



CEIS REVIEW INC.

# Loan Portfolio Stress Testing

## How to Use Stress Test Results and Current Areas of Regulatory Focus

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Liz Williams  
Managing Director  
CEIS Review Inc.

[LWilliams@ceisreview.com](mailto:LWilliams@ceisreview.com)



## About CEIS Review Inc

- Independent consulting firm serving lending institutions regarding loan portfolios since 1989
  
- Experience providing the following services:
  - Loan Review Programs
  - Due Diligence
  - Loan Loss Reserve Methodology Validation or Refinement
  - Loan Portfolio Stress Testing
  - Consulting
    - Process Reviews
    - Credit Policy Review and Development



## Agenda

- I. Brief Overview of Stress Testing and Regulatory Requirements
- II. How to Use Stress Test Results
- III. Qualitative Considerations – Areas of Regulatory Focus
- II. Q & A (also throughout)



## Types of Stress Testing

### ➤ “Bottom-up” Analysis

- Apply set of assumptions to a sample of individual transactions
- Determine impact on key ratios (DSC, LTV, etc) for each transaction
- Aggregate results at the portfolio level
- Extrapolate results across portfolio (depending on sample size)

### ➤ “Top-down” Analysis

- Segment the portfolio into homogeneous pools
- Evaluate impact of a scenario(s) on each pool
- Aggregate results for each pool at total portfolio

### ➤ Individual Transactional Analysis

- Typically performed at underwriting / approval
- Sensitize cash flow or other indicators
- Assess impact on risk of migration to criticized / classified / default
- Not focus of today’s discussion



## Regulatory Expectations for Stress Testing

**2006 Interagency Guidance on CRE Concentrations**

**2009 CCAR Requirements for 19 Largest Banks**

**2011 Dodd-Frank – Requirements for Banks > \$10 Billion in asset**

**2011 - OCC Comptroller's Handbook – “Concentrations of Credit” – Update**

**2012 Interagency Expectations for Stress Testing by Community Banks**

**2012 FDIC –Supervisory Insights – “Stress Testing Credit Risk at Community Banks”**

**2012 OCC – “New Stress Testing Guidance and CRE Stress Test Tool”**

**2013 Interagency Guidance on Leveraged Lending**



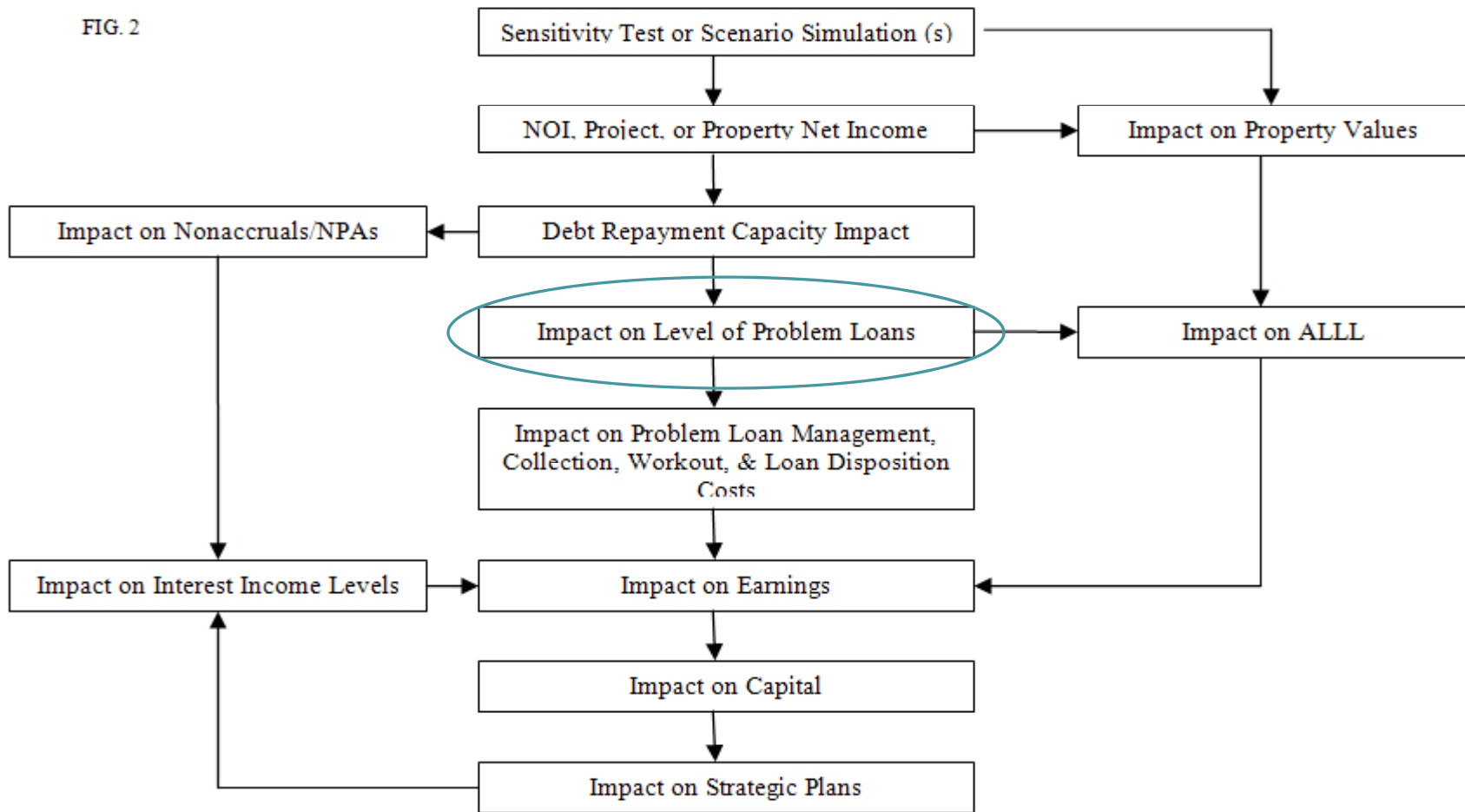
## Regulatory Expectations for Stress Testing for Community Banks Key Take-Aways

- “Banks of all sizes will benefit by supplementing stress testing of significant individual loans [i.e., concentrations] with portfolio and firm-wide stress testing. The **overall goal is to quantify loss potential and the impact on earnings and capital adequacy.**”
- Stress test “...sophistication ...should be **consistent with the size, complexity, and risk characteristics of its [the bank’s] CRE loan portfolio.**”
- Reiterated that “**all banking organizations, regardless of size, should have the capacity to analyze the potential impact of adverse outcomes on their financial condition....**The agencies note that such **existing guidance, including that covering** interest rate risk management, **commercial real estate concentrations**, and funding and liquidity management (among others), **continues to apply.**”



### Bottom-Up Stress Testing

FIG. 2



Source: Federal Reserve Bank of Philadelphia – SRC Insights 3Q08 – *Stress Testing: A Risk Management Tool for Commercial Real Estate Loan Concentrations, Part II*



## “Bottom-Up” Stress Testing Estimating Impact on Problem Loans

- Estimating impact on problem loan levels by calculating stressed DSCR and LTV ratios for each loan to estimate migration to criticized and classified ratings

<b>Grade Migration Assumptions</b> <i>Assumed Migration Depends on Recourse, LTV and DSCR</i>		
<b>Full Recourse</b>		
Grade	LTV < Benchmark %	LTV ≥ Benchmark %
Pass	(Appropriate DSCR Thresholds)	(Appropriate DSCR Thresholds)
Marginal Pass		
Special Mention		
Classified ( <i>SS or worse</i> )		
<b>Less Than Full Recourse</b>		
Grade	LTV < Benchmark %	LTV ≥ Benchmark %
Pass	(Appropriate DSCR Thresholds)	(Appropriate DSCR Thresholds)
Marginal Pass		
Special Mention		
Classified ( <i>SS or worse</i> )		





## Bottom-Up Scenario Results Interest Rate Sensitivity

Indicator (\$000)	Base	+100bps	+200bps	+300bps	+400bps
Criticized					
Classified					
Impairment Amounts (Losses)					
Loss %					
Incremental ASC 450 Reserves					
Stressed ALLL Provision					
Tier 1 Leverage Ratio – Post-Stress					

➤ Above can be derived for different portfolio segments, products, geographic areas, lending units, etc



## Scenario Results

### Impaired, or Criticized /Classified in All Four Scenarios

Borrower	12/31/13 Exposure (\$000)	Property Sector	Estimated Grades				Potential Impairments (\$000)			
			Scenario I (+400)	Scenario II (+150, -15%)	Scenario III (-40%)	Scenario IV (-20%, -20%)	Scenario I (+400)	Scenario II (+150, -15%)	Scenario III (-40%)	Scenario IV (-20%, -20%) (\$000)
Borrower 1	1,401	Industrial	Classified	Classified	Classified	Classified				
Borrower 2	1,076	Retail	Classified	Classified	Classified	Classified				177
Borrower 3	1,037	MF	Classified	Classified	Classified	Classified				107
Borrower 4	1,002	Industrial	Classified	Classified	Classified	Classified				119
Borrower 5	918	MF	Classified	Marginal Pass	Classified	Classified				78
Borrower 6	793	MF	Classified	Classified	Classified	Classified				64
Borrower 7	743	Office	Marginal Pass	Pass	Classified	Pass			55	
Borrower 8	663	Retail	SM	Marginal Pass	Classified	Marginal Pass			30	
Borrower 9	546	Retail	Classified	Classified	Classified	Classified			18	124
Borrower 10	438	Industrial	Classified	Classified	Classified	Classified	30	92	88	158



## “Top-Down” Loan Portfolio Stress Testing Approaches

- Complexity varies based on objectives, regulatory requirements, size and nature of loan portfolio
  - “For most community banks, a simple stressed loss-rate analysis based on call report categories may provide an acceptable foundation to determine if additional analysis is necessary.” – *OCC Supervisory Guidance – Community Bank Stress Testing – 10/18/12.*
- Segment the portfolio into pools with similar loss characteristics
- Develop “stressed” loss rates for each segment; consider:
  - Bank’s historical loss rates over several stress periods
  - Peer / market loss rates over several stress period
  - **Results of any “bottom-up” stress testing**
- Calculate stress period loss amounts (minimum 2 year timeframe)
- Estimate earnings impact
- Apply earnings impact to Tier 1 Capital; pre- and post- stress capital ratios

# FDIC Supervisory Insights Example

1. Estimate Portfolio Losses Over the Stress-Test Horizon					
		Stress Period Loss Rates, Two Yrs		Stress Period Losses, Two Yrs	
	Est. Portfolio Balances, in \$	Moderate Case Stress	Severe Case Stress	Moderate Case Stress, in \$	Severe Case Stress, in \$
Construction & Development	124	14.0%	25.0%	17	31
Commercial Real Estate	22	2.5%	5.0%	1	1
Residential Mortgage	372	2.9%	6.5%	11	24
Other Loans	125	5.0%	10.0%	6	13
Totals	643			35	69
2. Estimate Revenues and Impact of Stress on Earnings					
		Moderate Case Stress, in \$	Severe Case Stress, in \$		
Pre-provision net revenue (over two years)		31	25		
Less Provisions		35	69		
Less Tax Expense (Benefit)		-1	-13		
Net After-Tax Income		-3	-31		
3. Estimate Impact of Stress on Capital					
		Moderate Case Stress, in \$	Severe Case Stress, in \$		
Beginning Tier 1 Capital		88	88		
Net Change in Tier 1 Capital		-3	-31		
Ending Tier 1 Capital		85	57		
Estimated Average Assets		850	816		
Estimated Tier 1 Leverage Ratio		10%	7%		



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## How Can We Use Stress Test Results?

### Manage Concentration Risk

- Use results to establish or assess meaningful concentration limits
- Over time, re-evaluate limits if stress test results change
- Regulators are increasingly looking for this analysis to support new / increases in concentration limits

Stressed loss or provision rate

Apply to max portfolio per limit

Resulting loss or provision \$

Impact on Tier 1 Capital

Affirm or revise limit

- Stress testing (particularly “bottom-up”) is one of the best ways to “justify” a loan portfolio concentration



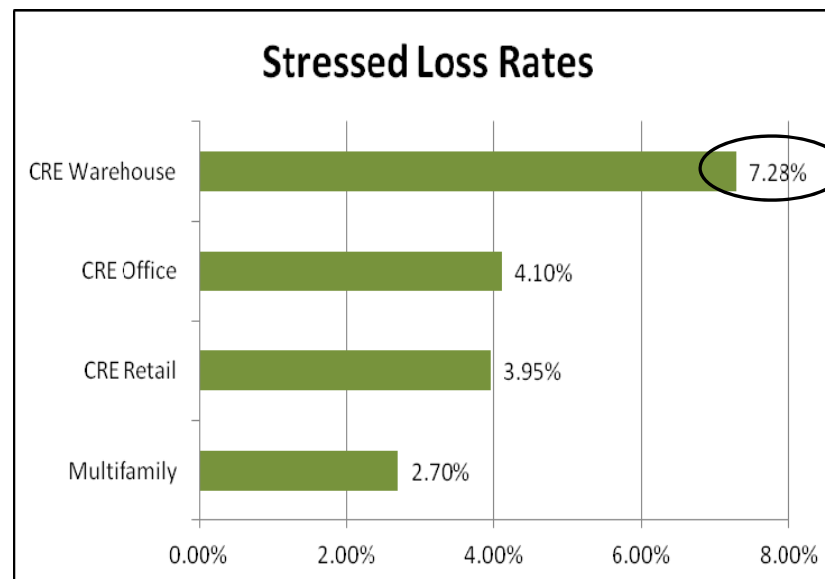
## How Can We Use Stress Test Results?

### Identify vulnerable segments

- Which segments frequently produce weaker stress test results?

### Possible Action Plans

- Tighten underwriting standards
- More frequent monitoring
- Consider ceasing originations / exiting
- Bulk sale or loan participations to reduce exposure

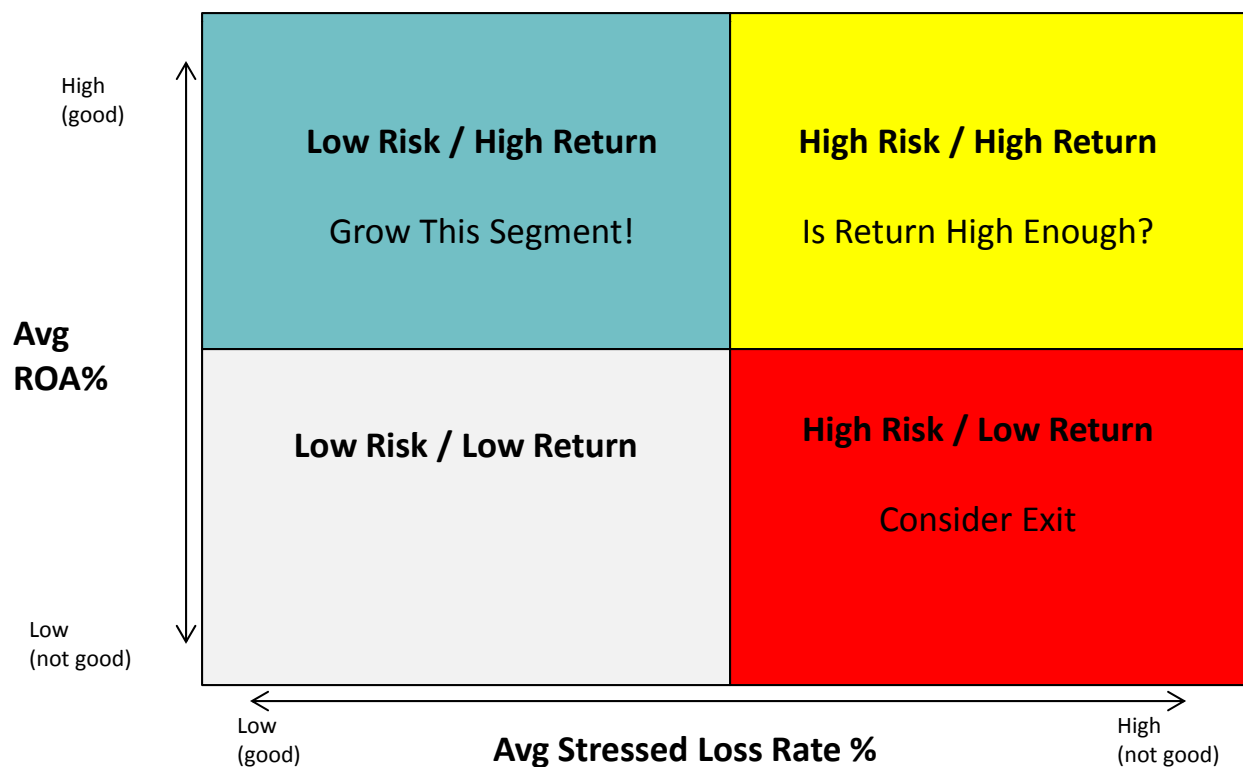




## How Can We Use Stress Test Results?

### Evaluate business line risk/reward

- Compare stressed loss rates to measures of profitability / return
- Do products or lines of business have appropriate risk/return trade-off?
- Strategic planning considerations



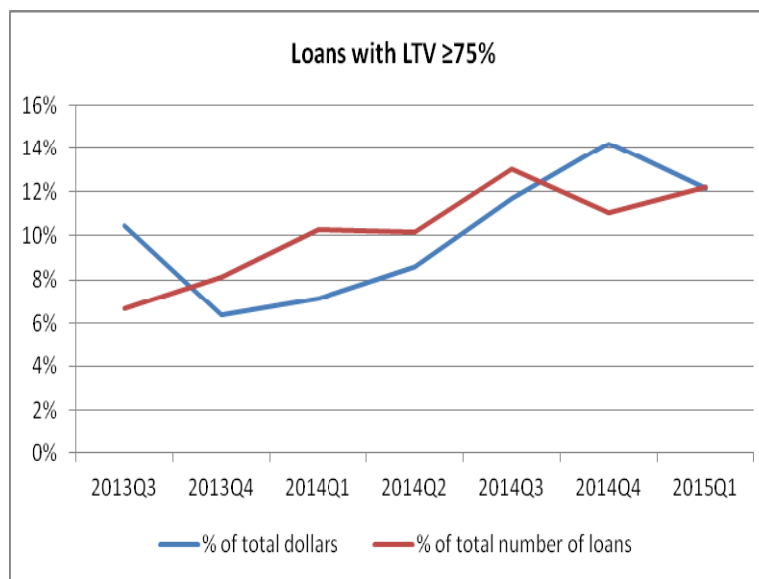




## How Can We Use Stress Test Results?

### Evaluate Impact / Quality of New Business

- Many geographic / produce markets are increasingly competitive
- Is the bank “giving” on structure in order to gain market share?
- What is the impact on stress test results?



Source: CEIS Publication – CRE Underwriting Trends for Banks in NY and NJ



## How Can We Use Stress Test Results?

### Evaluate Risk Associated with Upcoming Maturities

- Past several years have seen increased competition / pressure on structures
- Stratify stress test results by maturity profile
- Is any particular “vintage” more vulnerable than the other?
- Particularly useful analysis if (when?!) property values begin to decline again



## How Can We Use Stress Test Results?

### Identify vulnerable borrowers

- Press for all required financial info
- Site visits
- More frequent monitoring – add to “watch list”
- View modification requests more critically
- Seek opportunities to exit

Borrower	12/31/13 Exposure (\$000)	Property Sector	Estimated Grades				Potential Impairments (\$000)			
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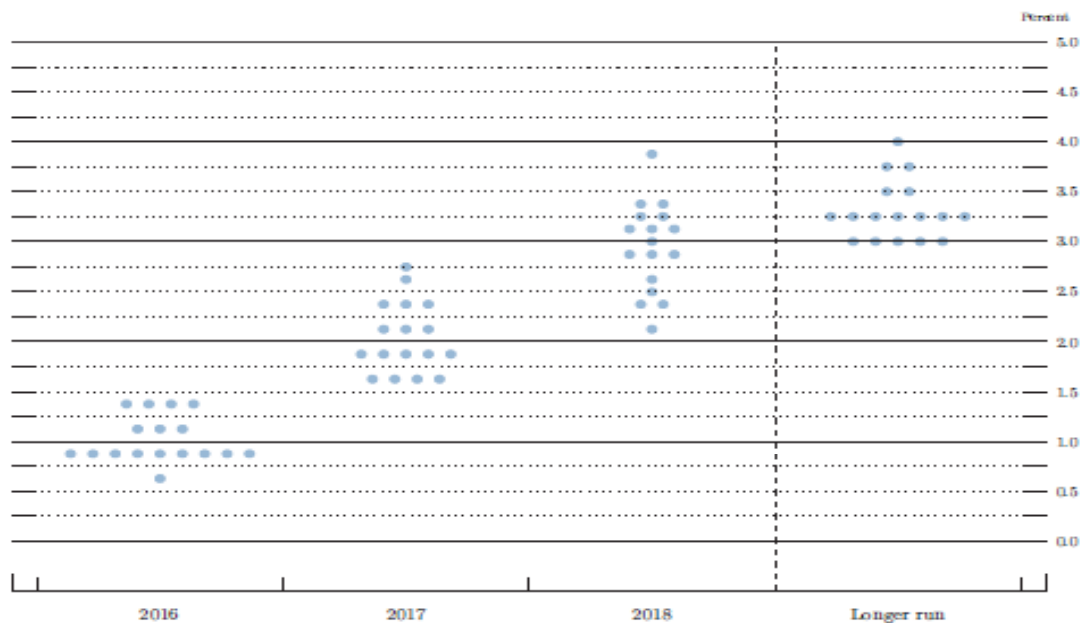


## How Can We Use Stress Test Results?

### Assess Impact of Near Term Increases in Interest Rates

- Higher rates seem likely in the near future  
    Though, we've been saying this for awhile...

Figure 2. FOMC participants' assessments of appropriate monetary policy: Midpoint of target range or target level for the federal funds rate



Source: Federal Reserve – FOMC Statement – March 16, 2016



## How Can We Use Stress Test Results?

### Assess Impact of Near Term Increases in Interest Rates

➤ Include borrowers with floating rates and those with rate re-sets or **maturities** within established time horizon

(\$000)	Pre-Stress	Scenario I					
		+50 bps	+100 bps	+150 bps	+200 bps	+300 bps	+400 bps
Criticized Loans	32,008	43,558	56,462	73,286	101,570	184,687	243,869
Classified Loans	18,192	28,831	37,285	49,524	63,257	134,690	190,383
CRE Pass* Loans (CRE, Multifamily & Construction)	746,691	721,181	710,277	697,453	669,169	586,052	526,870
Non-CRE Pass* Loans - NOT STRESSED (Resi, C&I & Other)	656,873	656,873	656,873	656,873	656,873	656,873	656,873
<b>Total Loans from Call Report</b>	<b>1,471,558</b>	<b>1,471,558</b>	<b>1,471,558</b>	<b>1,471,558</b>	<b>1,471,558</b>	<b>1,471,558</b>	<b>1,471,558</b>
<b>Average Loans from Call Report</b>	<b>1,376,505</b>	<b>1,376,505</b>	<b>1,376,505</b>	<b>1,376,505</b>	<b>1,376,505</b>	<b>1,376,505</b>	<b>1,376,505</b>
Criticized % Total Loans	2%	3%	4%	5%	7%	13%	17%
Classified % Total Loans	1%	2%	3%	3%	4%	9%	13%

ASC 450 (FAS 5) Reserve Change vs. Pre-Stress	-	2,086	3,779	5,901	8,690	18,577	25,689
ASC 310 (FAS 114) Reserve Change vs. Pre-Stress	-	373	457	747	932	1,057	1,375
Loan Loss Provision Based on Estimated Reserve Changes	-	2,460	4,237	6,648	9,621	19,634	27,063

For illustrative purposes only - amounts may not foot.



## How Can We Use Stress Test Results?

### Capital Planning Process

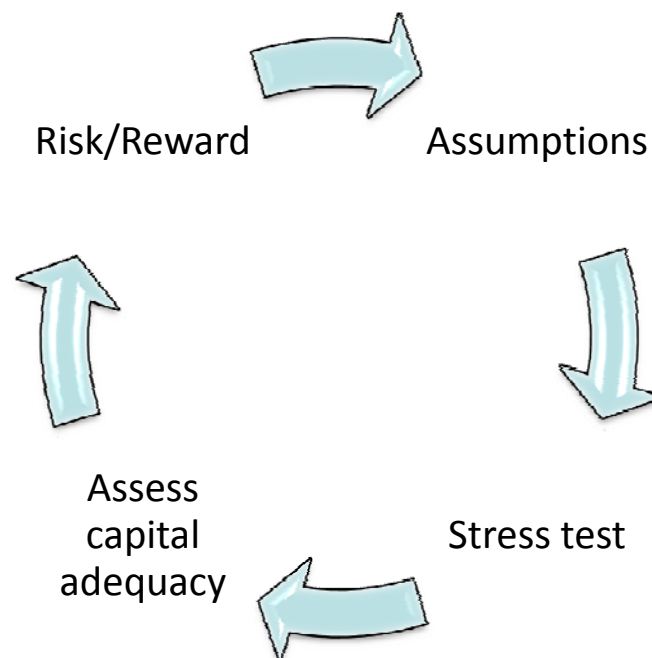
➤ “The OCC expects every bank, regardless of size or risk profile, to have an effective internal process to (1) assess its capital adequacy in relation to its overall risks, *and* (2) to plan for maintaining appropriate capital levels.”

*-Community Bank Stress Testing – OCC – 2012*

➤ Stress assumptions used in capital planning process

➤ Challenge approach to capital plan versus stress test (and vice versa)

➤ ALLL projections, expenses





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## Next Phase of Stress Testing

- Concepts and process becoming more universally understood
- Regulatory expectations continue to evolve, but focus often shifting from implementation to more “qualitative “ issues
  - ✓ Controls
  - ✓ Consistency / Integration with other Capital Planning and Forecasting
  - ✓ Concentration management / limits
  - ✓ Using stress test results
  - ✓ Essentially embedding stress test inputs, analysis, outputs into overall risk management and planning processes





## Importance of Controls

- Past two years, all CCAR “fails” have been due to qualitative issues
  - No objections based on quantitative concerns / results
- CCAR not applicable for community banks but still useful lessons learned
- Qualitative Assessment focuses on “internal practices a BHC uses to determine the amount and composition of capital it needs to continue to function throughout a period of severe stress”
  - *Comprehensive Capital Analysis and Review 2015: Assessment Framework and Results*, March 2015 – Board of Governors of Federal Reserve
    - ✓ Processes surrounding development and implementation of stress scenarios
    - ✓ Robust governance for overall process, data, model development, control, management judgment and documentation
    - ✓ Extent to which capital plan and analysis addresses key firm-specific risks
    - ✓ “Challenge” approach
    - ✓ Expectations differ depending upon size, scope of operations, activities and systemic importance



## CCAR - 2015

### **Deutsche Bank Trust Co**

- CCAR first-timer
- “Numerous and significant deficiencies” across several areas of the capital planning process, including risk identification
- Posted strongest quantitative results (a red flag itself???)

### **Santander**

- Failed for 2<sup>nd</sup> year in a row
- “Widespread and critical deficiencies across” its planning procedures
- Issues with internal controls and risk management

### **Bank of America**

- Conditional approval
- Address weaknesses in ability to measure losses and revenue and in other internal controls by Sept 30<sup>th</sup>

### **CCAR 2014 – Qualitative “Fails”**

- Citigroup
- HSBC North America
- RBS Citizens Financial Group
- Santander



## What Does this Mean for a Community Bank?

### ➤ Data

- Processes for gathering and updating necessary data
  - On-boarding, annual reviews, loan review, etc
  - Not a one-time “fire drill”
  - Processes for validating
  
- Identifying / dealing with “stale” data
  - Get ahead of the issue
  - Consider where you are in the credit cycle
  - Leverage other information to make adjustments (with conservative bias)
  
- Leveraging data for other purposes (CECL)

### ➤ Scope

- Not just CRE.....
- Other concentrations
- C&I, Leveraged Loans, etc



## What Does this Mean for a Community Bank?

- **“Challenge” Approach**
  - Process for ongoing reviewing / questioning stress test framework, assumptions, data, results
  - “Does it make sense?”
  - Are assumptions severe enough?
  - Benchmarking / back testing
    - Compare results to historical / peers / external data
  - Using stress testing to challenge bank’s existing business model or planned changes to the model – what could go wrong, how bad could it get, and what hidden risks are embedded in the business



## What Does this Mean for a Community Bank?

### ➤ **Controls**

- Model validation and beyond....
- Processes and checks / balances that confirm inputs and outputs can be relied upon

### ➤ **Governance**

- Integrate stress testing with other planning and risk management functions
- Board and senior management oversight
- Management “ownership” of the process
- Should not be just a compliance exercise.... Use results of stress testing in decision-making



CEIS REVIEW INC.

## ABOUT CEIS REVIEW

CEIS Review is an independent consulting firm serving the commercial and savings bank communities as well as those of other commercial lending institutions.

Available Services: **Loan Review, LLR Methodology and Validation, Portfolio Stress Testing, Stress Test Validation**, Portfolio Acquisition Review, Structured Finance Review, Municipal and Public Finance Review, Loan Policy Maintenance, Problem Loan Advisory, Real Estate Inspection Services, Credit Analysis, Regulatory Relations, **Credit Database Formation**, and Loan and Credit Seminars.

(888) 967-7380

[info@ceisreview.com](mailto:info@ceisreview.com)

[www.ceisreview.com](http://www.ceisreview.com)