U.S. Macroprudential Policies and Supervisory Stress Tests

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Cyclical macroprudential policies

- Objective: Increase resilience of the financial system and reduce downside macro risks

- Prudential regulations and supervision are procyclical
  - Bank capital (Repullo and Suarez 2013);
  - Margins and haircuts (CGFS Longworth report 2010)
  - Stress test losses have declined amid improving economic conditions

- Also borrower and investor behavior is procyclical
  - Credit-to-GDP (Borio and Lowe, 2002; Drehmann and Juselius, 2013)
  - Asset valuations and risk appetite (Adrian and Shin, 2008)
  - Interaction of asset prices and credit growth (Jorda, Schularik, and Taylor, 2015)
  - Credit-to-GDP is a vulnerability that leads to subsequent downturns in the US (Aikman, Lehnert, Liang, Modugno, 2015)
Stress tests and CCAR

U.S. stress testing program has evolved since SCAP into an annual exercise for the largest banking firms (> $50 billion in assets) with two components

1. Dodd-Frank Act Stress Tests (DFAST)
   - Purely quantitative
   - Mandated by law
   - Firms cannot “pass” or “fail”
   - Three scenarios: baseline, adverse, and severely adverse

2. Comprehensive Capital Analysis & Review (CCAR)
   - Quantitative and qualitative assessment of firm capital plans
   - Quantitative assessment of capital ratios in the severely adverse scenario if a firm makes its proposed dividend and share repurchases
   - Qualitative assessment of firms’ risk management processes
   - The Fed publicly objects or not to firm capital plans
Steps in the quantitative assessment

- Design influences all steps of the quantitative assessment including scenario specification, model selection, capital policy, and disclosure decisions.
Supervisory stress test objectives

• Microprudential
  – Forward-looking measure of capital adequacy for each bank under severe macro and financial stress scenarios
  – Promotes safety and soundness of the stressed firms

• Macroprudential
  – Builds resilience at the largest most complex banking firms, and thus the financial system
  – Firms able to provide credit – can’t shrink to health – in a downturn
Macroprudential elements

• Macroeconomic and financial scenarios
  – Banking system as a whole cannot diversify its exposure to household and business credit
  – Recession vs probabilistic approach, to counter procyclicality
  – Salient risks identified by financial stability monitoring
  – Initial shock and amplification

• Aggregate credit
  – BHCs project balance sheets, which typically show shrinkage. The Fed’s independent projections maintain credit supply.

• Failure of single largest counterparty
• Proposed shareholder payouts are assumed even in the stressful scenarios
Supervisory macro scenarios - Probabilistic approach
## Supervisory macro scenarios - Recession approach

<table>
<thead>
<tr>
<th>Peak</th>
<th>Trough</th>
<th>Severity</th>
<th>Duration (quarters)</th>
<th>Real GDP Growth</th>
<th>Change in Unemp. Rate During Recession</th>
<th>Total Change in Unemp. Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1957Q3</td>
<td>1958Q2</td>
<td>Severe</td>
<td>4 (Medium)</td>
<td>-3.1</td>
<td>3.2</td>
<td>3.2</td>
</tr>
<tr>
<td>1960Q2</td>
<td>1961Q1</td>
<td>Moderate</td>
<td>4 (Medium)</td>
<td>-0.5</td>
<td>1.6</td>
<td>1.8</td>
</tr>
<tr>
<td>1969Q4</td>
<td>1970Q4</td>
<td>Moderate</td>
<td>5 (Medium)</td>
<td>-0.1</td>
<td>2.3</td>
<td>2.4</td>
</tr>
<tr>
<td>1973Q4</td>
<td>1975Q1</td>
<td>Severe</td>
<td>6 (Long)</td>
<td>-3.1</td>
<td>3.4</td>
<td>4.1</td>
</tr>
<tr>
<td>1980Q1</td>
<td>1980Q3</td>
<td>Moderate</td>
<td>3 (Short)</td>
<td>-2.2</td>
<td>1.4</td>
<td>1.4</td>
</tr>
<tr>
<td>1981Q3</td>
<td>1982Q4</td>
<td>Severe</td>
<td>6 (Long)</td>
<td>-2.6</td>
<td>3.3</td>
<td>3.3</td>
</tr>
<tr>
<td>1990Q3</td>
<td>1991Q1</td>
<td>Mild</td>
<td>3 (Short)</td>
<td>-1.3</td>
<td>0.9</td>
<td>1.9</td>
</tr>
<tr>
<td>2001Q1</td>
<td>2001Q4</td>
<td>Mild</td>
<td>4 (Medium)</td>
<td>0.7</td>
<td>1.3</td>
<td>2.0</td>
</tr>
<tr>
<td>2007Q4</td>
<td>2009Q2</td>
<td>Severe</td>
<td>7 (Long)</td>
<td>-4.7</td>
<td>4.5</td>
<td>5.1</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>Severe</strong></td>
<td>6</td>
<td></td>
<td><strong>-3.8</strong></td>
<td><strong>3.7</strong></td>
<td><strong>3.9</strong></td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>Moderate</strong></td>
<td>4</td>
<td></td>
<td><strong>-1.0</strong></td>
<td><strong>1.8</strong></td>
<td><strong>1.8</strong></td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>Mild</strong></td>
<td>3</td>
<td></td>
<td><strong>-0.3</strong></td>
<td><strong>1.1</strong></td>
<td><strong>1.9</strong></td>
</tr>
</tbody>
</table>
Macroprudential Scenario Design

- Policy statement (2013) – Unemployment rate (UR) in the severely adverse scenario will increase between 3 to 5 pp, or to 10 percent
  - In “good times,” when the UR is low, the increase in the UR in the scenario will be larger, so somewhat limiting procyclicality
- Scenarios include salient risks beyond those typical to recessions
  - Examples: Property prices, interest rates
In 2015, included stressed corporate credit markets, based on compressed spreads and rising leverage of speculative-grade nonfinancial businesses.

A total of 28 variables were included in the 2015 published scenarios and the Fed also publishes a narrative that describes developments for the paths of key variables not in the scenarios.

- CCAR 2015 narrative described spreads for many high-yield instruments.
Procyclicality as economy and balance sheets improve

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</thead>
<tbody>
<tr>
<td>Loan Losses</td>
<td>8.1</td>
<td>7.5</td>
<td>6.9</td>
<td>6.1</td>
<td>-25%</td>
</tr>
<tr>
<td>(Portfolio loss Rate)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decline in Net Income</td>
<td>1.9</td>
<td>1.7</td>
<td>1.6</td>
<td>1.5</td>
<td>-21%</td>
</tr>
<tr>
<td>(% of Avg. Assets)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

From: CCAR and Dodd-Frank Act Stress Test Results
Balance sheet projections

- Each firm’s individual projection reflects its own view of its market share, and reduces the horizontal comparability.
- Starting in 2013, Fed produces own projections of balance sheets under the supervisory scenario, based on aggregate volume as a function of broad economic conditions.
- Common assumptions for household and business borrowing, and firms’ market shares.
- Used to produce projections of firm PPNR, loan losses, RWA and pro forma regulatory capital ratios.
- Consistent with objective of a system that can function in stress.

Table 3: Loan Growth Projections in CCAR/DFAST 2013

<table>
<thead>
<tr>
<th>BHC Projections</th>
<th>Cumulative change in total loans over nine quarters (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25\text{th} percentile</td>
<td>-0.5</td>
</tr>
<tr>
<td>50\text{th} percentile</td>
<td>-7.8</td>
</tr>
<tr>
<td>75\text{th} percentile</td>
<td>-9.4</td>
</tr>
<tr>
<td>Federal Reserve model</td>
<td>1.0 to 2.0</td>
</tr>
</tbody>
</table>
Capital Distributions in DFAST and CCAR

- Starting tier 1 common
- Net losses (losses less PPNR)
- DFAST standardized capital distributions
- CCAR capital plan proposed distributions
- Post-CCAR tier 1 common

**Average dividends paid out over the previous four quarters.**

**Independently calculated by the Federal Reserve, based on firm-supplied data and Fed models.**

**Firms’ planned capital actions under the baseline, but applied to the stress scenario.**
Shareholder payout assumptions

• Firm continues shareholder payouts even in stress environment
  – Firms did not cut materially in 2007-2008 episode
  – If assumed instead they cut payouts, could cause funding problems for a firm, and for other firms

• Design process that mitigates a firm’s incentives to increase dividends beyond what can be supported by stability of earnings
  – Past year’s dividends are included in following year’s DFAST
  – Proposed dividends are included in the CCAR
  – DFAST and CCAR exercises occur each year
Next steps for stress tests in macroprudential policies

• Stress tests have strengthened microprudential supervision
  – Forward-looking assessment of capital and capital plans, conducted on a horizontal basis
  – Disclosure of results increases the transparency of bank risks
  – Fosters market discipline

• Some macroprudential risks
  – Banks may focus on back-engineering CCAR and ignore other risks
  – May load on risks that are systemic but orthogonal to projected losses
  – Stress losses still procyclical

• Some possible next steps
  – Links to funding risks and fire sale externalities
  – Common counterparty distress
End
Disclosure

Table 2. 31 participating bank holding companies
Projected stressed capital ratios, risk-weighted assets, losses, revenues, net income before taxes, and loan losses
Federal Reserve estimates: Severely adverse scenario

<table>
<thead>
<tr>
<th>Actual 2014:Q3 projected stressed capital ratios through 2016:Q4</th>
<th>Actual 2014:Q3</th>
<th>Stress capital ratios ( ^{1} ) Ending</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier 1 common ratio (%)</td>
<td>11.9</td>
<td>8.4</td>
<td>8.3</td>
</tr>
<tr>
<td>Common equity Tier 1 capital ratio (%) ( ^{2} )</td>
<td>n/a</td>
<td>7.8</td>
<td>7.6</td>
</tr>
<tr>
<td>Tier 1 risk-based capital ratio (%)</td>
<td>13.5</td>
<td>8.6</td>
<td>8.4</td>
</tr>
<tr>
<td>Total risk-based capital ratio (%)</td>
<td>16.2</td>
<td>11.0</td>
<td>10.8</td>
</tr>
<tr>
<td>Tier 1 leverage ratio (%)</td>
<td>8.8</td>
<td>5.9</td>
<td>5.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk-weighted assets (billions of dollars) ( ^{3} )</td>
<td>8,790.2</td>
<td>9,103.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Projected losses, revenue, net income and other comprehensive income through 2016:Q4</th>
<th>Billions of dollars</th>
<th>Percent of average assets ( ^{1} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-provision net revenue ( ^{2} )</td>
<td>359.5</td>
<td>2.1</td>
</tr>
<tr>
<td>Other revenue ( ^{4} )</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Provisions</td>
<td>361.9</td>
<td>17.5</td>
</tr>
<tr>
<td>Realized losses/gains on securities (AFS/HTM)</td>
<td>15.6</td>
<td>0.8</td>
</tr>
<tr>
<td>Trading and counterparty losses ( ^{5} )</td>
<td>102.7</td>
<td>5.3</td>
</tr>
<tr>
<td>Other losses/gains ( ^{5} )</td>
<td>29.3</td>
<td>1.4</td>
</tr>
<tr>
<td>equals Net income before taxes</td>
<td>-222.2</td>
<td>-1.5</td>
</tr>
</tbody>
</table>

From: Dodd-Frank Act Stress Test 2015: Supervisory Stress Test Methodology and Results

- The same type of information is provided for all 31 of the banks in the CCAR/DFA stress tests.
Disclosure, continued

• CCAR 2012 and all subsequent CCARs have disclosed bank-level results by type of exposure for the severely adverse scenario

• DFAST 2013 disclosed severely adverse scenario results only but all subsequent DFASTs have disclosed results for both scenarios

• Disclosing results – even outside of stress periods – can be valuable
  – Results provide the market with information on banks’ risks in normal times, promoting transparency and market discipline

• Disclosing results beyond top-line results also
  – Increases stress-test credibility, by showing how supervisors came to their final results
  – Increases the information on banks’ risks available to the market
Key Risk Driver: Delinquent Loans

Delinquency Rate

- Residential Real Estate
- Credit Cards
- Other Consumer Loans
- C&I Loans
- Commercial Real Estate

Legend:
- 2011Q3
- 2012Q3
- 2013Q3
- 2014Q3