

Liquidity, Leverage, and Regulation Ten Years after the Global Financial Crisis

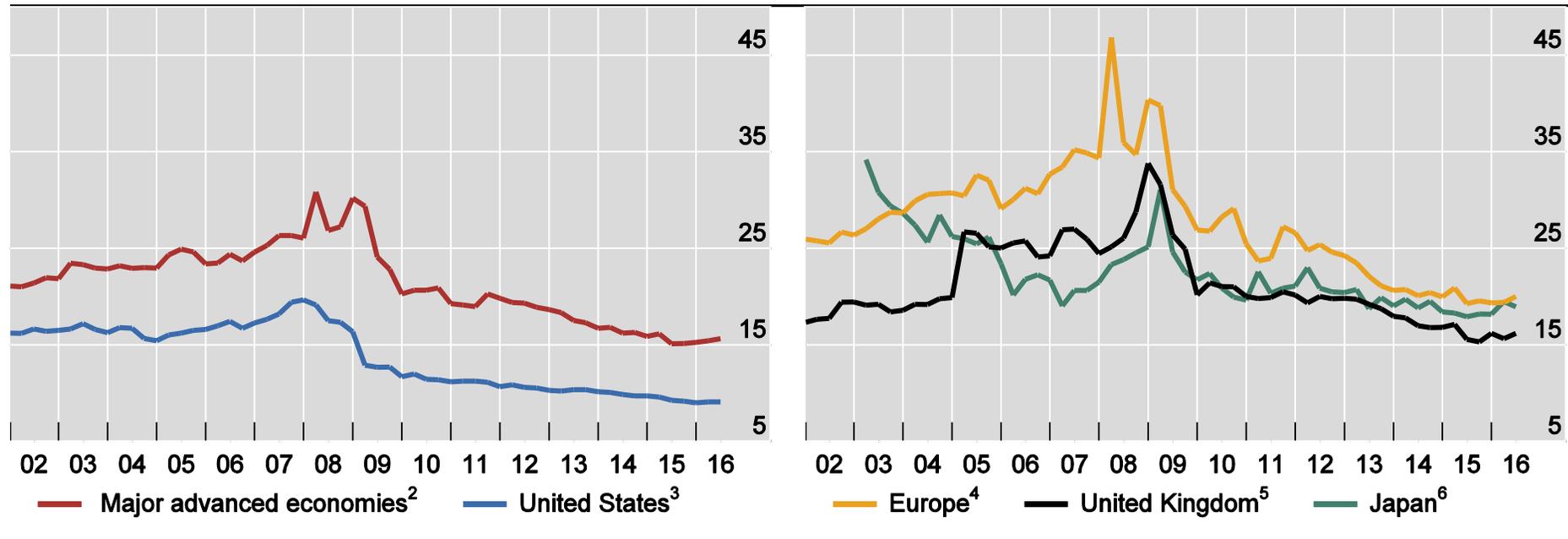
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International Monetary Fund and Bank for International Settlements

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Leverage has declined since the crisis

Bank Balance Sheet Leverage¹

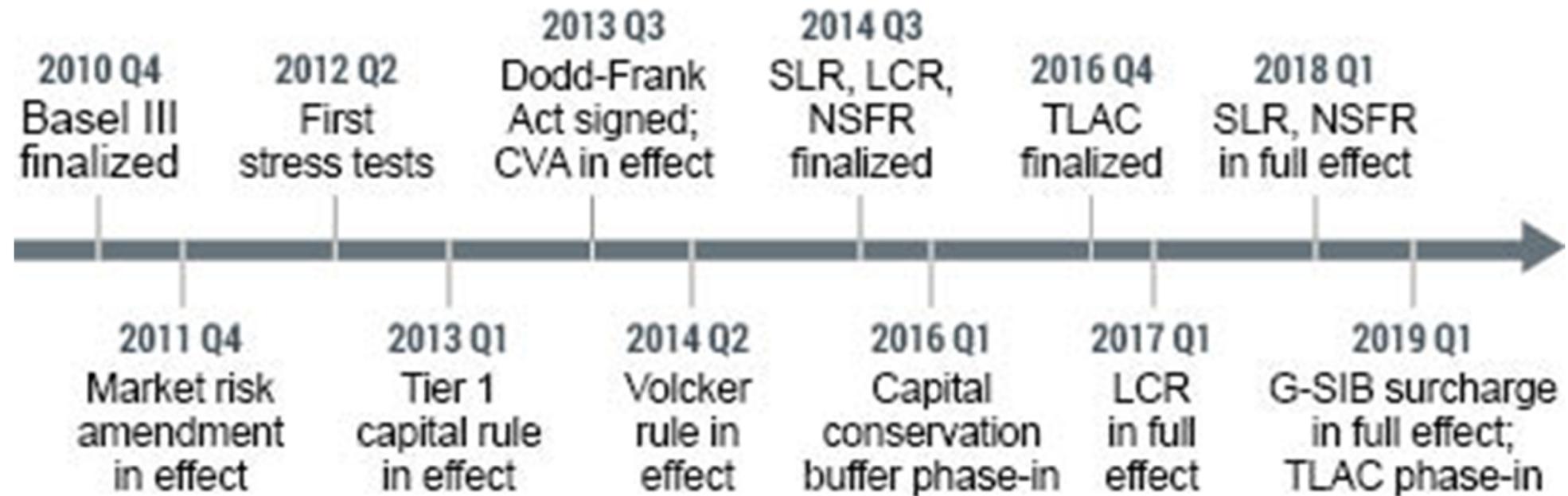


¹ Total assets divided by total equity, weighted by asset size. ² For all the banks showed in this graph. ³ Bank of America, Citigroup, Goldman Sachs, JPMorgan Chase, Lehman Brothers (up to 08Q2), Merrill Lynch & Co, Morgan Stanley, Wachovia Corporation (up to 08Q2) and Wells Fargo & Company. ⁴ Banco Santander, BNP Paribas, Commerzbank AG, Credit Suisse, Deutsche Bank, UBS, UniCredit SpA. ⁵ Barclays, HSBC, Lloyds TSB Group, Royal Bank of Scotland. ⁶ Mitsubishi UFJ Financial Group, Mizuho Financial Group, Sumitomo Mitsui Financial Group.

Sources: Capital IQ; BIS calculations.

Regulatory reforms

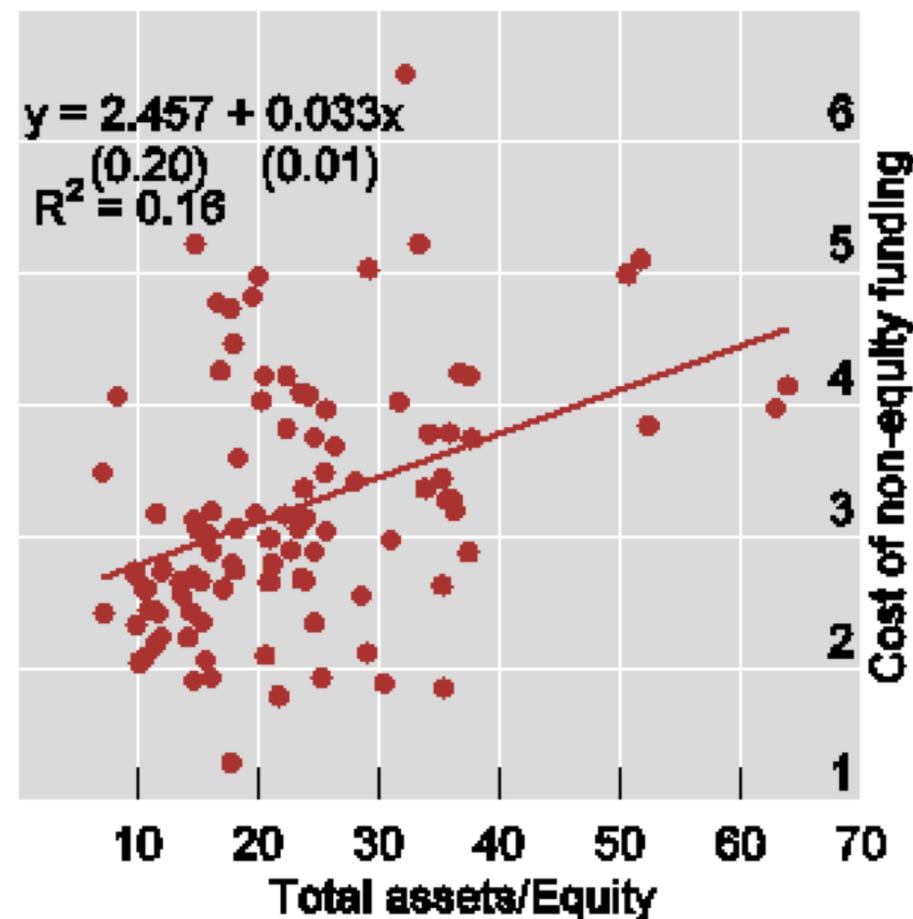
Regulatory Reforms Timeline



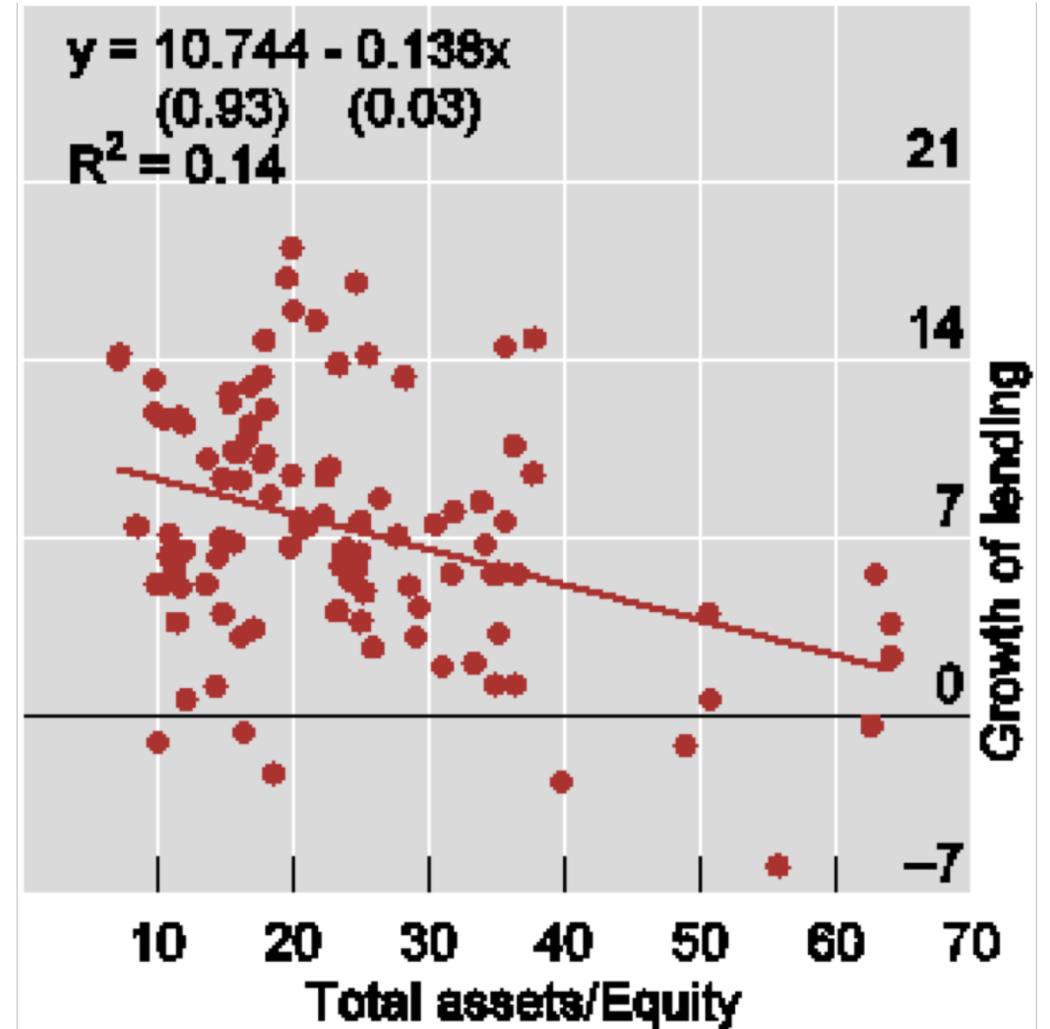
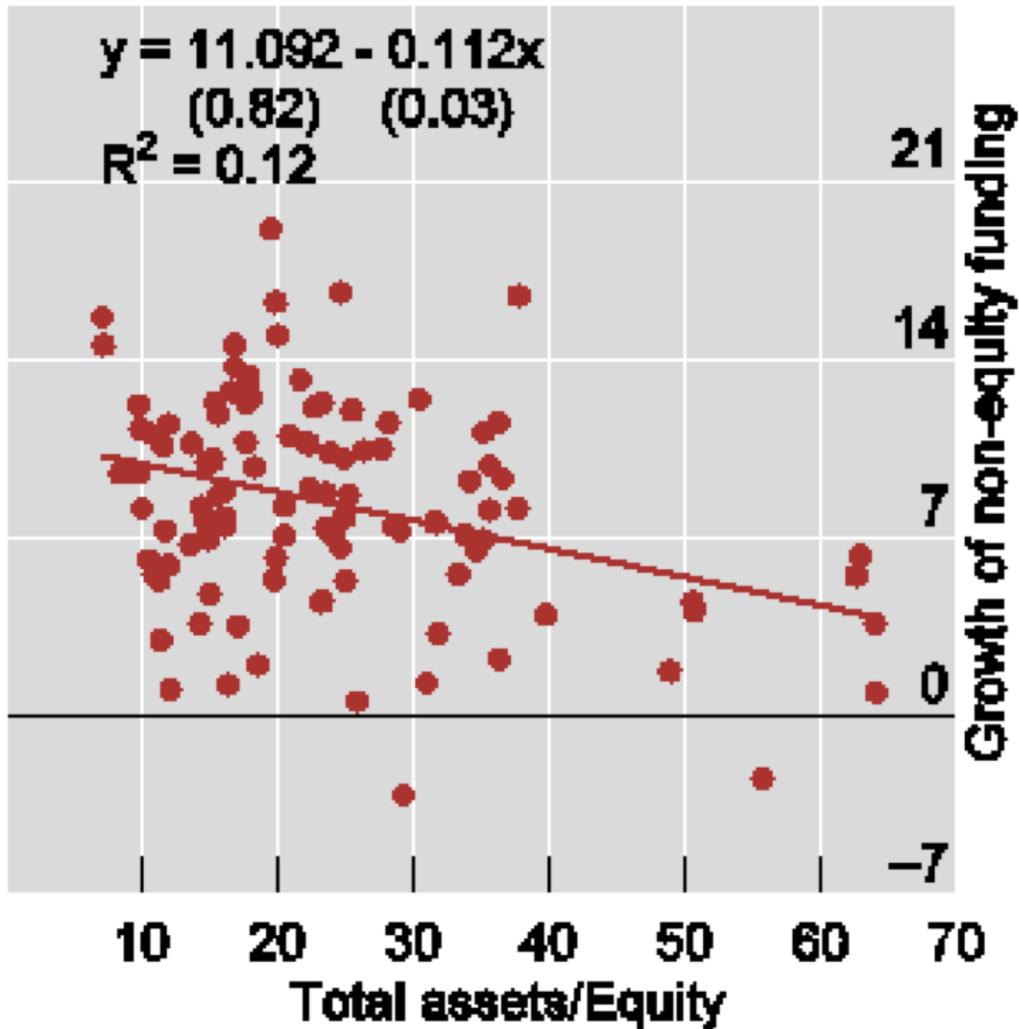
Note: CVA is credit valuation adjustment; SLR is supplementary leverage ratio; LCR is liquidity coverage ratio; NSFR is net stable funding ratio; TLAC is total loss absorbing capacity; G-SIB is global systemically important bank.

Better capitalized banks enjoy lower funding costs

- Relationship between the cost of banks' borrowed funds and their overall leverage
- A one- percentage-point increase in the equity-to-total-assets ratio is associated with a four basis point reduction in the cost of borrowed funds for the bank
- Banks could mitigate higher cost of funding by retaining more profits to build capital



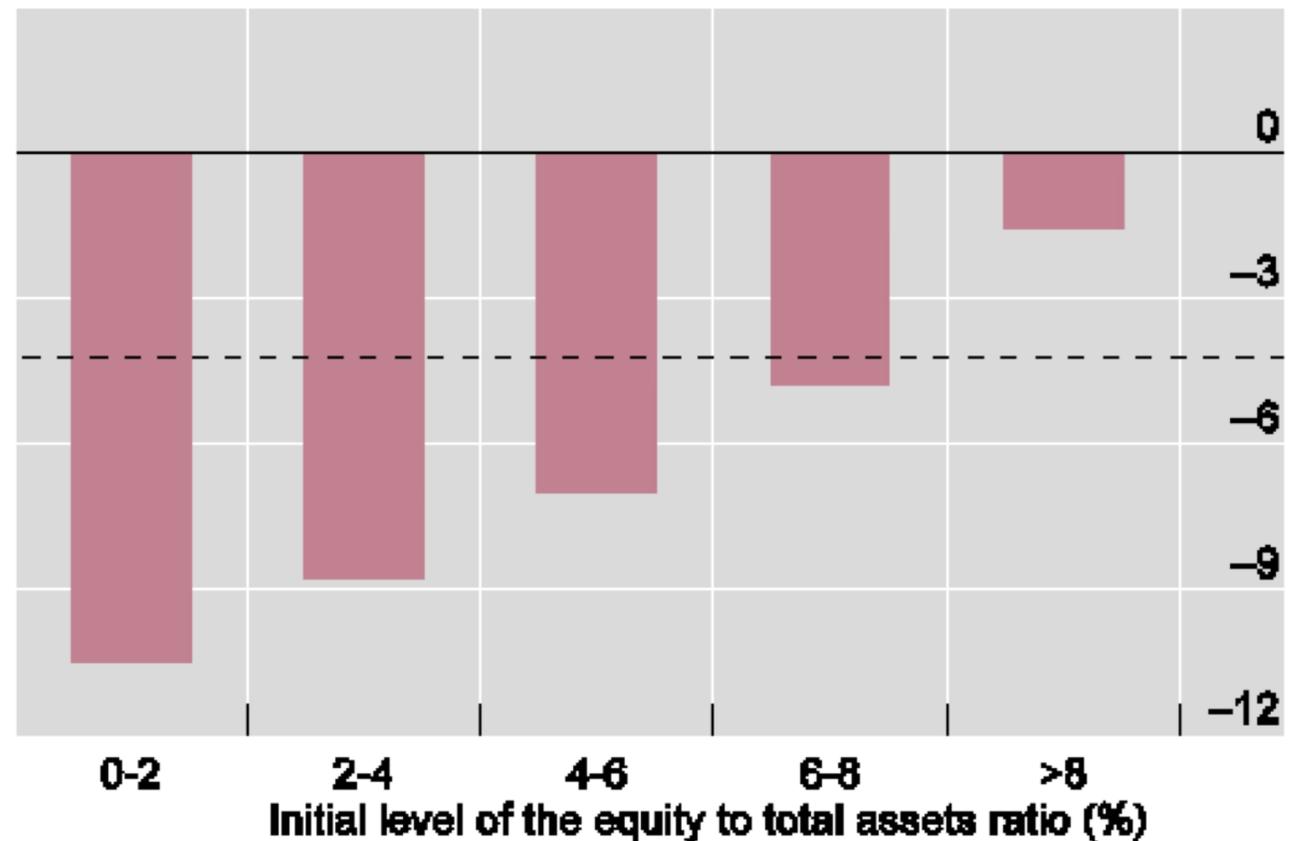
Banks with lower leverage raise funds and expand their lending at a faster rate



Cost advantage from higher capital is larger for more thinly capitalized banks

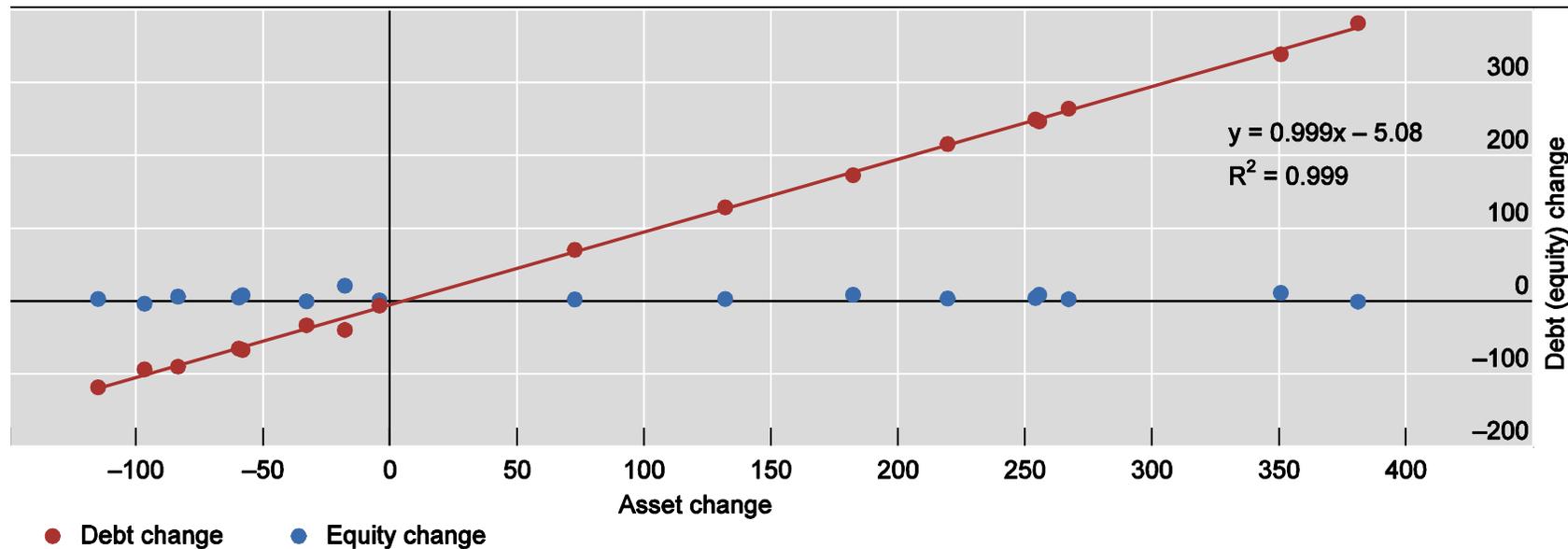
- Cost advantage from an additional percentage point of capital to total assets reduces the cost of funding by 10 basis points for banks with ratios below 2%
- Cost advantage falls as the bank becomes better capitalized, but, even for banks with leverage ratios above 8%, there is a 2 basis point funding cost reduction.

Percent reduction of the cost of funding (basis points)



Bank asset changes over about one-year are almost all explained by changes in debt

Annual Changes in Assets, Equity and Debt for a Large European Bank (1999–2015, in billions of euros)



Scatter plot showing how much of the change in assets is accounted for by changes in debt and equity, respectively. Annual changes in billions of euros are shown for large European bank (1999–2015).

Sources: S&P Capital IQ; authors' calculations.

The leverage cycle...

- During periods of ample funding liquidity, even thinly capitalized banks borrow and leverage up on easy terms
- Easier funding conditions translate into easier lending conditions, reinforcing the already-easy financial conditions
- Hence the boom phase rides an apparent virtuous circle of greater leverage and easier liquidity
- But this virtuous circle is only apparent, not real, and the true nature of the situation is revealed when the easy conditions go into reverse, and the amplification mechanism kicks in as a downward spiral

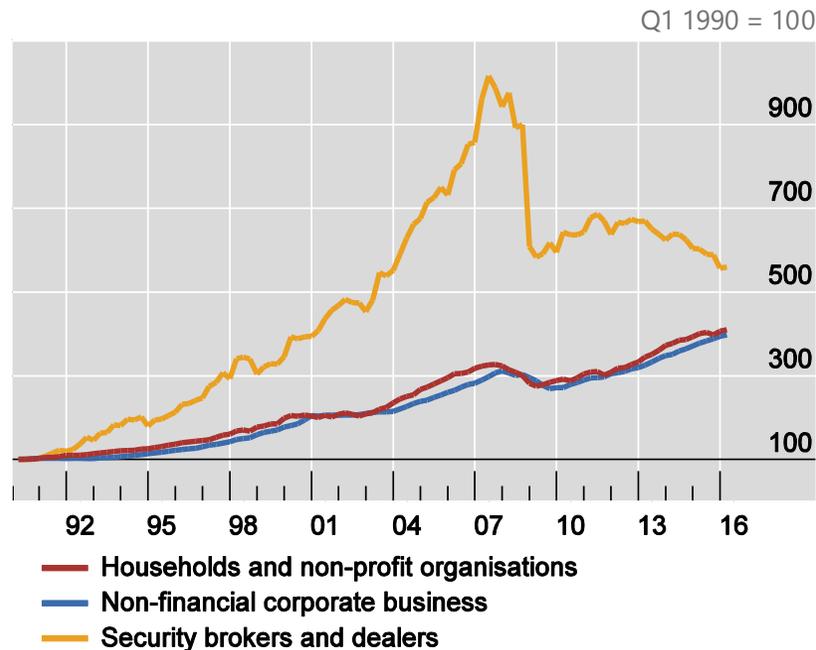
Repo haircuts illustrate the leverage cycle

- A repo agreement is a collateralized funding arrangement in which the borrower sells a security agreeing to buy it back later at a pre-agreed price
- The repo "haircut" (difference between the sold security's market price and the amount borrowed) determines the broker-dealer's maximum leverage
- If the haircut is 2%, the broker-dealer can borrow \$98 by pledging \$100 of securities, so to hold \$100 of securities, only \$2 of equity need be put up, implying a maximum leverage ratio of 50
- If the haircut rises to (a still modest) 4% the maximum leverage halves to 25, and assuming that equity stays constant, assets must be cut by half
- For a large broker-dealer the asset sales could be immense, setting in motion 2nd and 3rd order financial system effects

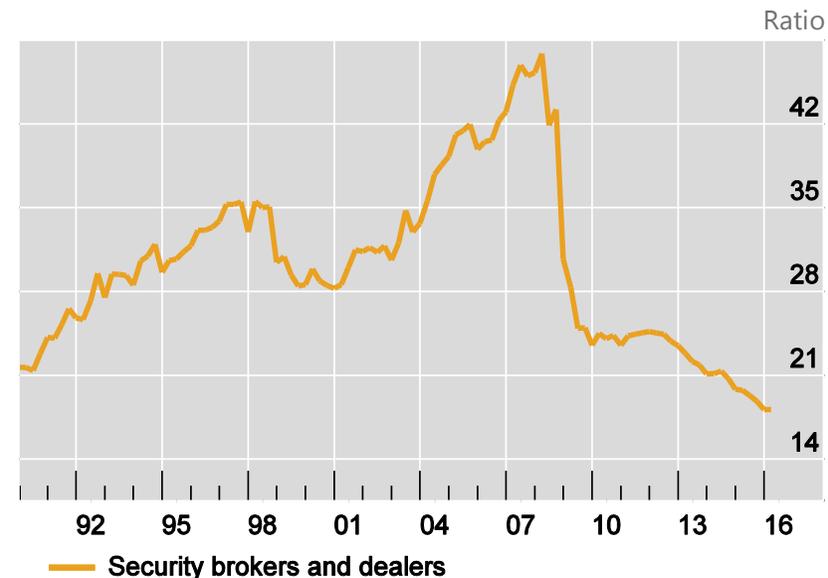
Boom and bust in bank leverage associated with the global financial crisis

Total Assets and Leverage of the U.S. Security Broker-dealer Sector

Total assets



Leverage¹

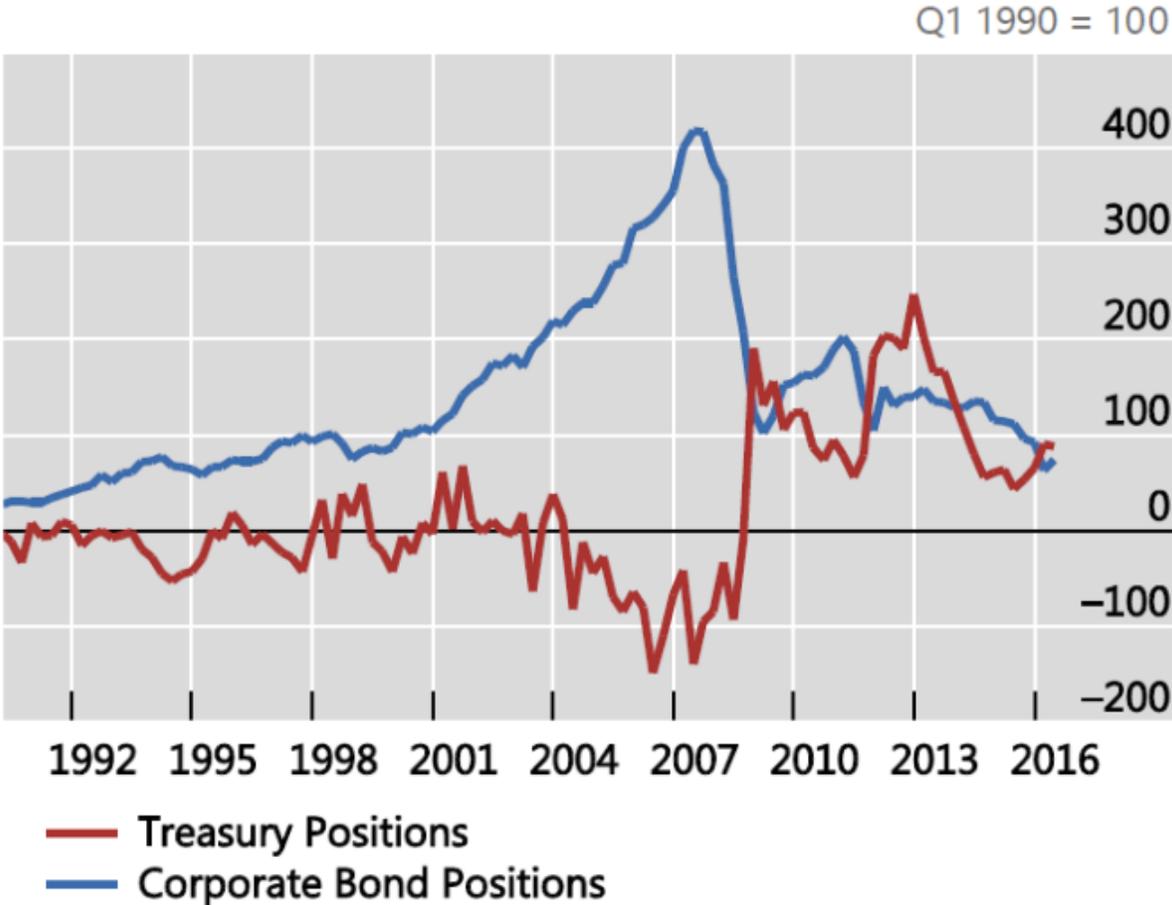


¹ Calculated as total assets divided by equity.

Sources: Federal Reserve, *Flow of Funds*; authors' calculations.

Net Treasury and corporate bond positions tend to offset, suggesting dealers trade credit spreads

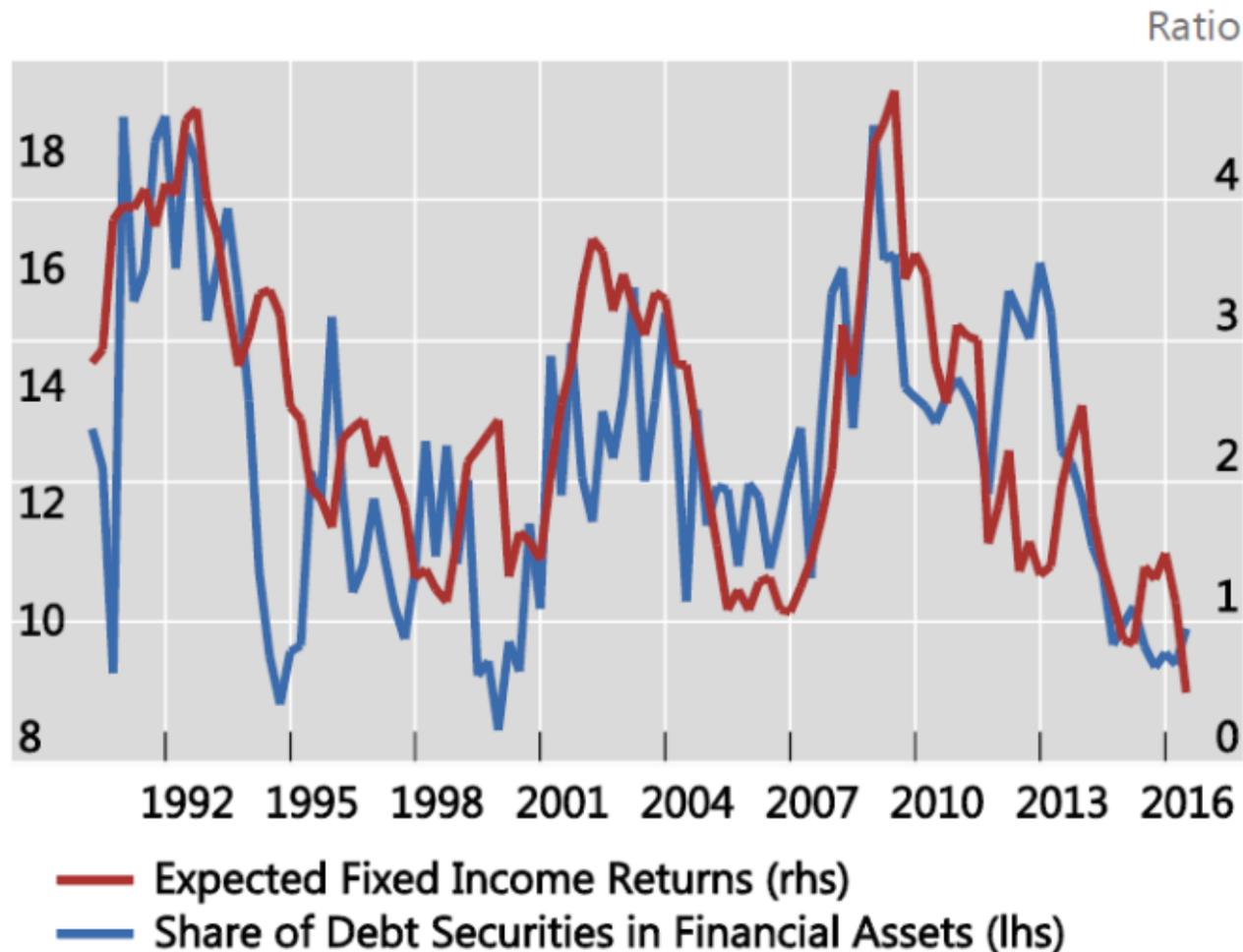
U.S. Dealer Positioning



Source: Adrian, Fleming, Shachar, Vogt (2017).

Dealer positioning is likely managed to maximize expected returns and hence varies over time

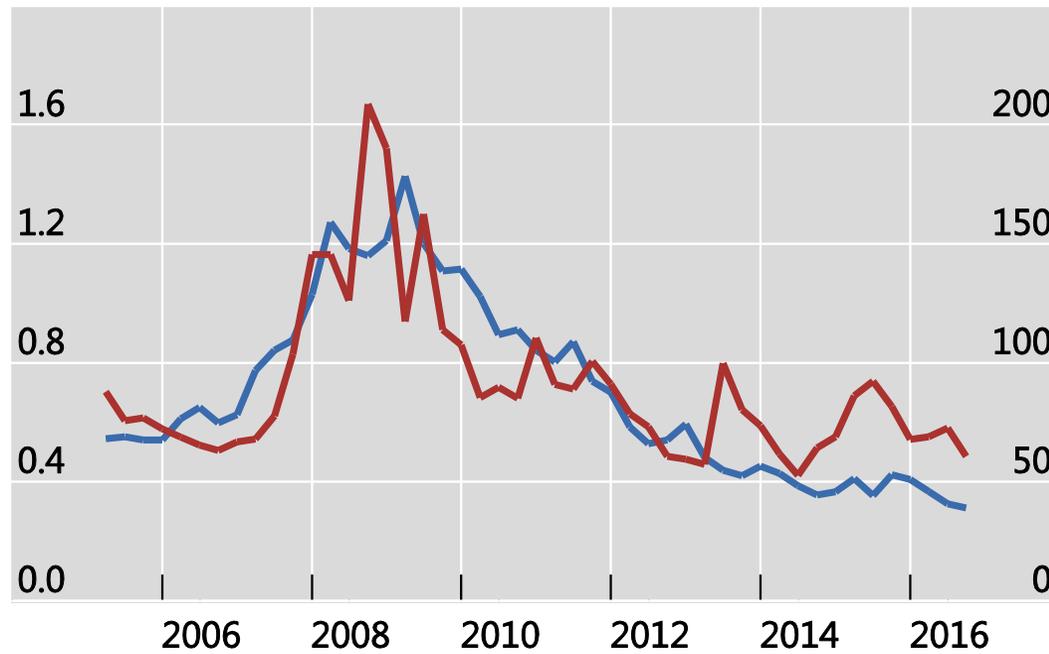
U.S. Dealer Positioning and Expected Returns



Risk management constraints and market volatility are also important dealer balance sheet drivers

U.S Dealer VaR and Market Volatility

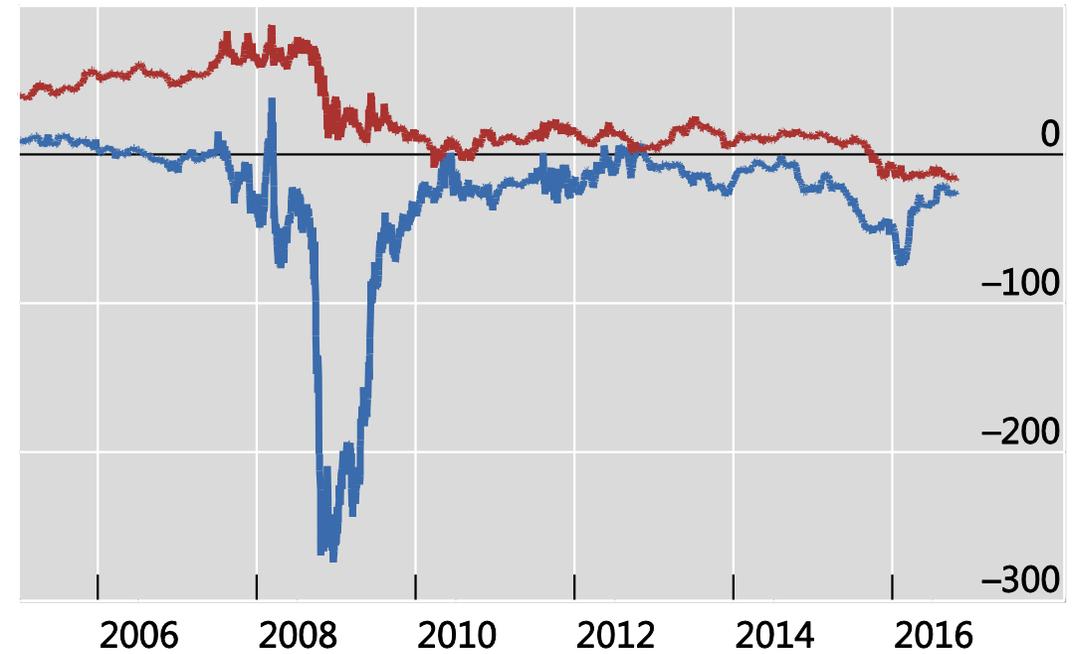
VaR (billions of Dollars)



— MOVE
— VaR

The CDS-Bond Basis and the 10-Year Swap Spread

Basis points

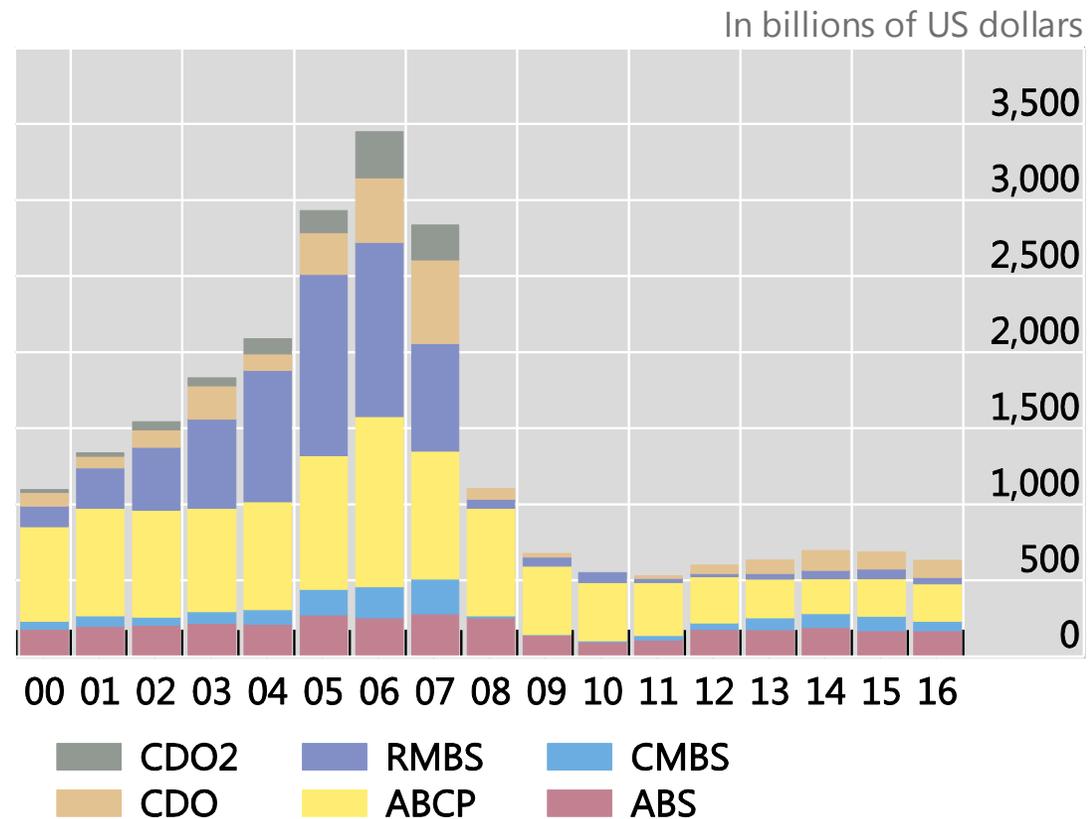


— 10-year Interest Rate Swap-Treasury Spread
— CDS-Bond Basis

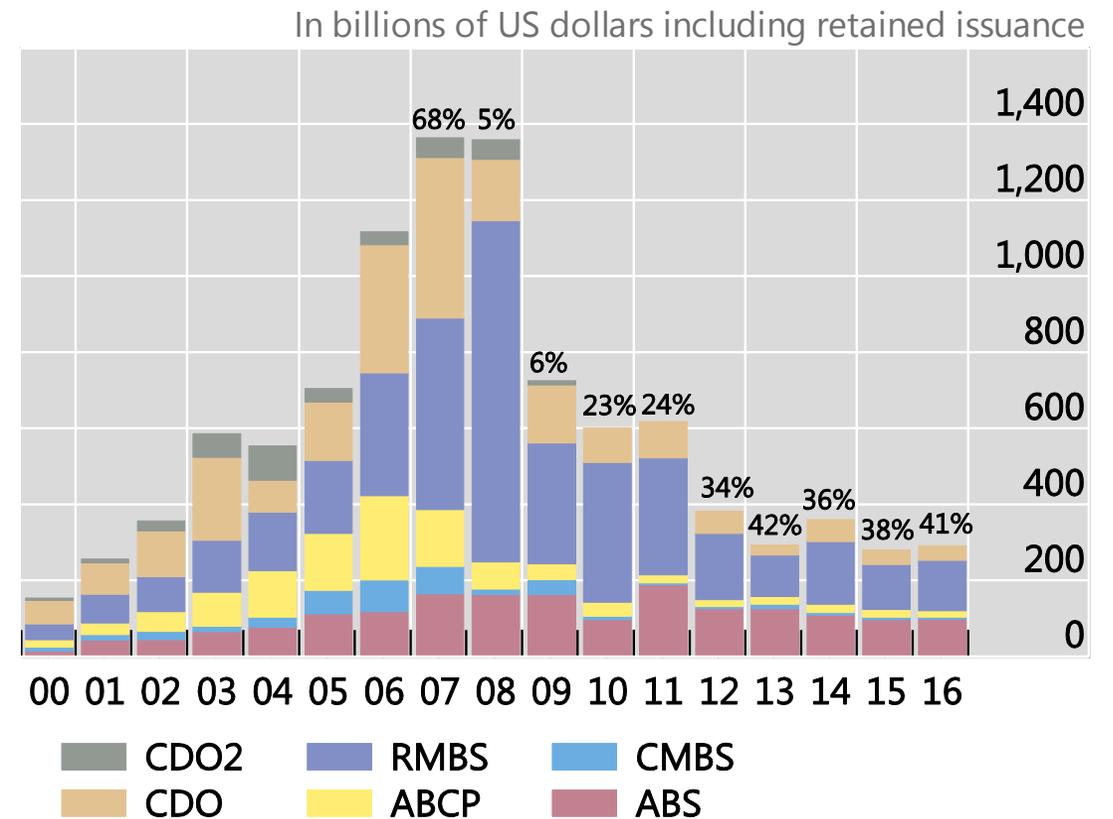
Securitization activity has plummeted

Private-Label Term Securitization Issuance by Type

U.S.



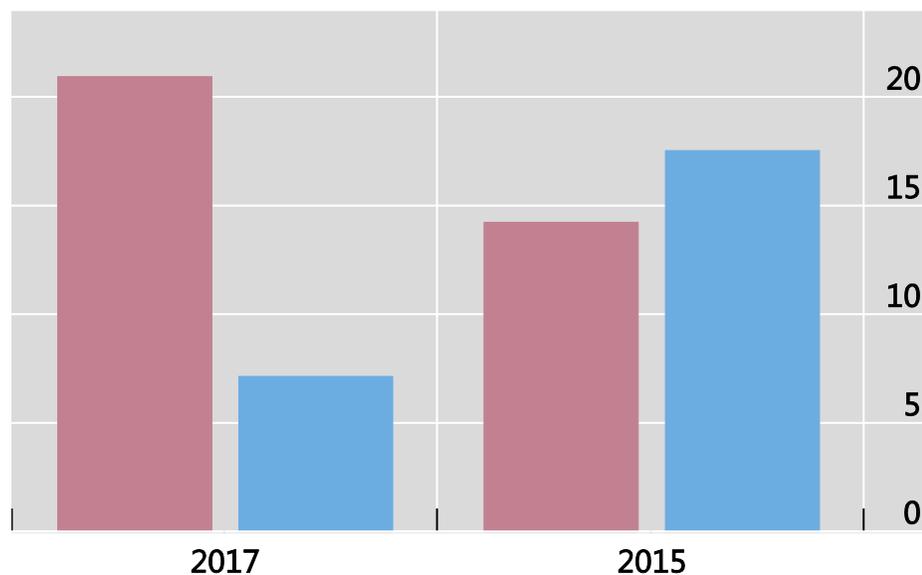
European



There has been a swing towards nonbank credit intermediation

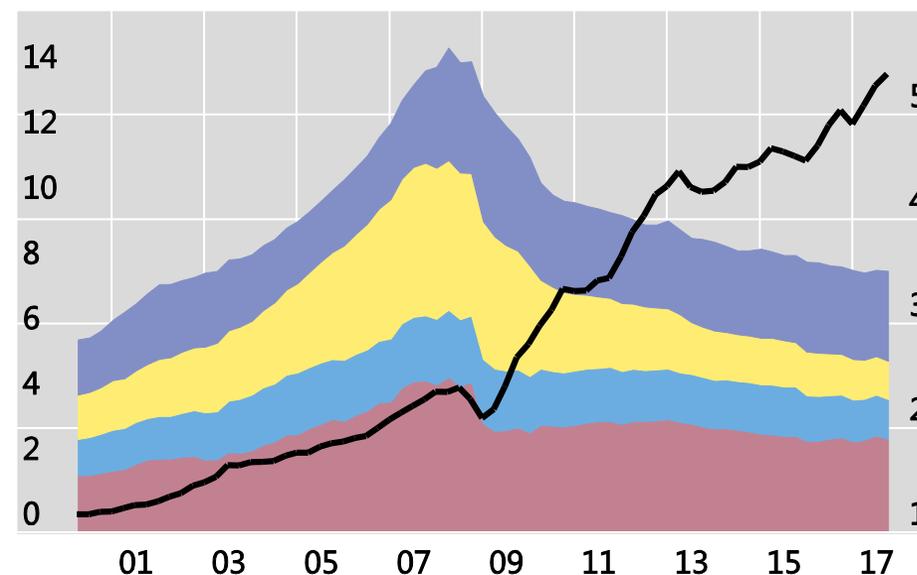
Shadow Credit Intermediation

Non-bank Credit Intermediation (in trillions of US dollars)



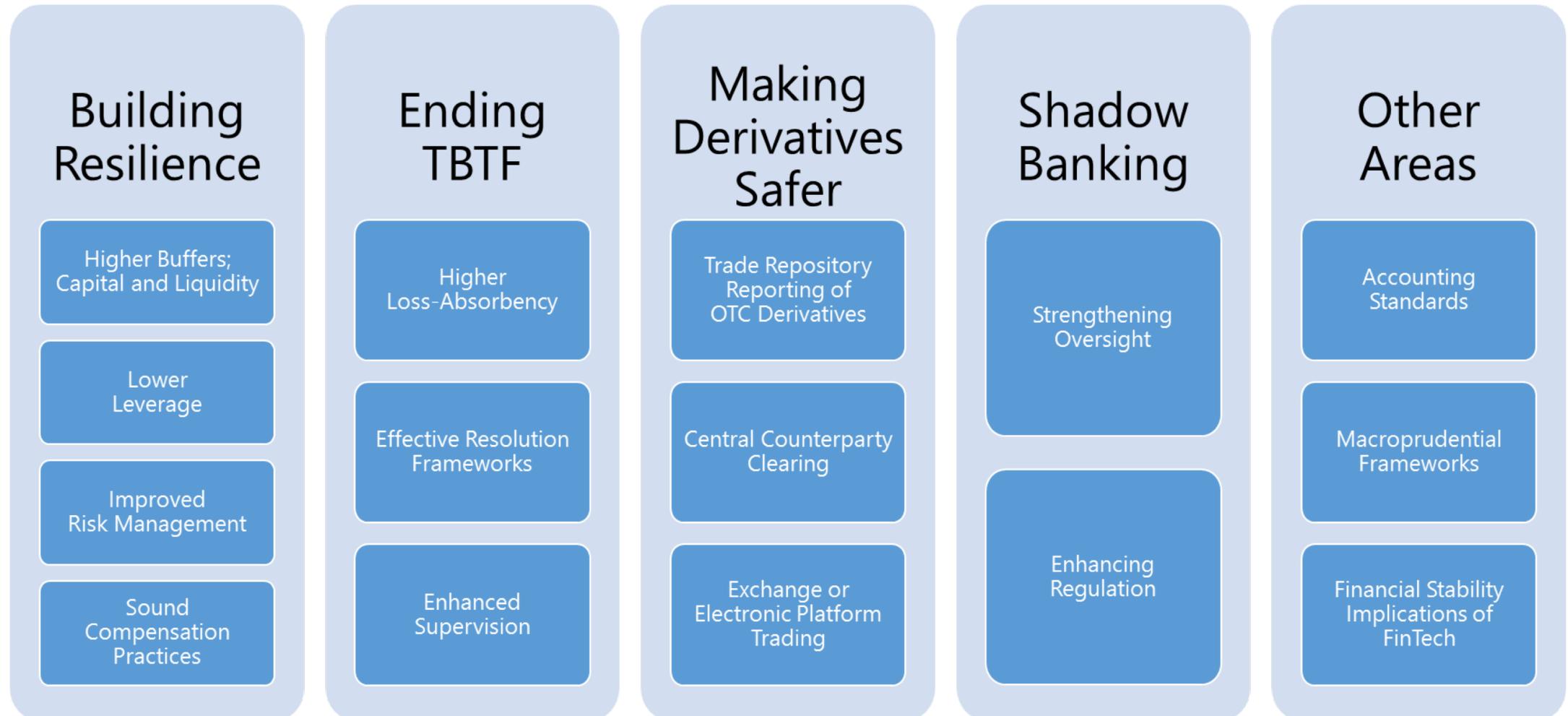
- FSB Economic Functions 2-5: Other Non-bank Credit Intermediation (but including MMFs)
- FSB Economic Function 1: Collective Investment Vehicles (but excluding MMFs)

U.S. Non-bank Credit Intermediation



- Lhs:
 - Broker-dealers
 - Finance Companies
 - ABS Issuers
 - MMFs
- Rhs:
 - Publicly-traded Bond Investment Funds (Mutual and ETF)

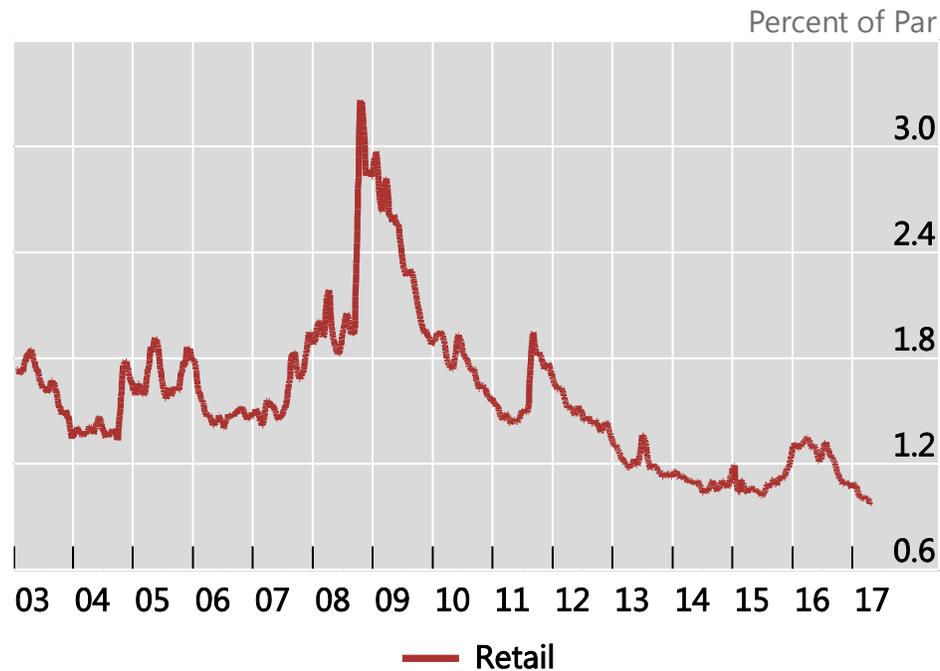
Current state of regulatory reform



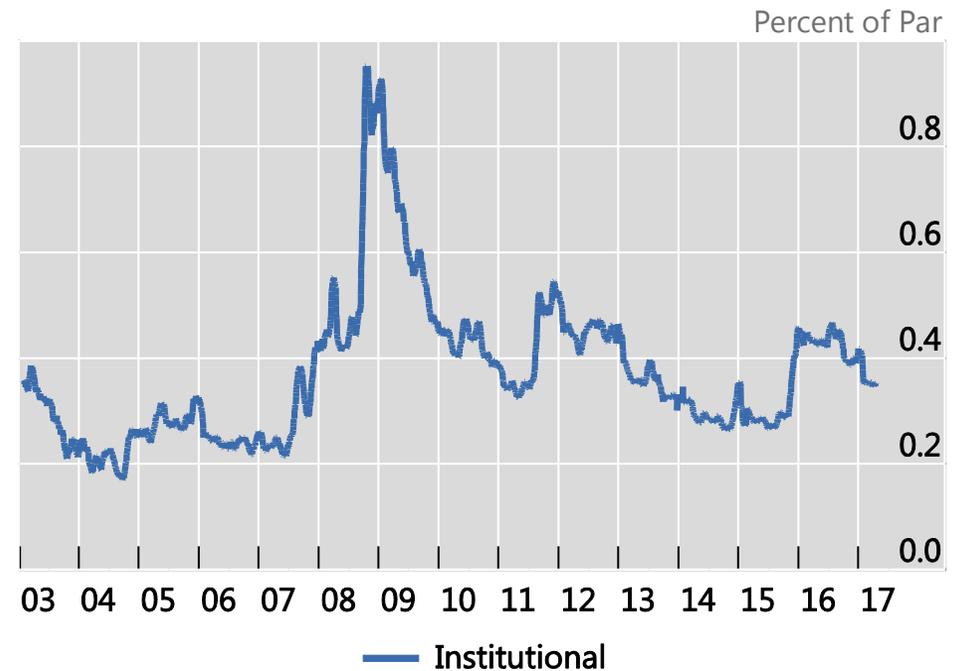
Traditional market liquidity metrics indicate mostly robust market liquidity

U.S. Corporate bond market liquidity measured by price impact

Retail



Institutional



Source: Adrian, Fleming, Shachar, Vogt (2017)

Key Takeaway

- Regulatory reforms improve bank capacity to absorb losses by limiting leverage and promoting stable funding
- More resilient banks with sufficient capital and liquidity reduces the probability of widespread liquidity crises
- Market-making is more robust, although possibly at lower levels of activity in normal times
- Capitalization and more limited leverage can help keep banks from building overly extended positions in financial markets, reducing risks of sudden market reversals