



Mark H. Smith
I N C O R P O R A T E D

VALIDATING THE INTEREST RATE RISK PROCESS

Presented by Cynthia Walker, CEO

**Interest rate risk is one of the risk categories
evaluated during the exam process**

CAMEL “S” – Sensitivity or IRR



NCUA Evaluates Credit Unions’ IRR Exposure

- **Threat to earnings**
- **Threat to capital**
- **Overall safety and soundness**
- **Undue risk to NCUSIF**

REGULATORY QUESTIONNAIRE

#1

Step B: Model Validation

b) Model Validation	Has the ALM model been validated by the credit union (i.e., mathematical integrity, user inputs, system output and reports, etc.) to confirm that the model produces accurate forecasts of earnings and valuations? If so, what documentation is available to support the validation?
-------------------------------	---

- REVIEW OF THE MATH
 - Methods
 - Formulas and calculations
 - Most models or vendors will have validation documentation

REGULATORY QUESTIONNAIRE

#2

Step C: Process Validation

c)

Process Validation	Does the CU obtain an independent validation of the IRR measurement process and assumptions that generate the IRR reporting? Did management implement the recommendations?
---------------------------	--

• REVIEW OF THE PROCESS

- Review of the entire IRR management process (framework)
- Assessment of model inputs, processing, and outputs
- Tailored to CU activities and complexity
- Independent
 - Separate from IRR measurement & management
 - Skills and knowledge to completely assess
 - Transparency – documented and available
 - Communication of results

OBEJCTIVE OF THE REGULATOR QUESTIONS

Does the program reasonably identify, measure, monitor, manage, and control interest rate risk?

Is the program performed consistently and periodically evaluated for appropriateness?

Is the program effective?

The background features a light gray gradient with several overlapping geometric shapes. A large white diamond is centered on the page. Surrounding it are various blue and green polygons, some of which are semi-transparent, creating a layered effect. The text 'POLL QUESTION ONE' is centered within the white diamond.

POLL QUESTION ONE

CONSIDERATIONS

As FI's become larger & more complex regulatory pressure for independent review increases.

IRR modeling done in-house versus out-sourced.

Modelers experience and expertise.

The credit unions current IRR profile.

NCUA Supervisory test results.

Comfort and confidence with current assessment.

Degree of reliance on the results for significant decisions.

ENGAGE NOW OR LATER?



Is an outside review the best use of time and resources?



Can review be performed in-house to save money?



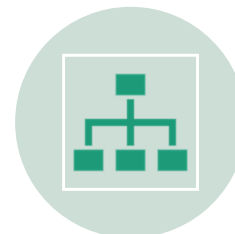
Value of assurance the model adequately presents risk?



Is there room for improvement?



Is management inclined to implement recommendations?



Is the program effective at identifying, measuring, monitoring, managing, and controlling IRR?

BENEFITS OF A DIY PROCESS VS. OUTSOURCED PROCESS

Do it Yourself

Benefits

- Price
- No external intrusion
- Utilize current staff/departments
- Increase staff participation
- Reg allows for inhouse and customized approach

Outsourced

Benefits

- Expertise
- Added value
- Independence
- Time
- Regulatory acceptability
- Access to industry resources
- Educational



Mark H. Smith
INCORPORATED

COMPONENTS OF AN IRR REVIEW

IRR and related policies

Oversight and management

Measurement and monitoring

Model assumptions

- Reasonableness and evaluation process

Internal controls

- Governance
- Operational
- Back-testing

Decision making

IRR AND RELATED POLICIES

Does IRR Policy have these framework components?

Define purpose
and objectives

Define process
management and
oversight

Designate
accountabilities
and
responsibilities

Identify periodic
measurement and
monitoring process

Adequately reflect
board's risk
tolerance.

Include limits and
other types of
controls.

Does IRR Policy have all the key elements?

IRR AND RELATED POLICIES

Non-compliance
remediation
process

Assumption
review process (at
least major
assumptions)

Define
methodologies
and applicable
risk control limits

Identifies actions
or tools utilized to
manage IRR

Periodic
alternative
scenarios

Consider early
warning
thresholds

Addresses
modeling of new
products /
strategies

Annual review of
the process

Key Elements Often Missing From a Policy



POLL QUESTION TWO

OVERSIGHT AND MANAGEMENT

- Identify responsibilities and accountabilities of the
 - Board
 - ALCO
 - Management
- Set competency expectation for boards and participating staff
- Set expectation for ongoing training
- Periodic evaluation of resource given to IRR
- Establish an annual assessment (effective and appropriate)
- IS THE POLICY ESTABLISHED FRAMEWORK BEING FOLLOWED CONSISTENTLY?



MEASUREMENT AND MONITORING

Question Setup Adequacy



Is your model appropriate for your level of complexity?



Is it set up correctly?



Are your chart of accounts detailed enough?

Monitoring risk at the right level (option behaviors, etc.)



Are account types set up correctly?

Chart of account IRR characteristics (v/f, call, step, balloon, etc.)

Discount methodology appropriate



Should you be modeling individual loan level detail?

MEASUREMENT AND MONITORING

QUESTION DATA CAPTURE AND INPUT

Data
aggregation

Data
integrity

Data entered
into the
model
accurately

Consistency

Input
controls to
verify and
check for
errors

MEASUREMENT AND MONITORING


Are the output measures consistent with policy?



Do the results seem reasonable?



Ongoing model monitoring (consistency, trends, and understanding of changes)?



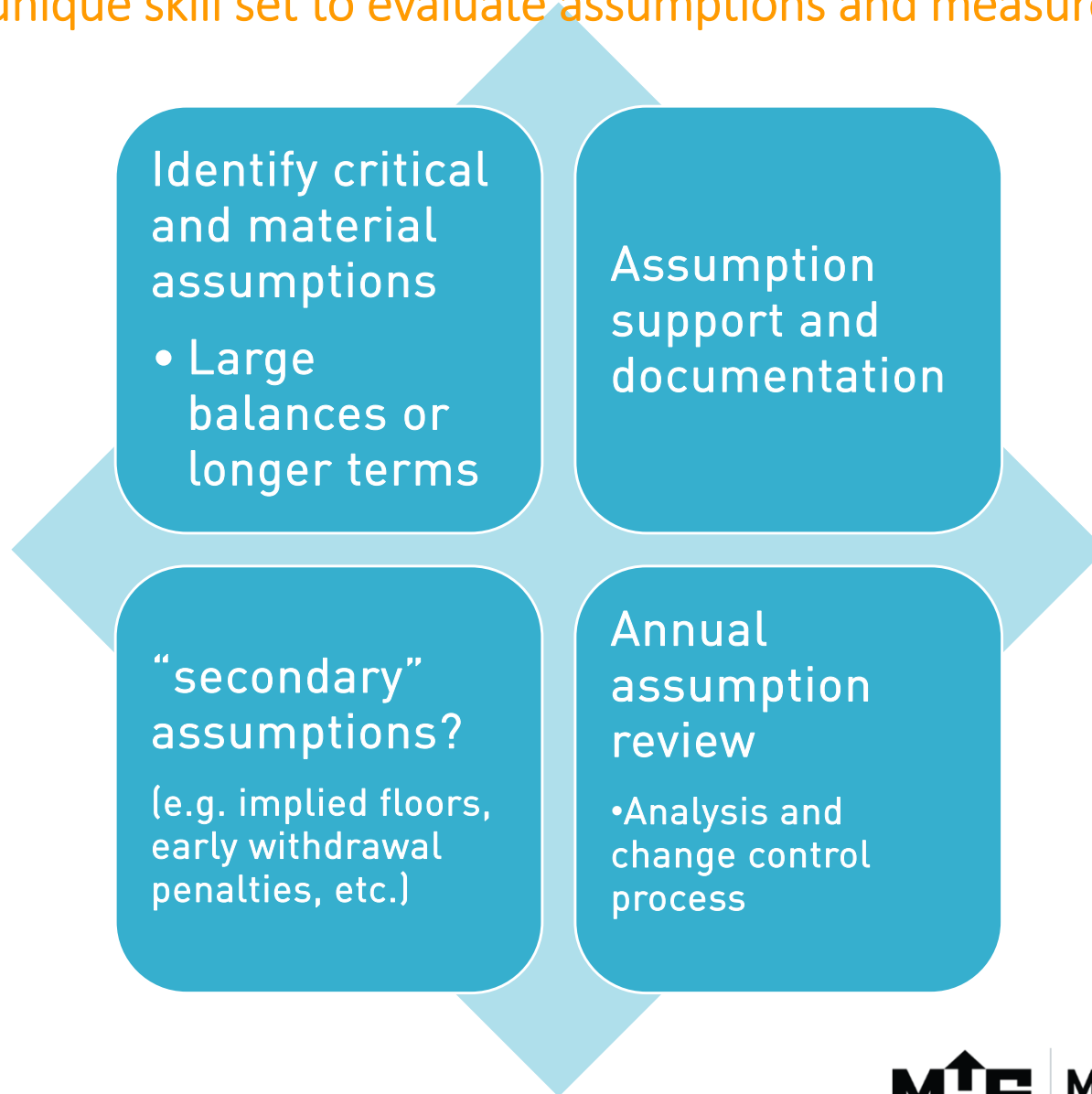
Are the limits reviewed annually?



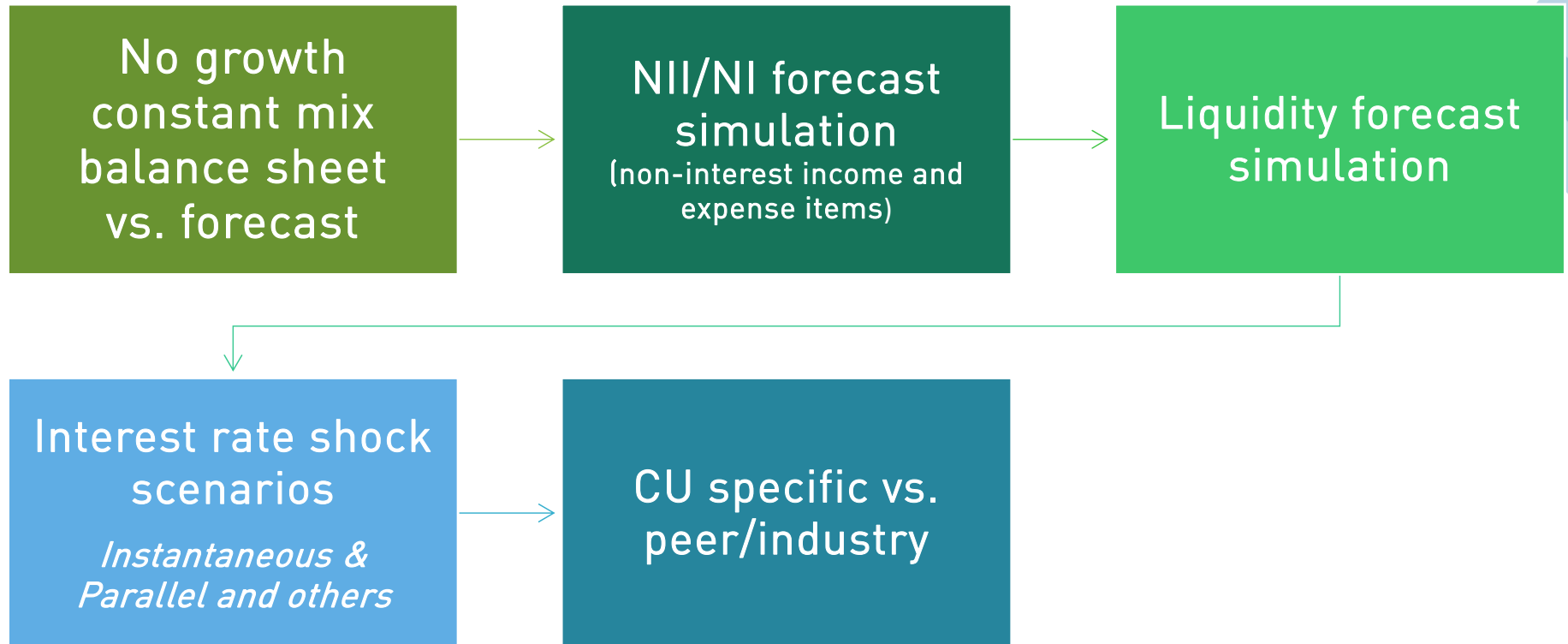
Are the limits and measures still applicable?

MODEL ASSUMPTION REVIEW

Requires a more unique skill set to evaluate assumptions and measurement results

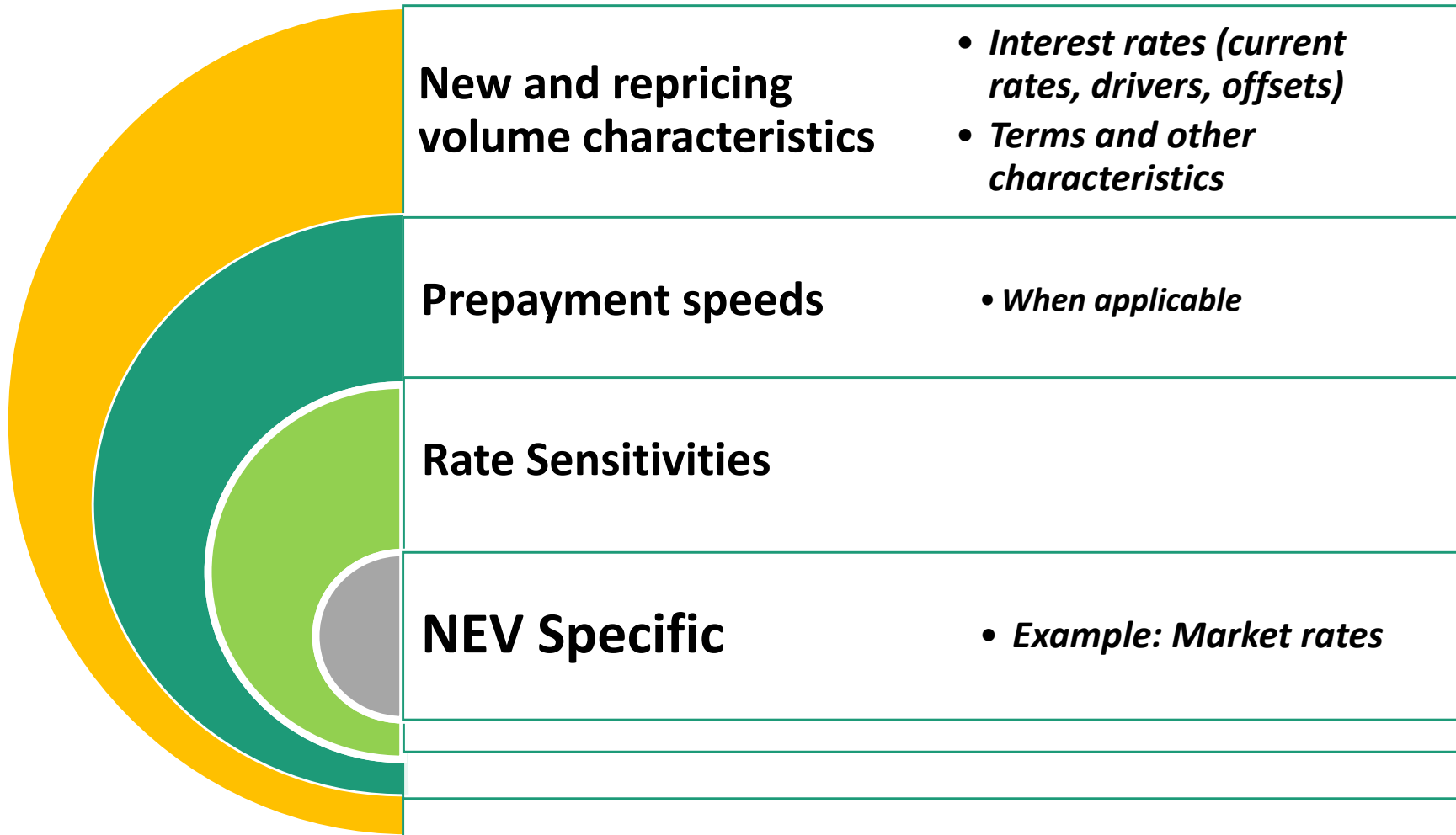


MODEL ASSUMPTION REVIEW



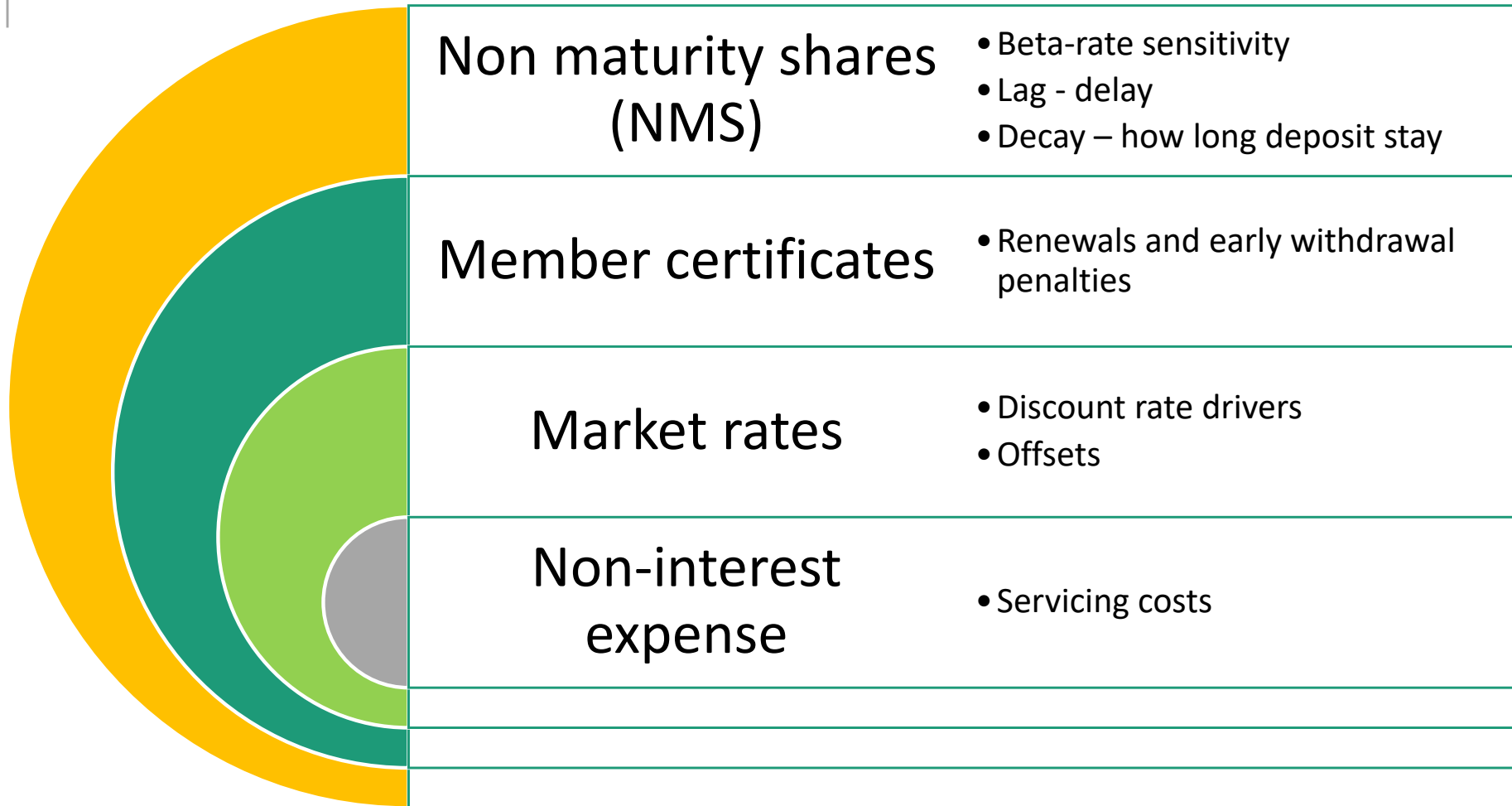
MODEL ASSUMPTION REVIEW

Major Loan and Investment Assumptions



MODEL ASSUMPTION REVIEW

Major Liability Assumptions





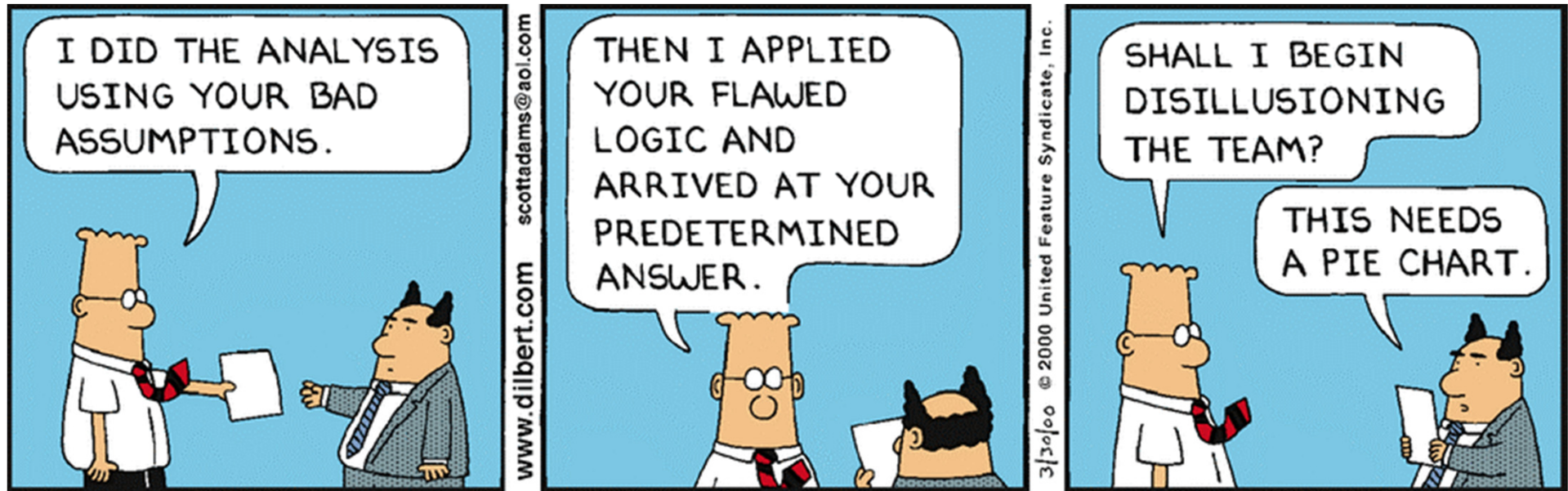
Model Governance And Validation

Credit unions that rely on external service providers should ensure there is adequate documentation of their use of those models, including any specific customization. If vendors provide input for market data, behavioral assumptions or model settings, the credit union should have a process in place to determine if those inputs are reasonable for the risk characteristics of its portfolio and activities.

<https://publishedguides.ncua.gov/examiner/Pages/Content/ExaminersGuide/IRR/MeasurementSystems/GovernanceValidation.htm>



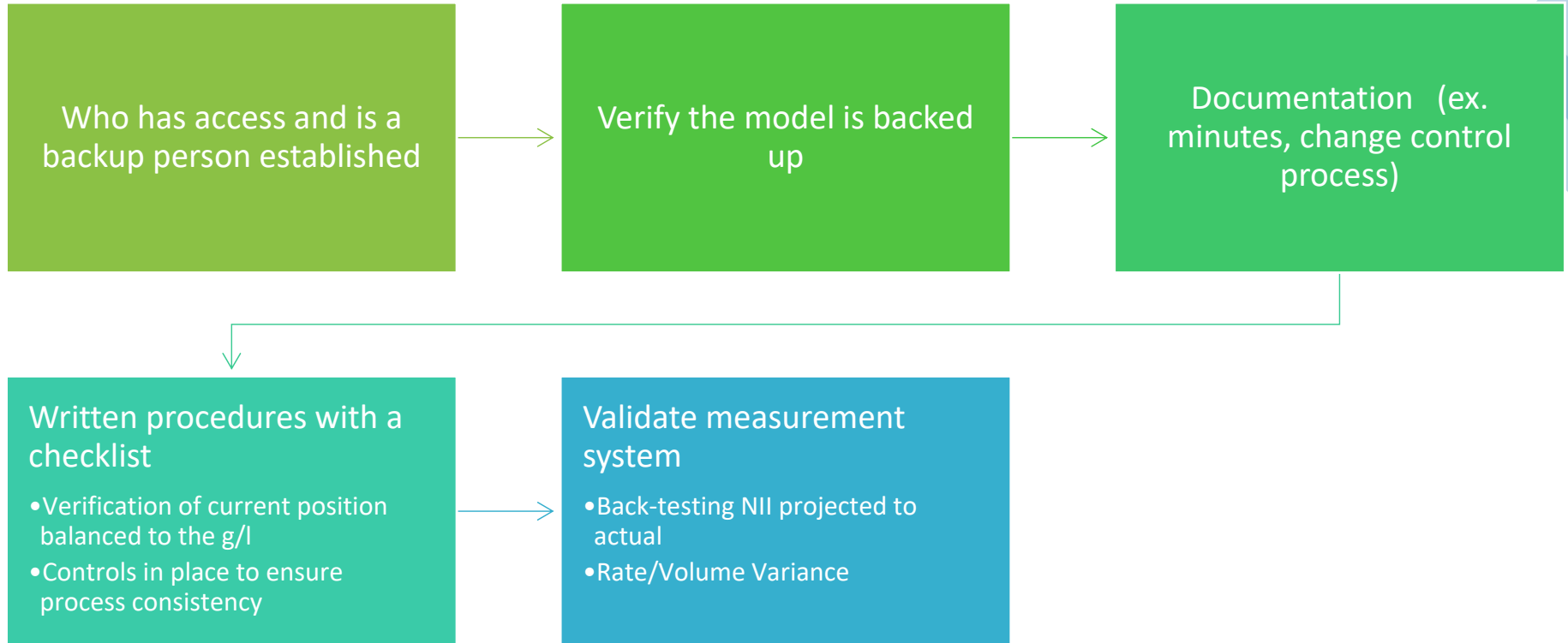
Stress/sensitivity test key assumptions



The background features a light gray gradient with several overlapping geometric shapes. A large white diamond is centered on the page. Surrounding it are various blue and green polygons, some of which are semi-transparent, creating a layered effect. The text 'POLL QUESTION THREE' is centered within the white diamond.

POLL QUESTION THREE

INTERNAL CONTROLS - OPERATIONAL



Example of backtest review

FORECASTED VS ACTUAL QUARTERLY INCOME STATEMENTS													
Last 2 Reports													
	ALMPro forecast compared to actual						ALMPro forecast compared to actual						
	Actual	Projected	Difference	Difference	Tolerance	Outside	Actual	Projected	Difference	Difference	Tolerance	Outside	
	6/30/19	6/30/2019	\$	%	%	Tolerance ?	9/30/19	9/30/2019	\$	%	%	Tolerance ?	
1	Total loan interest	1,430,939	1,661,135	230,196	16.1%	5.0%	11.1%	1,613,015	1,651,424	38,409	2.4%	5.0%	N/A
2	Total interest on investments	454,733	427,814	(26,919)	-5.9%	5.0%	0.9%	421,001	412,915	(8,086)	-1.9%	5.0%	N/A
3	Total interest income	1,885,672	2,088,949	203,277	10.8%	5.0%	5.8%	2,034,016	2,064,339	30,323	1.5%	5.0%	N/A
4	Total other income	521,613	582,398	60,785	11.7%			749,308	581,781	(167,527)	-22.4%		
5	Total income	2,407,285	2,671,347	264,062	11.0%			2,783,324	2,646,121	(137,203)	-4.9%		
6	Total cost of funds	232,891	242,098	9,207	4.0%	5.0%	N/A	279,984	255,263	(24,721)	-8.8%	5.0%	3.8%
7	Total margin	2,174,394	2,429,249	254,855	11.7%			2,503,340	2,390,858	(112,482)	-4.5%		
21	Total operating expenses	3,429,006	1,637,634	(1,791,372)	-52.2%			2,086,251	2,140,688	54,437	2.6%		
28	Net income	(381,569)	791,614	1,173,183	-307.5%			455,668	250,171	(205,497)	-45.1%		
22	Total assets	225,709,693	225,528,729	(180,964)	-0.1%			233,101,508	226,434,648	(6,666,860)	-2.9%		

	ALMPro forecast compared to actual						ALMPro forecast compared to actual					
	Actual	Projected	Difference	Variance due	Variance due	Unidentified	Actual	Projected	Difference	Variance due	Variance due	Unidentified
	6/30/19	6/30/2019		to balance	to yield	variance	9/30/19	9/30/2019		to balance	to yield	variance
Average Loan balance	127,068,097	125,874,276	(1,193,821)	(15,755)	245,951	-	132,750,190	128,822,359	(3,927,830)	(50,352)	88,762	-
Loan yield	4.50%	5.28%	0.77%				4.86%	5.13%	0.27%			
Average Investment balance	82,089,390	83,579,297	1,489,907	7,626	(34,545)	-	78,284,863	80,971,589	2,686,726	13,701	(21,787)	-
Investment yield	2.22%	2.05%	-0.17%				2.15%	2.04%	-0.11%			
Average Deposit & Borrowings balance	189,544,573	189,414,724	(129,849)	(166)	9,373	-	193,563,023	190,148,297	(3,414,726)	(4,584)	(20,137)	-
Deposit & Borrowings yield	0.49%	0.51%	0.02%				0.58%	0.54%	-0.04%			

Explanation: Either change in rate or change in volume



Mark H. Smith
INCORPORATED

INTERNAL CONTROLS - GOVERNANCE



Board, ALCO,
and management
reporting
structure

- (Board is ultimately responsible for IRR management)

Segregate
risk taker
from risk
modeler/me
asurer.

Change
control
processes
that are
documented

Frequency
and
timeliness
of
processes
established

Document findings

- with recommended corrective actions
- and time frames for remediation
- (periodic evaluations, resource assessments,
- and independent reviews/validations)

PROGRAM EFFECTIVENESS

-
**IS IT
USED
FOR
DECISION
MAKING**

Is the model
utilized for
new
products,
strategies,
and other
"what if"
scenarios?

Is the model used
during the
budgeting
process?

Is the program
effective?

Is it used
to aide in
managing
the credit
union and
strategic
planning
for the
future?

Is the
process
effectively
incorporat
ed into
decisions?

RESOURCES

- <https://publishedguides.ncua.gov/examiner/Pages/Content/PDFs/IRR%20Workbook%20Guide%20EXTERNAL.pdf>
- <https://publishedguides.ncua.gov/examiner/Pages/default.htm#ExaminersGuide/IRR/RiskManageFramework/InternalControls.htm?Highlight=back-testing>
- <http://www.ncua.gov/Resources/Documents/LCU2012-05.pdf>

Type "X" when complete			Return to Checklist ver. 09/11/03
IRR Review Questionnaires			
INSTRUCTIONS			
ALM Policies Review – Step 1	Rating	Inadequate	The credit union does not consider the impact future events could have on the credit union's exposure to interest rate risk. The credit union establishes strategic plans without considering the risk/reward relationship. If interest rate risk is considered when implementing a new strategy or program, the level of analysis or method of risk measurement is not sufficient to identify the scope and magnitude of risk (e.g., the horizon of analysis may be too short, the method may be too imprecise). Key persons are absent from the strategic planning process (e.g., ALCO). ALM policies and risk limits are not updated to reflect the projected risk profile. The ALCO minutes evidence the committee is not actively engaged in assessing risk or making recommendations to the board to mitigate risk or improve the ALM program.
1. Are the credit union's policies addressing interest rate risk management Adequate or Inadequate?			
ALM Planning Review – Step 2	Rating	Adequate	The credit union considers the impact of future events on the credit union's exposure to interest rate risk. The credit union adopts strategic plans after considering the risk/reward relationship. Interest rate risk is considered when implementing a new strategy or implementing a new program, and the level of analysis and methods of risk measurement identify the scope and magnitude of risk being taken (e.g., the horizon of analysis is appropriate, the risk associated with the characteristics of new products or investments is measured with adequate precision). The ALCO and other persons with ALM responsibilities are included in the strategic planning process (e.g., ALCO). ALM policies and risk limits are updated in a timely manner to reflect the projected risk profile. The ALCO minutes evidence the committee actively assesses risk and makes recommendations to the board to mitigate risk or improve the ALM program.
2. Is there an Adequate or Inadequate degree of integration between interest rate risk management and planning?			
CONTINUE IF THE CU HAS AN ALCO			
ALCO Review – Step 3	Rating	Inadequate	ALCO does not document its discussions or actions, and is not meeting its prescribed responsibilities. ALCO knowledge of IRR concepts is low or ALCO comprehension of the risk measurement reports is low. These conditions lead to ineffective risk assessment or improper recommendations to mitigate risk. ALCO does not attend or receive training on contemporary ALM issues or risk measurement methodologies. ALCO does not understand the key assumptions driving the model to determine if accuracy or precision of risk measurement reports are sufficient.
3. Is the ALCO's oversight of the credit union's ALM program Adequate or Inadequate?			
ALM Program Staff Review – Step 4	Rating	Inadequate	ALCO does not document its discussions or actions, and is not meeting its prescribed responsibilities. ALCO knowledge of IRR concepts is low or ALCO comprehension of the risk measurement reports is low. These conditions lead to ineffective risk assessment or improper recommendations to mitigate risk. ALCO does not attend or receive training on contemporary ALM issues or risk measurement methodologies. ALCO does not understand the key assumptions driving the model to determine if accuracy or precision of risk measurement reports are sufficient.
4. Is the ALM person's ability to generate sound and reasonable IRR measurement results Adequate or Inadequate?			
IRR Measurement Review – Step 5	Rating	Adequate	ALCO documents its discussions and action, and demonstrates it is meeting its prescribed responsibilities. ALCO's knowledge of IRR risk concepts is commensurate with the amount risk permitted. ALCO comprehends the risk measurement reports so that it effectively assesses interest rate risk and makes proper recommendations to mitigate risk. ALCO attends training on contemporary ALM issues and risk measurement methodologies on a regular basis. ALCO understands the key assumptions driving the model to ascertain the results' accuracy and precision of risk measurement reports, and offers recommendations for improvement.
5. Is the credit union's IRR measurement process Adequate or Inadequate?			
Conclusion	Rating	Inadequate	
6. Is the quality of interest rate risk management Adequate, or Inadequate?			
STOP – Part C is concluded			

- [Appendix A- Examination Questionnaire](http://www.ncua.gov/Resources/Documents/AIRESExamQuestions.zip)
<http://www.ncua.gov/Resources/Documents/AIRESExamQuestions.zip>



Mark H. Smith
INCORPORATED



Mark H. Smith
I N C O R P O R A T E D

- **EASY AND AFFORDABLE CECL SOLUTION**
- **SPECIAL OFFER: ONE-TIME MHSI CECL REPORT FOR A SMALL FEE AND A CURRENT AIRES LOAN FILE TO TRY IT OUT**



Mark H. Smith
I N C O R P O R A T E D

- **PLEASE VISIT OUR WEBSITE**
 - **MARKHSMITH.COM**
- **CONTACT INFO**
 - **800 268-7795**
 - **CYNTHIA@MARKHSMITH.COM**
 - **INFO@MARKHSMITH.COM**

Additional services offered

MHSI CECL - an affordable and easy solution to a complex requirement.

Features include:

- Minimal credit union data and time requirement
- Analysis of credit union's own loan loss and experience AND includes peer comparisons
- Easy to read and understandable results
- Multiple methodologies
- Loan level detail analysis
- Online functionality which includes drill down, segmentation, and what-if
- Stress Testing
- Compatible with any available data

Third Party Review - this service reviews all components of the credit union's IRR management process to ensure an appropriate, thorough, and effective IRR management program for non - MHSI clients