INVICTUS GROUP

May 3, 2023

CAPITAL STRESS TESTING IN A POST-SVB WORLD

WHY IT'S SO IMPORTANT AND HOW IT NEEDS TO CHANGE

Adam Mustafa, CEO and Co-Founder, Invictus Group

TODAY'S AGENDA

1. Why Stress Testing is So Important *Right Now*
2. The Limitations of Existing Approaches to Stress Testing
3. How to Approach Stress Testing in 2023
4. "So What?" -- What to Do with Stress Test Results
5. Wrap Up and Q&A

SECTION 1

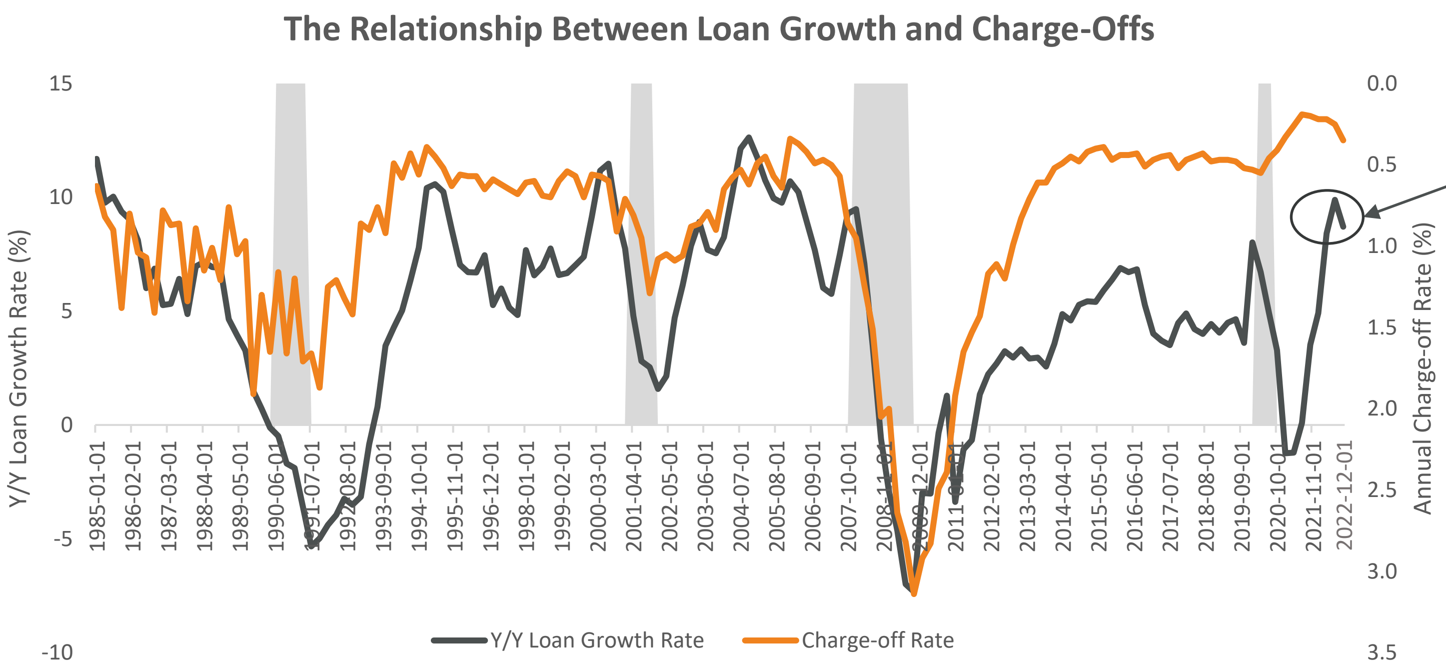
WHY STRESS TESTING IS SO IMPORTANT ***RIGHT NOW***

BANK FAILURES, TIGHTENING LIQUIDITY ….& A CREDIT CRUNCH?

PRIORITIZING LIQUIDITY COMES WITH A MAJOR TRADE-OFF

- March bank failures driven by interest rate and liquidity risk, not credit risk
- Logical response of most banks is to increase and/or prioritize liquidity
- But more liquidity may mean less lending
- Less lending means higher probability of a credit crunch

THE RELATIONSHIP BETWEEN DECELERATING LOAN GROWTH AND CHARGE-OFFS IS VERY STRONG



This is as of 12/31/22… so it was already dipping prior to recent bank failures!

Note: Grey bands are recessions.

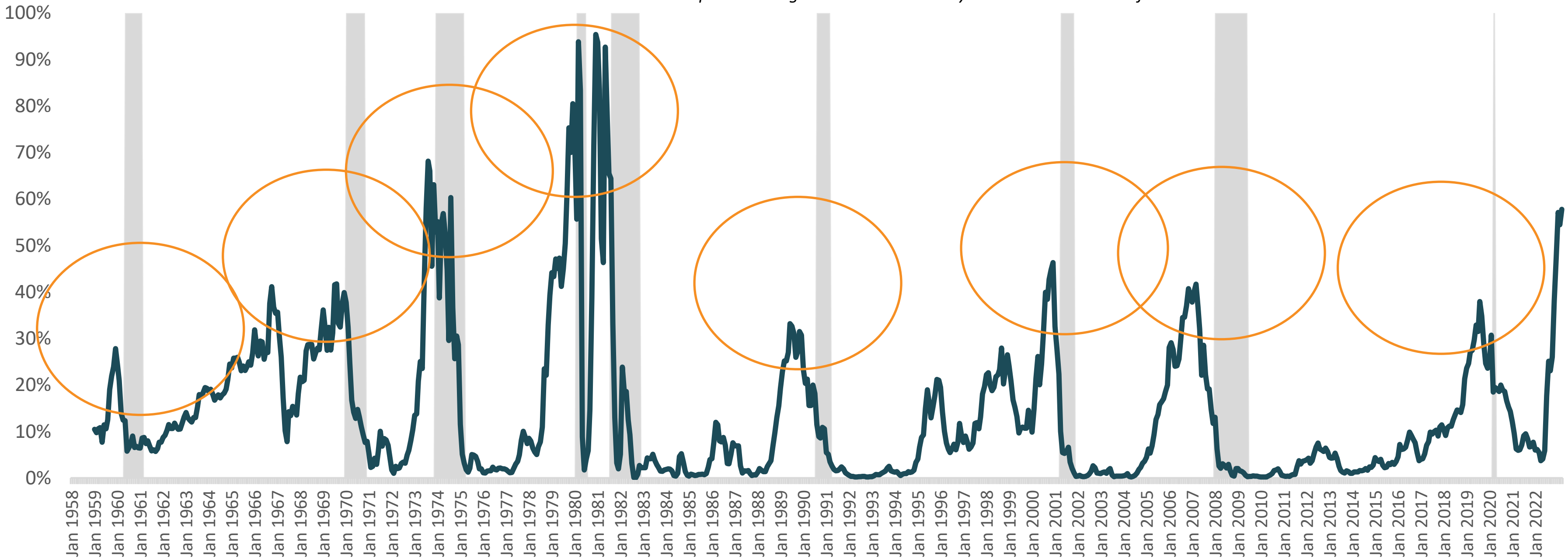
Source: Federal Deposit Insurance Corporation, Balance Sheet: Total Assets: Total Loans and Leases [QBPBSTASTLN], retrieved from FRED. Board of Governors of the Federal Reserve System (US), Charge-Off Rate on All Loans, All Commercial Banks [CORALACBN], retrieved from FRED.

LEADING INDICATORS OF A RECESSION ARE FLASHING RED.

THE FEDERAL RESERVE'S LEADING INDICATOR – THE RPI MODEL

The Probablity of a Recession Occuring In 12 Months, per the NY Fed's RPI Model

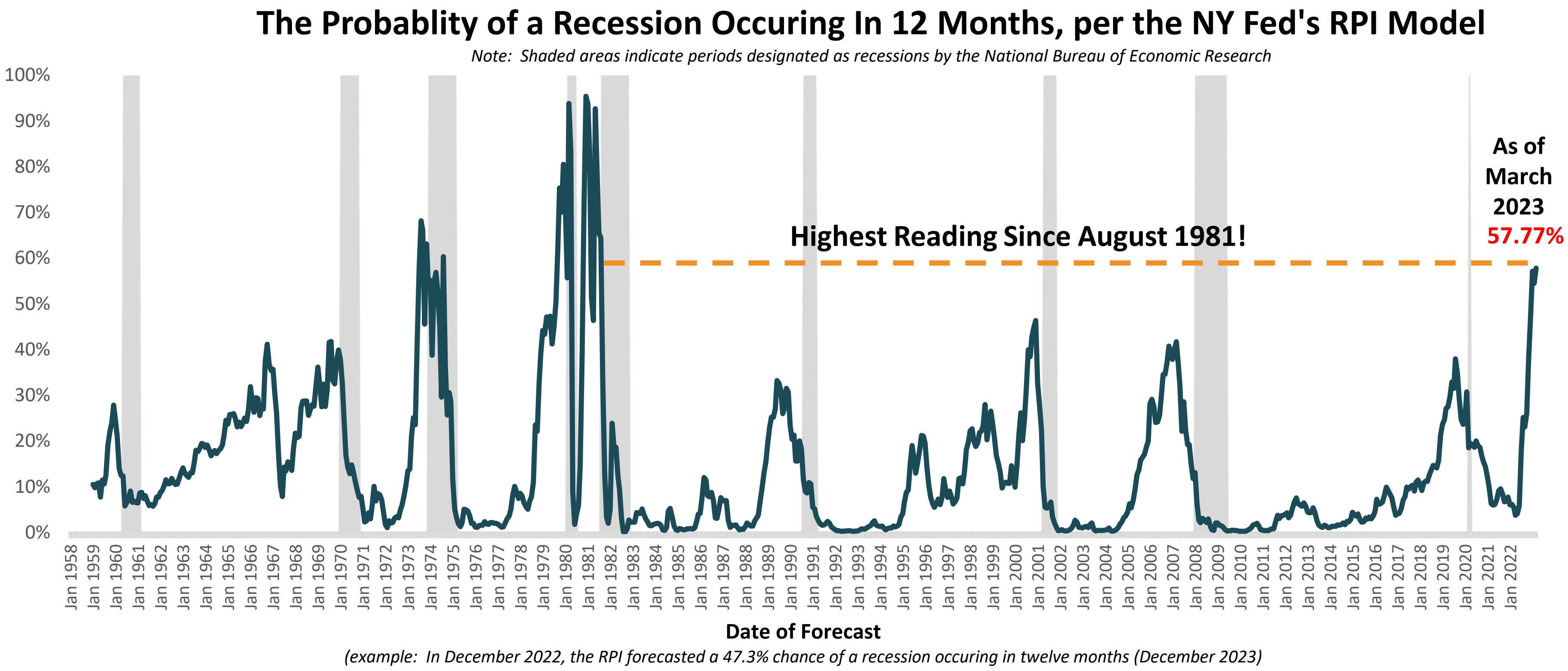
Note: Shaded areas indicate periods designated as recessions by the National Bureau of Economic Research



Date of Forecast

(example: In December 2022, the RPI forecasted a 47.3% chance of a recession occuring in twelve months (December 2023)

THE FEDERAL RESERVE'S LEADING INDICATOR – THE RPI MODEL

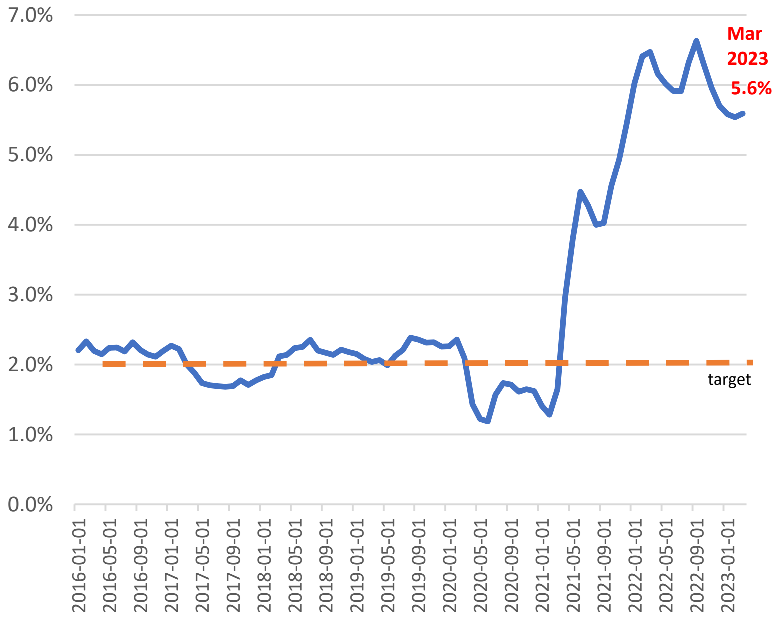


TIGHTENING MONETARY POLICY…ARE WE SURE ITS NEARLY OVER?

The Case for Why Interest Rates May Go Higher Than Expected

- CPI still at 300 bps higher than Fed target
- Core CPI (aka Services ex food ex energy) is the stickiest and increased in March
- Structural changes are pro-inflationary
  - China reopening accelerating
  - Clean energy transition
  - De-globalization trends
  - Geopolitical risks

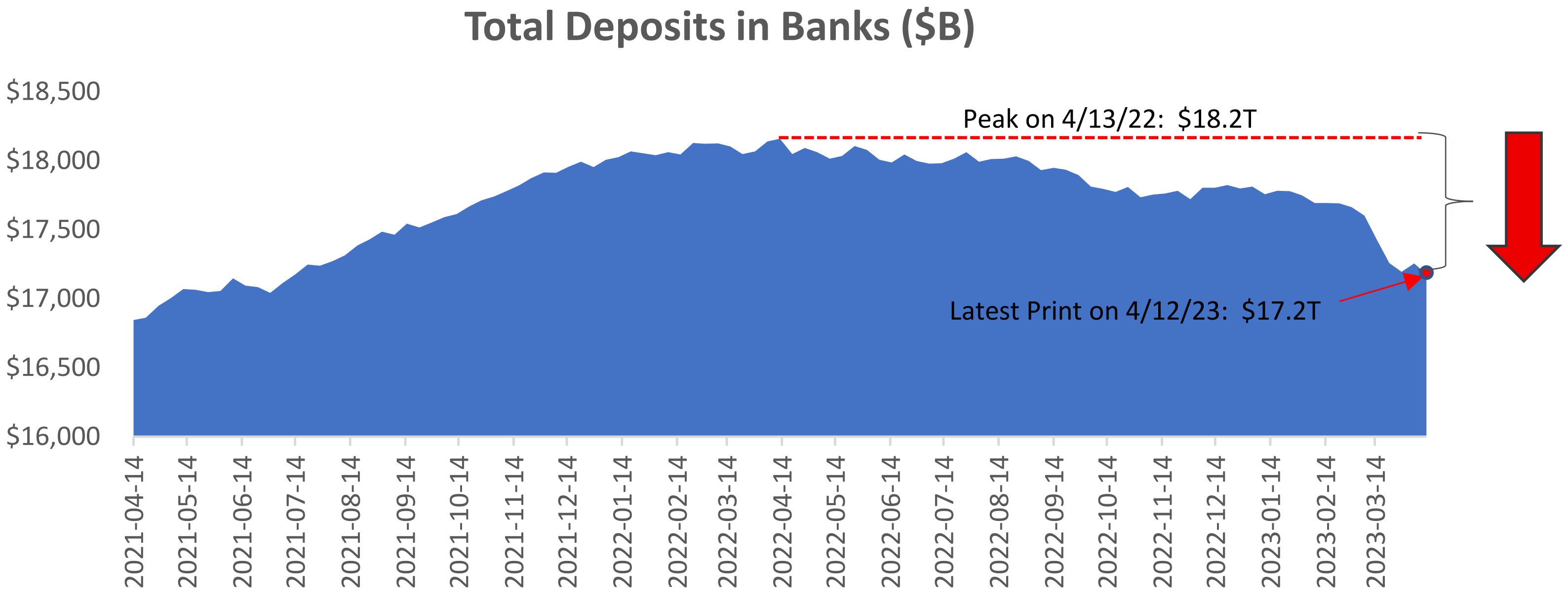
Core CPI Annual % Chg




ONE TRILLION DOLLARS OF DEPOSITS DESTROYED IN 12 MONTHS.

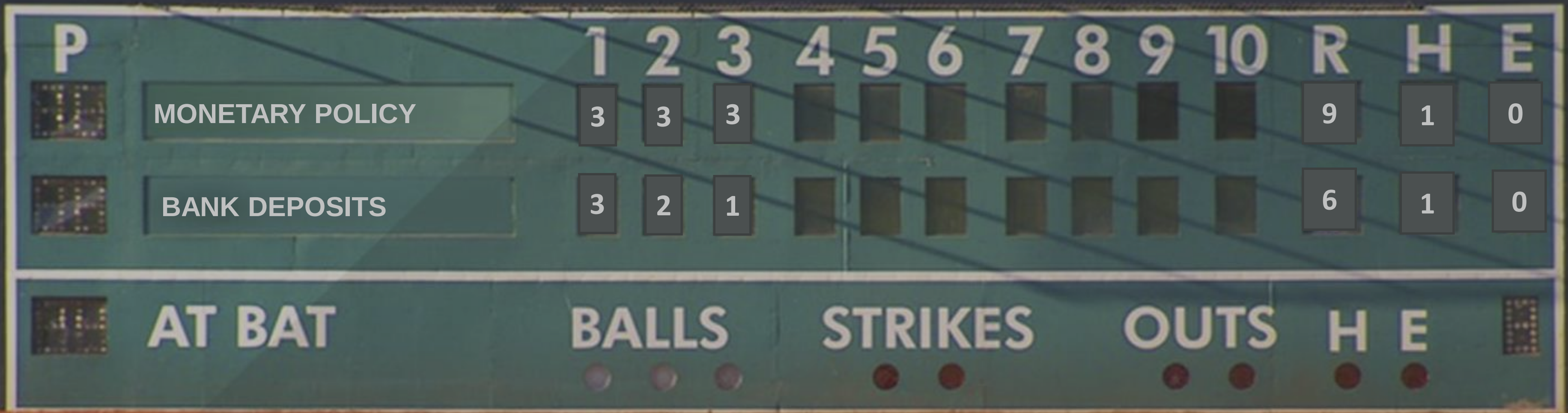
TIGHTENING MONETARY POLICY…ARE WE SURE ITS NEARLY OVER?

The industry has lost nearly 6 percent of its deposits in the last twelve months!



$1.0T of deposits destroyed in 12 months!

Source: Board of Governors of the Federal Reserve System (US), Deposits, All Commercial Banks [DPSACBW027SBOG], retrieved from FRED



IS THE FED DONE WITH QUANTITATIVE TIGHTENING?

WE MAY ONLY BE IN THE 3RD INNINGS OF THE BATTLE TO PRESERVE DEPOSITS.

THE BOTTOM LINE – WHY STRESS TESTING IS SO IMPORTANT!

Reduced Lending

- Post-SVB fallout
- Liquidity prioritized over lending

Inverted Yield Curve

- NY Fed’s Recession Probability Model at 43 year high!
- Reflects market expectations

Potential for Tighter Monetary Policy

- Interest rates may go higher than expected
- QT has a ways to go


“HE WHO FAILS TO PLAN IS PLANNING TO FAIL.”
SIR WINSTON CHURCHILL

SECTION 2

THE LIMITATIONS OF EXISTING APPROACHES TO STRESS TESTING

NOI / CAP RATE SHOCK ON COMMERCIAL REAL ESTATE (CRE)

CONVENTIONAL APPROACH #1: The NOI / Cap Rate Shock on CRE

<u>Limitations</u>

- X Only focuses on CRE
- X Ignores property type
- X Ignores vintage
- X Ignores underwriting characteristics
- X Critical data not stored in core
- X It's a sensitivity test, not a stress test
- X Not CECL compliant
- X Results in a binary outcome
- X Impossible to effectively use for strategic and capital planning

Ideal Role

Evaluates individual CRE loans prior to maturity date and/or rate reset date.

Example of a NOI / Cap Rate Shock CRE Stress Test

	Current Balance	20% NOI Haircut / 2% Cap Rate Increase
NOI	$ 1,000,000	$ 800,000
Debt Service	$ 833,333	$ 833,333
DSCR	1.20	0.96
Cap Rate	5.0%	7.0%
Property Value	$ 20,000,000	$ 11,428,571
Loan Balance	$ 14,000,000	$ 14,000,000
LTV	70%	123%
Capital at Risk	**$ -**	**$ (2,571,429)**

TOP-DOWN CAPITAL STRESS TESTS

THE PLACEBO OF CAPITAL STRESS TESTS

CONVENTIONAL APPROACH #2: The Top-Down Capital Stress Test

Limitations

- X Not forward-looking
- X Ignores underwriting characteristics
- X Turns important strategic exercise into a superficial "check the box" one
- X Reduces every bank down to the lowest common denominator
- X Not CECL compliant

Ideal Role

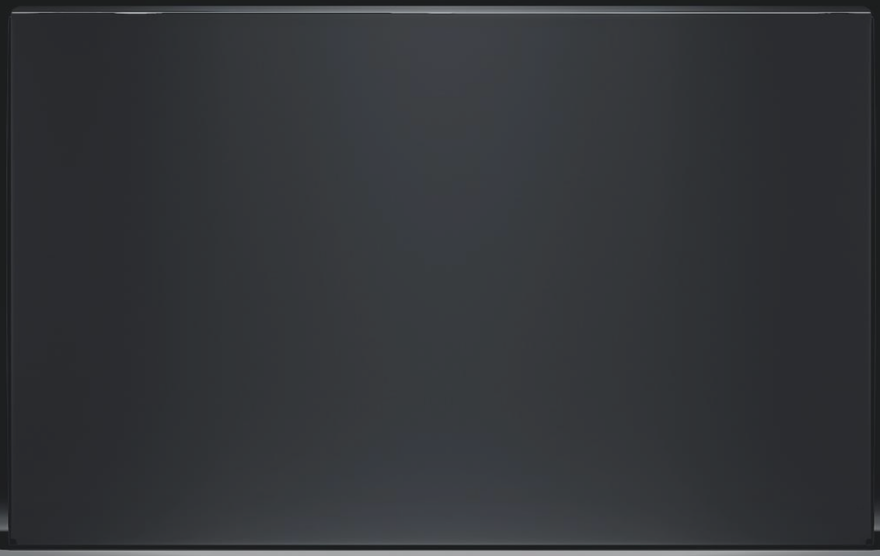
It's the "placebo" of stress tests. They may make you feel better, but they won't help you.

Example of a Top-Down Stress Test

	Balance ($M)	Loss Rate	Projected Net C/O
Construction	$ 100	25%	$ 25
CRE	300	5%	15
Residental	200	3%	6
C&I	100	7%	7
Other	50	5%	3
Total	$ 750		$ 56
Pre-Provision Earnings			$ 25
Less: Provisions			(56)
Less: Tax Expense/(Benefit)			(9)
Net After Tax Income			$ (22)
Beginning Tier 1 Capital			$ 100
Net After Tax Income			(22)
Ending Tier 1 Capital			$ 78
Average Assets			$ 1,000
Post-Stress Tier 1 Leverage Ratio			**7.8%**

SECTION 3

HOW TO APPROACH STRESS TESTING IN 2023

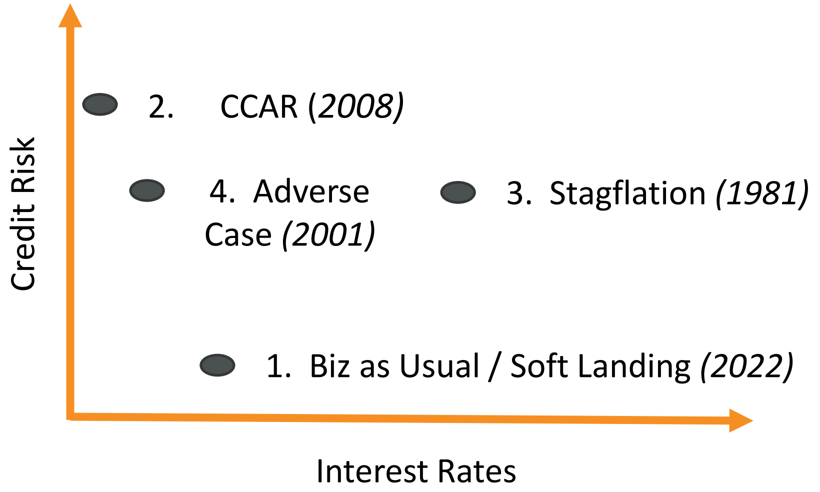


BEWARE OF THE BLACK BOX.

PRE-REQUISITES FOR *EFFECTIVE* STRESS TESTING

- All loans should be stressed, not just CRE
- Must generate loan-level results
- Loan-level results must be driven by underwriting characteristics
- Must use a CECL-compliant methodology (PD / LGD is the crème de la crème)
- Must include rest of balance sheet and P&L (pre-prov earnings, securities, liquidity, etc.)
- Must be able to run multiple iterations of your bank (no-growth, strategic plan, concentration limits, contingency plans)
- Model must be transparent and easy to conceptually understand (avoid black-boxes like the plague!)

STRESS SCENARIOS TO RUN



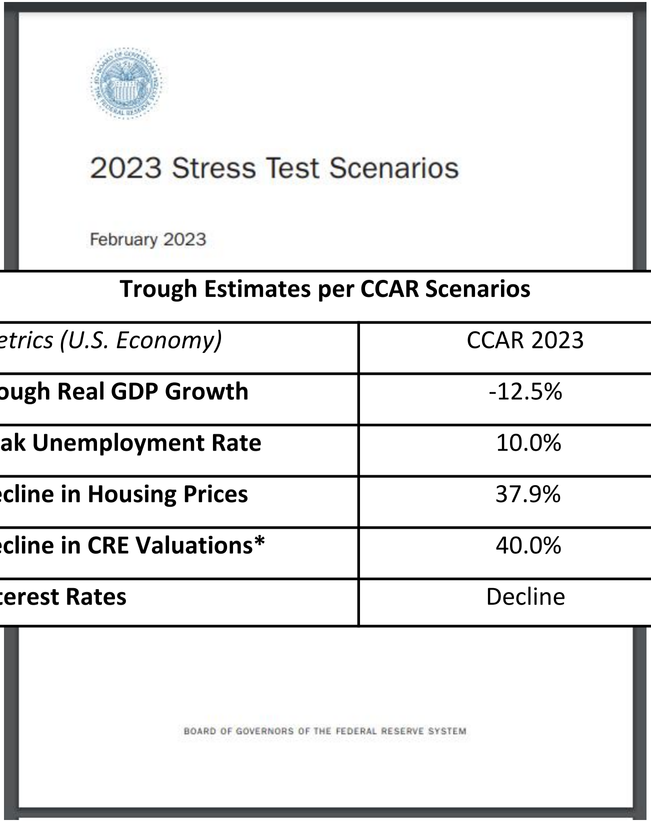
Comparable years in parentheses

CCAR / DFAST STRESS TESTING

THE CASE FOR CCAR / DFAST STRESS TESTING

Benefits

- ☑ The official scenario of the Fed
- ☑ Used to customize capital requirements for large banks
- ☑ Reflects the "Hard Landing" Scenario
- ☑ Comparable to 2008 Financial Crisis
- ☑ Can be easily customized to fit business model / local economy



2023 Stress Test Scenarios

February 2023

BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

Trough Estimates per CCAR Scenarios	
Metrics (U.S. Economy)	CCAR 2023
Trough Real GDP Growth	-12.5%
Peak Unemployment Rate	10.0%
Decline in Housing Prices	37.9%
Decline in CRE Valuations*	40.0%
Interest Rates	Decline


STAGFLATION.

STAGFLATION

Article in American Banker (by yours truly) in March 2022

AMERICAN BANKER

BANKING POLICY PAYMENTS TECH CREDIT UNIONS WORKPLACE OPINION

ECONOMY

BankThink Banks should stress-test for stagflation

By Adam Mustafa March 07, 2022, 11:00 a.m. EST 2 Min Read

The Federal Reserve recently released the severely adverse economic scenario for the required Comprehensive Capital Analysis and Review stress tests for the largest banks in the country. The annual tests determine each large bank's minimum capital requirement, making the results significant, to say the least.

As the CEO of an advisory firm that works with many community banks, I am stunned at the disparity between the Fed's hypothetical scenario and what is happening in the economy right now. The Fed has prescribed a scenario that is just like another 2008 financial crisis. It assumes gross domestic product collapses at a similar rate; the unemployment rate rises to a similar peak; housing and commercial real estate prices decline by a similar rate.

But that is not the shocking part. It's what the Fed assumes about interest rates.

CCAR 2022 assumes declining interest rates because, of course, this is what the Fed does when combating a recession. However, this is the complete opposite of our current economic environment.

Excerpt from CCAR 2023 Scenarios published by Federal Reserve in February 2023

12 2023 Stress Test Scenarios

Box 1. Exploratory Market Shock Component

This year, for the first time, the Federal Reserve is publishing an additional, exploratory market shock component (the exploratory market shock) that will be applied only to U.S. G-SIBs.[1] The purpose of the stress test is to understand a firm's resilience to a range of severe but plausible events, and the exploratory component furthers that purpose by posing a different set of risks than is probed in this year's global market shock component.

For instance, while this year's global market shock is characterized by a severe recession with fading inflation expectations, the exploratory market shock is characterized by a less severe recession with greater inflationary pressures induced by higher inflation expectations. Such differences in scenarios could reveal different losses across banks, depending on the positions held in their portfolios.

Consistent with the nature of an exploratory exercise, the exploratory market shock will not contribute to the capital requirements set by this year's stress test. Instead, it will be used to assess the potential of multiple scenarios to capture a wider array of risks in future stress test exercises.

Firm-specific results from the exploratory market shock will be published along with those from the severely adverse scenario in June 2023.

THE INVICTUS STAGFLATION SCENARIO

Differences vs CCAR

- Less overall credit risk than CCAR, but still significantly elevated
- Elevated risks for loans scheduled to reprice or mature within next two years
- More NIM compression with higher interest rates and continued QT
- More pressure on unrealized bond losses and liquidity!
- CRE prices decline at a similar level, but its more cap rate driven than vacancy rate / NOI driven

THE INVICTUS STAGFLATION SCENARIO

Date	Real GDP growth	Nominal GDP growth	Unemployment rate	CPI inflation rate	3-month Treasury rate	10-year Treasury yield	Mortgage rate	Prime rate	Level: House Price Index	Level: Commercial Real Estate Price Index
2023 Q2	-6.3	-1.3	4.5	5.0	5.0	4.8	7.8	8.0	249	348
2023 Q3	-3.4	1.5	5.4	4.9	6.0	6.3	9.3	9.0	229	337
2023 Q4	-4.0	0.7	6.5	4.8	6.5	7.0	10.0	9.5	213	323
2024 Q1	-3.0	1.7	7.4	4.6	7.0	7.5	10.5	10.0	202	301
2024 Q2	-0.9	3.6	7.8	4.5	7.0	7.5	10.5	10.0	194	277
2024 Q3	0.3	4.7	7.9	4.4	7.0	7.5	10.5	10.0	190	255
2024 Q4	0.5	4.8	8.0	4.3	7.3	8.0	11.0	10.3	186	234
2025 Q1	3.2	7.4	7.6	4.2	7.3	8.0	11.0	10.3	191	215

Less severe than CCAR

Increasing instead of decreasing (think 1981 instead of 2008)

WHAT ABOUT YOUR ALM?

- Your deposit mix doesn't remain static!
- Do you know where your prepay rate assumptions are coming from and have they been updated?
- What about credit risk?
- Can you run different strategic scenarios?
- Is this a tactical or a strategic exercise?

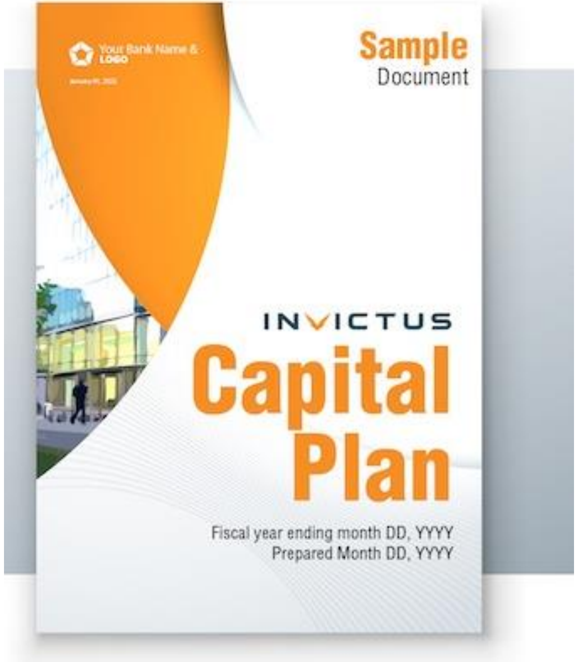
SECTION 4

"SO WHAT?"

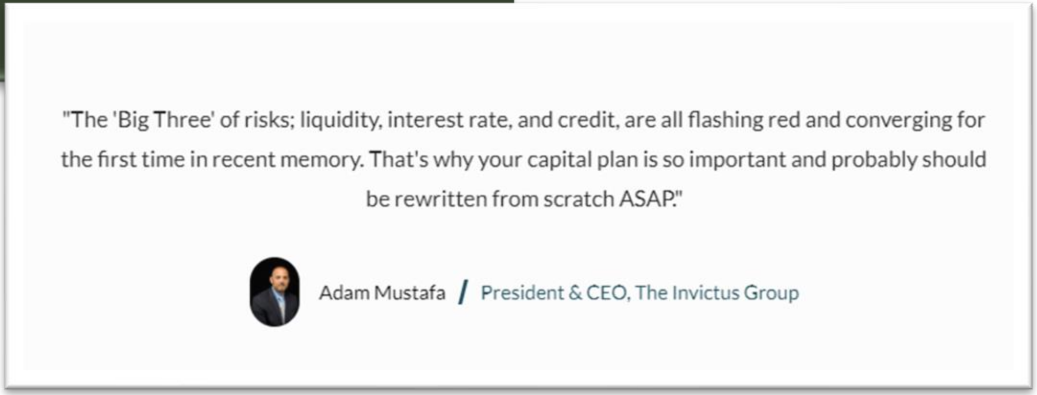
WHAT TO DO WITH THE STRESS TEST RESULTS

PUT IT ALL TOGETHER INTO A CAPITAL PLAN

- Formalizes internal capital and concentration limits estimated from stress testing process
- Includes other Key Risk Indicators which are custom selected based on risk assessment of Bank and the strategic plan
- Developed to support the strategic plan
- Includes contingency planning framework



NEXT WEBINAR: WEDNESDAY JUNE 7TH @ 1pm ET / 10am PT



WRAP UP

The Key Takeaways from Today's Discussion

State of Alert for Credit Crunch: Very High	Stress Testing Will Help You Prep
Not All Stress Tests are Created Equal	Use Stress Tests to Rewrite Capital Plan

INVICTUS GROUP

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