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Changes in US OTC markets since the crisis

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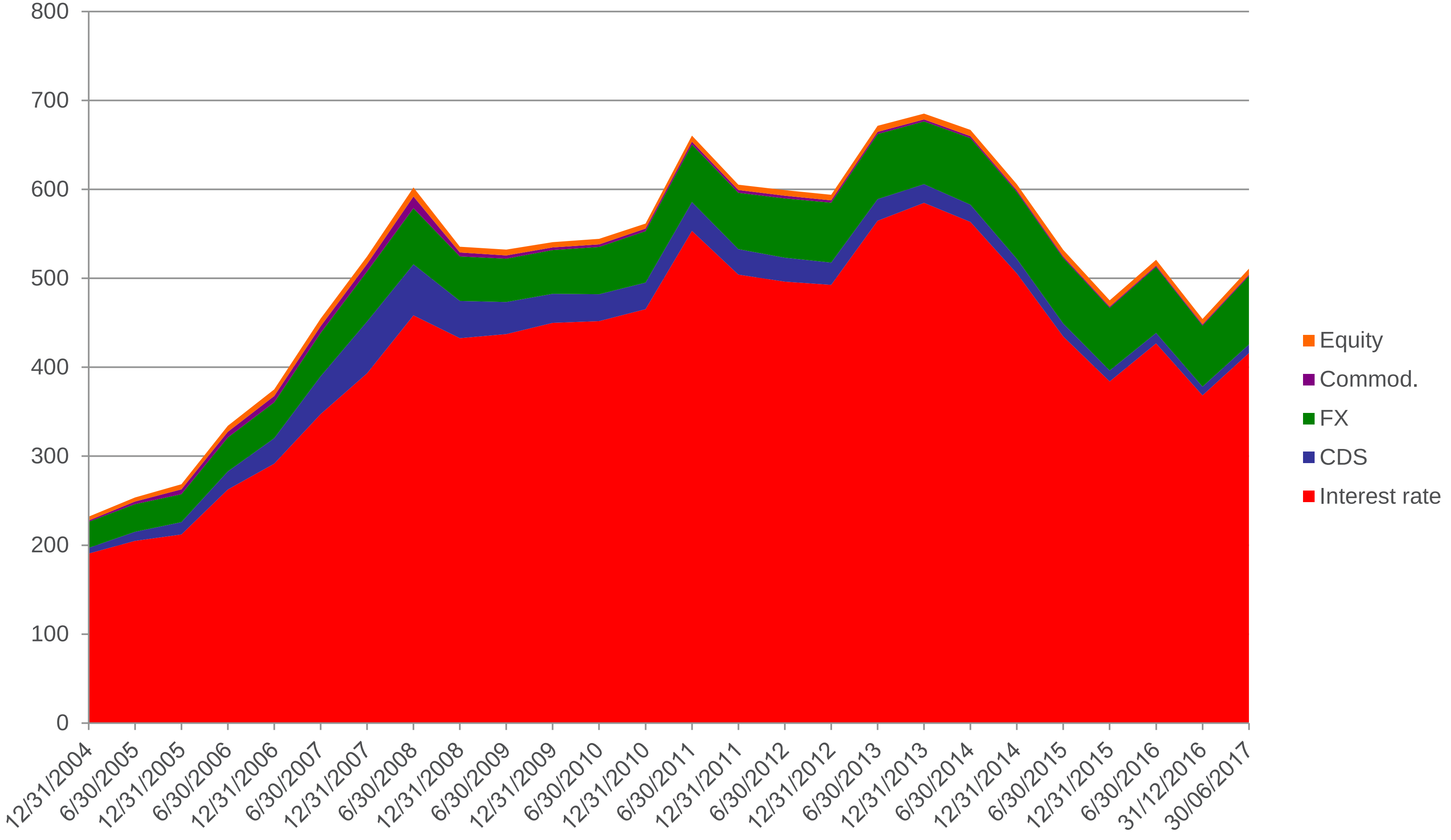
Agenda

- OTC markets in the run up to the crisis

- Focus on three elements of market changes:
  - Mandatory/voluntary central clearing
  - Electronic trading
  - Basel III regulation: direct impact through mandatory margins/indirect impact through capital requirements

- Very different market landscape than prior to the crisis

Rapid growth in OTC derivative markets prior to 2008



Gross notional outstanding. Source: BIS Semiannual OTC Derivative Statistics

OTC markets prior to the crisis

- Poor system design obscured true exposures
  - Lack of centralized trade confirmation mechanism
  - Lack of contract standardization
  - Lack of recognition of counterparty risk

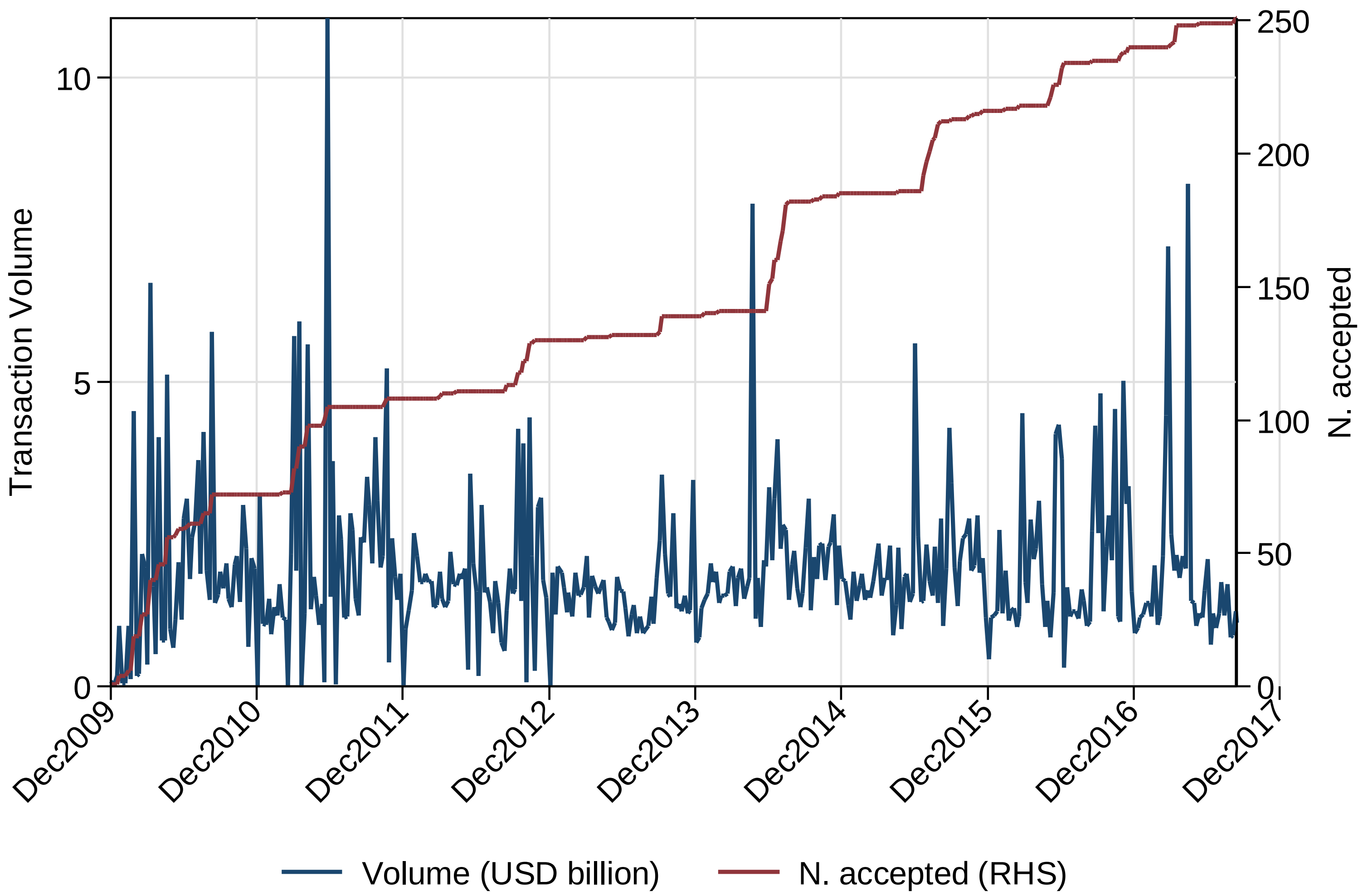
- Objectives of post-crisis reform of OTC derivatives markets include:
  - Increased transparency: SEFs, SDRs
  - Improved market efficiency: contract standardization (Big Bang/Small Bang Protocols)
  - Reduced systemic risk: CCPs, mandatory margins, Basel III

Central Clearing

- Dodd-Frank Act (DFA) requires mandatory clearing through a regulated central counterparty (CCP)
  - CFTC and SEC determine which contracts should be cleared
  - CFTC: mandatory central clearing of interest rate swaps (IRS) and index credit default swaps
  - SEC: rules for mandatory clearing of SN CDS not finalized
    - Voluntary clearing
    - Almost all constituents of CDX.NA.IG and around 40 percent of constituents of CDX.NA.HY accepted for clearing

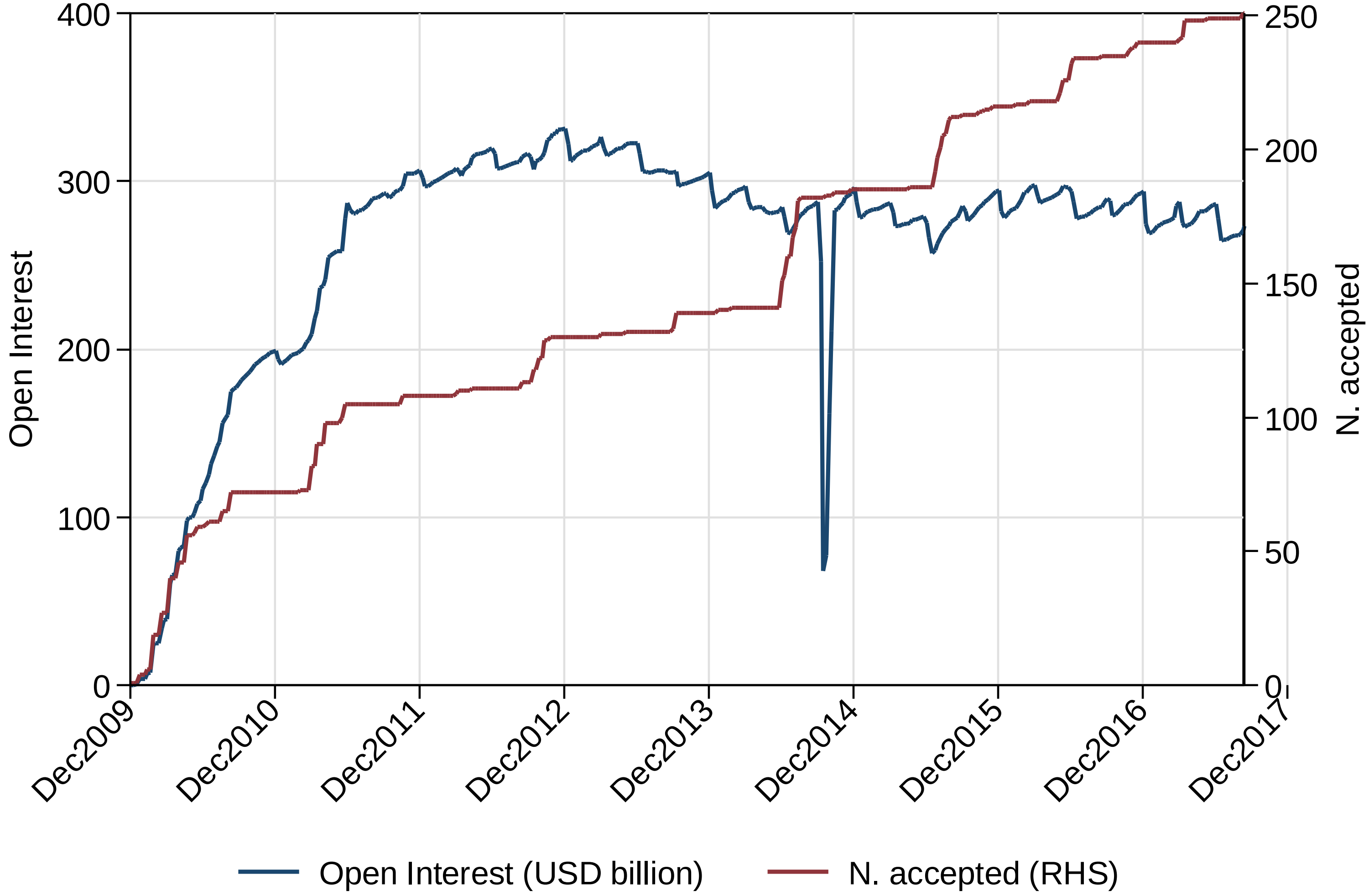
- Benefits:
  - Reduced counterparty risk
  - Initial margin at the portfolio level
  - Reduced capital requirements

SN CDS Clearing



Source: ICE

SN CDS Clearing

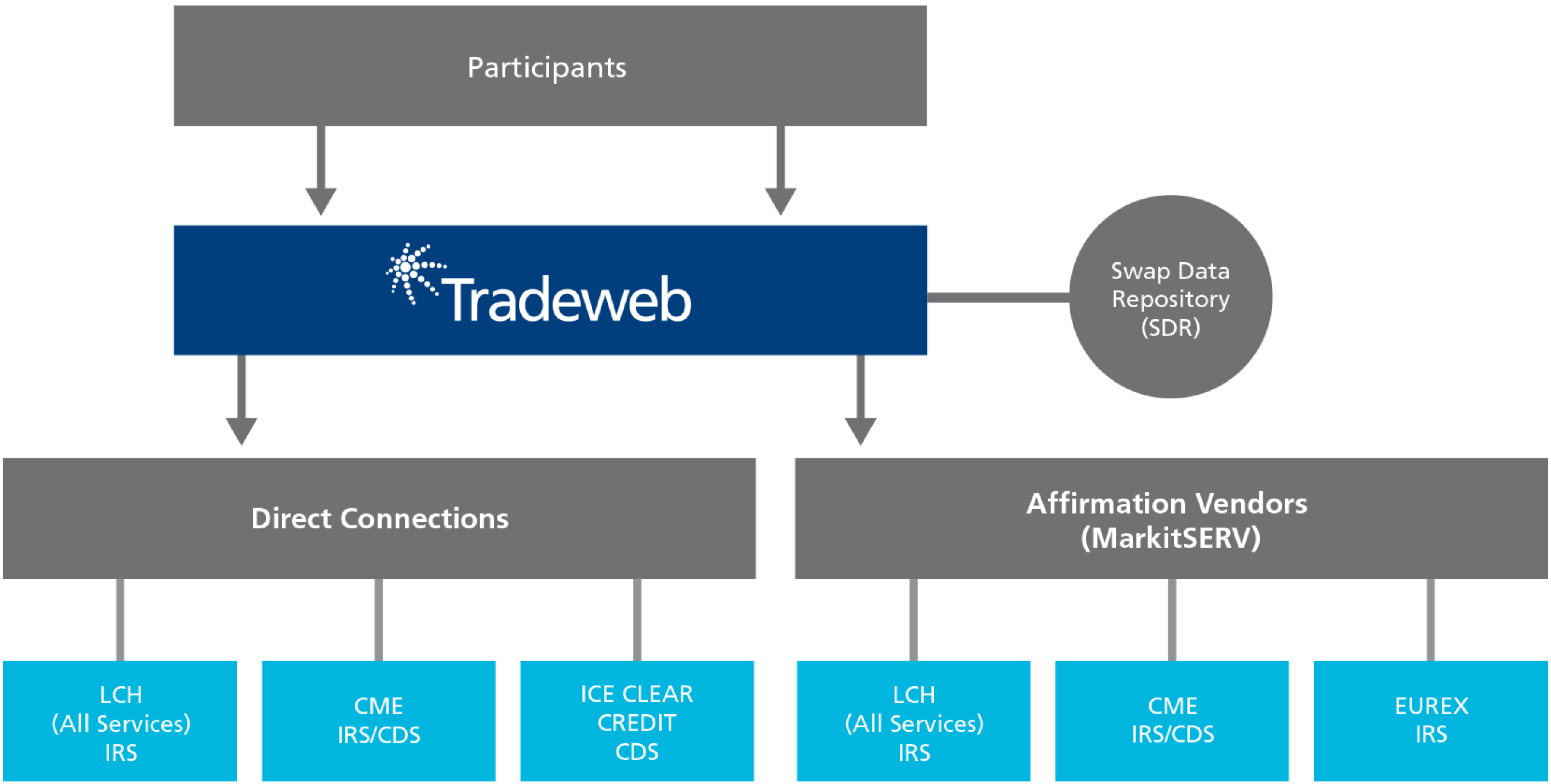


Source: ICE

Electronic Trading

- Both market solutions and mandated by regulation
  - Electronic trading for US Treasuries, mainly interdealer and PTFs (e.g. BrokerTec)
  - Electronic trading for US corporate bonds; small but growing in volume over time (e.g. MarketAxess)
  - Swap Execution Facilities (SEFs): trading platforms for swaps
    - CFCT requires all interest rate swaps and all index CDS transactions with US counterparties to be executed on a SEF
    - Provides pre-trade transparency
    - Swap must be eligible for central clearing

Example: SEF Workflow



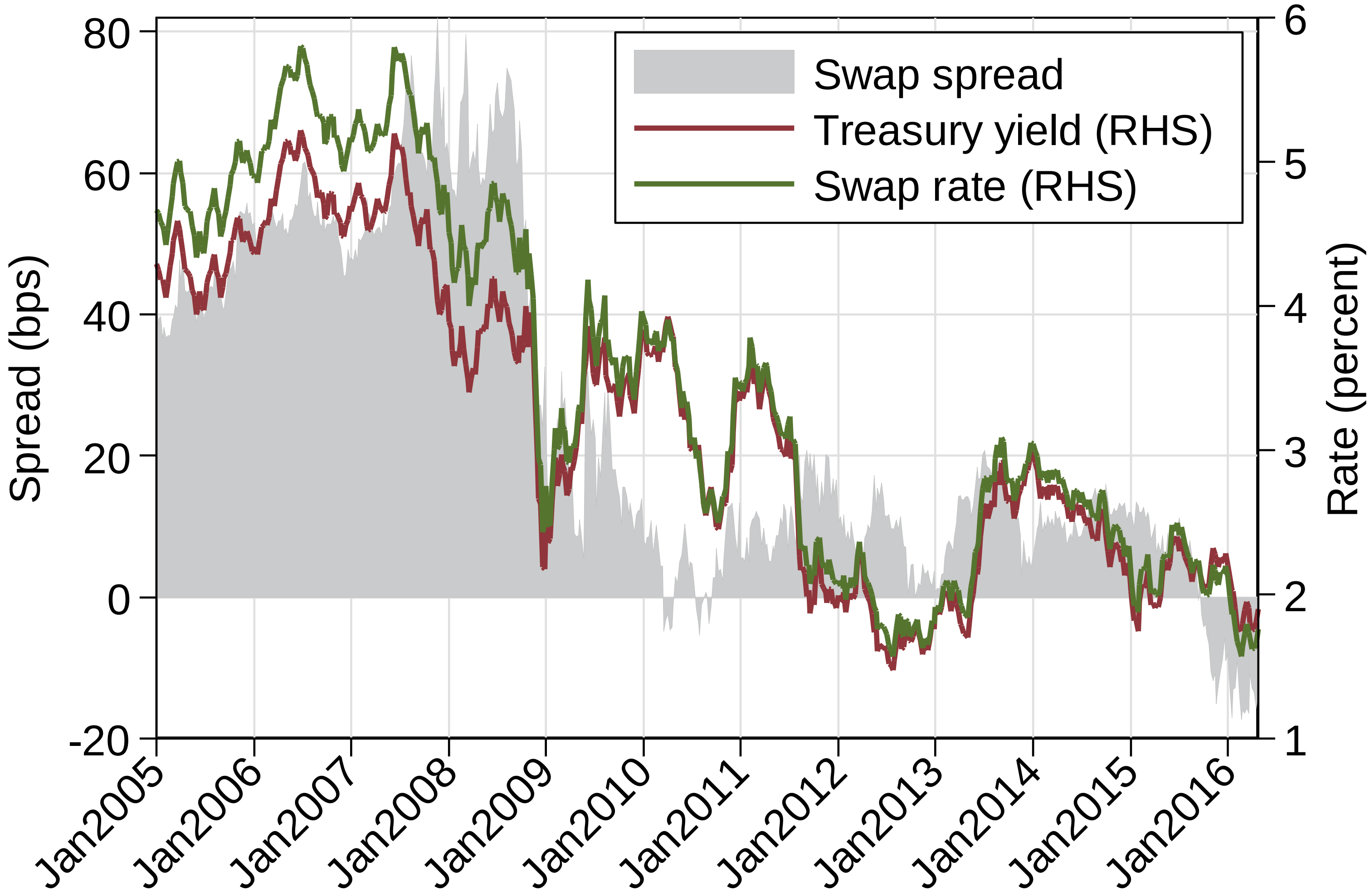
Source: Tradeweb

Basel III

- Direct effect through mandatory initial margin for bilateral positions
  - In effect in US since September 1, 2016, and globally since March 1, 2017
  - Incentive to clear contracts if eligible: usually higher initial margin than in CCPs
  - Dealers usually didn’t post initial margin prior to the crisis

- Indirect effect through the leverage ratio
  - Requires to include potential future exposure (PFE) and mark-to-market of OTC derivative exposures
  - Increased balance sheet cost of OTC derivative positions

Example: More persistent UST-swap deviations



Source: Boyarchenko, Gupta, Steele and Yen (2018)

To sum up

- Substantially different market landscape than prior to the crisis
  - Central clearing
  - Increased electronic trading
  - Increased pre- and post-trading transparency

- Potential unintended consequences
  - CCP/SEF fragmentation
  - Regulatory fragmentation across jurisdictions
  - Reduced availability of bespoke contracts

- OTC markets remain a significant part of the financial landscape