OTC Derivatives and Central Clearing

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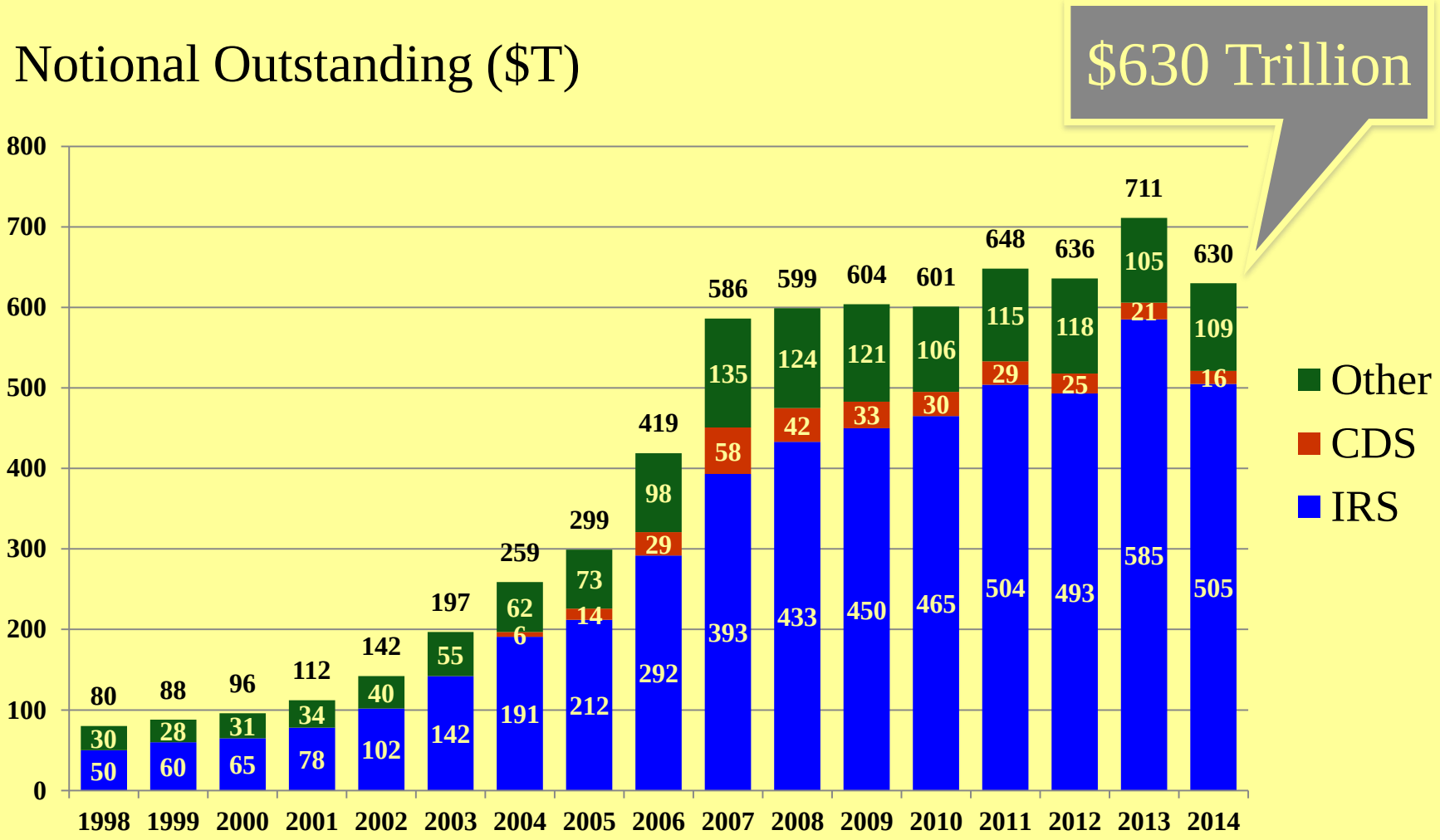
Roadmap

1. OTC Derivative Markets
2. Issues in Bilateral Markets
3. Derivatives in Bankruptcy
4. Key Features of Central Clearing (CCPs)
5. Stress in the System: The CCP Waterfall
6. Regulatory Issues in Central Clearing
7. Central Clearing in the U.S. Today
8. Other Issues

OTC Derivatives Markets

Growth in OTC Derivatives: 1998 - 2014

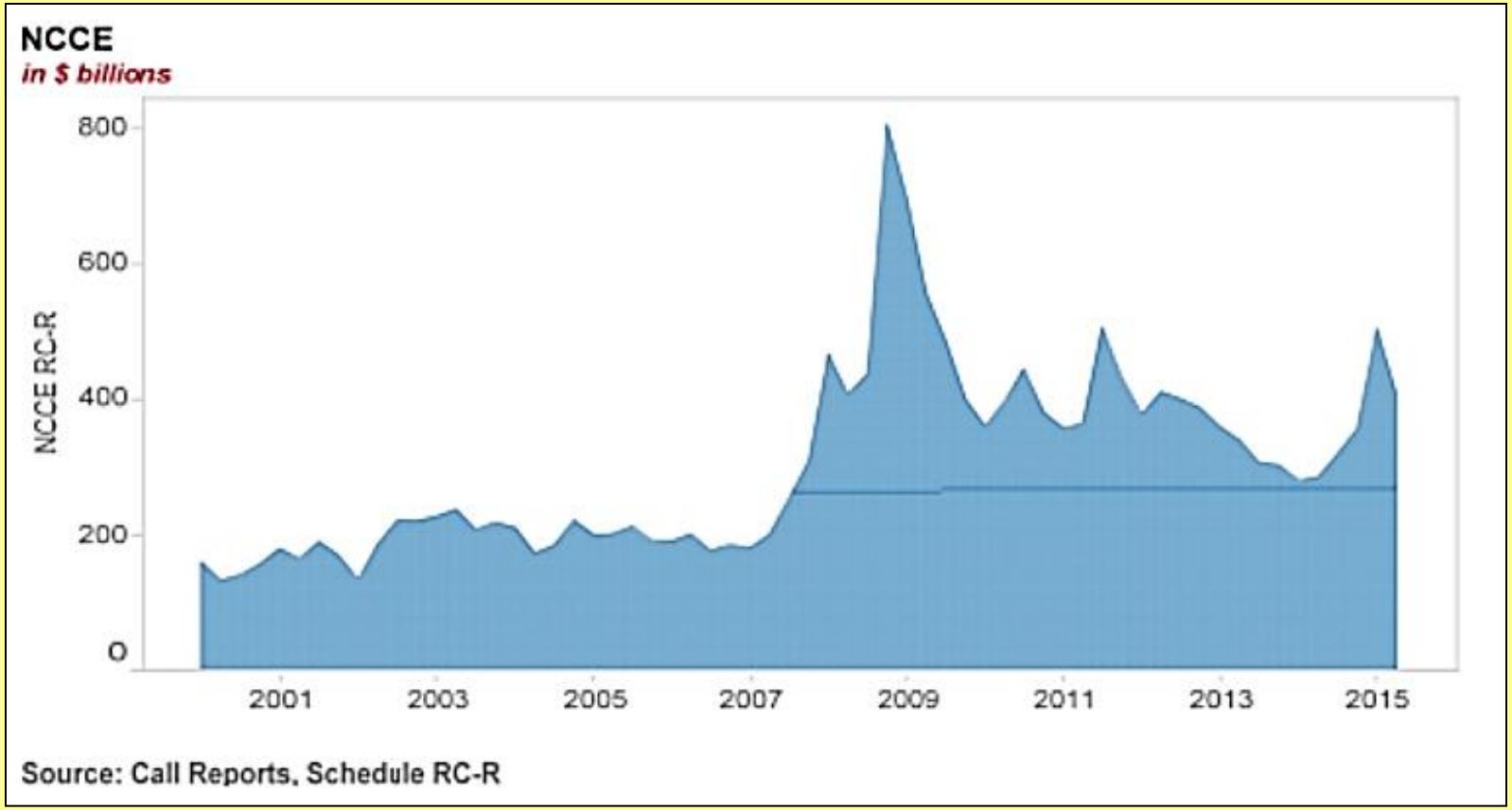


Source: BIS Derivative Statistics, www.bis.org/statistics/derstats.htm. Data through December 2014

OTC Derivatives Market, Dec 2014

$630.1T	Notional Outstanding
20.9T	Gross Market Value (GMV)
3.4T	GMV with netting
950B	GMV with netting and collateral

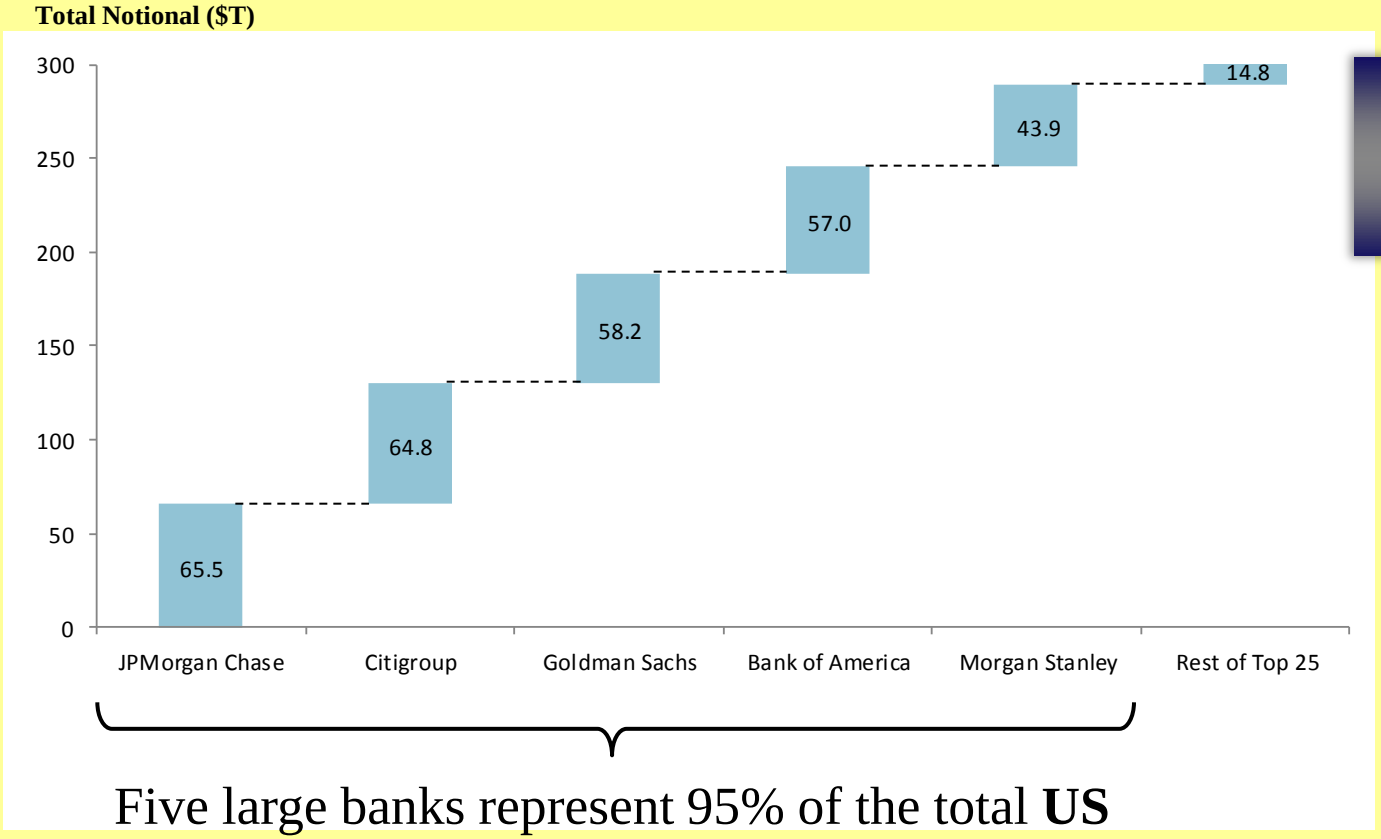
Net Current Credit Exposure (NCCE)
Q2 2015



Source: Office of the Comptroller of the Currency. OCC's Quarterly Report on Bank Trading and Derivatives Activities, Second Quarter 2015. *http://www.occ.gov/topics/capital-markets/financial-markets/trading/derivatives/dq215.pdf*

Concentration in the OTC Derivatives Markets

Notional Amount of Derivative Contracts – Top 25 Holdcos



100% = $304.2 trillion

Five large banks represent 95% of the total **US** banking industry notional amounts

Source: OCC Quarterly Report on Bank Trading and Derivatives Activities (Q3 2014), Data as of September 30, 2014

Reduction of Credit Risk in Derivatives Markets

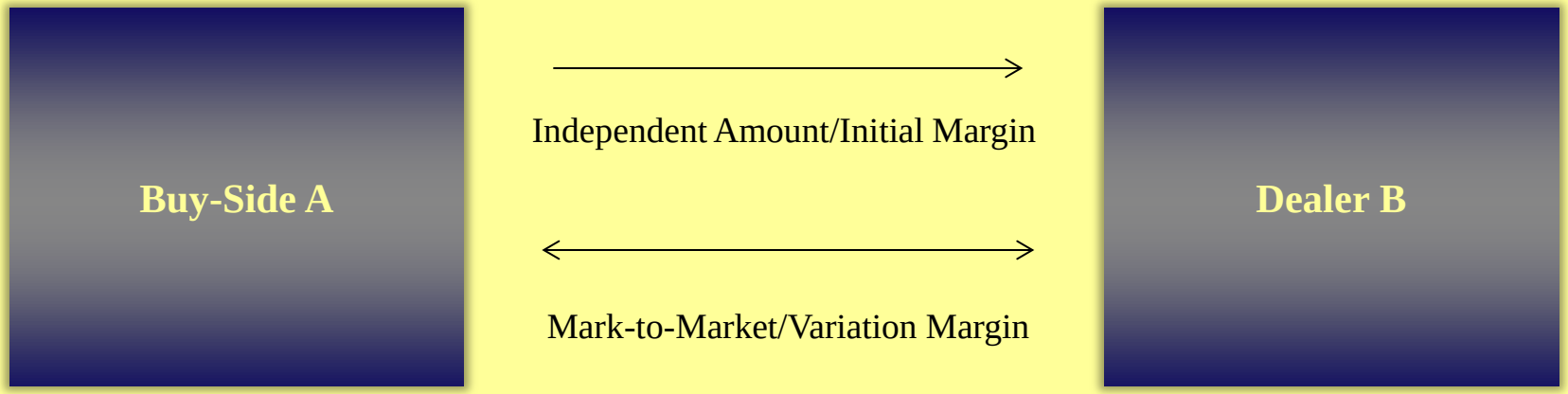
- **Credit rating** of counterparty
- **Initial Margin**: based on risk of replacing swap after a default (on bilaterals from counterparty to dealer, one-way)
- **Variation margin**: based on daily changes of value of swaps, given to in-money party (for whom default means losses) by out-of money party
- **Netting** of offsetting positions

Issues in Bilateral Markets

Issues in Bilateral Markets

- Assessing credit risk is important but difficult (diversification)
- Margins are not concentration-risk adjusted
- Novation (replacing a party) on contracts is complicated, contract specific, delayed and causes uncertainty
- Accessibility of segregated collateral and rehypothecation
- Dealer to Buy-Side Transactions
  - Margin Asymmetry: buy-side posts margin to Dealer, not vice versa
  - Inconsistent collection of collateral
- Dealer to Dealer Transactions: no initial margins collected

Bilateral Collateral Flows – Dealer to Buyside



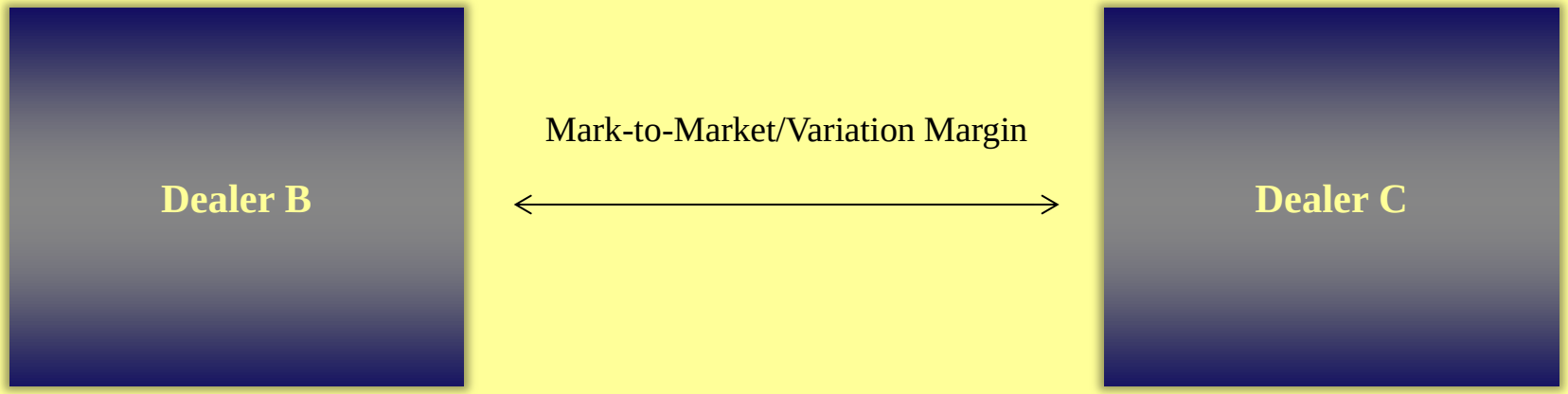
- Margin Asymmetry: Buy-side posts initial margin to, but does not receive initial margin from, Dealer B
- Initial margin posted to Dealer B is not protected from Dealer B's bankruptcy

Buy-side initial margin used as Dealer B working capital

Inconsistent collection and magnitude of buy-side initial margin

No regulatory capital reduction for collecting buy-side initial margin

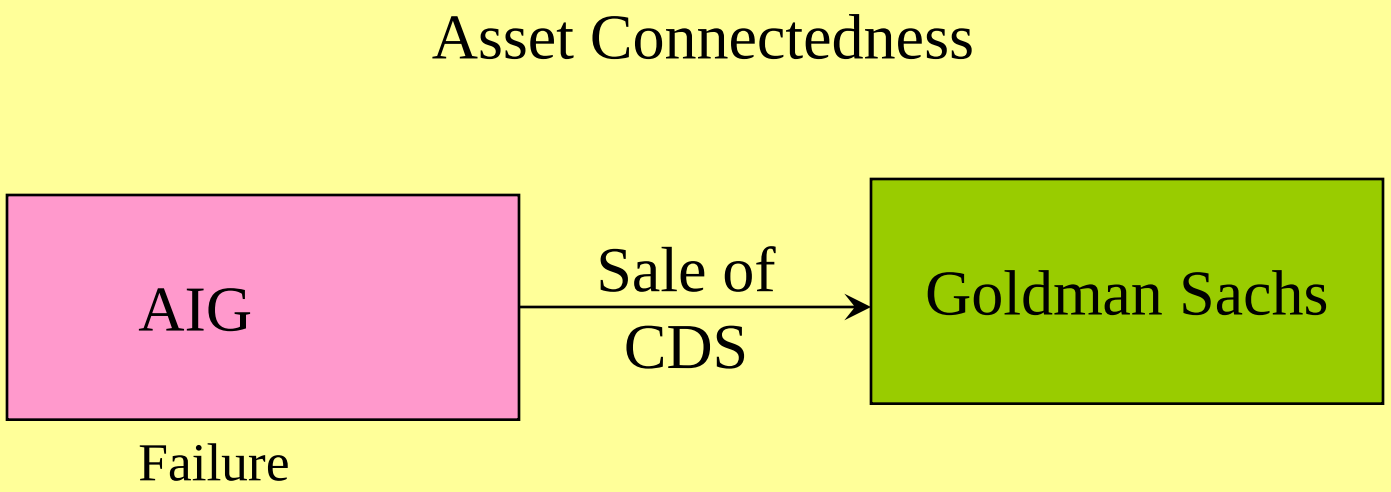
Bilateral Collateral Flows – Dealer to Dealer



- No initial margin posted to Dealer C
- No regulatory capital penalty for not collecting initial margin from Dealer C

- No initial margin posted to Dealer B
- No regulatory capital penalty for not collecting initial margin from Dealer B

Connectedness and Systemic Risk

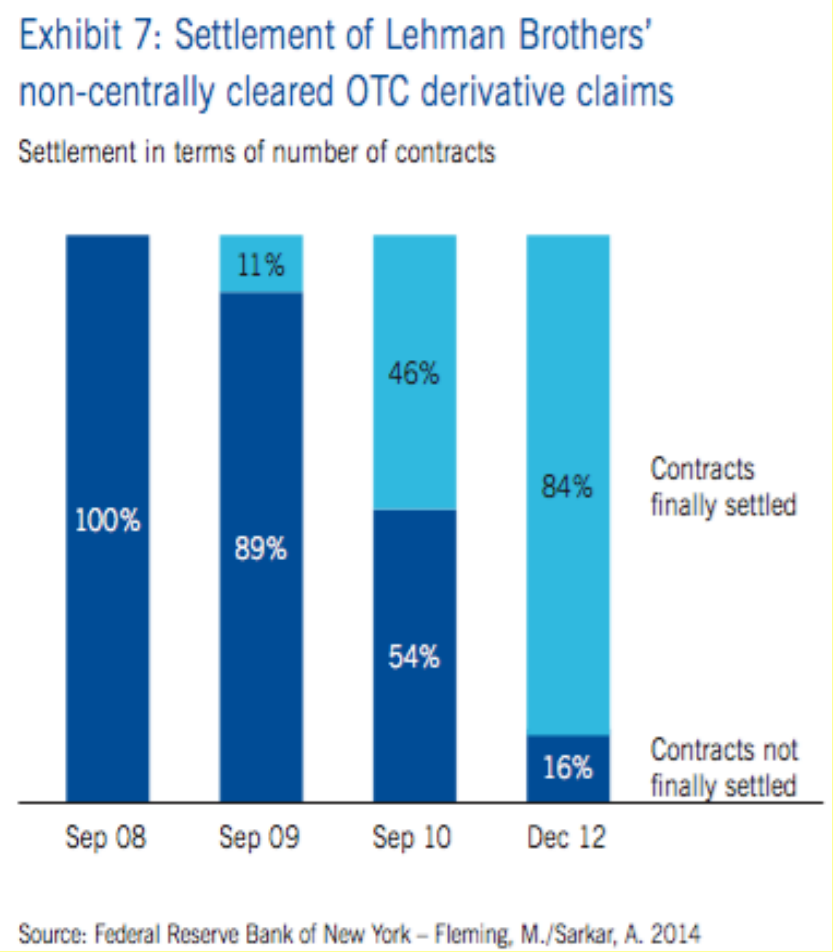


Connectedness: Lehman's Derivative Portfolio

- Overall in the money (GMV): $46.3B in assets and $24.2B in liabilities [notional $3.65 - $5 trillion]
- Total claims brought by counterparties estimated at $44 billion reduced to $28 billion
- No real connectedness problem on Lehman's own portfolio

Connectedness Issue: Lehman's Derivative Portfolio

- While the overall net market exposure may have been limited…
- Counterparties faced uncertainty throughout the process of legal resolution



AIG: Maximum Losses on Multi-Sector CDS Relative to Equity (*$ billions)*

Firm	Exposure to Maiden Lane III Portfolio	Collateral Posted Prior to Bailout	Max. Possible Loss	Shareholders' Equity (Q2 2008)	Max. Possible Loss as % of Shareholders' Equity
Société Générale	$16.5	$5.5	$11.0	$56.1	**19.6%**
Goldman Sachs	14.0	5.9	8.1	44.8	**18.1%**
Deutsche Bank	8.5	3.1	5.4	50.3	**10.7%**
Merrill Lynch	6.2	1.3	4.9	42.2	**11.6%**
Calyon	4.3	2.0	2.3	56.9	**4.0%**
UBS	3.8	0.5	3.3	42.2	**7.8%**
Ten other banks	8.8	0.2	8.6		
Total	$62.1	$18.5	$43.6		

Derivatives in Bankruptcy

Privileged Bankruptcy Position of Swaps

- Counterparties **exempt from bankruptcy automatic stay**
  - can immediately seize and sell collateral
  - need not return eve of bankruptcy preferential payments
  - they become unsecured creditors for any shortfalls
- But, actions are **forestalled for 24** hours in bank or OLA bankruptcies handled by the FDIC
  - concern with contagion effect of fire sales;
  - time allows sale of book to third party of recapitalization of "good" financials institution
  - ISDA Resolution Stay Protocol of November 4, 2014: no termination or cross-default rights will be asserted for 48 hours—gives more time
  - 18 largest global dealers signed (foreign banks not covered by US law)
  - Applies to proceedings in certain specified countries, including US / UK
- Efforts underway to have more global agreement on this
- These procedures in effect give derivatives counterparties senior creditor priority—is this good?

Calculating Claims in Bankruptcy

- **Netting**: allows netting across counterparties portfolio and protects from "cherry picking"
  - Applies in the U.S.; jurisdictional variations in netting causes uncertainty

- The amount owed to a non-defaulting party =

  [1] net value of the position (degree to which in the money) plus

  [2] any unpaid amounts on CDS premiums minus

  [3] posted collateral.

- To the extent a claimant is owed more than the value of collateral, he becomes an unsecured creditor of the bankrupt

Calculating Claims in Bankruptcy

- Key issue is valuation of position, three different ISDA methods:
  1. **Market Quotation** determines through three reference market makers;
  2. **Loss Method** requires "an amount that party reasonably determines in good faith to be its total losses;"
  3. **Close Out Amount**, costs "realized under then prevailing circumstance in replacing [] or in providing…the economic equivalent of the terminated trades."

- **Replacement cost is different than fair market value** (FMV) due to the dealer spread.
  - That is, the person seeking replacement must pay more than FMV when he buys replacement protection and receive an amount below the fair market value when he sells replacement protection. Given market conditions, spreads on CDS's were quite high following Lehman

Key Features of Central Clearing

OTC Cleared Structure versus Bilateral

Evolving Structure of Market - Cleared

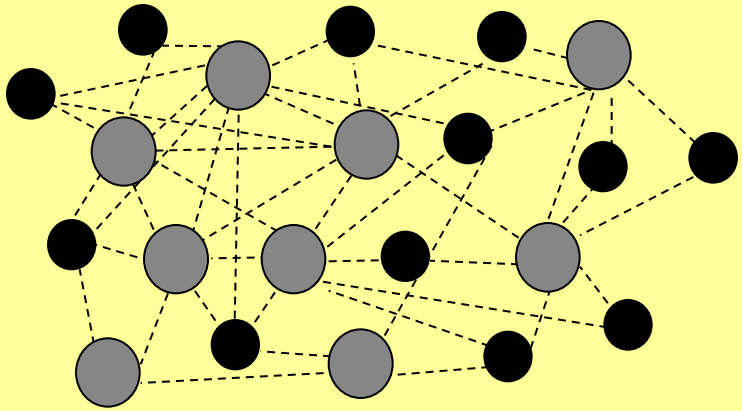
= Dealer
(Cleared: clearing member, direct clearing participant)

= Buy-side
(Cleared: customer, indirect clearing participant)

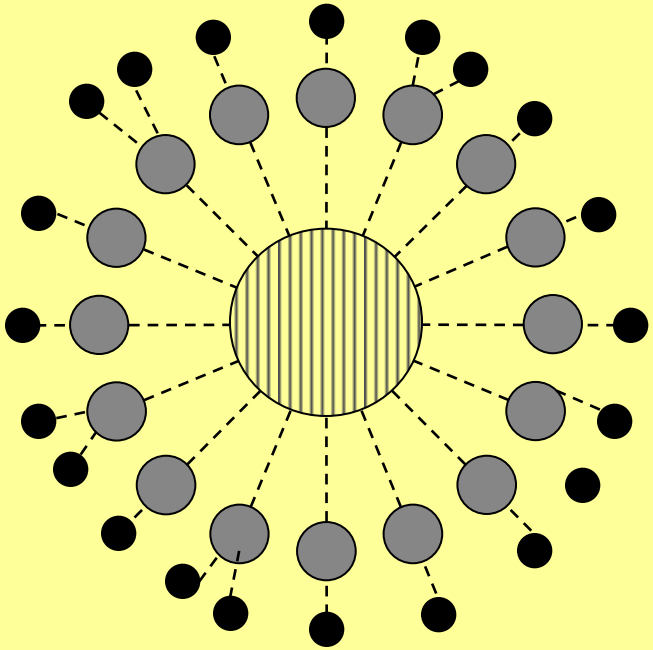
= Clearinghouse

---- = Trade

Bilateral Non-Cleared

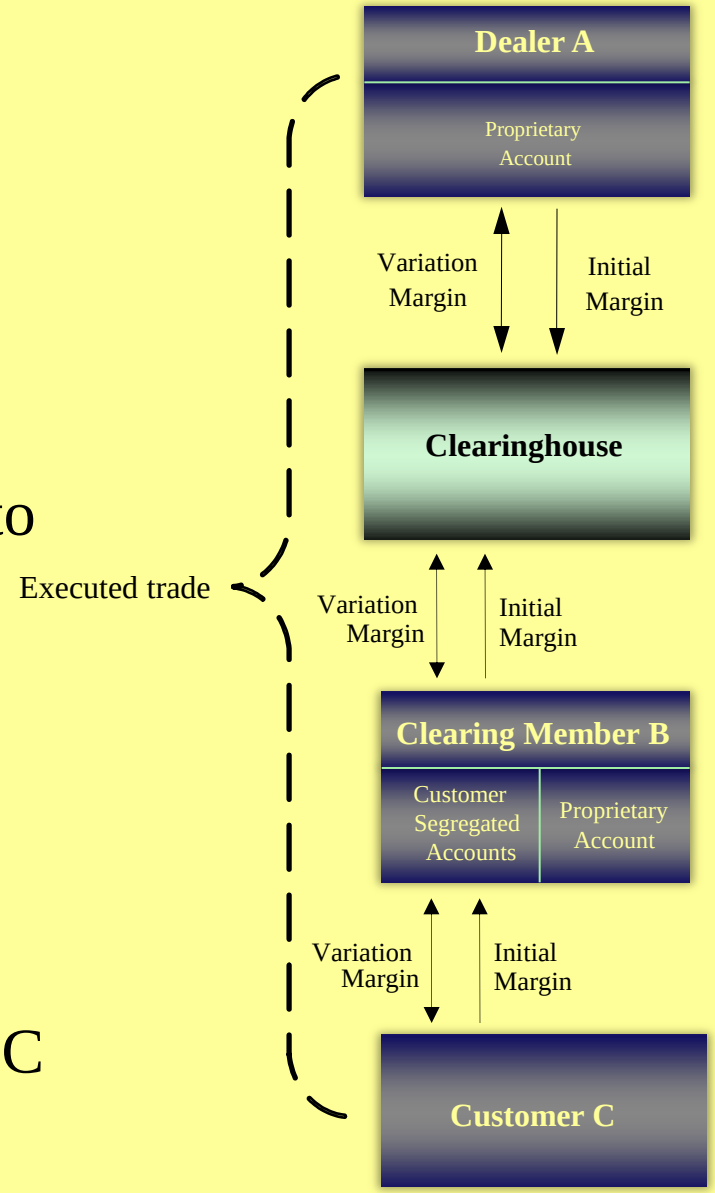


Cleared



Margin & Collateral: The Cleared Model

- Clearinghouses as legal counterparties to their transactions
- Dealer A and Customer C enter into a CDS transaction
- C and A agree to clear through Clearinghouse
- The CDS transaction is cleared by Clearing Member B for Customer C



Key Features and Benefits of Good Clearing

Segregation	➢ Isolates investor positions and margin from the insolvency of dealer clearing member (CM); eliminates key contributor to "too interconnected to fail"
Portability	➢ Allows prompt movement of segregated positions and margin of investor from one CM to another, including from a defaulting CM to a solvent one
Natural Compression	➢ Instantaneous netting of offsetting cleared contracts reduces net exposures
Price Transparency	➢ Publication of end-of-day prices by the clearinghouse provides more accurate risk assessment than in current bilateral market and allows bid-offer spread competition
Straight-Through-Processing	➢ Eliminates bilateral exposure of buyside participant to its executing counterparty and ensures that all exposures are immediately only to the clearinghouse, not to a dealer ➢ Eliminates "balance sheet" advantage of large dealers that are perceived to be "too big to fail"
No Barriers to Competition	➢ Objective, risk-based criteria for direct clearing access and protection of anonymity ➢ Enables open access for all participants, competition in liquidity provision, and unhindered opportunity for investors to secure best execution
Electronic Trading	➢ STP clearing models support electronic trading for products with sufficient liquidity ➢ Allows rapid adjustment of risk positions, including providing a pool of liquidity for risk management in times of market stress

The Mutualization of Losses and Risk Management

Mutualization of risk creates an incentive scheme for clearinghouse managers and owners

In bilateral trades, a counterparty's risk is important. If a counterparty defaults, the loss is entirely born by the non-defaulting party.

•Monitoring has benefits, but it's difficult

•Players diversify risk by spreading out portfolio across dealers

•Which increases interconnectedness

In a cleared system, credit risk to original party is irrelevant, so no incentive to monitor.

•Instead, the monitoring role is transferred to the CCP and CCP-members.

•The CCP uses margin requirements and concentration risk premiums.

•The larger the scale of a dealer's exposure, the more risk it poses to fellow members.

•Members are **incentivized to improve CCPs risk management practices** because all members are subject to losses.

Downsides of a Cleared System

- Since central clearing is limited to certain asset classes, it does not permit netting across all asset classes
  - Can be achieved in a bilateral system

- Dealers will lose initial margin as source of funding
  - Assets will go to CCPs
  - Estimated $5 trillion

Stress in the System: The CCP Waterfall

CCP Default Management and Mutualization

1. Seizes positions of defaulting participant,
    1. transfers customer positions, which are kept segregated, to solvent clearing members (usually by auction) to insure clearinghouse has a matched book
2. Covers losses: taps into the waterfall

First Resources: defaulting participant's margin, guaranty fund deposits, shares in the clearinghouse, and any parent guarantee

If insufficient …

(Cover 2 Standard)

Additional Resources:
1.Clearinghouse's own capital (should be higher TLAC?)
2.Clearing members' guaranty fund pool
3.Assessment from all clearing members

- (endanger member solvency, connectedness still there)

3. CCP resolution procedures, central bank liquidity support, and possibly bail-out since really too-important-to-fail

The Risk of Central Clearing

- Heavily Concentrated Risk
- Resolution Plans – Great in Theory…
  - FSB September 2015 Progress Report finds "resolution frameworks for CCPs are not well developed…[and] not yet in place for any of the largest CCPs"
- Unlimited Calls on Capital may re-create connectedness issue by placing stress on members

Source: For quotation, see FSB Progress Report on the CCP Workplan, September 22, 2015

BlackRock's CCP Recommendations (April 2014)

- End investors should be protected from a CCP failure
- CCPs should be subject to uniform stress testing
- More transparency on risk management policies
- Mandatory clearing should not be required until two CCPs offer clearing in same swap, facilitates customers moving their positions to a still solvent CCP
- More capital of CCP, put in 8-12% of a pre-funded guaranty fund
- CCPs should be allowed to fail and have adequate ex-ante liquidation procedures

Regulatory Issues in Central Clearing

Historical Examples

Exhibit 8: Lessons learned from FMI defaults in centrally cleared markets

Case study	Country and year	Reason for default	Learnings and today's mitigation mechanism
Hong Kong Futures Exchange	Hong Kong, 1987	▪ Flawed governance structure: no incentive for adquate risk management ▪ Insufficient margin and default fund requirements	▪ "skin-in-the-game": equity before loss mutualisation ▪ State-of-the-art margining algorithms ▪ Regular stress testing of default fund
Caisse de Liquidation	France, 1974	▪ Unauthorised trading by clearing members ▪ Insufficient margin requirements	▪ Adequate regulation and audits of clearing members ▪ State-of-the-art margining algorithms ▪ Need for recovery and resolution plans
Kuala Lumpur Commodity Clearing House	Malaysia, 1983	▪ Accumulation of uncovered selling positions by one trader ▪ Management's inaction: lack of coordination with regulator and a FMI	▪ State-of-the-art risk management ▪ Rules regarding qualification of management ▪ Include market concentration measure in margin calculation
National Spot Exchange	India, 2013	▪ Insufficient or missing commodities collateral as advertised: fraud ▪ No physical backing of commodities required ▪ Entering derivative contracts despite prohibition of regulator	▪ Regular audits ▪ Need for membership criteria ▪ State-of-the-art risk management

■ Issues in governance and incentives ■ Issues in risk management ■ Issues in operations

Source: Davison, I.H. 1988, Norman, P. 2011, Government of India – Forward Markets Commission 2013

Basel III Bank Capital Requirements for Swaps

- Must stress test positive exposure—expected in the money position since counterparty risk may be positively correlated with market risk—the more you are in the money, the more likely counterparty default may be
- Calculate capital needed to cover counterparty exposure based on default probabilities of counterparty bonds at a 99.9% confidence level
- More capital for higher asset correlations on swap portfolio (take diversification into account)
- Longer horizon on close-out exposure (time needed to take new position to replace old one or to terminate exposure by hedging)
- Bigger haircuts when use securitized collateral (usually collateral is cash)—amount of capital generally depends on adequacy of collateral
- Require adequate collateral management—amounts and management
- Less capital (2% risk weight) for exposures to central counterparties than on bilateral swaps: incentive to centrally clear
- Risk-weighting for funds at clearinghouse, minimum 20% (down from 1250% in original proposal!)

Non-Cleared Swaps Capital Requirements

The Goal: non-cleared swap margin requirements 1) improve market resilience and 2) encourage use of CCPs

Status of Implementation:

- In the US, the CFTC and SEC have proposed margin requirements for non-cleared swaps.
  - If approved, will phase-in September 2016

- In Europe, ESMA expects to adopt rules by end of 2015, with implementation in late 2016

- Basel Committee/IOSCO push back start date from December 2015 to September 2016 at urging of ISDA

Uncleared Swaps Margin Rules, CFTC and Prudential Regulators Proposal September 2014

	Uncleared	Cleared
Scope	All swap entities 1. Swap Dealers 2. Material exposure (>$3B) 3. (FX Exempt)	Mandated by Product 1. IRS 2. Credit Index
Initial Margin	Two Way (cash or approved securities)	Posted to CCP
Variation Margin	Two Way (cash)	Posted to CCP
Calculation of Margin	Standard Tables or Approved Models	Regulated rules
Rehypothecation	Initial margin to be segregated No rehypothecation permitted Held by custodian	Segregated accounts

Central Clearing in the U.S. Today

What Derivatives Are Centrally Cleared

- Mandatory Clearing in the US for:
  1. Interest rate swaps (USD, EUR, GBP, and JPY)
     - Fixed vs. Floating IRS
     - Basis Swaps
     - Forward Rate Agreements
     - Overnight Indexed Swaps
  2. Credit Default Swap Indexes

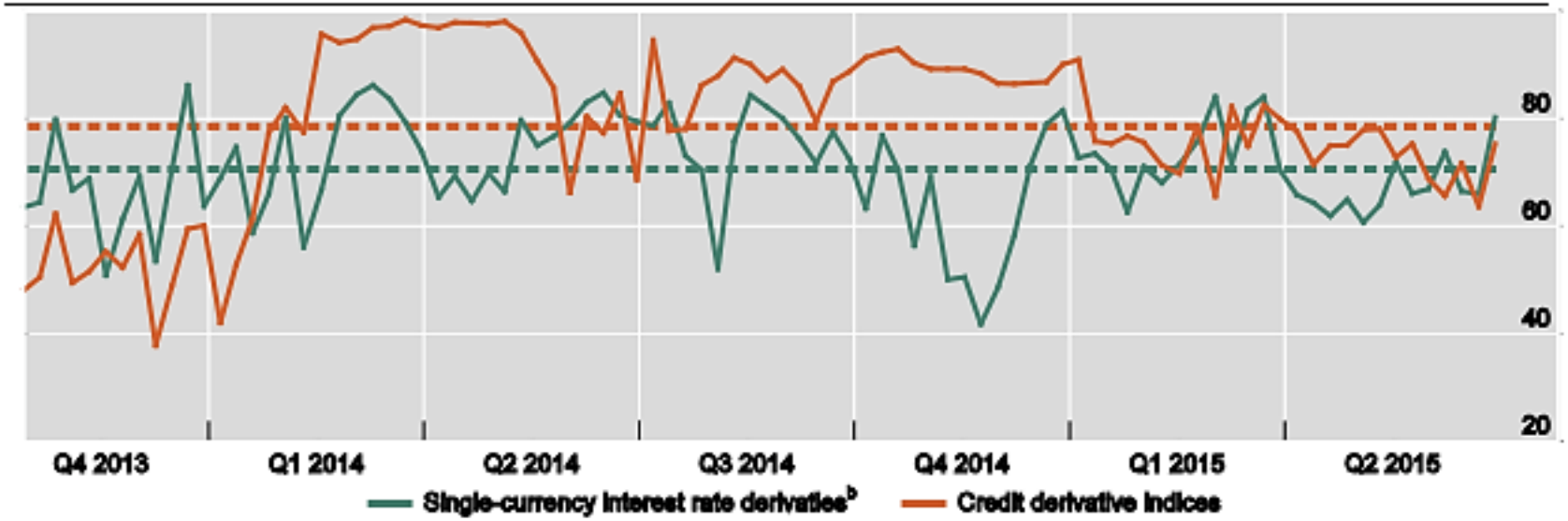
- Clearing available but not mandatory for
  - Commodity
  - Equity
  - FX

- End-users are excluded

What Derivatives Are Centrally Cleared

Central Clearing of New OTC Derivatives Transactions in the US

Centrally cleared trades as percentage of weekly aggregate transaction volume[a]



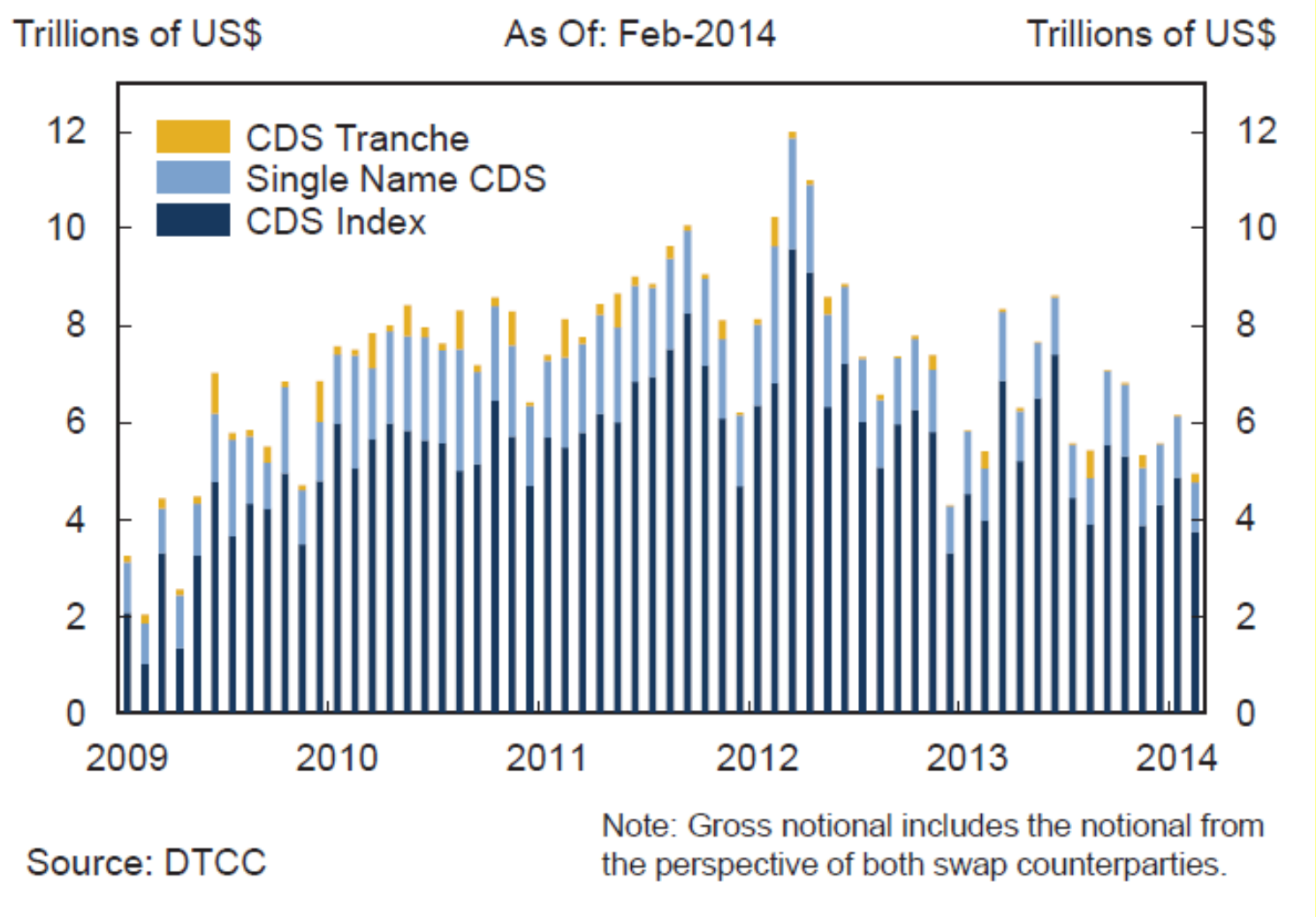
Dotted line indicates average from October 2013 to June 2015.

[a] Transactions reported to CME Group SDR, DTCC Data Repository and ICE Trade Vault in accordance with CFTC trade reporting rules. Amounts cleared include both transactions subject to CFTC mandatory clearing requirements and those cleared voluntarily. [b] Excludes cross-currency transactions.

Source: CFTC.

Source: FSB OTC Derivatives Market Reform, *Ninth Progress Report on Implementation.* July 24, 2015.

Credit Derivatives Outstanding

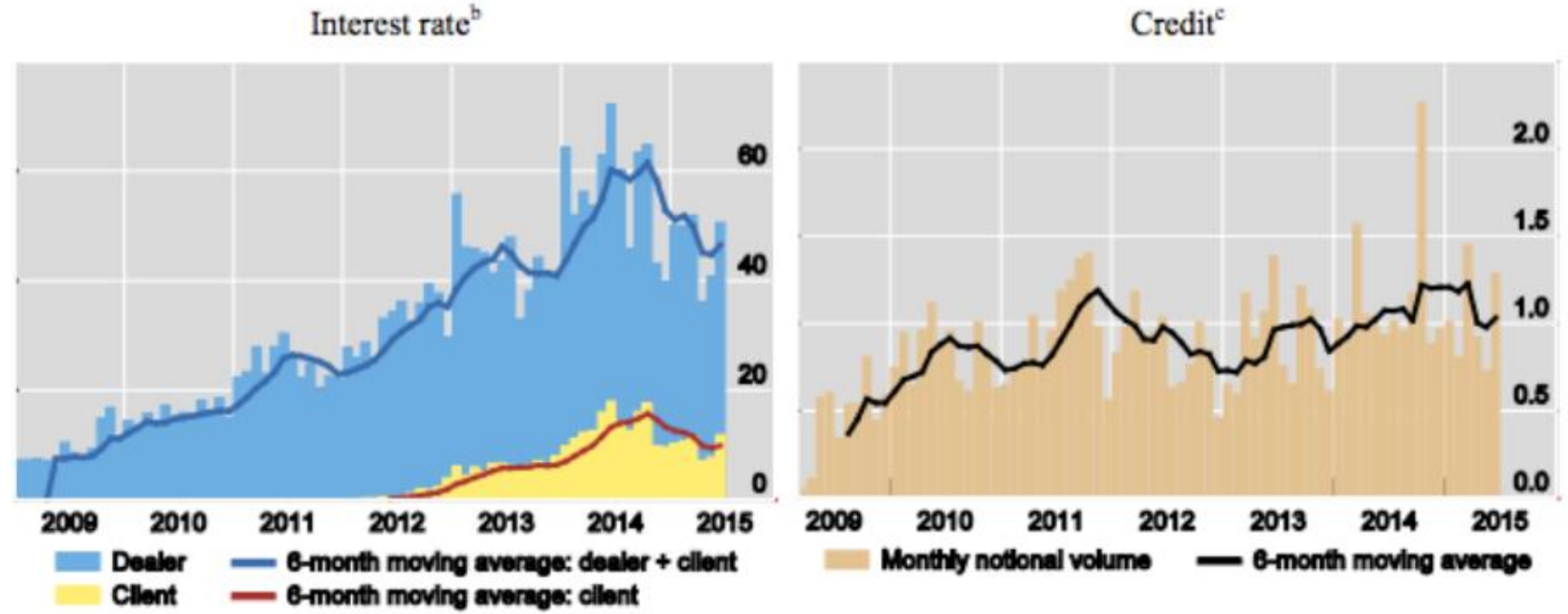


Source: "2014 Annual Report," Financial Stability Oversight Council (FSOC), Chart 5.6,2, p.87
http://www.treasury.gov/initiatives/fsoc/Documents/FSOC%202014%20Annual%20Report.pdf

Growth of Central Clearing Volumes

Central Clearing Volumes in OTC Derivatives for Selected EU and US CCPs

Monthly notional amounts[a], USD trillions

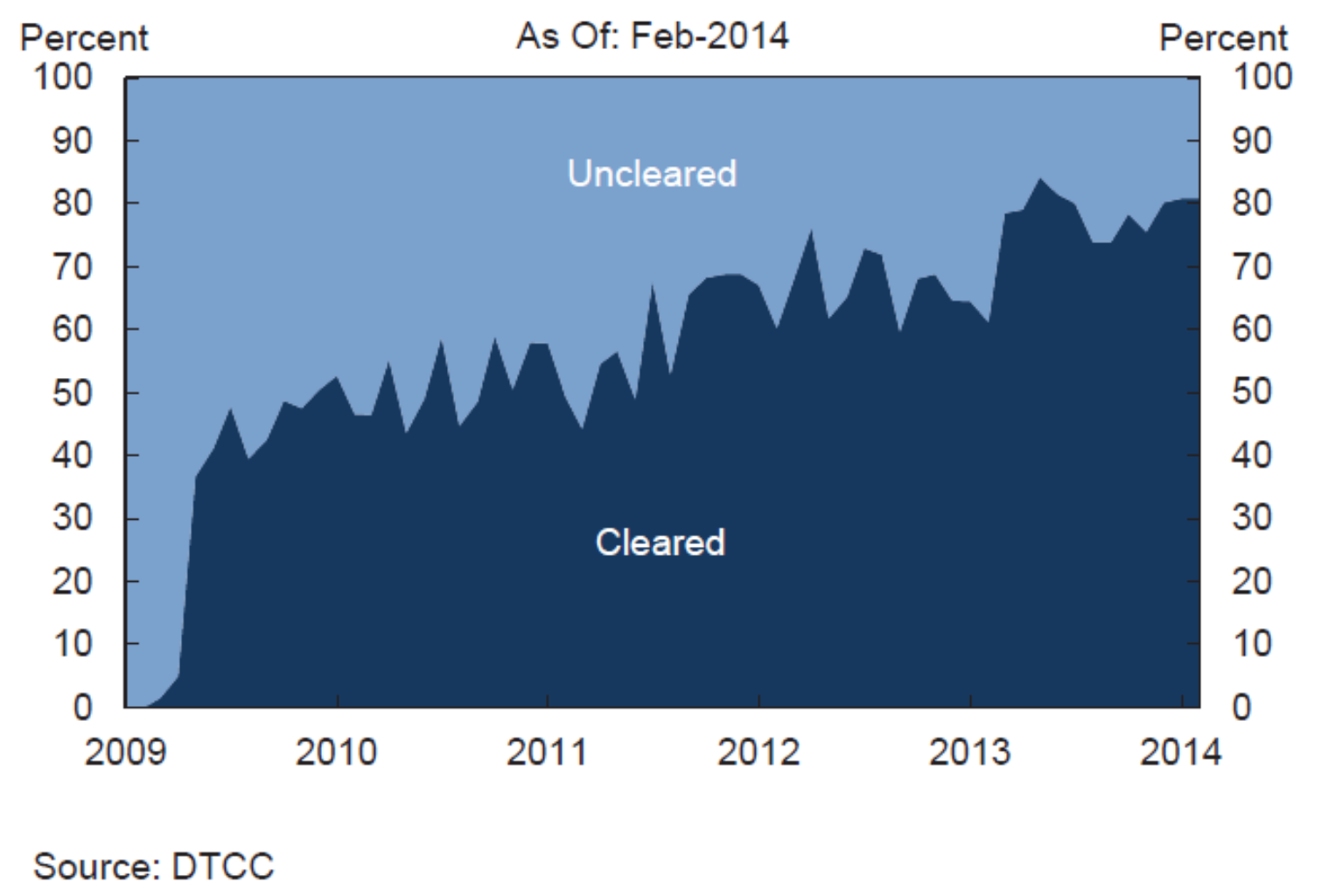


[a] Newly cleared transactions, gross of subsequent netting or compression. [b] All OTC interest rate derivative transactions cleared by CME Clearing and LCH.Clearnet Ltd (SwapClear); assumes all CME Clearing figures are buy-side transactions. [c] All credit derivative transactions cleared by ICE Clear Credit and ICE Clear Europe; all counterparty types.

Sources: CME Group; ICE Clear, LCH.Clearnet.

Source: FSB OTC Derivatives Market Reform, *Ninth Progress Report on Implementation.* July 24, 2015.

Growth of Central Clearing: Credit Derivatives



Source: "2014 Annual Report," Financial Stability Oversight Council (FSOC), Chart 5.6,3, p.89
http://www.treasury.gov/initiatives/fsoc/Documents/FSOC%202014%20Annual%20Report.pdf

Other Issues in Designing a System

1. Who will regulate them?
    - In U.S., CFTC, SEC and Fed
    - In E.U., ESMA (plus individual country regulators)
    - In England, FSA (Financial Conduct Authority)
2. How many clearing houses? Numerous in the U.S.
    - CCIL; Chicago Mercantile Exchange, Inc.; Clearing Corporation; ICE Clear Credit LLC; ICE Clear Europe Limited; ICE Clear US, Inc.; LCH.Clearnet LLC; LCH.Clearnet Ltd.; LCH.Clearnet SA; Natural Gas Exchange; North American Derivatives Exchange, Inc.; Options Clearing Corporation; SGX Derivatives Clearing Limited
3. Standards for membership
    - Minimum capital
    - Exclusion of corporate clients with limited net exposure
    - Clearing Corporation; SGX Derivatives Clearing Limited
4. Provision of LLR (U.S. provides) and nee for Bailout if all else fails
5. Clashes between jurisdictions: principal central clearing venues, US and EU

Issue	E.U. Approach	U.S. Approach
Exchange Trading	• Will apply new rules to all derivatives exchanges, including swaps, futures and options. • Cleared swaps not necessarily subject to exchange trading requirement.	• New regime only applies to swaps, so different rules apply to futures/options exchanges. • All cleared swaps must be exchange traded.
Transparency (Data Reporting)	• Reporting requirements apply to all derivatives, including swaps, futures and options. • Swaps must be reported no later than one day after execution.	• Reporting requirements apply only to swaps. • All swaps subject to real-time reporting requirements.
Clearing Requirements	• Minimum of 2- days of margin for standardized interest rate swaps and CDS • Minimum of 2-days of margin for futures	• Minimum of 5-days of margin for standardized interest rate swaps and CDS • Minimum of 1 day of margin for futures
FX Swaps	• Subject to clearing and margin requirements.	• Exempt from all requirements, including margin and clearing.
Categories of Swaps Entities	• Does not create new classes of entities.	• Creates new classes of entities (Swap Dealers and Major Swaps Participants) subject to registration requirements.