Stress Testing Community Banks

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Stress tests are not required for community banks

• **Regulators**: Failed community banks are resolvable. Hence, they are not systemically important.

• **Community banks**: Disproportionate regulatory burden. Lack of internal modeling expertise.

But community banks should want to know...

• “How would our bank hold up if we had another severe economic shock?”
We estimate a stress test model for small U.S. banks

Our model is an augmented version of the New York Fed’s “CLASS” model

- We estimate the model for U.S. commercial banks of all sizes.
- We use the model to stress U.S. community banks under Fed scenarios:
  - Adverse Supervisory stress scenario
  - Severe Adverse Supervisory stress scenario

We plan to update the model annually and make bank-specific stress test results available to individual community banks (upon request).
16 equations in the model

1. Net interest income
2. + Noninterest income
3. - Noninterest expense (Compensation)
4. - Noninterest expense (Fixed Assets)
5. - Noninterest expense (All Other)
6. - Loan loss provisions (Commercial & Industrial)
7. - Loan loss provisions (Construction & Development)
8. - Loan loss provisions (Agricultural Production)
9. - Loan loss provisions (Farm Land)
10. - Loan loss provisions (Credit Cards)
11. - Loan loss provisions (Other Consumer)
12. - Loan loss provisions (Residential Real Estate)
13. - Loan loss provisions (Home Equity Lines of Credit)
14. - Loan loss provisions (Multi-family Real Estate)
15. - Loan loss provisions (Nonfarm Nonres. Real Estate)
16. - Loan loss provisions (All Other)

≈ Income before taxes

Estimating the model:

- Estimate each line separately, for 1991Q1-2015Q4 panel data.

- Each regression includes:
  - **Bank-specific** variables
  - **Macroeconomic** variables from the Fed’s stress scenarios.
  - Pooled panel approach with geographic fixed effects.
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Use model parameters to project bank capital for 2016-2018:

1. Use 2015Q4 bank data and Fed’s Q1 stress scenario → project values for all 16 items for each bank in 2016Q1.
2. The sum of the 16 projected values → expected pre-tax income in 2016Q1.
4. Iterating each quarter through 2018Q1 takes each bank through Fed stress scenario.
Data subsamples

We estimate the model over 1991-2015 for four separate subsamples:

- SIFI banks (assets > $250 billion)
- CLASS banks (assets > $5 billion; roughly the largest 200 banks)
- Large Community Banks ($500 million to $10 billion)
- Small Community Banks ($50 million to $500 million)

We focus mainly on these banks today.

We project capital for each bank over 2016-2018 based on:

- Assume that the Fed’s **Severely Adverse** stress scenario happens.
- Each bank starts the stress test at its 2015Q4 capital level.
Projected Risk-based Tier 1 ratio in Severely Adverse scenario

% of **Large** Community Banks in each capital range

- Well Capitalized
- Adequately Capitalized
- Undercapitalized
- Significantly Undercapitalized
- Severely Undercapitalized
- Insolvent

Why are so few banks projected to be insolvent by 2018?
Why so few projected bank insolvencies?

1. Extreme survivor bias in our sample. The only community banks left in 2015 were those strong enough to survive the financial crisis!

2. Our stress scenario projections are only nine quarters long. As we know, some banks continued to fail long after the end of the crisis.

3. Our projections are based on the expected (mean) outcomes. Alternative projections based on “worse case outcomes” resulted in more insolvencies.

4. Regulators required banks to hold more capital in 2015 than in 2008.
Tier 1 Risk-based ratio, 1996-2015

Assets < $10 Billion

Assets > $250 Billion
Projected Risk-based Tier 1 ratio in Severely Adverse scenario

% of **Large** Community Banks in each capital range

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**2015 Equity**  **2008 Equity**
Projected Risk-based Tier 1 ratio in Severely Adverse scenario

% of **Small** Community Banks in each capital range

<table>
<thead>
<tr>
<th>Capital Range</th>
<th>2015 Equity</th>
<th>2008 Equity</th>
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<tbody>
<tr>
<td>Well Capitalized</td>
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A summary of our findings

- The community banking sector is now substantially less exposed to macroeconomic shocks than before the crisis.
  - Very few projected insolvencies.
  - Higher capital ratios; surviving banks are battle tested.

- However, individual community banks are still exposed to large (though non-fatal) losses should a 2007-2009 type shock occur again.
  - Large community banks: Given 2015 equity levels, expect 79% to drop below adequately capitalized.
  - Small community banks: Given 2015 equity levels, expect 18% to drop below adequately capitalized.
Outreach to the community banking sector

- Visit the **KU Center for Banking Excellence** website:
  - [https://business.ku.edu/centers/center-banking-excellence](https://business.ku.edu/centers/center-banking-excellence)

- At the website you can find:
  - These *presentation slides* and the *full-length technical paper*.
  - Research, analysis, and commentary on the banking industry.
  - How to get a customized, detailed report describing *how your bank performed* in our stress test model.
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