

Disclosure of Stress Test Results

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IMF-Bank of Russia Macroprudential Stress Testing Workshop

Roadmap

- ▶ About me:
 - BA: Lomonosov Moscow State University 2004 – 2009,
 - PhD: Stanford Graduate School of Business 2009 – 2014,
 - Work: Simon School of Business 2014 – present.

- ▶ Research area: capital markets, information design, stress tests.

- ▶ This talk is about disclosure of stress test results.
 - Based on a normative theory in “Design of Macroprudential Stress Tests” with Pavel Zryumov and Andrzej Skrzypacz.

Why manage information?

- ▶ The Central Bank (Regulator) learns about the risks to the financial system.
- ▶ Disclosure of stress test results is
 - **good** for market liquidity and allocations;
 - **good** for market discipline and ex-ante incentives;
 - **good** for credibility of the Central Bank;
 - **bad** for potentially creating market panics and breakdowns.
- ▶ How to disclose information about systemic risk
 - health of a Too-Big-to-Fail bank;
 - magnitude system-wide risk exposures.
- ▶ In both cases the externality of a failure on the economy is very big.

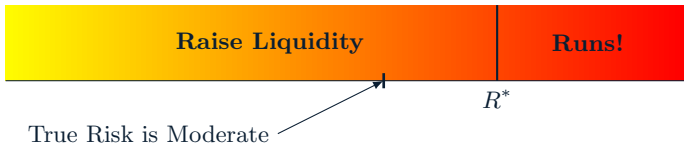
Systemically Important Financial Institution

Stress Tests

- ▶ Systemically Important Financial Institutions (SIFIs) are at the core of the financial network.
 - JP Morgan Chase, Bank of China, AIG, Prudential Financial.
- ▶ Stress Testing is one of the main forward-looking tool to regulate SIFIs.
 - liquidity requirements are set contingent on stress test results
 - banks that fail the test are required to raise capital/adjust portfolio in a precautionary manner
- ▶ Adverse scenario choice and liquidity regulation go hand in hand.
 - very harsh test and very soft test are informationally equivalent
 - distinction – regulation and monitoring imposed on the banks

It is Easy to Bring Good News

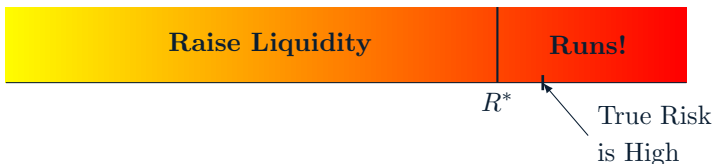
- ▶ Suppose run a stress test and uncover the true risk of JP Morgan's assets.
 - Below is a set of possible risks (like a fire hazard chart).
 - You uncover a point estimate on this chart.



- ▶ If the uncovered risk is less than R^* , then you can disclose the results to the bank and to the markets.
 - Threshold R^* can be coming from the expected value of the banks' assets.
- ▶ Even if JP Morgan fails the test, as long as it does not fail it by too much, it can still be regulated safely.

What to do When Bringing Bad News?

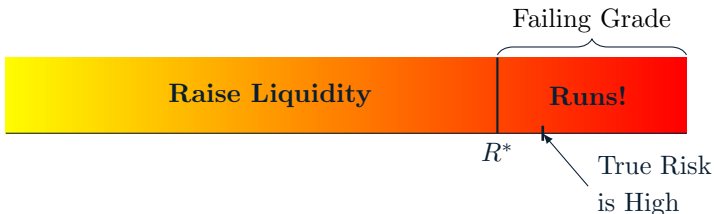
- ▶ What if the true uncovered risk turns out to be high?



- ▶ If you disclose the high observed amount of risk to the market
 - investors panic and refuse to rollover JP Morgan's debt;
 - increased default risk devalues JP Morgan's equity;
 - Central Bank may need to bailout JP Morgan since it gets locked out from public markets.
 - ▶ Both expensive and unpopular.
- ▶ Can you do better?

Partial Disclosure of Results

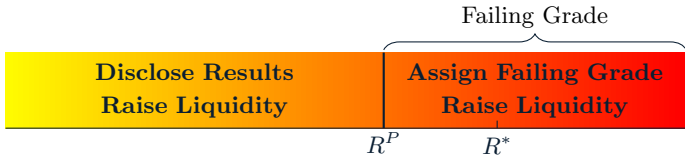
- ▶ Instead of telling the market that the risk is high, assign a single failing grade for these states of the world.



- ▶ Market participants are rational.
- ▶ If they expect you to only fail the banks if risk is above R^* then they rationally run on the bank.
- ▶ A failing grade for only good states of the world does not help.

Fail More Risk States

- ▶ Assign a failing grade for moderate and large levels of risk.
 - So that, on average, the total risk does not exceed R^* .
 - Think of it as failing the bank based on a more adverse scenario.



- ▶ Now the failing grade does not carry the same stigma.
 - Markets are rational but they know that the risk is, on average, not too high.
- ▶ Bank can still recapitalize conditional on the receiving a failing grade.
- ▶ It is crucial not to disclose specific stress test outcomes to the markets.

Capital Ratios

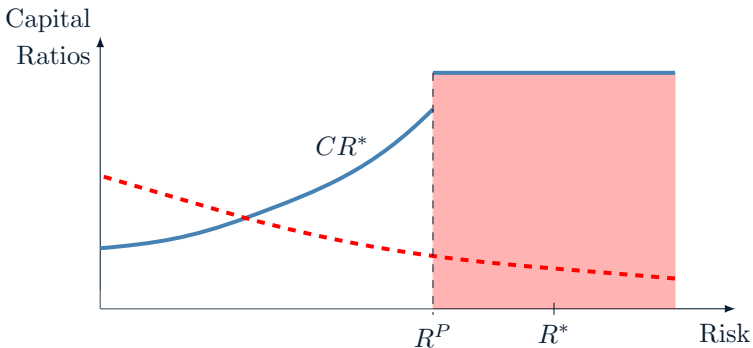


Figure 1: Capital Ratio CR^* implied by the optimal capital requirements (in blue) and Capital Ratio of the initial portfolio (in red) as a function of uncovered risk.

Systemically Important Disclosure

- ▶ A failure of a large bank is expensive to the system and the regulator.
- ▶ One way to avoid it is to set stress test contingent capital requirements and only disclose results partially.
- ▶ Can the Central Bank commit to such partial disclosure?
 - Assets are priced competitively and so is fair to investors.
 - The regulator may be tempted, ex-post, to disclose moderate risk levels between R^P and R^* .
- ▶ Possible implementations:
 - recapitalization in response to more adverse scenarios than necessary may achieve this objective;
 - strategic ignorance about parts of the bank's balance sheet may also achieve this.

Macroprudential Disclosure

Macroprudential Stress Tests

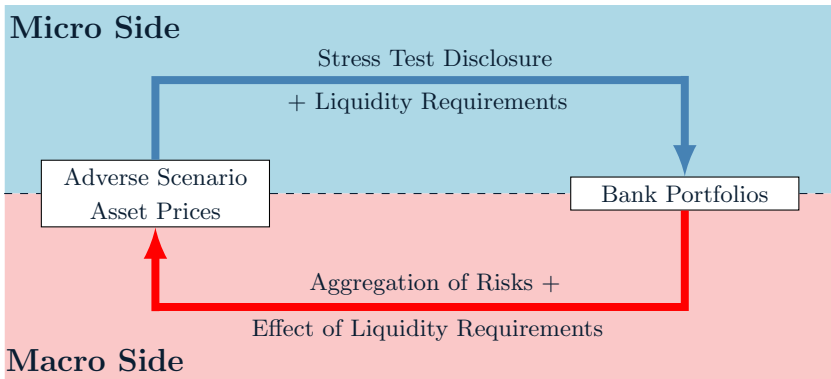
- ▶ Macroprudential tests focus on general equilibrium feedback effects.
 - whether a bank is well capitalized depends not only on its own balance sheet but also on the stability of the whole system
 - feedback effect = fire sales
- ▶ The regulator is better positioned to uncover the sources and exposures to systemic risks.
 - collects sensitivities of bank portfolios to market, liquidity and idiosyncratic scenarios
- ▶ Systemic risk can present itself as either
 - common quality of the banks' portfolios,
 - or degree of correlation among banks' portfolios (more interesting case)
- ▶ Information you uncover affects all banks simultaneously.

Aggregate Risk with Small Banks

- ▶ SIFI is a source of systemic risk for the financial system.
 - But it is not the only source of such risk.
- ▶ If the economy has smaller banks their portfolios may
 1. Have low fundamentals, then the analysis is virtually the same as with one big bank,
 - ▶ micro-prudential test of banks one-by-one uncovers this source of risk.
 2. Have good fundamentals, but have latent correlation.
 - ▶ Need to model fire sales and capital provision externalities in the stress-testing framework.
- ▶ Public markets are especially bad at aggregating and pricing available information about asset correlation.

Macroprudential Scenario Testing

- ▶ Microprudential test subjects each bank to the adverse scenario.



- ▶ Macroprudential test checks the adverse scenario is consistent with banks' balance sheet effects on asset prices.

Two Types of Feedback Effects

▶ **Feedback effects of liquidity needs.**

- Fire sale externalities: a bank needing liquidity fire sells assets into the market creating a shortfall for other banks.

▶ **Feedback effects of capital requirements.**

- If most banks are well capitalized, then the system is resilient.
- Each bank may have to hold more liquidity than it needs individually. Liquidity is a public good.

Implications for Capital Requirements

- ▶ The bank needs more capital than it needs under the mild scenario.
 - Since the mild scenario captures the case where aggregate liquidity is not an issue.
- ▶ The bank needs less capital than under the adverse scenario.
 - Because if all banks raise precautionary capital/liquidity then the adverse scenario does not occur.
- ▶ Whether a bank passes the stress test or not should depend on how strong other banks are.
 - Negative regulatory externality on the strong bank if other banks in the system are weak.
 - Liquidity requirements must be an aggregate constraint.

Back to Disclosure of Stress Test Results

- ▶ Disclosing to the market that the entire system is severely under-capitalized is dangerous.
 - Risking a system-wide bank run.
- ▶ Previous logic implies the need to assign a single failing grade.
 - Overcapitalize moderate risk states to keep high risk states safe.
 - This is ex-ante cross-subsidization between moderate and high risk states.
- ▶ Subsequent liquidity requirements on the banks must reflect aggregate liquidity.
 - Stronger banks may have to raise more capital than they need.
 - This is ex-post cross-subsidization between strong and weak banks.

Gradual Disclosure of Results

Sequential Disclosure and Recapitalization

- ▶ The current approach is to disclose the stress test results at once.
 - Some countries disclose bank-level results, some disclose only aggregates.
- ▶ These results have implications for regulatory capital and liquidity requirements.
- ▶ Can sequential stress test result disclosure be welfare improving?
 - Yes, if banks are also sequentially updating their portfolios.
 - Especially if banks are heterogeneous.
 - Intuition: smooth out the volatility shock in the disclosure decision
- ▶ This is good for ex-post information efficiency, market discipline, and regulatory transparency.

Sequential Disclosure and Recapitalization

- ▶ Suppose you have two banks: weak bank A and strong bank B.
- ▶ If you run the stress test and uncover large amounts of systemic risk, then bank A may be at risk.
- ▶ Before any information is disclosed, ask bank A to raise capital.
- ▶ Once it is more resilient to news about aggregate risk, disclose the results.
 - Let both banks adjust to the actual results of the stress test.
- ▶ This is, in theory, welfare improving.
 - Not only how much information to disclose to the markets but also when.

Conclusion

Conclusion and Questions

- ▶ Disclosure of stress test results introduces risk to the financial markets.
- ▶ Strategic management of this information may lower the downside risk of this news and avoid runs.
 - Transparency if risk is low.
 - Opacity and some over-capitalization if risk is high.
- ▶ Sequential stress test result disclosure may be welfare improving.
 - Additional degree of freedom simplifies the treatment of heterogeneous banks.

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- ▶ Sequential stress test result disclosure may be welfare improving.
 - Additional degree of freedom simplifies the treatment of heterogeneous banks.
- ▶ Thank you!