Capturing Idiosyncratic Risk in the Capital Planning Process: Firm Practices

Stress Test Model Symposium
Federal Reserve Bank of Boston

October 5, 2016

Overview

Andreas Lehnert
Federal Reserve Board

Overview

- Previous panel was about supervisory expectations on risk identification, scenario design and capital planning

- This session is case studies focused on tailoring scenarios to firms' idiosyncratic risk
  - Tailoring core macro scenarios
  - Parallel examples from two participants

Tailoring a scenario

- For large & non-complex firms ("15-19")
  - Business model is usually pretty simple to stress
  - Can adapt a standard severe macro downturn, e.g. Fed's scenario
  - Geographic footprint, industry concentrations

- For the larger firms ("15-18")
  - Tailoring is more difficult – diversified across geography, industry, products
  - Standard credit shock (even if very large) may not be biggest risk
  - Can't jam all risks into one scenario (e.g. can't have rates rise *and* fall)
  - Scenario may not be perfectly coherent to a macroeconomist
 - Events – e.g. the default of a specific entity – likely to play a larger role

Tailoring within macro scenarios

David Arseneau
Federal Reserve Board

Aggregate Real and Financial Activity

- The scenarios tend to be generically described as severe, protracted downturns in domestic real and financial market activity.
  - An example of a summary statistic to assess aggregate macro severity:
  - Can still meet expectations below the red line or to the right of the SSA

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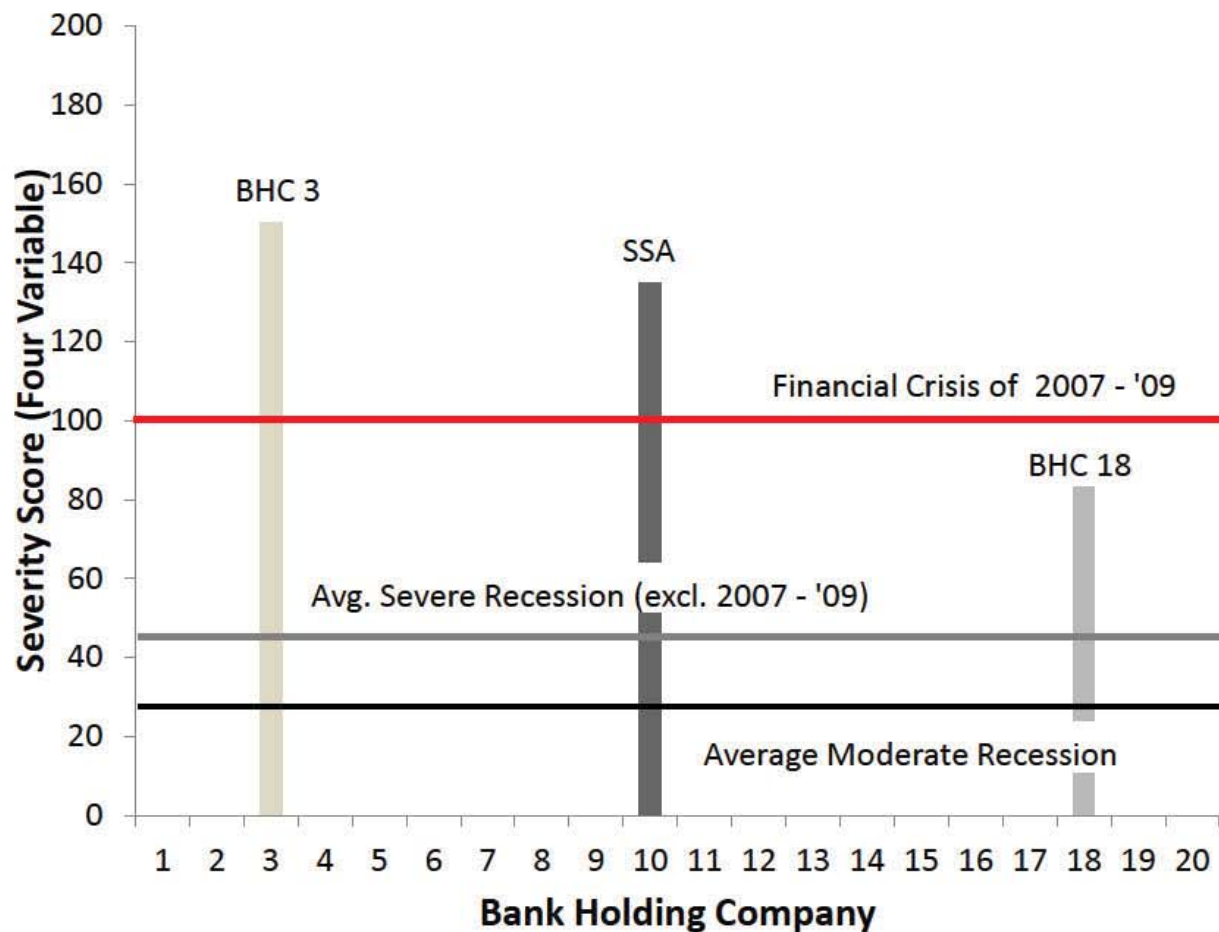
Aggregate Real and Financial Activity (con't.)

- **Broadly similar view** about what constitutes a severe downturn for real economy...
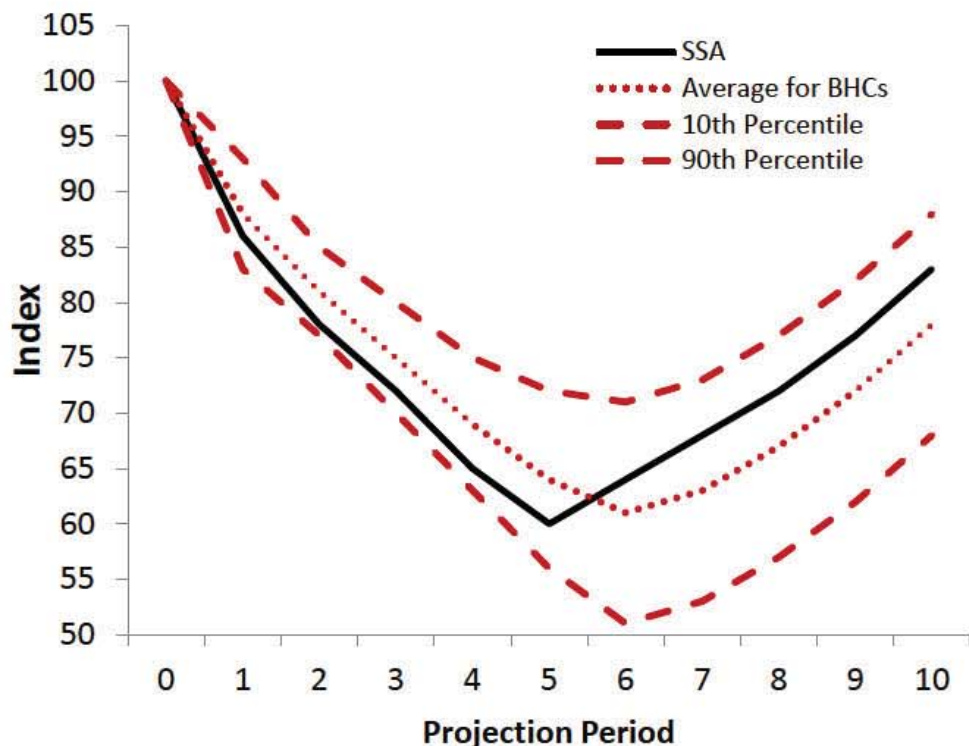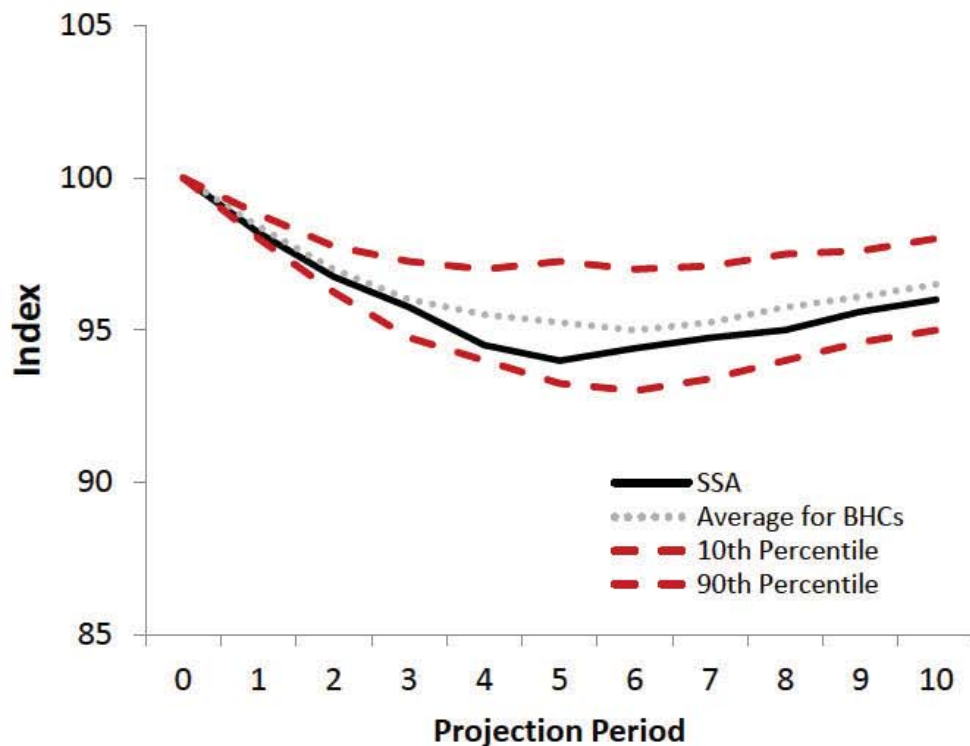
- ...but, there is a **wider set of beliefs** about financial markets.

Capturing Bank-specific Risks in the Macro Scenario

- In addition to the aggregate macro background, firms are asked to tailor the scenario to their specific business model and idiosyncratic risk exposures.

    - This requires a more granular view about how the scenario would play out

        - For example, some selected sector-level exposures:
            - Residential and commercial real estate;
            - Exposure to the energy or auto sector;
            - Credit card portfolio;

        - Geographic exposure:
            - Domestic regional;
            - International.

Sector-specific exposure

- If firms are tailoring, we should see a predictable relationship between assumed stress within that sector and the bank's exposure.
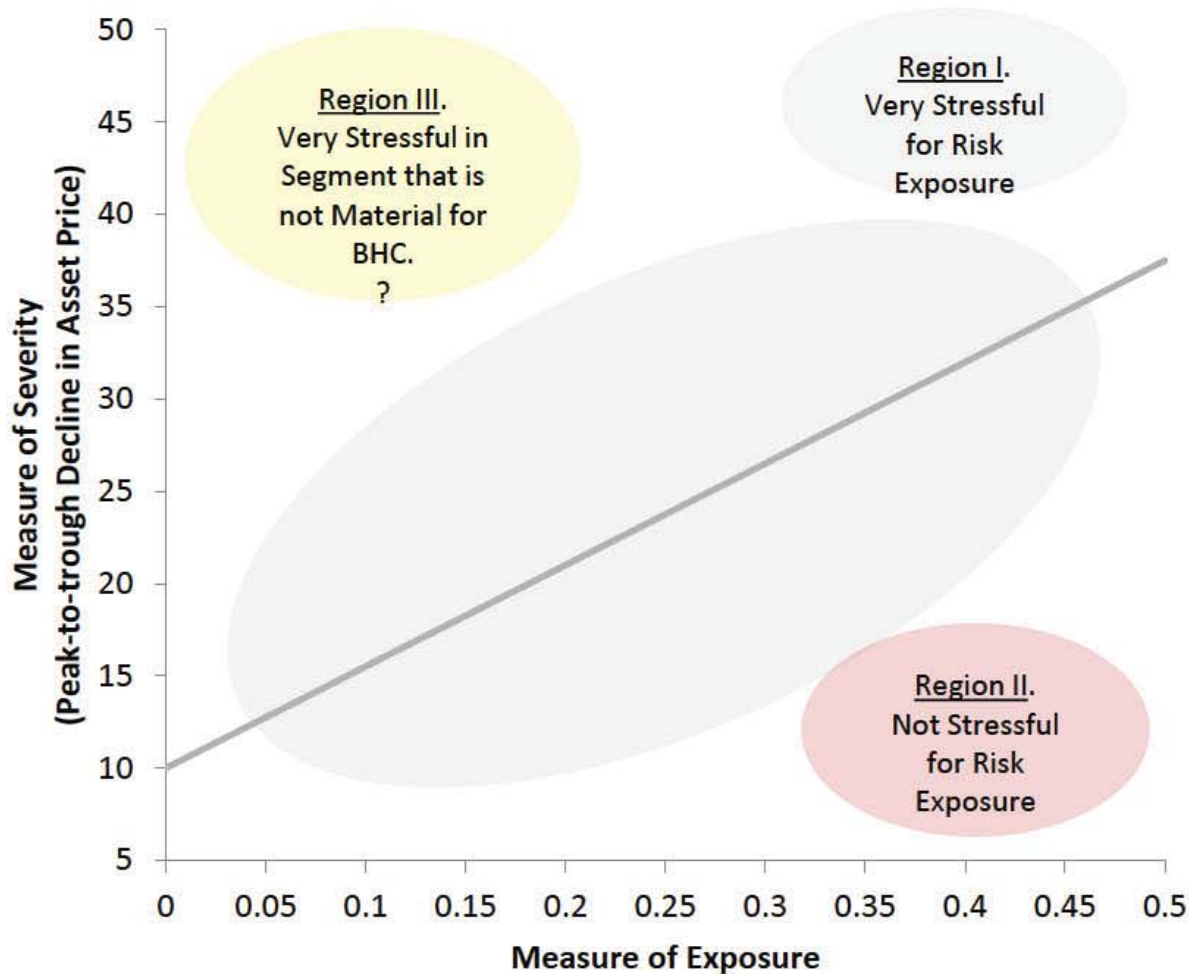
Domestic geographic exposure
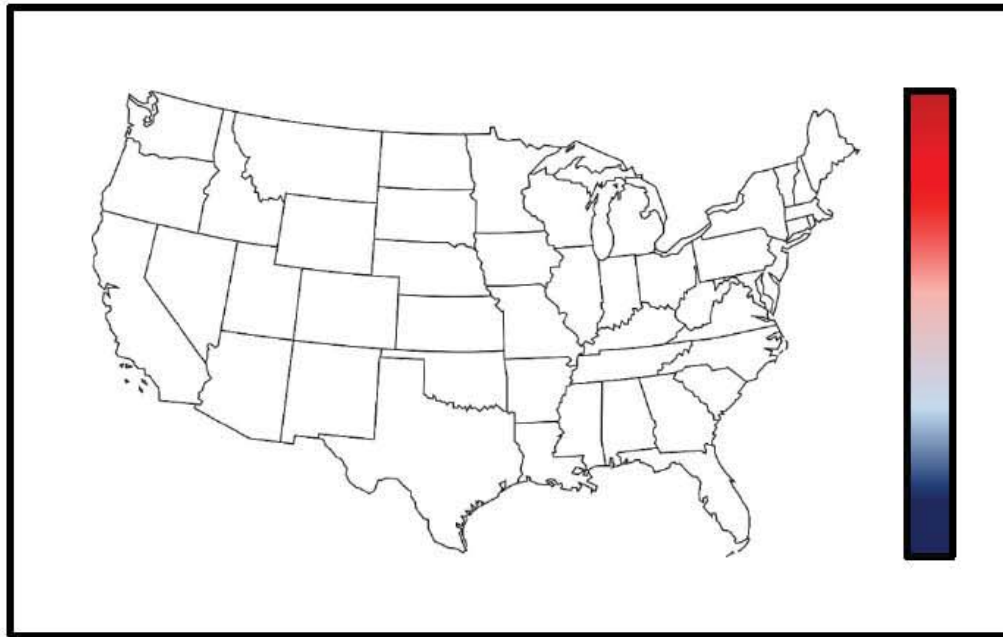
- Banks with heavy domestic geographic concentration in mortgage lending might want to tailor stress through regional house price assumptions.

$$y_i = a + b(HousePriceVolatility_i)$$
$$+c(MacroVolatility_i)$$
$$+d(MortgageExposure_i) + e_i$$

Where: y_i is a measure of severity of house price scenario for a specific MSA

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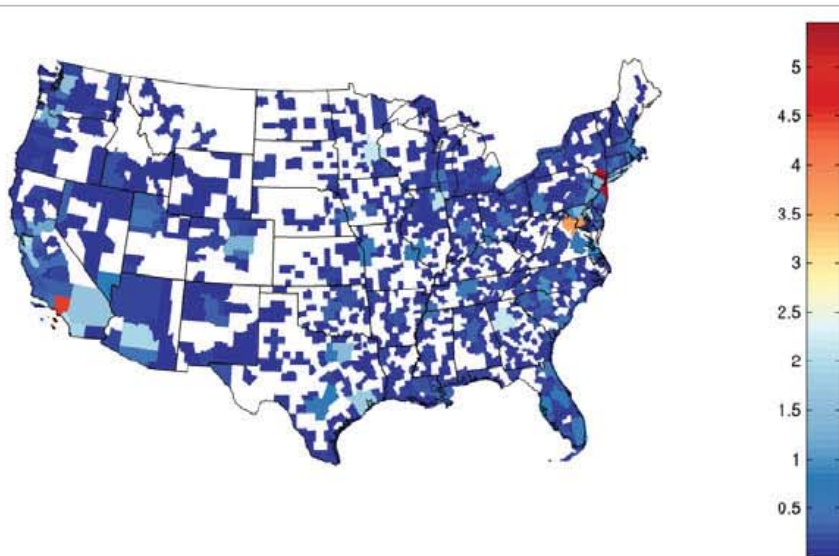
International Exposure

- Similarly, the international component of the scenario should be tailored to reflect international exposures.

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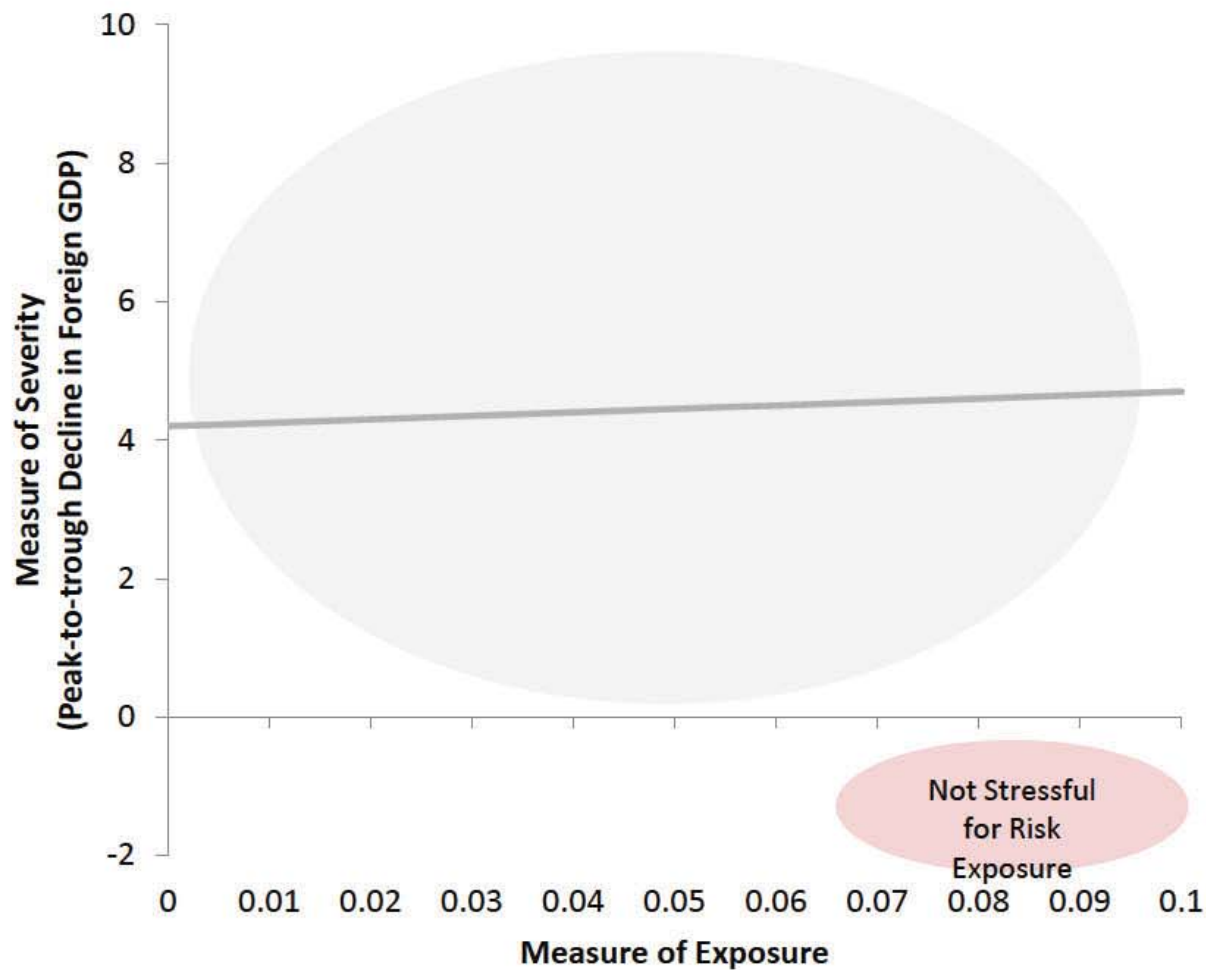
Simple Top-down Models to Assess Tailoring

- Finally, we can use top-down models to assess the degree of assumed stress relative to historic norms for a given bank.

    - An example for net interest margins (NIMs):

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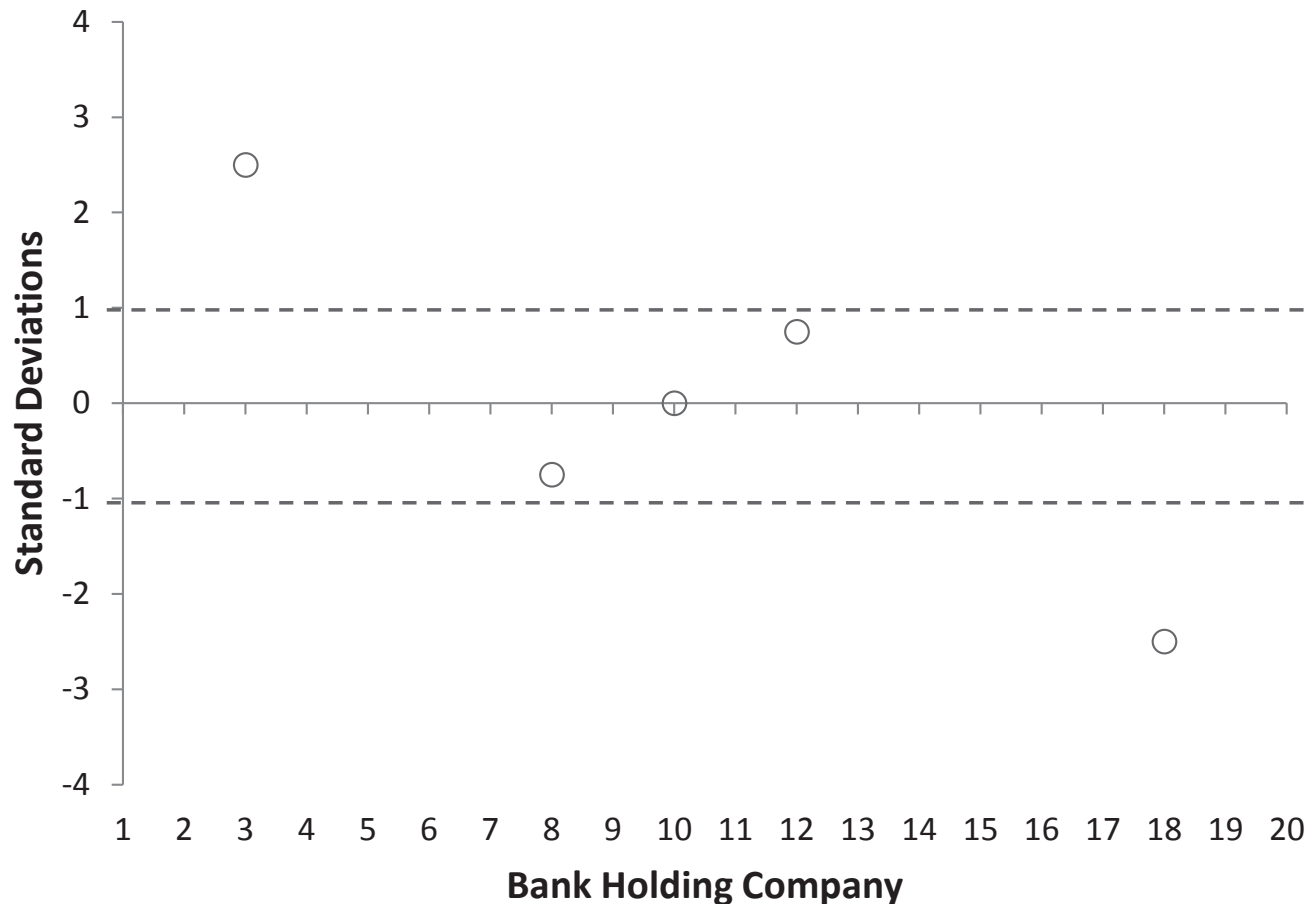
One Approach to Scenario Customization

Tom Scrivener
Bank of America

Scenario Customization Approach

- Scenario generation, and customization of the BAC Severely Adverse scenario, is a key part of the capital planning process

- Through customization, process allows the company to incorporate outputs from the Risk ID analysis and ensure stress of key vulnerabilities and idiosyncratic risks are appropriately captured in post stress capital estimates

End to End Capital Planning and Stress Testing

1 Risk Identification	2 Methodology Development	3 Scenario Generation	4 Forecast Production	5 Forecast Aggregation / Financial Plan	6 Strategic and Capital Plan
• Inventory all risks • Prioritize risks • Link risk to forecasts and methodologies • Embed Risk ID into BAU across the company	• Establish methodology choices • Develop model and non-model approaches • Document approaches	• Select scenario • Customize for idiosyncratic risks to address vulnerabilities • Generate narrative and broader variables	• Usage of methodologies to generate forecast results • Documentation of results	• Aggregate individual FLU results, perform aggregated calculations, and facilitate consolidated reviews	• Assess capital adequacy • Determine capital actions • Establish critical strategies • Align with Risk Appetite

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Segmenting Material Risks

- While all material risks must be dimensioned for the Board of Directors, not all material risks are suited for scenario analysis and even those suited for scenario analysis can not all occur in the same scenario
- As a result, we bucket risks prior to customization meetings, to help with the customization process:

Addressed through ...

Material Risks for Customization Consideration

A. Macro-Driven Forecasting
- Risks identified that are directly impacted by macroeconomic variables / narrative produced through central scenario design process
- Key Risks Considered: Core economic stress in the US and across the globe, geographic concentration risk, interest rate volatility, housing market declines, prolonged deterioration across used vehicle market and wages, etc.

Reach a consensus on customizations to be applied

B. Business Driven Non-Macro Forecasting
- Risks identified that are not directly impacted by macroeconomic variables / narrative
- Impact addressed in various forecasting methodologies through key assumptions aligned to scenario environment
- Key Risks Considered: Business Strategy Execution (e.g, pricing, underwriting standards)

C. Legal / Non-Legal Ops Forecasting
- Risks identified that are subject to centralized loss forecasting processes (i.e. Operational Risk and Legal Risk Customization frameworks)
- Key Risks Considered: Compliance Failures, Cyber attack, Fraud, and Inadequate Controls / Systems

Determine whether additional risks should be included within Scenario Narrative

D. Not Well Suited to Scenario
- Business risks identified that are not in forecasting methodologies described above; stand-alone analysis completed
- Key Risks Considered: Model / Forecast Error, and potential Regulation Changes

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Customization Meetings - Overview

- Material Risks from the Risk Identification Inventory ("Inventory") are reviewed with participants to deliberate and debate which should be incorporated into the macroeconomic scenario design (referred to as Selected Risks)

- Central team hosts Customization Meetings

  - Risk Identification process represents the source of risks to:

    1. drive discussions, and

    2. ultimately design the macroeconomic element of the BAC Severely Adverse scenario used for quarterly capital planning

  - Meetings attended by broad range of internal stakeholders, including key representatives from the relevant FLU / LOB, Risk, Finance and stress forecasting teams

- Selected Risks are chosen based on quantitative and/or qualitative factors & initial proposals for macroeconomic variable customizations are discussed

Quantitative Factors: measured by a large geographic concentration, large portfolio concentration, or large driver of revenue that warrants inclusion into the scenario design; and/or

Qualitative Factors: identified as an emerging risk, supervisory concern, or potential risk sensitivity for which impacts should be monitored.

Key considerations:

(1) How Selected Risks will be impacted by the forecasted macroeconomic data provided; and

(2) Whether any additional narrative customizations are required to further stress the Company's idiosyncratic positions and activities (beyond modeled results).

Meeting Documentation

Example: Customization Meeting – Consumer Meeting

Documentation template			
Date and time:	1pm EST 11/16/2015 (Working Group) 8am EST 11/20/2015 (Steering Committee)	**Meeting participants**	
		FLU (owner): Msdhdjk Sfjflfkj	Forecast administrator: Pdhdj Shjlkhfl
Workstream being reviewed:	Consumer	Finance (challenger): Sddhjkl Ussjkld	Risk (challenger): Hsddfj Jjlljlljd
List of meeting artifacts used and respective location of relevant documentation:	**Meeting Invite:** Attached below **Customization Deck:** Scenario Generation\3. Scenario Design & Execution\Customization\16Q1\Customization Meeting Info & Presentations\Consumer	**Other challengers:** Zdjdlk Pdjhdfk	

Meeting agenda:

- Context
  - End to End Capital Planning & Stress Testing
  - Risk ID and Scenario customization
  - Business / portfolio profile

Outcomes and decisions made during the meeting: *Summarize key decisions made*

- Attendees agreed to keep Resubmission customizations for the following variables: (1) US RGDP, (2) S&P 500, and (3) Consumer Income, Confidence and Spending
- Attendees agreed to proposed customization changes for the following variables: (1) US U/R, (2) BAC HPI, and (3) Brent Crude
- Refer to deck (location noted above) for further details

Follow up items: *Document next steps and owners, include any external parties that need to be contacted or additional meetings that need to be scheduled (as needed)*

- Geographic Concentrations (All Attendees): portfolio concentration analysis necessary to determine appropriate customizations relative to national targets
- CMM (All Attendees): subsequent discussions warranted to determine appropriate shape of variable trajectory

Updates to the challenge log: *List all challenges to be included in the challenge log as a result of the meeting (description to be provided in challenge log, not here)*

- Not applicable

Example Macroeconomic Scenario Customization

Consumer Customization: Geographic Concentration

Risk Title	Risk Description	Risk Theme	Risk Type	LOB Impacted	Inclusion within BAC SA Scenario Design	Forecast Assessment
Geographic concentration	The risk of highly correlated negative financial impact to borrowers (employment / income / asset values) due to adverse economic or market event with outsized negative impact on borrowers within a region resulting in higher default rates and losses given default in California, Florida, and / or Mid-Atlantic	Economic Stress	Credit	Mortgage	Y	Through macro-economic narrative and variables produced	Fully captured in the forecast

- During the Consumer Customization Meeting, GST and Consumer FLU representatives:
    1. Designated the Geographic Concentration Material Risk (described above) as a Selected Risk,
    2. Concluded that this Selected Risk is impacted by the U/R and HPI macroeconomic variable forecasts, and
    3. Determined additional customization of these macroeconomic variables (beyond modeled results) was required to ensure adequate stress of the Company's consumer-related positions (e.g., Home Equity, First Mortgage, Credit Card, Auto Loan).

U/R Customization

Analysis Conducted:

- Reviewed aggregate Mortgage, Card and Auto Loan exposure by state
- Identified the following states where BAC has (1) significant portfolio concentration (of aggregate exposure), and/or (2) an outsized share of market relative to industry players
    - CA, FL, NJ, NY and TX ("Selected States")
- Compared modeled U/R output of each Selected State to historical U/R peaks and rises observed in those states during Great Recession

	Ultimate U/R BAC SA Customization	
CA	Curve shifted up by 125 bps	12.2% peak; 6.5% rise
FL	Curve shifted up by 100 bps	11.8% peak; 6.9% rise
NJ	Curve shifted up by 100 bps	11.2% peak; 6.0% rise
NY	Curve shifted up by 100 bps	10.3% peak; 5.5% rise
TX	Curve shifted up by 150 bps	11.2% peak; 6.6% rise (oil trajectory impact)

HPI Customization

Analysis Conducted:

- Reviewed Mortgage exposure by state
- Identified the following states where BAC has (1) significant portfolio concentration (of aggregate exposure), and/or (2) an outsized share of market relative to industry players
    - CA, FL, NJ, NY and TX ("Selected States")
- Compared modeled HPI output of each Selected State to historical HPI cumulative decline experienced in those states during Great Recession

	Ultimate HPI BAC SA Customization	
CA	5% added to Q13 cumulative decline level	44.3% cumulative decline
FL	5% added to Q13 cumulative decline level	42.3% cumulative decline
NJ	5% added to Q13 cumulative decline level	31.6% cumulative decline
NY	5% added to Q13 cumulative decline level	26.8% cumulative decline
TX	10% added to Q13 cumulative decline level	28% cumulative decline (oil trajectory impact)

Another Approach to Scenario Customization

Wynne Rumpeltin
State Street Corporation

State Street's BHC Scenario Design Process is structured to capture the firm's idyosyncratic risk profile

1 Risk Identification

2 Develop Macroeconomic Scenario Narratives

3 Map Material Risks to Stress Loss Approaches

4 Define Idiosyncratic Scenario Elements

5 Review Scenario Options

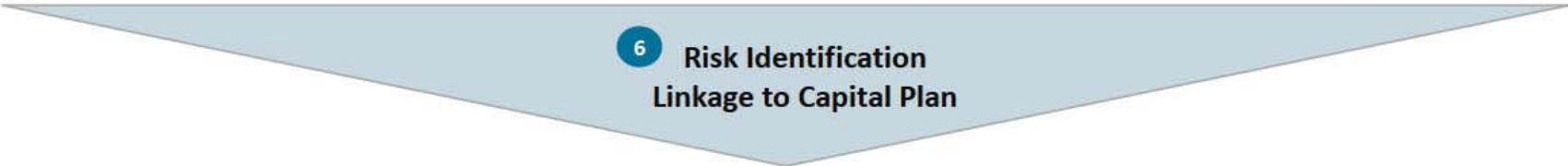- Conduct review of material risk inventory through quarterly risk identification updates

- Generate options of macroeconomic scenario narratives based on drivers of material risks

- Conduct mapping between the material risk inventory and the CCAR loss estimation methodologies

- Develop potential idiosyncratic scenario add-ons leveraging the material risk mapping exercise
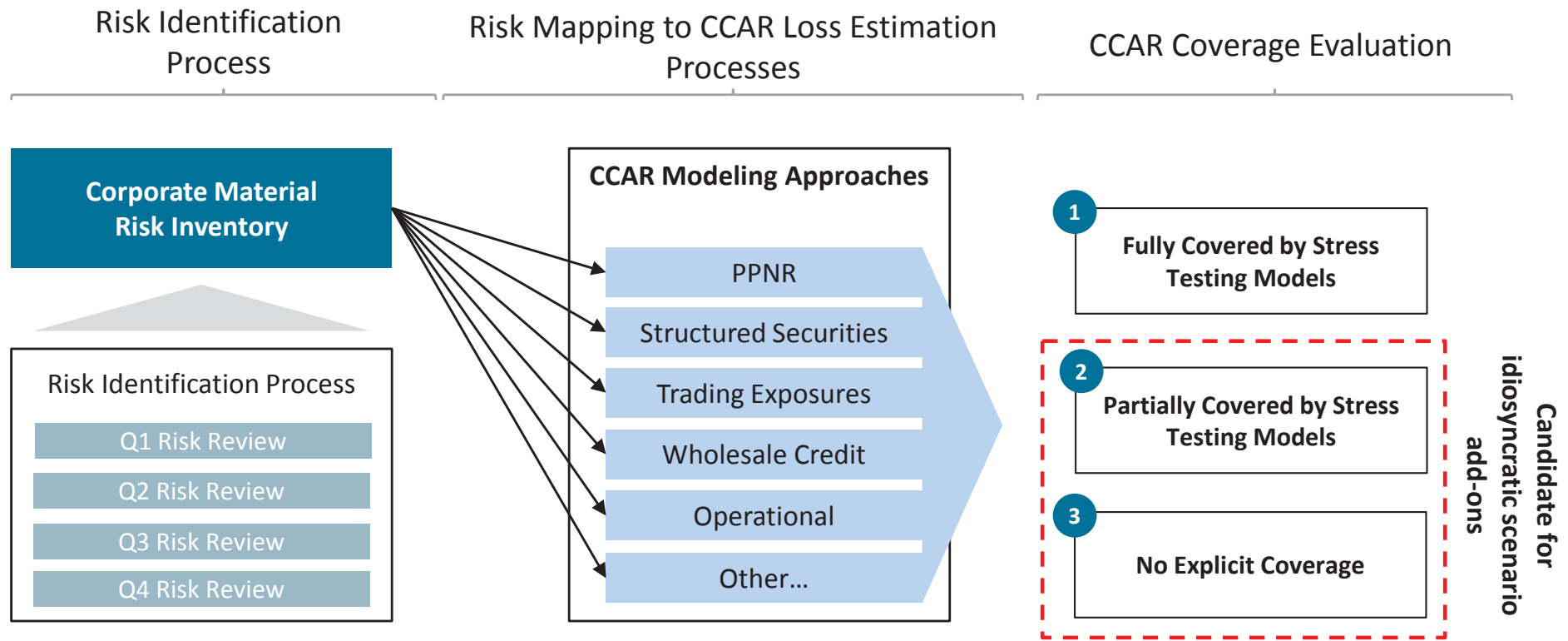
- Present BHC Scenario Design Process and proposed stress scenarios to governance bodies, including the Board of Directors

Focus of Today's Discussion

6 Risk Identification Linkage to Capital Plan

- Conduct a formal evaluation of the firm's material risk inventory to ensure that all risks are adequately covered by existing capital estimation processes

The material risk inventory mapping process identifies gaps where idiosyncratic add-ons should be considered

Risk Identification Process

Risk Mapping to CCAR Loss Estimation Processes

CCAR Coverage Evaluation

Corporate Material Risk Inventory

Risk Identification Process
- Q1 Risk Review
- Q2 Risk Review
- Q3 Risk Review
- Q4 Risk Review

CCAR Modeling Approaches
- PPNR
- Structured Securities
- Trading Exposures
- Wholesale Credit
- Operational
- Other…

1 Fully Covered by Stress Testing Models

2 Partially Covered by Stress Testing Models

3 No Explicit Coverage

Candidate for idiosyncratic scenario add-ons

- The risk inventory is evaluated on a quarterly basis to assess:
  - Changes in exposures
  - New sources of risk
  - Emerging risk issues
  - External risk factors
  - Tail risk events

- Each exposure in the risk inventory is mapped to one of the CCAR loss estimation methodologies

- The loss estimation methodologies are compared to the exposures to determine if the models provide sufficient coverage of the firm's risks

- Risks that are not fully covered by the stress testing models are used to develop idiosyncratic scenario add-ons

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Based on the risk inventory mapping, we clearly identify where CCAR models do not directly consider all material risks

Illustrative

Risk Category	Material Risks	CCAR Model Coverage	Material Risks Not Fully Covered	Comments
AFS/HTM Securities Risk	• Impairment Risk • Fair Value Risk • Other..	●		• A modelled approach sufficiently covers AFS/HTM Securities risk • The model is dependant on macroeconomic factors specifically designed to stress these risks, particularly credit spreads, interest rates and equities markets
Credit Risk	• Counterparty concentration • Collateral value • Other…	◑	• Counterparty concentration	• Credit risks are partially covered through the BHC's wholesale credit loss models • Given the BHC's counterparty concentration, and the potential for a stress environment to exacerbate counterparty default losses, the BHC scenario should include an idiosyncratic counterparty credit risk add-on

Sample (non-modeled) idiosyncratic scenario add-on process

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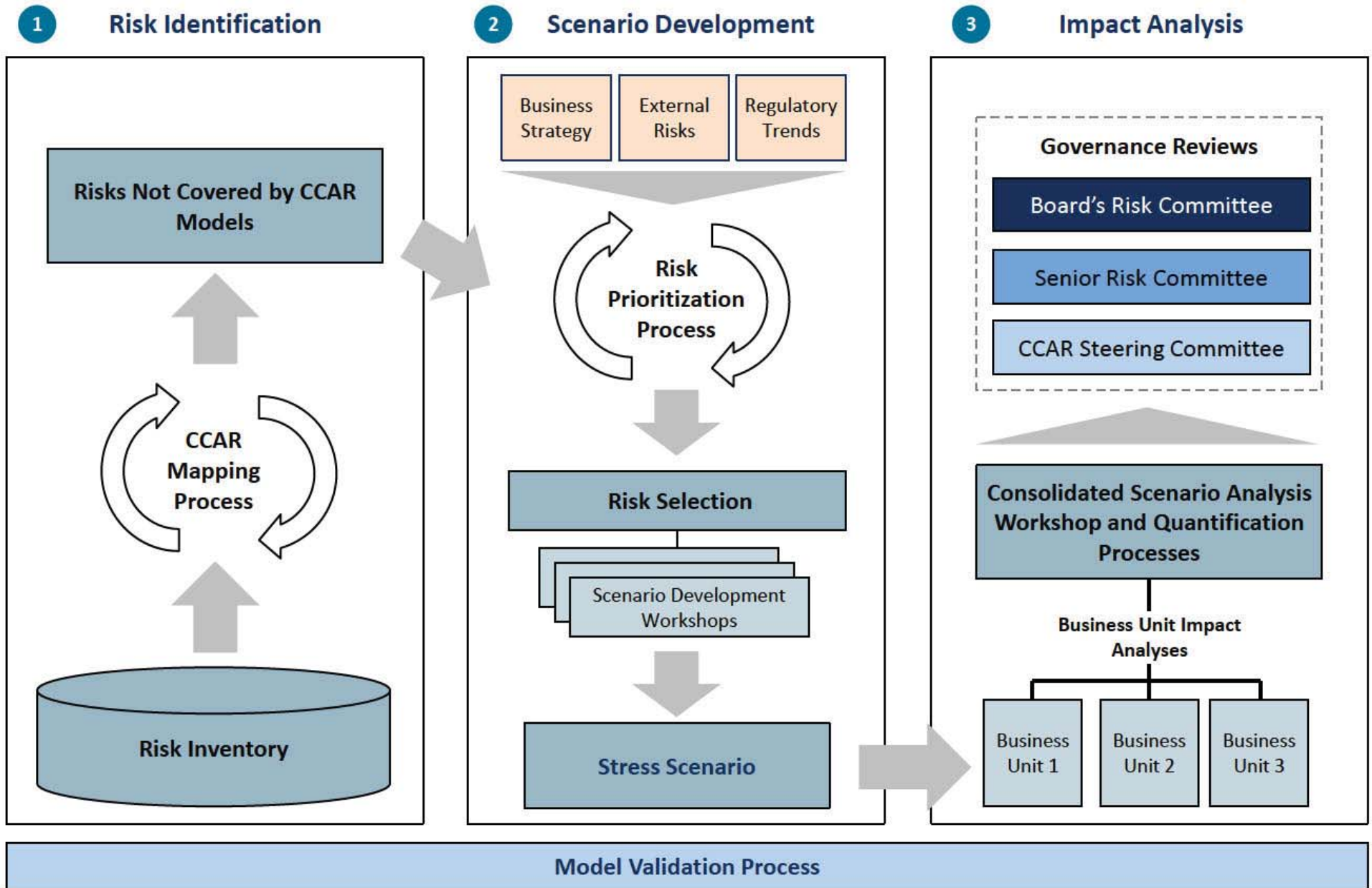
A menu of scenario options is created from the risk inventory and mapping process to highlight how idiosyncratic risks are captured

Illustrative

Scenario Proposal 1

BHC Menu of Scenario Options

		Option 1	Option 2	Option 3
1	Macro Scenario Environment	Asian Financial Crisis	Eurozone Crisis	Asset Blow-up

2	Elements Not Captured by Supervisory Scenarios	Largest Counterparty Default
		Litigation Risk Add-on

		Option 1	Option 2	Option 3
3	Idiosyncratic Scenario Add-ons	Cyber-security Event	Business Disruption Event	Third Party Failure

		Risk Materiality Scale:		
4	Additional Idiosyncratic Elements from Risk Inventory	High	Medium	Low
		• **MRI 1**	• MRI 4	• MRI 6
		• MRI 2	• **MRI 5**	• **MRI 7**
		• **MRI 3**		• MRI 8

Scenario Proposal 2

		Option 1	Option 2	Option 3
1	Macro Scenario Environment	Asian Financial Crisis	Eurozone Crisis	Asset Blow-up

2	Elements Not Captured by Supervisory Scenarios	Largest Counterparty Default
		Litigation Risk Add-on

		Option 1	Option 2	Option 3
3	Idiosyncratic Scenario Add-ons	Cyber-security Event	Business Disruption Event	Third Party Failure

		Risk Materiality Scale:		
4	Additional Idiosyncratic Elements from Risk Inventory	High	Medium	Low
		• MRI 1	• **MRI 4**	• **MRI 6**
		• **MRI 2**	• MRI 5	• MRI 7
		• MRI 3		• **MRI 8**