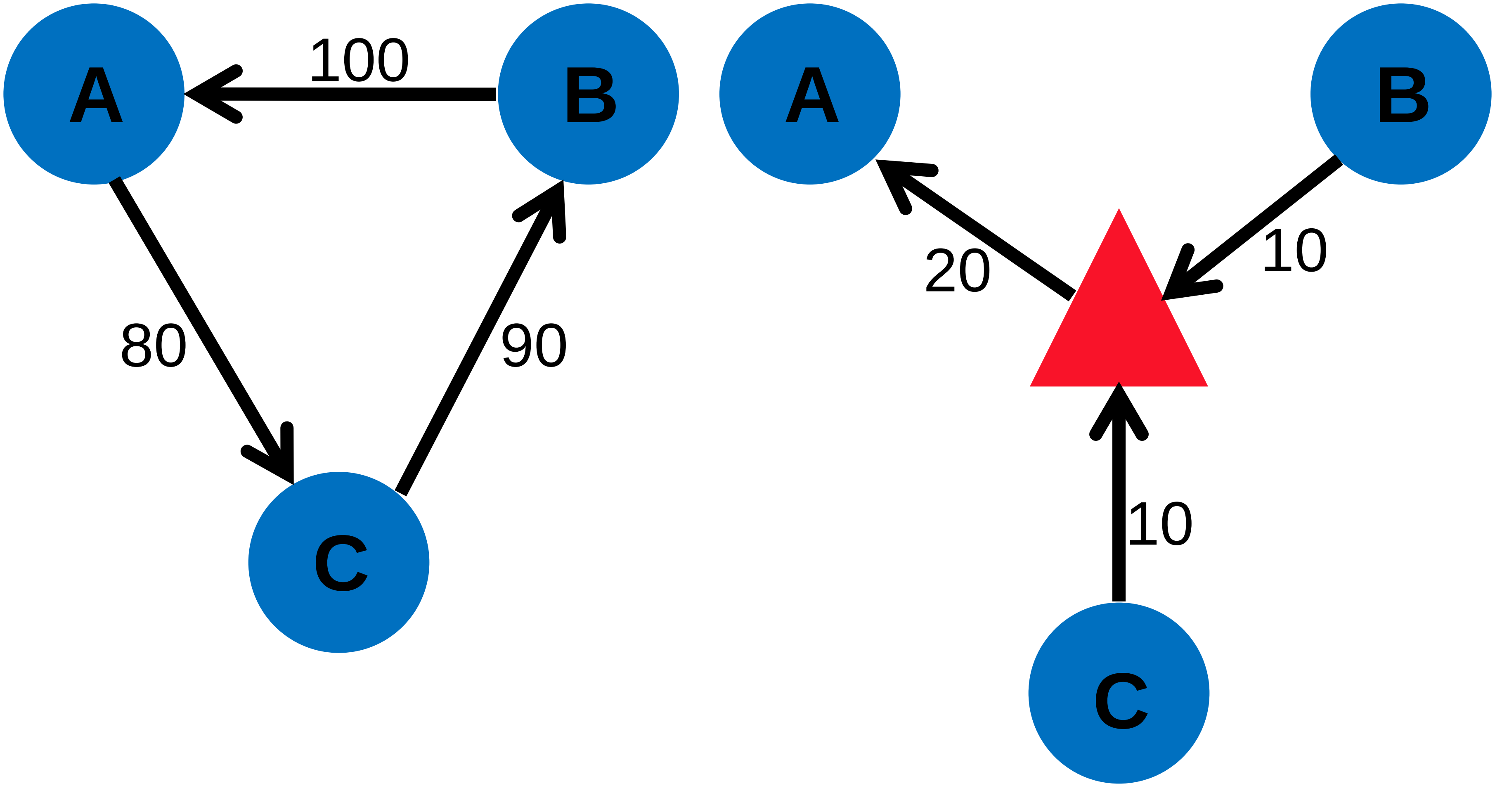
Table: Dealer OTC derivatives exposures. Source: BIS, May 2009.

Asset class	Exposure ($ billions)
CDS	5,652
Commodity	955
Equity Linked	1,113
Interest Rate	18,420
Foreign Exchange	3,917
Unallocated	3,831
Total	33,889
Total after netting	5,004


A
100 CDS
B


A
B
100
CDS
100
CDS
CCP

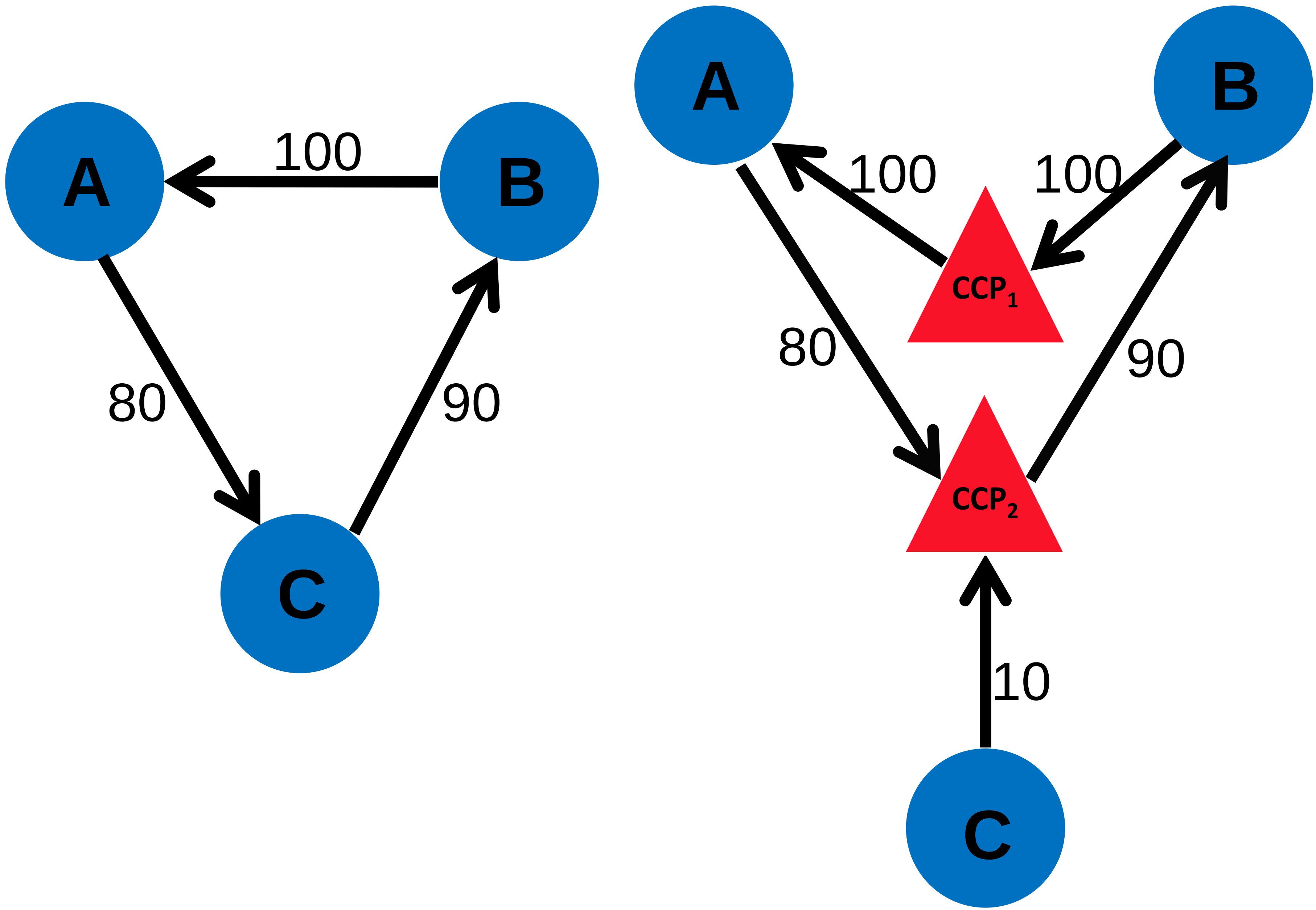

A
B
C
100
80
90



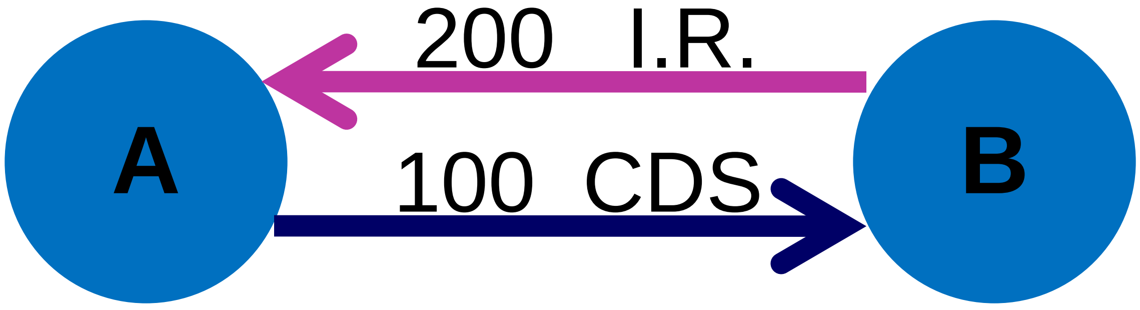
A
100
B
80
90
C
A
B
20
10
10
C

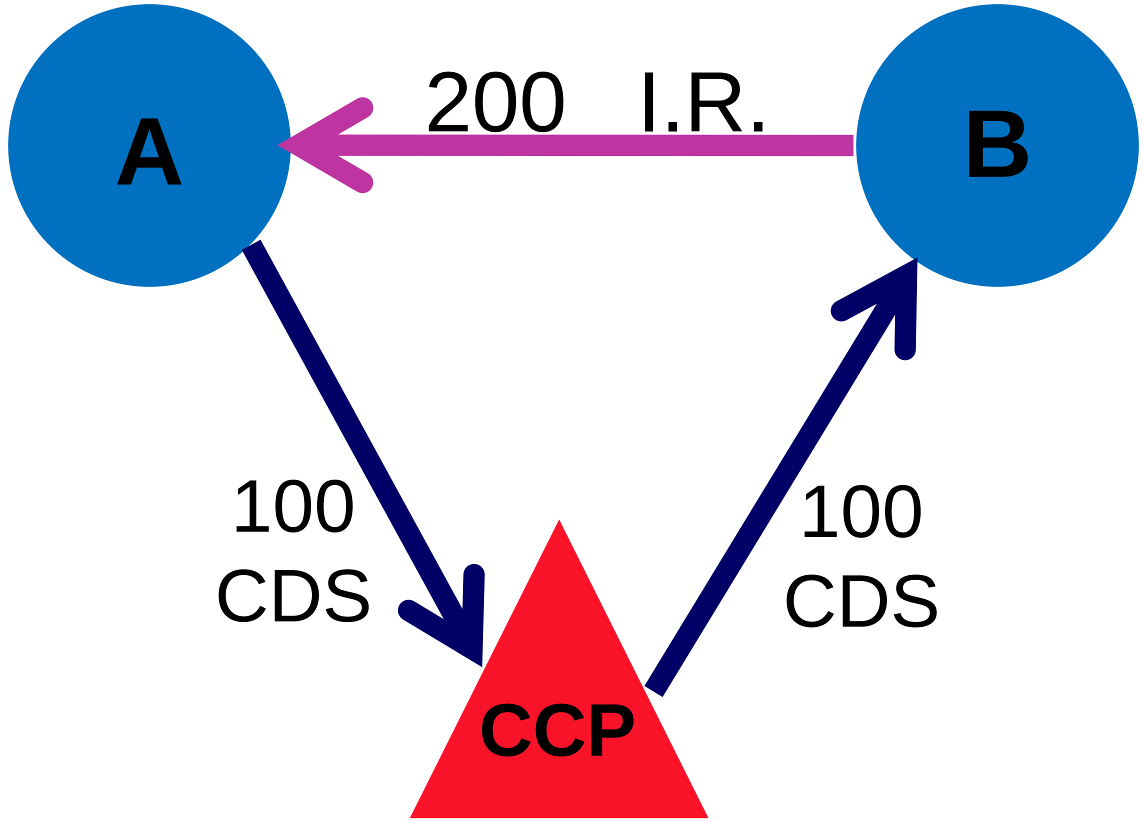
CDS-Dedicated CCP Proposals

- U.S. CCPs:
  - ICE.
  - CME.
- European CCPs:
  - NYSE-Liffe-LCH.Clearnet.
  - Eurex.
  - ICE Trust Europe.
  - LCH.Clearnet SA (a French subsidiary of LCH, dedicated to Eurozone CDS clearing).
  - CME Group (London-based clearing of European CDS).



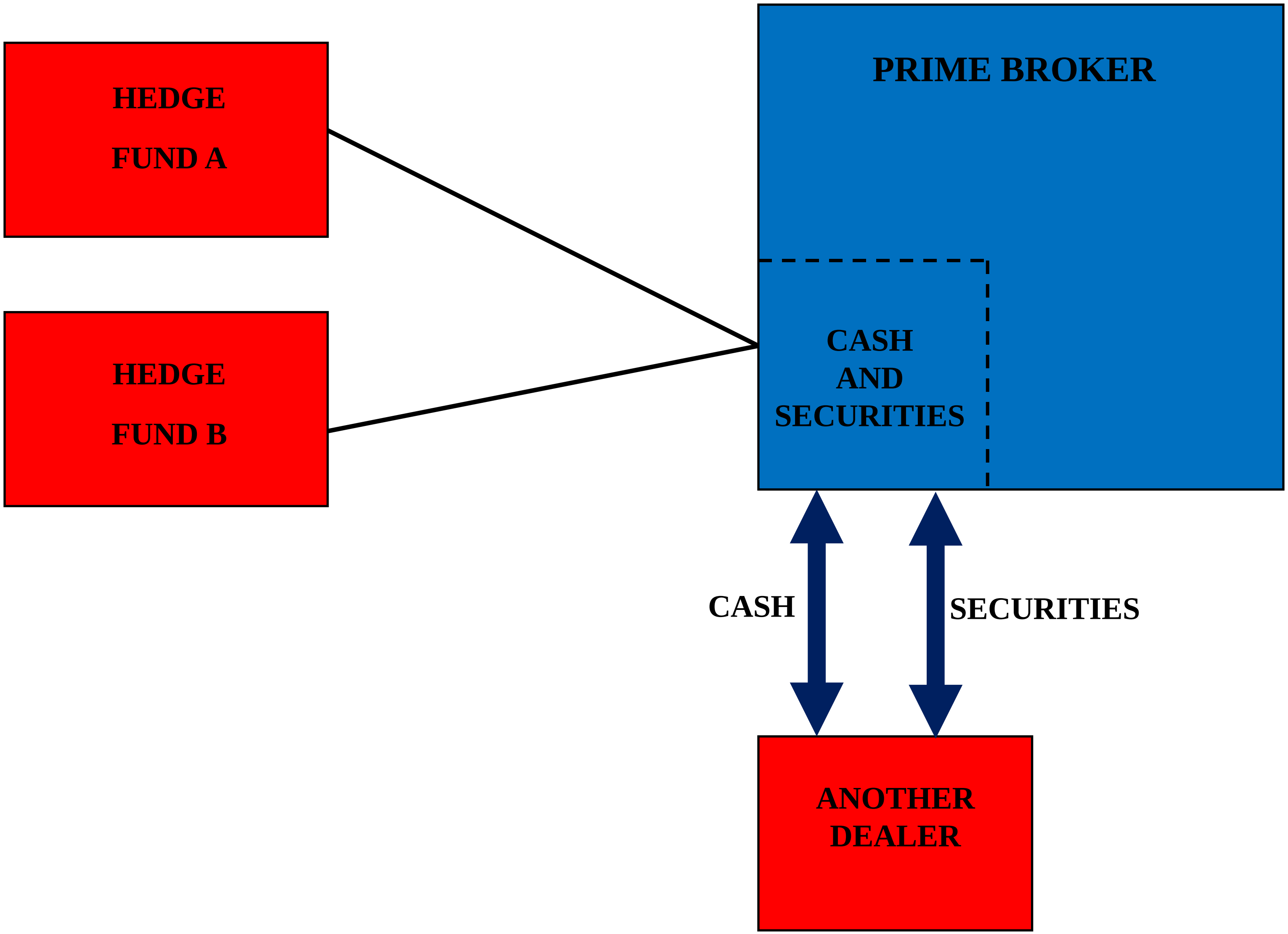
A
B
C
100
80
90
A
B
C
CCP1
CCP2
100
100
80
90
10


200 I.R.
A
100 CDS
B

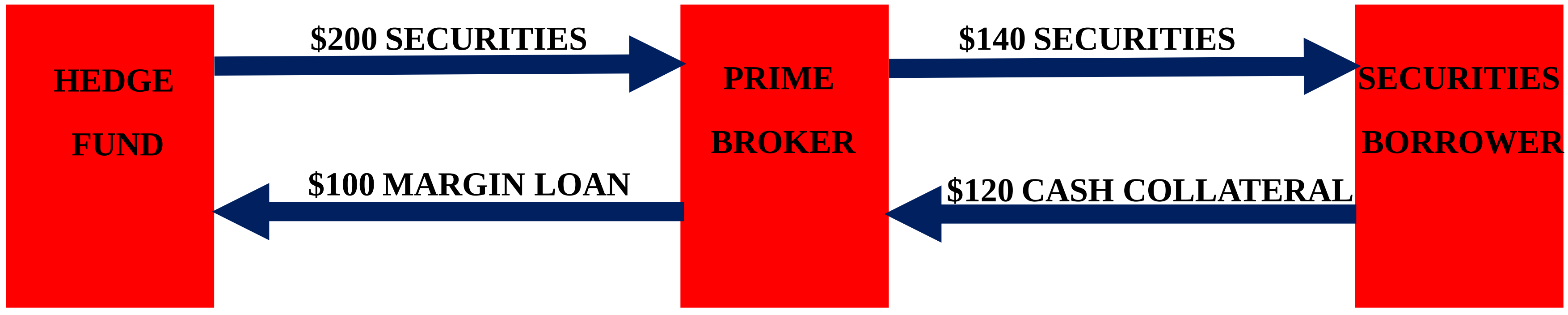

A
B
200 I.R.
100
CDS
100
CDS
CCP

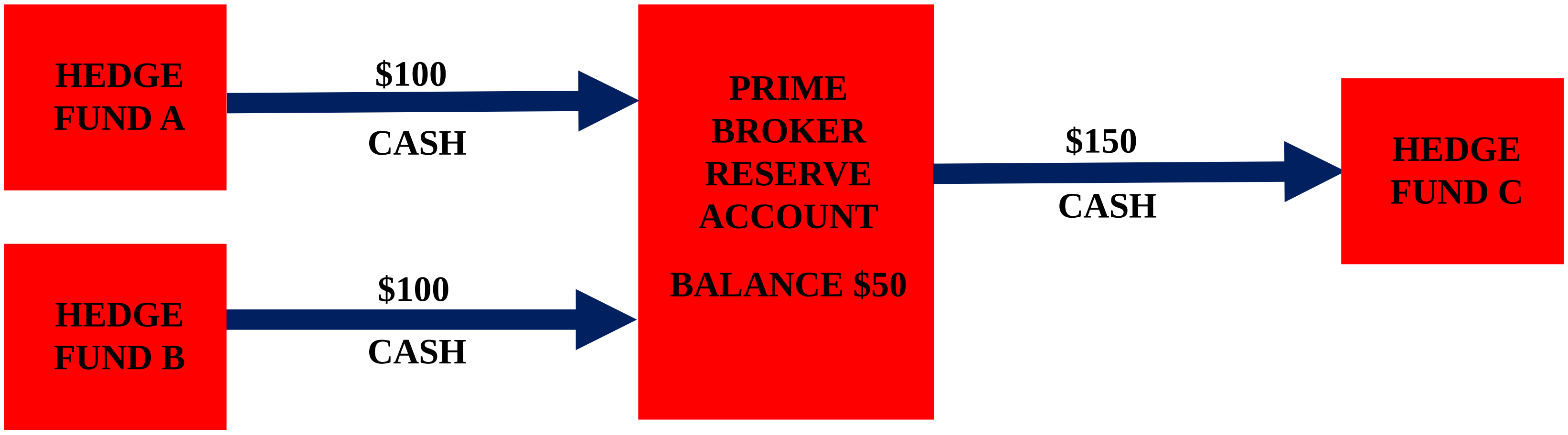
OTC Derivatives Boundary Conditions

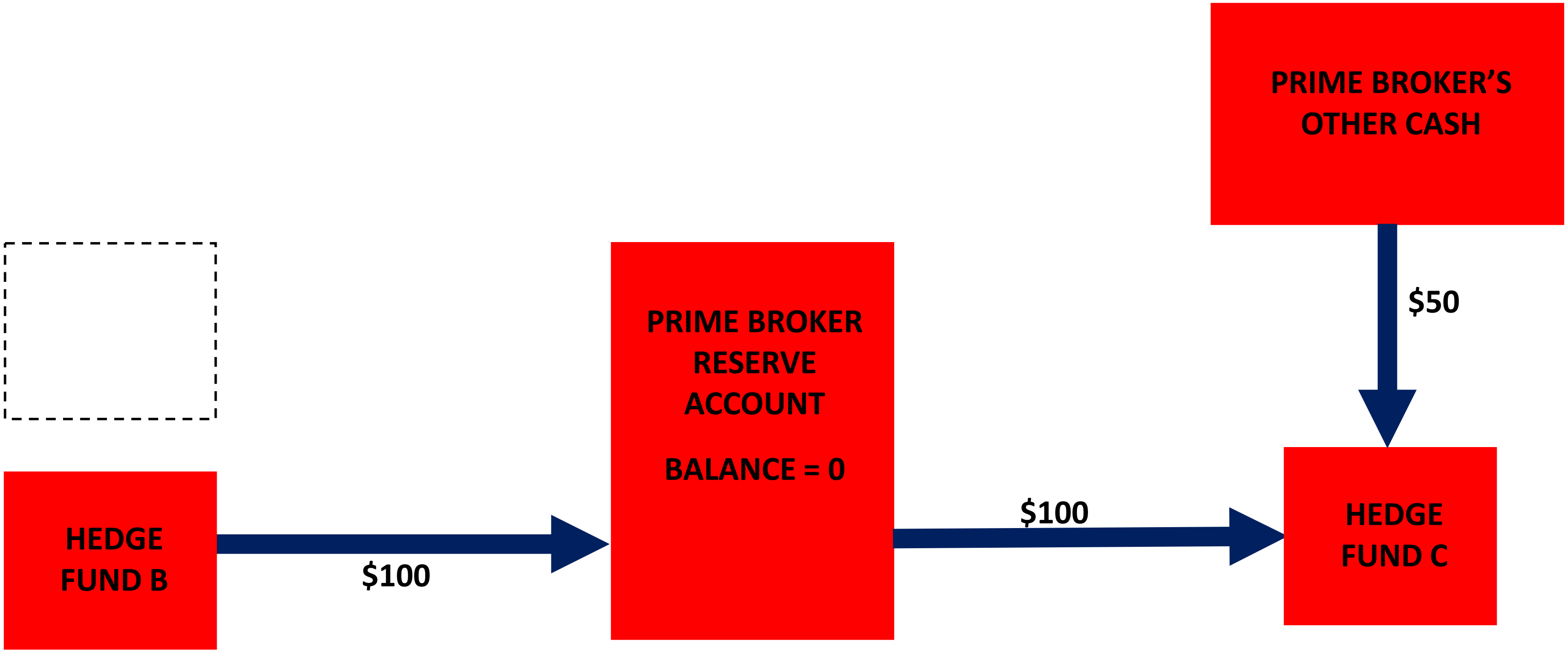
- Termination settlement on default or merger-acquisition (including good-bank-bad-bank resolution).
- Executory contracts are exempt from bankruptcy and receivership-conservatorship resolution, including proposed legislation.
- Counterparty to defaulter can exit for replacement or replacement cost.



PRIME BROKER
HEDGE
FUND A
HEDGE
FUND B
CASH
AND
SECURITIES
CASH
SECURITIES
ANOTHER
DEALER


HEDGE FUND
$200 SECURITIES
$100 MARGIN LOAN
PRIME BROKER
$140 SECURITIES
$120 CASH COLLATERAL
SECURITIES BORROWER


HEDGE FUND A
$100
CASH
HEDGE FUND B
$100
CASH
PRIME BROKER RESERVE ACCOUNT
BALANCE $50
$150
CASH
HEDGE FUND C

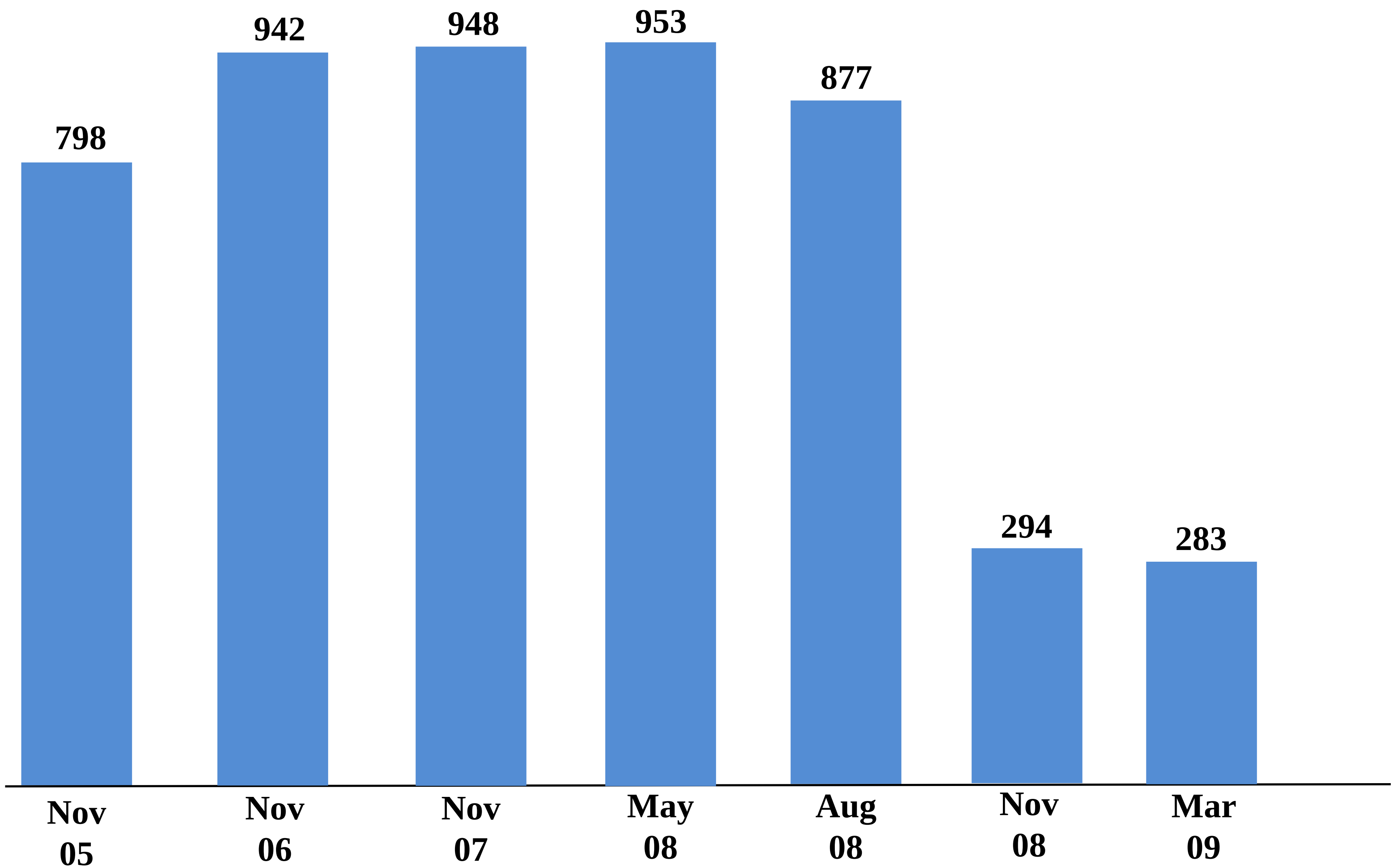

PRIME BROKER'S OTHER CASH
$50
PRIME BROKER RESERVE ACCOUNT
BALANCE = 0
HEDGE FUND B
$100
$100
HEDGE FUND C

Prime Brokerage Clients Run

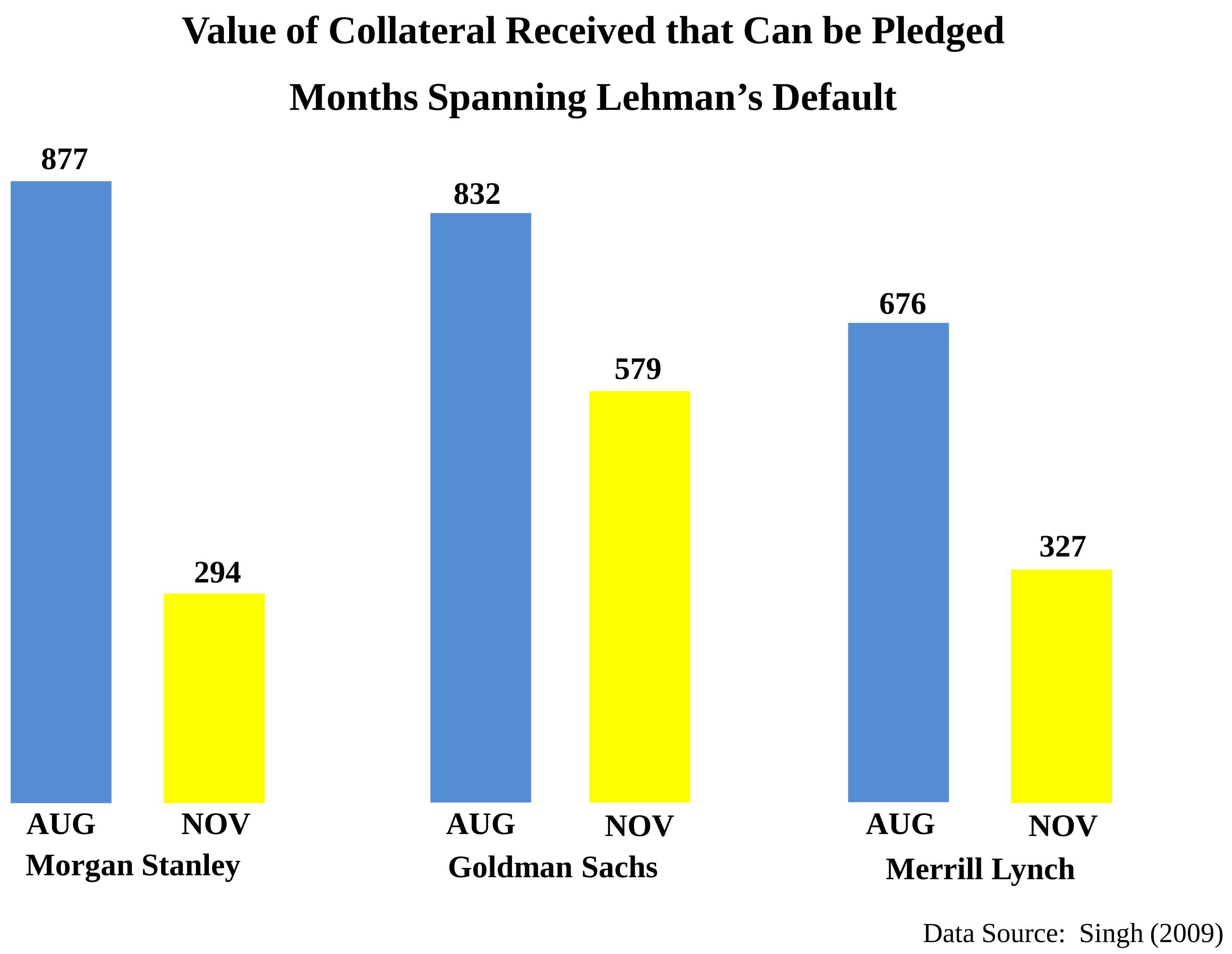
- The franchise values of some dealer banks depends heavily on prime brokerage. Flight by hedge fund clients discourages capital suppliers and drains cash.
- **London:** Client assets are commingled with the prime broker's assets, creating an incentive to run.
- **United States:**
  - Securities and Exchange Act of 1934, Rules 13c3-2 and 13c3-3: Client's assets and cash may or may not be segregated. *In aggregate*, free credit balances must be held in a reserve account.
  - Margin loans to clients are limited according to advance rates, by asset class. Example: Equities, 50%.
  - For each $100 margin loan, a prime broker may re-hypothecate client assets of up to $140.
  - The effect: Hedge fund clients may worsen a distressed prime broker's cash position, *whether or not they run*.

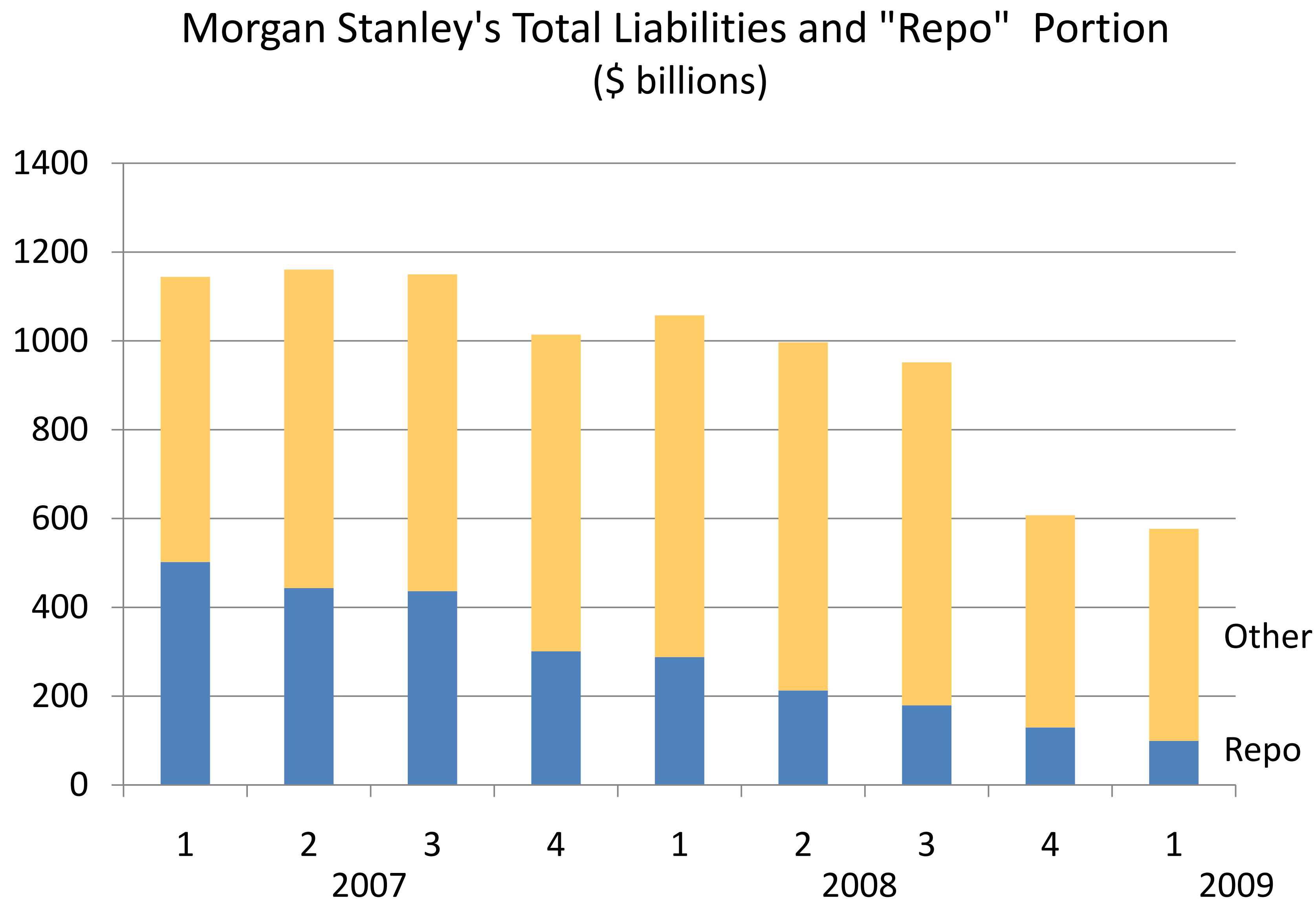
Value of Collateral Received that Can be Pledged

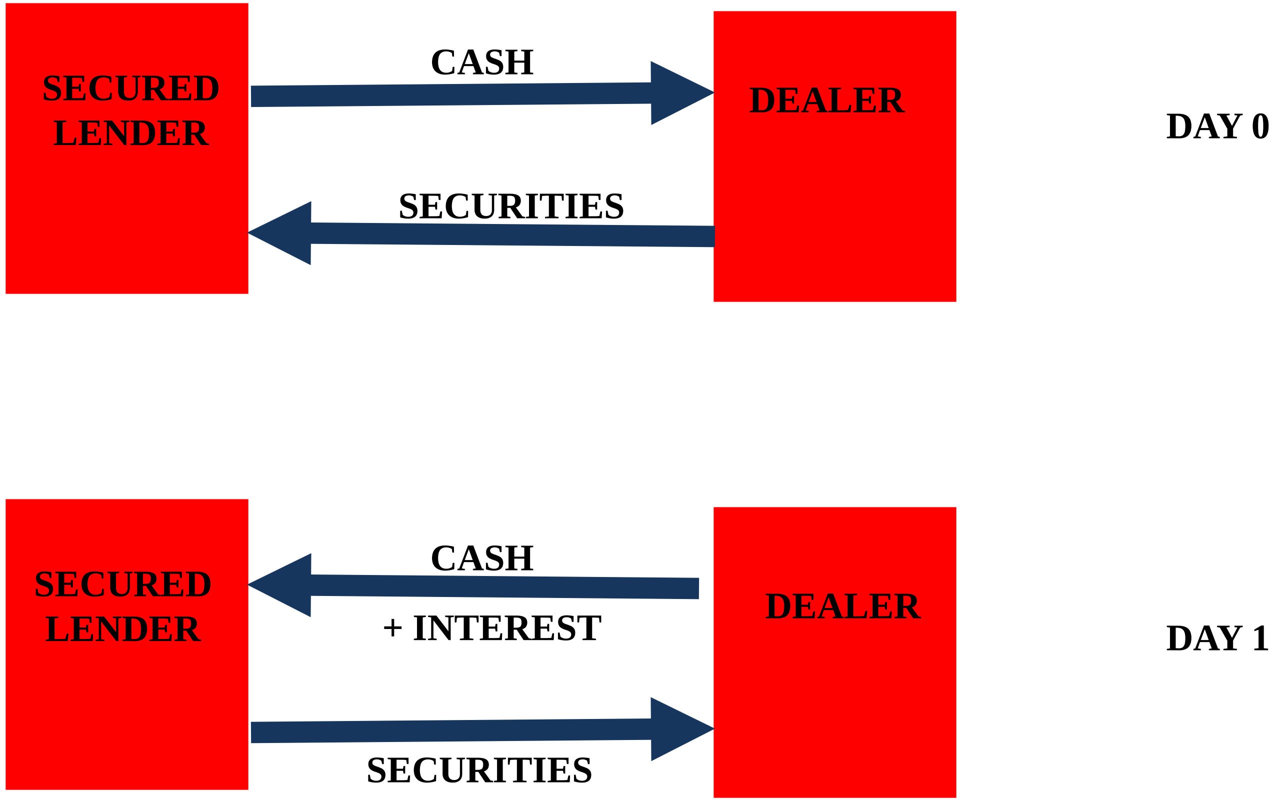
Morgan Stanley



Data Source: Singh (2009)

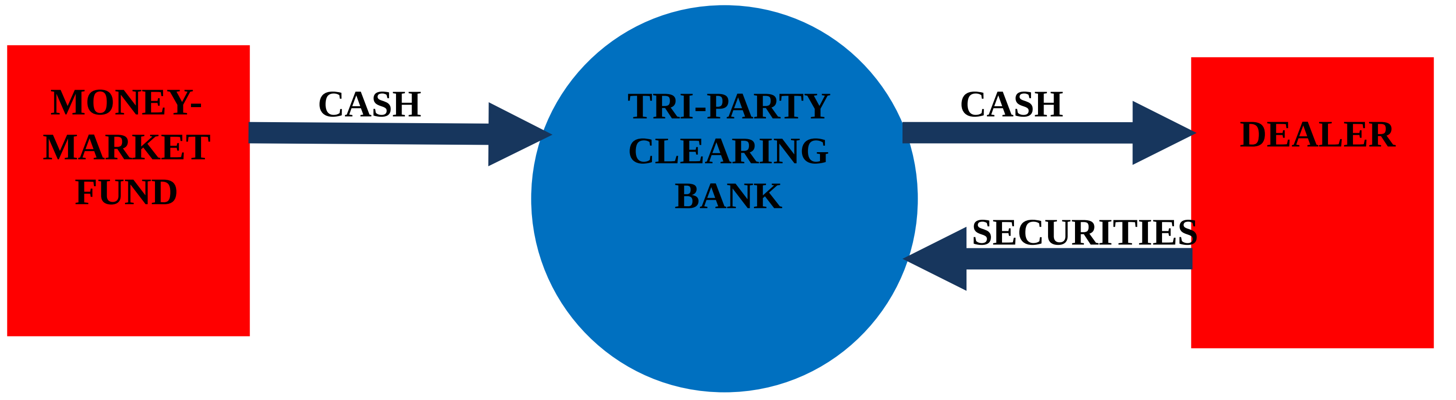

Value of Collateral Received that Can be Pledged
Months Spanning Lehman's Default
877
294
832
579
676
327
AUG
NOV
AUG
NOV
AUG
NOV
Morgan Stanley
Goldman Sachs
Merrill Lynch
Data Source: Singh (2009)

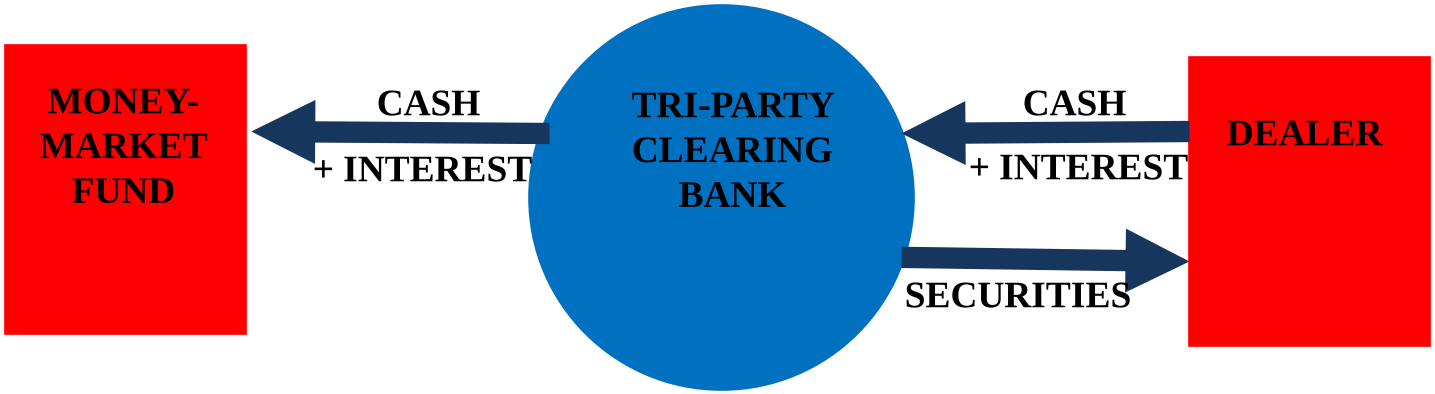

Morgan Stanley's Total Liabilities and "Repo" Portion
($ billions)
1400
1200
1000
800
600
400
200
0
Other
Repo
1
2
3
4
1
2
3
4
1
2007
2008
2009

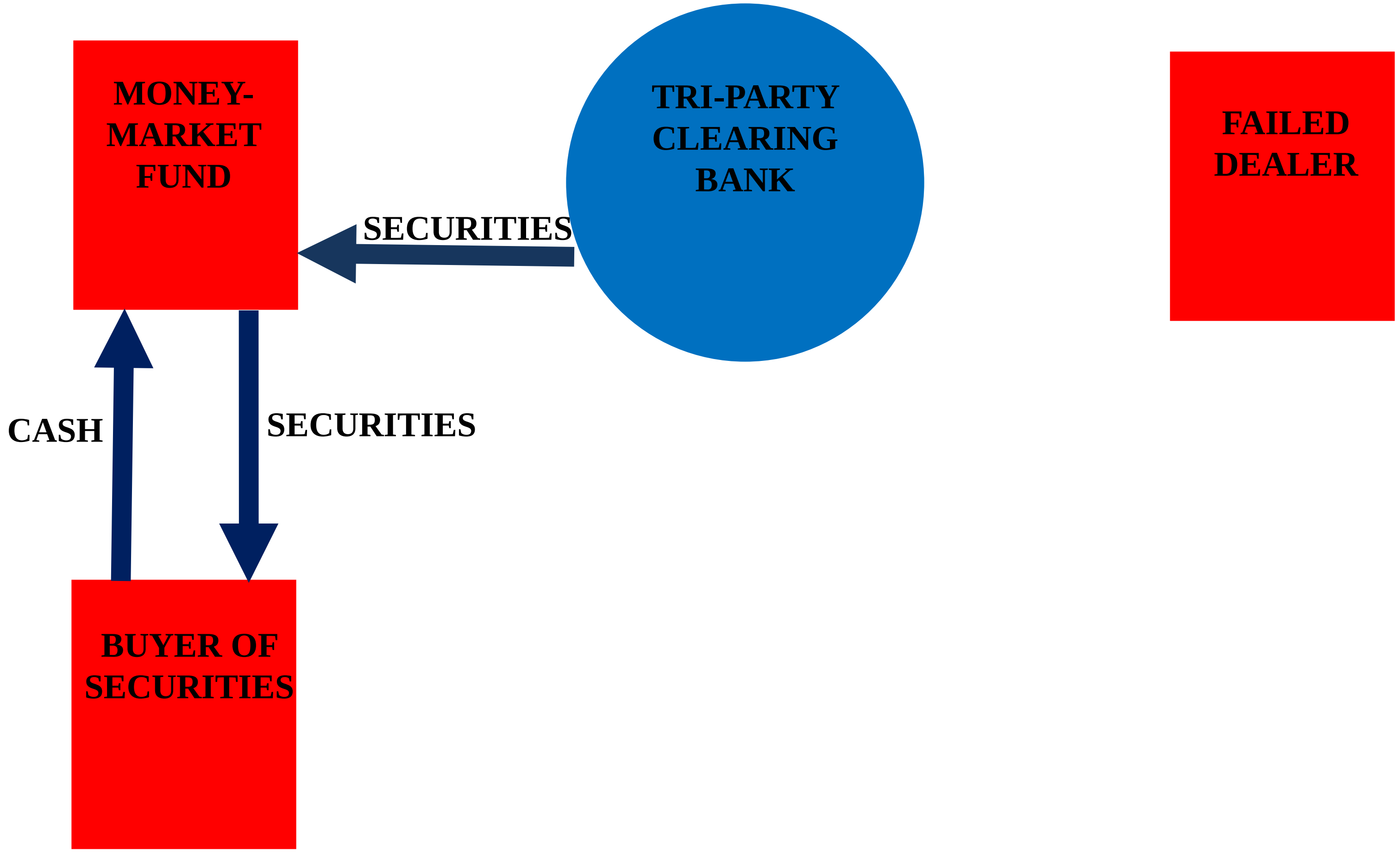

SECURED LENDER
CASH
DEALER
SECURITIES
DAY 0
SECURED LENDER
CASH
+ INTEREST
DEALER
SECURITIES
DAY 1

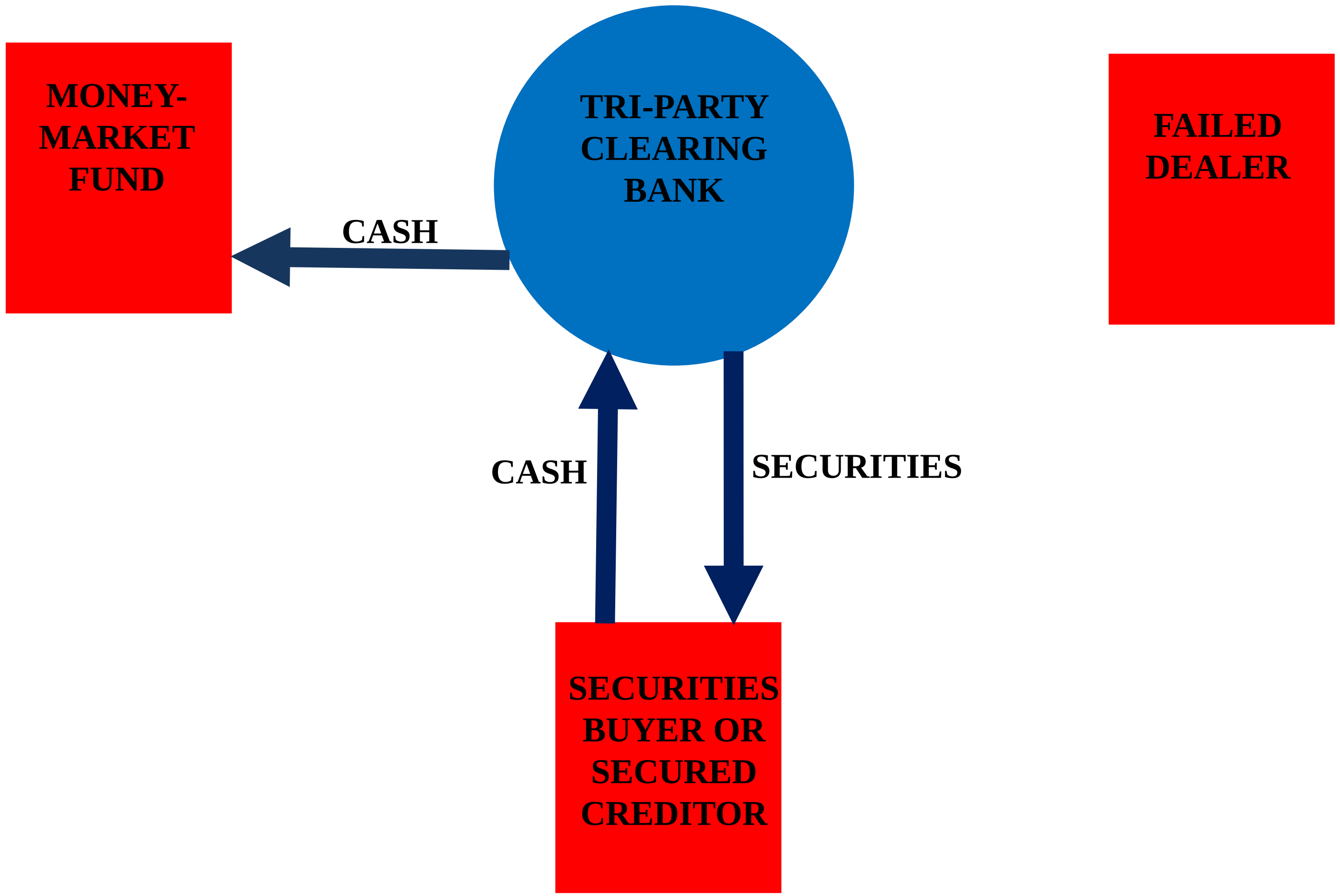
Repo Run

- Although secured by collateral, repo creditors have no good reason to renew their loans to a distressed dealer.
- Dealers usually rely heavily on overnight repo financing.
- Repo creditors can discriminate against a distressed dealer in terms of acceptable collateral, haircuts, and collateral valuations.
- Firesales or general market stress creates adverse feedbacks on haircuts and collateral valuations. (Brunnermeier-Pedersen).
- Tri-party repo:
  - Money-market-fund creditors are not permitted to hold many types of collateral, and are permitted to exit term repos on default.
  - Tri-party repo clearing banks (BONY-Mellon, JPMorgan-Chase) have discretion in rolling repos *and* other clearing services.


MONEY-MARKET FUND
CASH
TRI-PARTY CLEARING BANK
CASH
SECURITIES
DEALER


MONEY-
MARKET
FUND
CASH
+ INTEREST
TRI-PARTY
CLEARING
BANK
CASH
+ INTEREST
DEALER
SECURITIES


MONEY-MARKET FUND
TRI-PARTY CLEARING BANK
FAILED DEALER
SECURITIES
CASH
SECURITIES
BUYER OF SECURITIES


MONEY-
MARKET
FUND
CASH
TRI-PARTY
CLEARING
BANK
FAILED
DEALER
CASH
SECURITIES
SECURITIES
BUYER OR
SECURED
CREDITOR

Policy Implications

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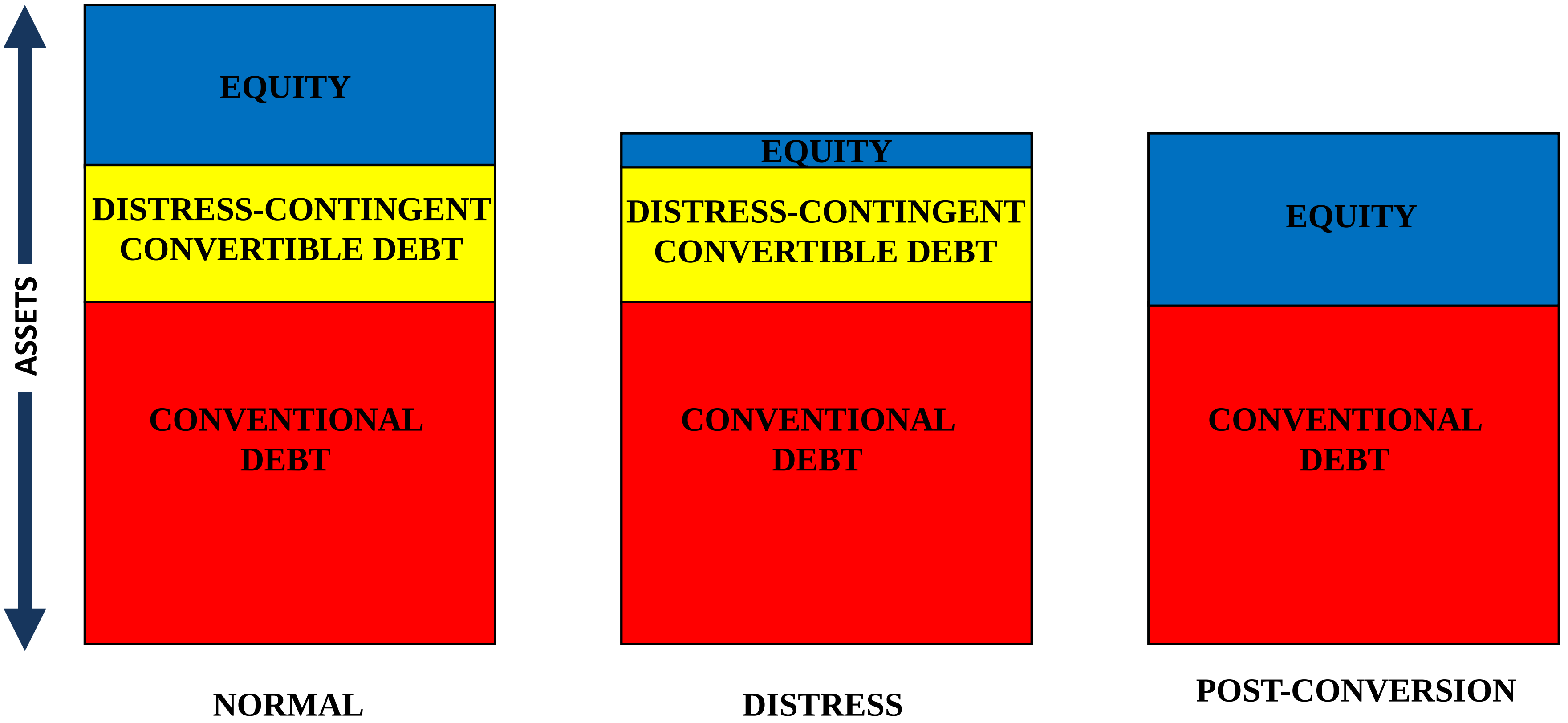
ASSETS
EQUITY
DISTRESS-CONTINGENT CONVERTIBLE DEBT
CONVENTIONAL DEBT
NORMAL
EQUITY
DISTRESS-CONTINGENT CONVERTIBLE DEBT
CONVENTIONAL DEBT
DISTRESS
EQUITY
CONVENTIONAL DEBT
POST-CONVERSION

Table: Quarter-end financing of broker-dealer financial instruments before the failures of Bear Stearns and Lehman (dollars, in billions) Source: King (2008).

	May-08 Morgan Stanley	May-08 Goldman Sachs	May-08 Lehman	June-08 Merrill Lynch	Feb-08 Bear Stearns
Financial instruments	390	411	269	289	141
pledged, repledgeable	140	37	43	27	23
pledged, not repledgeable	54	121	80	53	54
not pledged at all	196	253	146	208	64
Fraction pledged	50%	39%	46%	28%	55%