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

➢ Hirtle, Kovner, Vickery and Bhanot (2015, 2016) estimate their model for the **largest 200 U.S. banks**.

➢ 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**.

3. Apply tax rate. Adjust equity and loan charge-offs.

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)
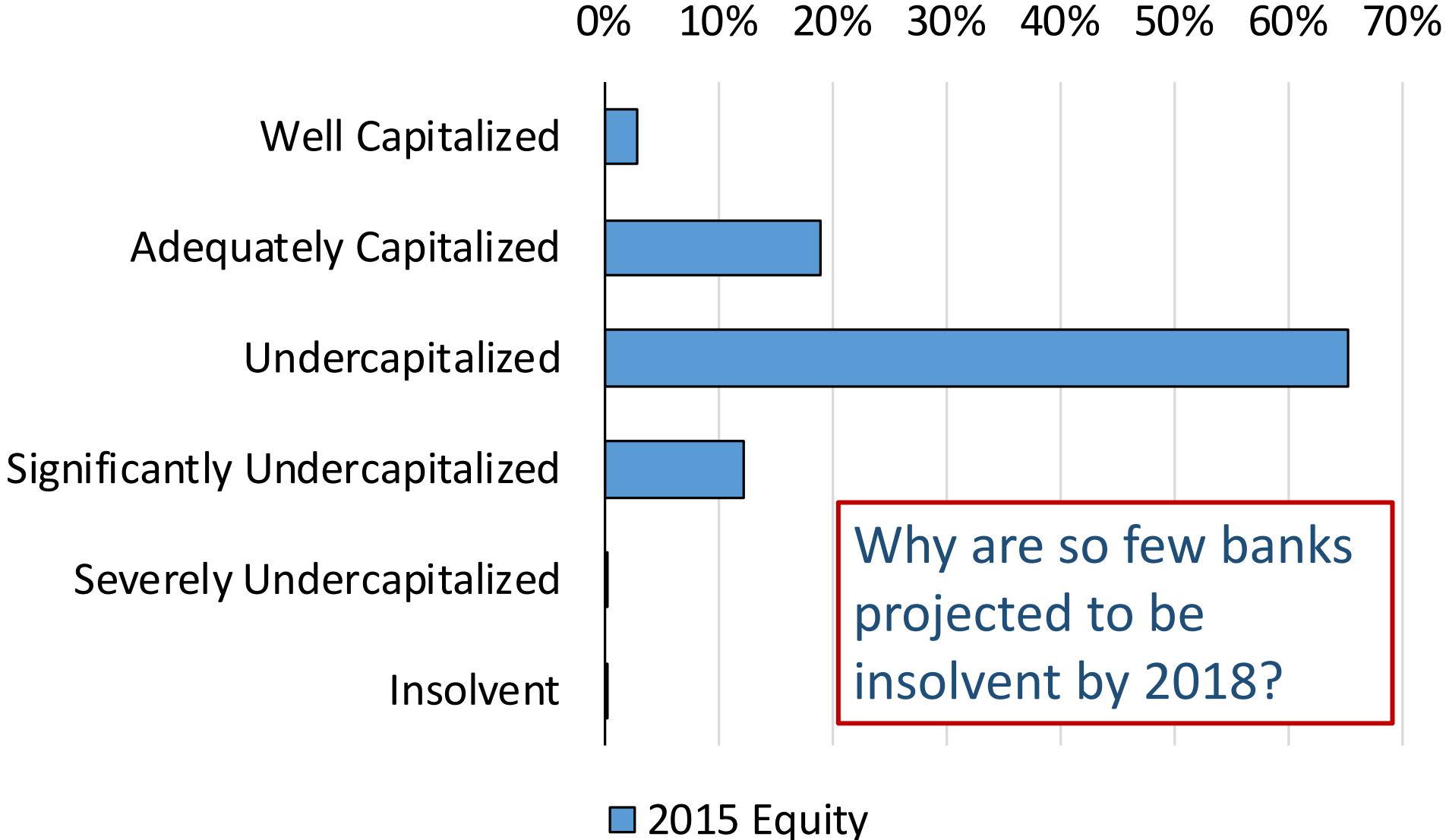
• Small Community Banks ($50 million to $500 million)

> 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.

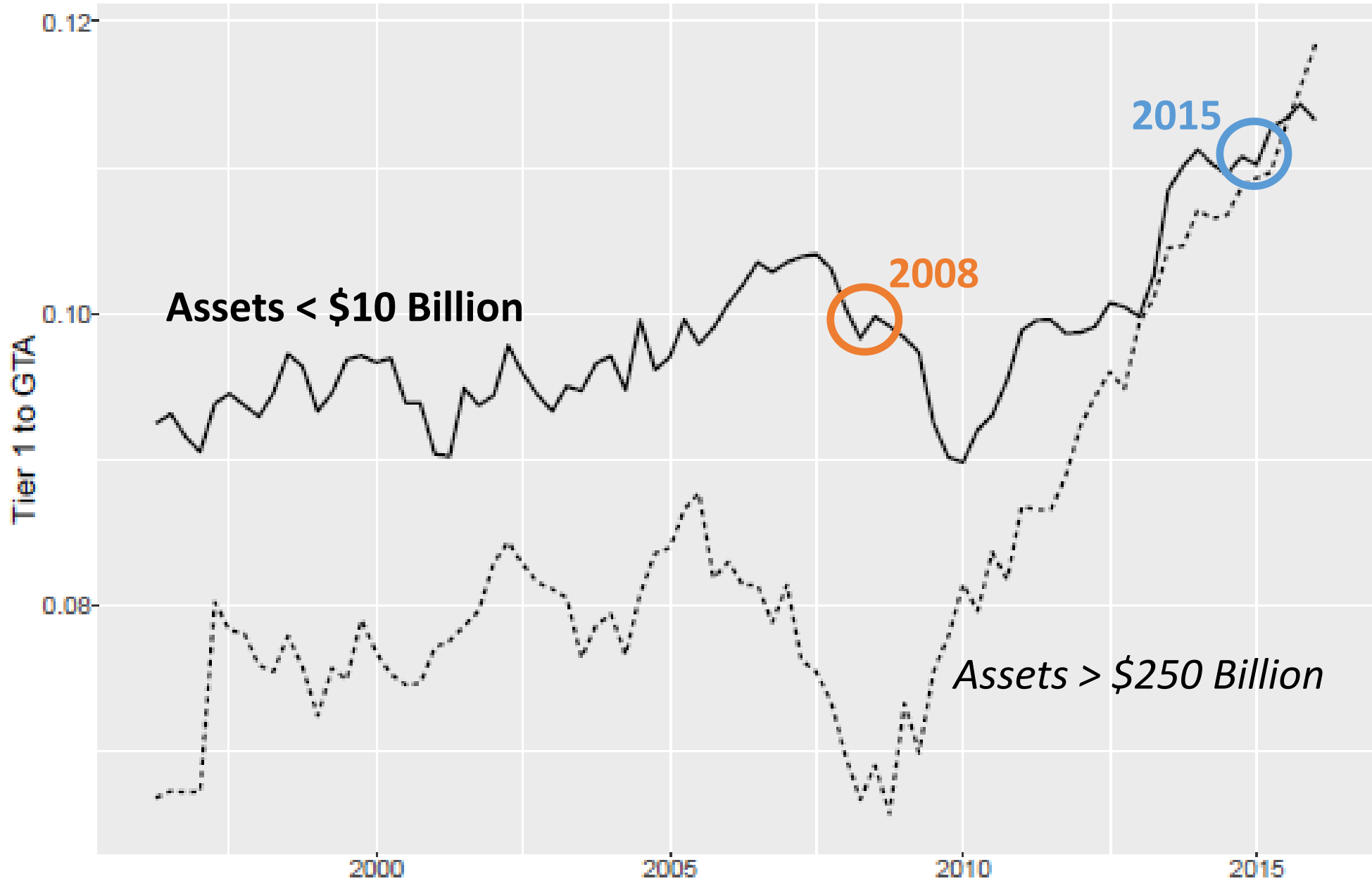# Projected Risk-based Tier 1 ratio in Severely Adverse scenario
% of Large Community Banks in each capital range

0%   10%   20%   30%   40%   50%   60%   70%

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

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

■ 2015 Equity

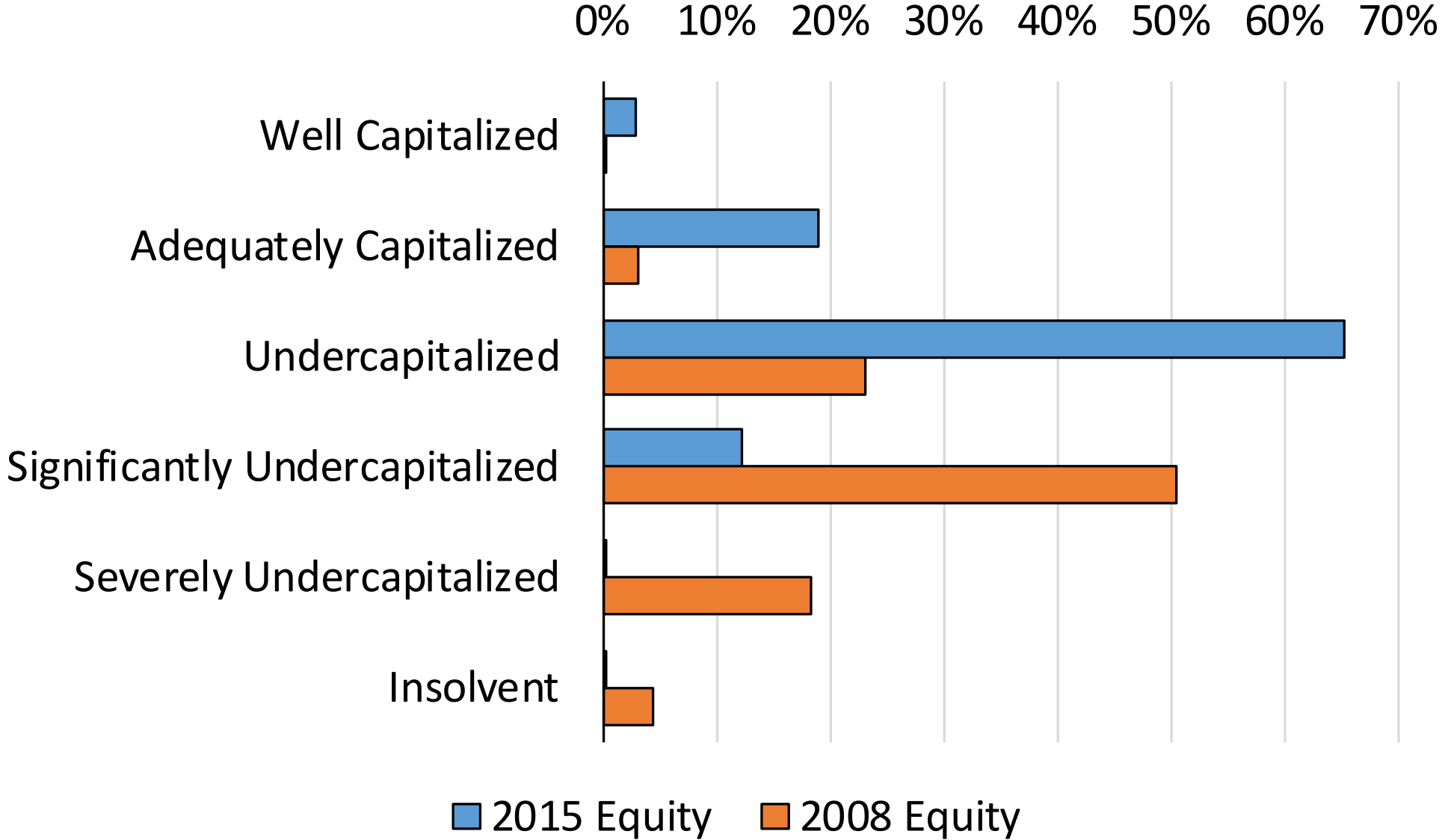# Why so few projected bank insolvencies?

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

Projected Risk-based Tier 1 ratio in Severely Adverse scenario
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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
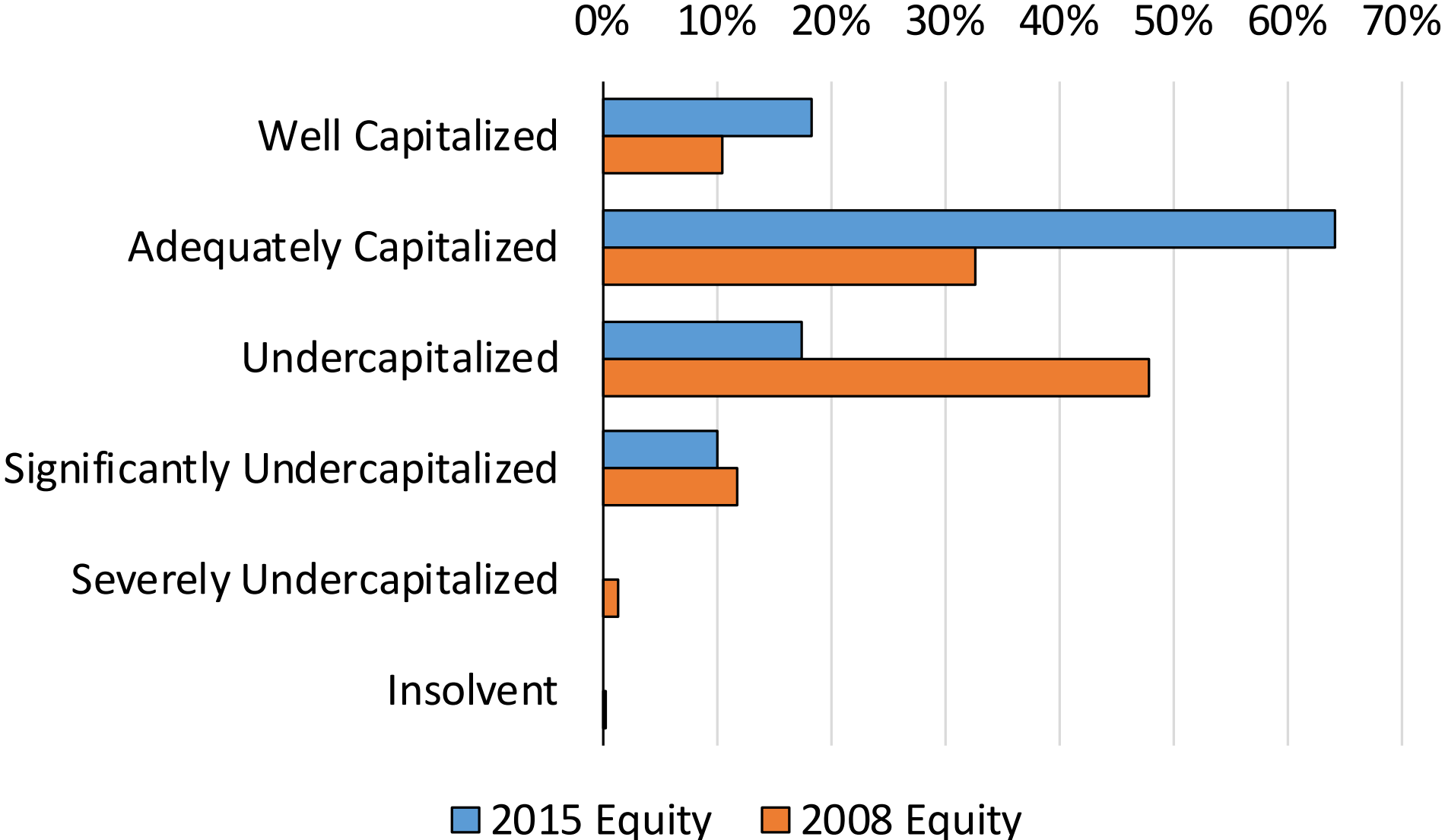
A summary of our findings

➢ 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

➢ 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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