Ten Years Later: Vulnerabilities, Resiliency, Resolvability

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Ten Years after the Global Financial Crisis: An Assessment Weil, Gotshal & Manges Roundtable Yale Law School Center for the Study of Corporate Law



Ten Years Later: Vulnerabilities, Resiliency, Resolvability

• Fed's Assessment of Vulnerabilities to Financial Stability

- 2008 vs. Today
- Resiliency of the Banking System: What Has Changed?
 - Increased Capital, Liquidity
 - Forward-Looking Stress Testing
- Resolvability of U.S. G-SIBs: What Has Changed?
 - SPOE Resolution Strategy
 - Usable TLAC
 - Secured Support Agreements
 - Triggers Based on Projections of Capital and Liquidity Needs in Resolution
- Debate
 - Optimal Capital
 - Idiosyncratic vs. Multiple Failures

Fed's Framework for Assessing Vulnerabilities

Fed's Inaugural Financial Stability Report (Nov. 2018)

- Stable vs. Unstable Financial System
 - Stable: When hit by shocks, continues to meet demands of households and business for money, credit, other financial services
 - Unstable: Shocks disrupt the flow of money or credit, leading to funemployment, output
- Framework for Assessing Vulnerabilities
 - Distinguishes between shocks and vulnerabilities
 - Shocks: Sudden surprises, inherently difficult to predict
 - Vulnerabilities: Build up over time, cause widespread problems in times of stress

Fed's Framework for Assessing Vulnerabilities

Assessment Framework (Four Elements)

- Elevated Valuation Pressures (aka asset bubbles)
 - Asset prices are high relative to economic fundamentals or historical norms
 - Increased willingness of investors to take on risk
 - Imply greater possibility of outsized drops in asset prices (bubble pops)
- Excessive Borrowing by Businesses and Households
 - Vulnerable to distress if incomes decline or assets fall in value
 - May be forced to cut back spending sharply, causing economic activity
 - Can't repay debt, causing FIs and investors to incur losses
- Excessive Leverage in Financial Sector
 - risk that FIs can't absorb modest losses cut back on lending, sell assets or shut down
 - Can lead to sudden and severe contraction of credit for businesses and households
- Funding Risks (aka contagion risks)
 - Runs on runnable liabilities of firms engaged in maturity / liquidity transformation
 fire sales of assets

Fed's Assessment of Current Vulnerabilities

Current Assessments

- Elevated Valuation Pressures (some resemblance to 2008)
 - Valuations are elevated (asset bubbles have developed)
 - Investors exhibit high tolerance for risk, esp. as to assets linked to business debt
- Excessive Borrowing by Businesses and Households (some resemblance to 2008)
 - Household debt has risen roughly in line with household incomes
 - Business debt relative to GDP is high
 - Signs of deteriorating credit standards
- Excessive Leverage in Financial Sector (more resilient than 2008)
 - Largest banks are strongly capitalized
 - Leverage of broker-dealers is substantially below pre-crisis levels (more resilient)
 - Insurance companies have strengthened financial condition (more resilient)
- Funding Risks (aka contagion risks) (more resilient than 2008)
 - Funding risks are low relative to period leading up to the crisis
 - Banks and MMFs hold more liquid assets
 - Plus runnable liabilities are down as a % of total liabilities

Data Behind Assessment of Current Vulnerabilities

- Valuation Pressures (aka asset bubbles) (some resemblance to 2008)
- Levels of Borrowing by Businesses and Households (some resemblance to 2008)
- Leverage in Financial Sector (more resilient than 2008)
- Funding Risks (aka contagion risks) (more resilient than 2008)

Valuation Pressures (Asset Bubbles)

- Commercial Real Estate Prices
- Cropland Values
- S&P 500 Forward Price-to-Earnings Ratio
- Nominal Prices of Existing Homes

Commercial Real Estate Prices (Real)





Source: Federal Reserve Board, Financial Stability Report, November 2018

Cropland Values





Source: Federal Reserve Board, Financial Stability Report, November 2018

Forward Price-to-Earnings Ratio of S&P 500 firms



Note: Based on expected earnings for 12 months ahead.

Source: Federal Reserve Board, Financial Stability Report, November 2018

Growth of Nominal Prices of Existing Homes



Source: Federal Reserve Board, Financial Stability Report, November 2018

Levels of Borrowing by Businesses and Households

- Business Debt Growth
- Balance Sheet Leverage of Publicly Traded Commercial Corporations
- Total Household Loan Balances
- Mortgages with Negative Equity
- Consumer Credit Balances
- Auto Loans

Growth of Real Aggregate Debt of the Business Sector



Source: Federal Reserve Board, Financial Stability Report, November 2018

Gross Balance Sheet Leverage of Public Nonfinancial Corporations



Note: The sample of risky firms is composed of firms with positive short-term or long-term debt that either have an S&P firm rating of speculative grade or have no S&P rating.

Source: Federal Reserve Board, Financial Stability Report, November 2018

Total Household Loan Balances



2000 2003 2006 2009 2012 2015 2018

Note: Near prime are those with an Equifax Risk Score from 620 to 719; subprime are below 620; prime are greater than 719. Scores are measured contemporaneously. Student loan balances before 2004 are estimated using average growth from 2004 to 2007, by risk score. Data are converted to constant 2018 dollars using the consumer price index.

Source: Federal Reserve Board, Financial Stability Report, November 2018

Consumer Credit Balances



Note: Data are converted to constant 2018 dollars using the consumer price index.

Source: Federal Reserve Board, Financial Stability Report, November 2018

Auto Loan Balances



Note: Near prime are those with an Equifax Risk Score from 620 to 719; subprime are below 620; prime are greater than 719. Scores are measured contemporaneously. Data are converted to constant 2018 dollars using the consumer price index.

Source: Federal Reserve Board, Financial Stability Report, November 2018

Leverage within the Financial Sector

- CET1 Ratio of Banks
- Leverage of Broker-Dealers
- Leverage of Hedge Funds

Common Equity Tier 1 Ratio of BHCs

Large BHCs have > 2X CET1 Ratios Compared to 2008



Note: Large bank holding companies (BHCs) are those with greater than \$50 billion in total assets.

Source: Federal Reserve Board, Financial Stability Report, November 2018

Common Equity Tier 1 Ratios of U.S. G-SIBs

U.S. G-SIBs would have higher risk-based capital ratios today in a stressed environment than actual risk-based capital ratios in 2008



All capital ratios presented on an aggregate (weighted average) basis. Actual T1 Common as of 12/31/2008 reflects the Tier 1 Common ratio in effect prior to Basel III for all U.S. G-SIBs. Stressed CET1 as of 12/31/2017 reflects the minimum CET1* ratio (under Basel III) under the supervisor-run severely adverse scenario, based on supervisory results of the 2018 DFAST** process, for all U.S. G-SIBS. Actual CET1 reflects the reported CET1 ratio for all U.S. G-SIBs.

	[*] CET1	 Common Equity Tier 1 capital, a measurement of a bank's core equity capital, subject to adjustments and deductions under Basel III
Source: SNL Financial, Regulatory Filings, 2018 DFAST Results	**DFAST	= Dodd-Frank Act Stress Testing

Usable TLAC

U.S. G-SIBs have > 5X Usable TLAC Compared to 2008



- TLAC consists of equity plus long-term unsecured debt that can be converted to common equity in bankruptcy
- U.S. G-SIBs now have >5 times more usable TLAC
- In 2008, long-term senior debt not usable without imposing losses pro rata on short-term senior debt (e.g., commercial paper)
- Subordinated debt and non-CET1 were considered unusable in 2008 because of market confusion about loss waterfall
- U.S. G-SIBs have restructured themselves to make all external unsecured long-term debt at toptier parent level structurally or contractually junior to all external short-term debt
- Enough long-term debt (senior + subordinate) to recapitalize U.S. G-SIBs at full Basel III capital levels under conditions twice as severe as 2008

All capital ratios presented on an aggregate (weighted average) basis. Long-term senior debt is estimated based on the long-term non-subordinated borrowings of parent holding companies of all U.S. G-SIBs

Leverage of Broker-Dealers

Leverage of Broker-Dealers > 2X in 2008 Compared to 2018



Note: Leverage is calculated by dividing financial assets by equity.

Source: Federal Reserve Board, Financial Stability Report, November 2018

Gross Leverage of Hedge Funds



Note: Leverage is computed as the ratio of hedge funds' gross notional exposure to net asset value, including derivative notional exposure and short positions. Data are reported on a three-quarter lag.

Source: Federal Reserve Board, Financial Stability Report, November 2018

Funding Risks (Contagion Risks)

- Liquid Assets Held by Banks
- Short-Term Wholesale Funding of Banks
- Runnable Liabilities as % of GDP
- Domestic Money Market Fund Assets
- Large Financial Institution HQLAs
- Optimal Liquidity: 2008 vs. Today (FRBNY)

Liquid Assets Held by Banks



Note: Liquid assets are excess reserves plus estimates of securities that qualify as high-quality liquid assets. Haircuts and Level 2 asset caps are incorporated into the estimate. Large bank holding companies (BHCs) are those with greater than \$50 billion in total assets.

Source: Federal Reserve Board, Financial Stability Report, November 2018

Short-Term Wholesale Funding of Banks



Note: Short-term wholesale funding is defined as the sum of large time deposits with maturity less than one year, federal funds purchased and securities sold under agreements to repurchase, deposits in foreign offices with maturity less than one year, trading liabilities (excluding revaluation losses on derivatives), and other borrowed money with maturity less than one year. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research.

Source: Federal Reserve Board, Financial Stability Report, November 2018

Domestic Money Market Fund Assets

Government Securities (Safer Assets) ~ 3X More as % of Assets Compared to 2008



Note: Data are converted to constant 2018 dollars using the consumer price index.

Source: Federal Reserve Board, Financial Stability Report, November 2018

Large Financial Institution High-Quality Liquid Assets

HQLAs ~ 4X Higher as % of Assets Compared to 2008



Note: High-quality liquidity assets (HQLA) are estimated by adding excess reserves to an estimate of securities that qualify for HQLA.

Source: Federal Reserve Board, Supervision and Regulation Report, November 2018

Liquidity Coverage Ratios

LCRs ~ 120% of Expected Net Outflows Under Stressed Conditions



Note: Average LCR across the eight U.S. G-SIBs that were required to report publicly on a quarterly frequency, starting from the second quarter of 2017.

Source: Federal Reserve Board, Financial Stability Report, November 2018

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Resiliency of the Banking System: What Has Changed?

Summary of Data

- > 2X Higher CET1 Risk-Based Capital Ratios Compared to 2008
- > 5X More Usable TLAC Compared to 2008
- ~ 1/3 the Amount of Short-Term Wholesale Funding Compared to 2008
- > 4X More HQLAs Compared to 2008

Other

- Forward-Looking Stress Testing
 - Capital: DFAST / CCAR Capital Planning Stress Testing
 - Countercyclicality Debate
 - Increasingly Severe Stress Scenarios
 - Liquidity: CLAR / Internal Liquidity Stress Testing
- Activities Restrictions: Volcker Rule

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SPOE Resolution Strategy (Start)



Note: This is a hypothetical and greatly simplified U.S. G-SIB structure. The location of various legal entities, including whether they are in a separate legal chain or in a chain with a domestic insured bank, varies from group to group. Asset management entities are not shown.

SPOE Resolution Strategy (Finish)

Recapitalized OpCos are transferred to either a New HoldCo (Bankruptcy Code) or Bridge Financial Company (OLA) owned by the Resolution Trust for the benefit of BHC's bankruptcy estate (Bankruptcy Code) or receivership (OLA)



SPOE Resolution Strategy (After)



U.S. G-SIBs Title I Resolution Plans—Public Section Description of Post-Resolution Firm

Bank of America – SPOE	BNY Mellon – SPOE	Citigroup – SPOE	Goldman Sachs – SPOE (except 2 OpCos)
 ~70% reduction in overall assets, Reduction of product offerings, global footprint and customers Wind down, sale or simplification of certain business lines 	 Discrete businesses disposed of through combination of strategic sales, wind-downs, or transfers Remaining assets, likely to consist of a fee-based operational services firm, consisting of business built around the custody business, taken public through IPO 	 Banking businesses divested; each divested business is significantly smaller and less systemically important Broker-dealers subject to solvent wind-down through sale or run-off 	 Firm would cease to exist post-resolution; all assets would be sold or unwound Only surviving businesses would be asset management, private wealth management, merchant banking businesses, special situations group, and commodities, which would have been sold
JPMorgan – SPOE	Morgan Stanley – SPOE	State Street – SPOE	Wells Fargo – FDIC Receivership / Bridge Bank
 ~ 40% reduction in main bank assets (including branches) ~ 80% reduction in broker-dealer assets; none would be systemically important ¼ lines of business and 8/21 sub- lines of business eliminated 72% reduction in total assets in foreign subs and branches 	 Firm would cease to exist post-resolution Sale or wind down of all businesses and material entities 	• Firm's size and operational footprint may shrink further due to the potential sale of divestiture options	 Sales of asset portfolios and business lines, in addition to sales of six regional portfolios IPO of surviving regional bank In late 2017, Wells Fargo publicly announced it would move to SPOE

Source: Public Sections of 2017 Title I Resolution Plans

SPOE Resolution Strategy (Operational Readiness)

Prerequisite	Resolution Readiness Feature(s)
1. Sufficiency of Resources in Resolution	 Capital and liquidity resources higher at the onset of material financial distress Usable External TLAC Debt or Equity (GLAC portion corresponds to contributable assets) Internal TLAC Debt or Equity (corresponds to prepositioned assets, including liquid assets) BHC bankruptcy or resolution proceeding must be commenced while capital and liquidity resources remain sufficient for SPOE resolution strategy (governance triggers)
2. No QFC Closeouts	 Contractual waiver of QFC closeout rights conditioned upon timely approval of emergency motion (see below)
3. Resilience of Opco Support to Legal Challenges	 Secured support agreement to provide capital and liquidity to support Opcos Security interest in contributable assets securing Support Agreement Prior notice / disclosure of structural changes and resolution strategy
4. Triggers Based on Projected Capital and Liquidity Needs	 Bankruptcy / resolution triggers based on projected capital and liquidity needs rather than balance-sheet insolvency or even traditional balance-sheet liquidity triggers Preservation of value for the estate / receivership No need to immediately value consideration received Mitigation of systemic risk Performance of QFCs by OpCos
5. Foreign Regulator Cooperation	 Meeting or exceeding applicable regulatory capital requirements at all times Conservative assumptions about inter-affiliate transactions during the reorganization period

Usable TLAC

U.S. G-SIBs have substantially increased and restructured their equity and long-term unsecured debt so that all of it can now be used to absorb losses without threatening financial stability



- TLAC consists of equity plus long-term unsecured debt that can be converted to common equity in bankruptcy
- U.S. G-SIBs now have >5 times more usable TLAC
- In 2008, long-term senior debt not usable without imposing losses pro rata on short-term senior debt (e.g., commercial paper)
- Subordinated debt and non-CET1 were considered unusable in 2008 because of market confusion about loss waterfall
- U.S. G-SIBs have restructured themselves to make all external unsecured long-term debt at toptier parent level structurally or contractually junior to all external short-term debt
- Enough long-term debt (senior + subordinate) to recapitalize U.S. G-SIBs at full Basel III capital levels under conditions twice as severe as 2008

All capital ratios presented on an aggregate (weighted average) basis. Long-term senior debt is estimated based on the long-term non-subordinated borrowings of parent holding companies of all U.S. G-SIBs

Secured Support Agreements

- Secured support agreements impose secured obligation on top-tier parent to use contributable assets to recapitalized operating subsidiaries when certain triggers occur
- Secured support agreements effectively subordinate the claims of the top-tier parent's creditors to the claims of operating subsidiary creditors
- Operating subsidiaries have a secured right to receive capital and liquidity support from the top-tier parent when certain triggers occur
- They are resilient against creditor challenge because they are entered into when the top-tier parent is indisputably solvent

Triggers Based on Capital, Liquidity Projections

- Triggers for bankruptcy or resolution proceedings historically based on:
 - Balance sheet insolvency or
 - Inability to pay debts when due (liquidity insolvency)
- Triggers in U.S. G-SIB resolution plans are now based on forward-looking projections of capital and liquidity that would be needed to successfully execute an SPOE recapitalization
- Purpose is to ensure that bankruptcy / resolution is triggered at a time when the U.S.
 G-SIBs still have enough capital and liquidity to recapitalize their operating subsidiaries and otherwise successfully carry out their SPOE resolution strategies

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Optimal Capital Studies

- Federal Reserve
 - CET1 = 13-26% of RWA
 - Current capital levels "about right"
- Minnesota Federal Reserve Bank (Neel Kashkari)
 - Common Equity = 23.5%-38% of RWA
 - Critical Assumption: TLAC debt can't be converted to common equity
 - Current TLAC levels are approximately 28% of RWA
- Anat Admati / Martin Hellwig
 - 25% Common Equity Leverage Ratio
 - Critical Assumption: No tradeoff between amount of capital and amount of credit extended.
 - Based on Modigliani-Miller Irrelevance Theorem
 - Or not?
- Deploy CCyB? Countercyclicality already reflected in CCAR severely adverse scenarios?

Idiosyncratic vs. Multiple Failures

Assuming Failure of U.S. G-SIB is Idiosyncratic

- The Fed and the FDIC have effectively determined that the SPOE strategies of the U.S. G-SIBs are credible under the Bankruptcy Code
 - Critical Assumptions:
 - U.S. G-SIB has sufficient usable TLAC and liquid assets, secured support agreement, triggers based on projected capital and liquidity needs
 - Bankruptcy Code not Title II of Dodd-Frank
 - No discount window or other government liquidity support for more than a few days

Idiosyncratic vs. Multiple Failures

Assuming Multiple U.S. G-SIBs Fail Contemporaneously

- Yes, SPOE is a credible strategy in a scenario where multiple U.S. G-SIBs fail contemporaneously
 - Critical Assumptions:
 - U.S. G-SIB has sufficient usable TLAC and liquid assets, secured support agreement, triggers based on projected capital and liquidity needs
 - OLA will be invoked under Title II of Dodd-Frank, rather than resolution through the Bankruptcy Code
 - FDIC uses Orderly Liquidation Fund (OLF) to provide secured liquidity to stabilize recapitalized subs
 - FDIC has enough people and expertise to process the failure of more than one U.S. G-SIB at a time because SPOE is much easier to execute with far fewer people than FDIC's traditional strategies (e.g., purchase and assumption transactions)
- No, SPOE is only credible in the case of an idiosyncratic failure
 - Critical Assumptions:
 - FDIC does not have enough people or the expertise to process the failure of more than one U.S. G-SIB at a time
 - Losses will be so great parent will not have enough contributable assets to recapitalize operating subs
 - OLA will be invoked, but OLF will not be sufficient to stabilize recapitalized subs, which will continue to suffer runs and fire-sale losses