



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

IN-DEPTH DISCUSSION OF NET ECONOMIC VALUE

**PRESENTED BY:
CYNTHIA R. WALKER, CEO**

(Webinar will begin on the hour)

ASSET LIABILITY MANAGEMENT

Manage the balance sheet and its composition

Understand how changes in interest rates will impact the economic value of the balance sheet

INTEREST RATE RISK ANALYSIS



- Art and science
- A process
- A continual effort to optimize the balance sheet to meet earnings objectives
- Leverage will turn small changes in balance sheet into large changes in net worth

ASSET LIABILITY MANAGEMENT

Methods to Estimate Interest Rate Risk

- **GAP:** Measures mismatch between repricing assets and liabilities
- **Income simulation:** Measures change in net interest income or net income
- **Net Economic Value:** Estimates change in market values of the balance sheet and the resulting impact on capital as interest rates change



NET ECONOMIC VALUE (NEV)

Uses the NET PRESENT VALUE formula which is a form of valuation used extensively across finance and accounting to determine the value of anything that involves cash flow.

Accounts for the time value of money and opportunity cost

POLL QUESTION #1



NET ECONOMIC VALUE - NEV



Uses economic value and change to net worth to estimate interest rate risk



Captures long-term IRR



Point in time estimate (like a balance sheet vs income statement)



All terms and all cashflows – best for longer term assets



Conceptually more difficult than income simulation

LOANS

WHICH ASSUMPTIONS ARE MOST CRITICAL?

FOCUS ON LONG TERM ASSETS (OVER 5 YEARS)

	Balance in Thousands	% of Total Assets	Current Yield	Market Yield for NEV*	Maturity Term In Months for NEV							Repricing Criteria
					Shock Down -300 BP	Shock Down -200 BP	Shock Down -100 BP	Bench mark	Shock Up 100 BP	Shock Up 200 BP	Shock Up 300 BP	
First mortgages	3,118	2.1%	3.62%	2.66%	54	66	78	90	102	114	126	Up to 30 years fixed rate
Home equity loans (1st and 2nd position)	24,672	16.3%	3.17%	4.69%	47	48	49	50	52	53	54	Up to 240 months fixed rate
Home equity lines of credit	2,580	1.7%	4.01%	3.81%	45	45	45	45	45	45	45	Variable rate with 4% floor and 12% ceiling
New auto loans	5,862	3.9%	1.99%	2.96%	31	31	31	31	31	31	31	Fixed-rate consumer collateral
Used auto loans	29,462	19.4%	2.43%	3.12%	27	27	27	27	27	27	27	Fixed-rate consumer collateral
Indirect new auto loans	1,625	1.1%	4.34%	2.96%	31	31	31	31	31	31	31	Fixed-rate consumer collateral
Indirect used auto loans	10,246	6.8%	4.51%	3.12%	27	27	27	27	27	27	27	Fixed-rate consumer collateral
Other vehicle loans	4,756	3.1%	2.58%	5.09%	31	31	31	31	31	31	31	Fixed-rate consumer collateral
Unsecured loans	1,105	0.7%	8.67%	8.98%	15	15	15	15	15	15	15	Fixed-rate consumer unsecured
Lines of credit	1,080	0.7%	7.17%	6.31%	12	12	12	12	12	12	12	Revolving credit
Share/certificate secured	205	0.1%	1.96%	2.36%	18	18	18	18	18	18	18	Fixed-rate share secured/tied to cert maturity
VISA classic	1,297	0.9%	11.62%	11.21%	36	36	36	36	36	36	36	Revolving credit
VISA gold	4,682	3.1%	9.96%	9.47%	36	36	36	36	36	36	36	Revolving credit
Loans purchased - HELOCs	555	0.4%	3.21%	3.81%	24	24	24	24	24	24	24	Prime +1.75%; 10 year draw; 25 year term
Loans purchased - Mortgages	2,032	1.3%	3.35%	2.66%	24	36	48	60	72	84	96	15-30 year fixed rate
Loans purchased - Indirect RV	0	0.0%	0.00%	0.00%	0	0	0	0	0	0	0	0
	0	0.0%	0.00%	0.00%	0	0	0	0	0	0	0	0
	0	0.0%	0.00%	0.00%	0	0	0	0	0	0	0	0
	0	0.0%	0.00%	0.00%	0	0	0	0	0	0	0	0
Allowance for loan losses	(271)	-0.2%	0.00%	0.00%	0	0	0	0	0	0	0	0
Net Loans	93,008	61.4%	3.61%		34	35	36	37	38	39	40	Weighted Average

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**RATE UP
SHOCK 3%**

- Assets lose value.
- The larger the difference between current loan yield and market rate the greater the discount or premium.
- The longer the term the greater the discount.

INVESTMENTS

WHICH ASSUMPTIONS ARE MOST CRITICAL?

FOCUS ON LONG TERM ASSETS (OVER 5 YEARS)



	Balance in Thousands	% of Total Assets	Current Yield	Market Yield for NEV*	Shock Down -300 BP	Shock Down -200 BP	Shock Down -100 BP	Bench mark	Shock Up 100 BP	Shock Up 200 BP	Shock Up 300 BP	Repricing Criteria
Daily accounts	17,665	11.7%	0.07%	0.07%	1	1	1	1	1	1	1	Adjusts daily
	0	0.0%	0.00%	0.00%	0	0	0	0	0	0	0	
Investment CDs - non callable	27,882	18.4%	0.70%	0.10%	12	12	12	12	12	12	12	Defined by maturity date
Investment CDs - callable	0	0.0%	0.00%	0.00%	0	0	0	0	0	0	0	
Investment CDs - step/callable	0	0.0%	0.00%	0.00%	0	0	0	0	0	0	0	
Securities - non callable	0	0.0%	0.00%	0.00%	0	0	0	0	0	0	0	
Securities - callable	7,000	4.6%	0.56%	0.38%	7	7	7	50	50	50	50	Defined by maturity date
Securities - step/callable	0	0.0%	0.00%	0.00%	0	0	0	0	0	0	0	
Securities - MBS	68	0.0%	3.54%	0.75%	16	19	22	25	28	31	34	Anticipated repayment
	0	0.0%	0.00%	0.00%	0	0	0	0	0	0	0	
	0	0.0%	0.00%	0.00%	0	0	0	0	0	0	0	
Membership shares	42	0.0%	2.25%	2.25%	1	1	1	1	1	1	1	Adjusts monthly
Total Investments	52,657	34.7%	0.48%									

**RATE UP
SHOCK 3%**

- Assets lose value.
- The larger the difference between current loan yield and market rate the greater the discount or premium.
- The longer the term the greater the discount.

MEMBER DEPOSITS

WHICH ASSUMPTIONS ARE MOST CRITICAL?

Liability & Share Classification	Balance in Thousands	% to Total Assets	Current Yield	Non-Interest Expense	Market Yield for NEV**	LAG	BETA	Average Life in Months for NEV			Rate Sensitivity
								Shock Down -100 BP	Shock Up 200 BP	Shock Up 300 BP	
Notes payable	0	0.0%			0.0%	1	1	1	1	1	Adjusts daily
Liabilities	(164)	-0.1%	0.00%								
Regular shares	68,084	44.9%		0.75%	1.86%	1	0.16%	88	85	85	Core shares-low by definition
Kasasa dividend bearing accounts	4,327	2.9%	0.05%	0.86%	0.91%	1	0.59%	36	35	35	High by definition
Share drafts	23,793	15.7%	0.36%	1.80%	1.84%	1	0.00%	87	83	82	Low by definition
IRA shares	1,093	0.7%	0.00%	0.86%	1.24%	1	0.42%	50	49	49	High by definition
Member certificates	12,563	8.3%	0.19%	0.00%	0.40%	22	1.00%	22	12	12	Average weighted maturity
Money market shares \$0 to \$2,499.99	18	0.0%	1.51%	0.86%	1.25%	1	0.29%	51	48	46	Low by definition
Money market shares \$2,500 to \$9,999.99	756	0.5%	0.00%	0.86%	1.25%	1	0.29%	51	48	46	Moderate by analysis/definition
Money market shares \$10,000 to \$19,999.99	1,973	1.3%	0.10%	0.86%	0.91%	1	0.59%	36	35	35	Moderate by analysis/definition
Money market shares \$20,000 to \$49,999.99	6,491	4.3%	0.10%	0.86%	1.25%	1	0.49%	51	48	46	Moderate by analysis/definition
Money market shares \$50,000 to \$99,999.99	6,645	4.4%	0.15%	0.86%	0.91%	1	0.53%	36	35	35	High by definition
Money market shares \$100,000 and above	11,464	7.6%	0.15%	0.86%	0.91%	1	0.59%	36	35	35	High by definition
	0	0.0%	0.15%	0.00%	0.00%	0	0.00%	0	0	0	
	0	0.0%	0.00%	0.00%	0.00%	0	0.00%	0	0	0	
Total Shares & Deposits	137,206	90.5%	0.20%	0.89%							
Owner's Equity (Capital)	14,540	9.6%									
Total Liabilities & Capital	151,582	100.0%									

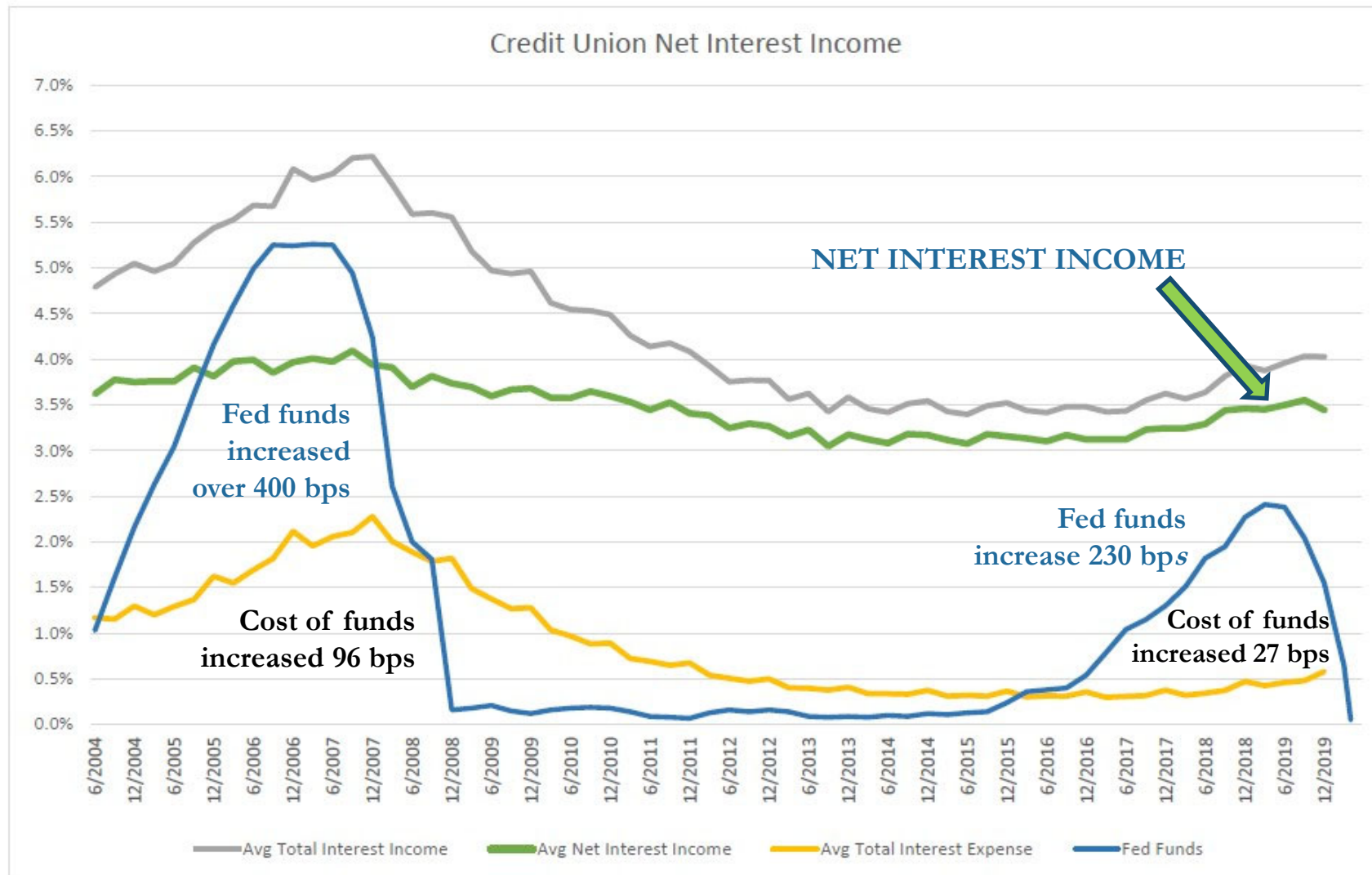
* Beta is defined as the change in rate paid from one interest rate scenario to the next (usually per 100 bp). Beta of .10% would equal 10 bp in a up 100 shock and 30 bp in up 300 shock.

Assumption: The market rate used for non maturity shares is the average of the 12 FHLB Regional advance rates weighted and averaged from 1 year to the truncation point for each deposit type. *Truncation Point:* The time period in which retention is truncated (runoff ballooned) to recognize the chance that event risk becomes material after some point in time. The truncation point has heavy weighting on the average FHLB Rate. Lower rates could be obtained through collateralized account or Secureconnect.

Decay or Average life is how long the deposits stay at the credit union

96/400=.24% beta

27/230= .12% beta



MEMBER DEPOSITS

- Decay or Average life is how long the deposits stay at the credit union.
- The longer the decay the greater the economic value in the up-rate shock scenarios

**RATE UP
SHOCK 3%**

- Liabilities gain value if their cost is below market.
- The larger the difference between current cost and market costs the greater the economic value.
- The longer the costs remains below market the greater the economic value.

Example: Regular shares and share drafts gain value

Book cost .05% + NIE .89% = .94%
Current 3-yr FHLB rate .75%
*Difference **-.19%***

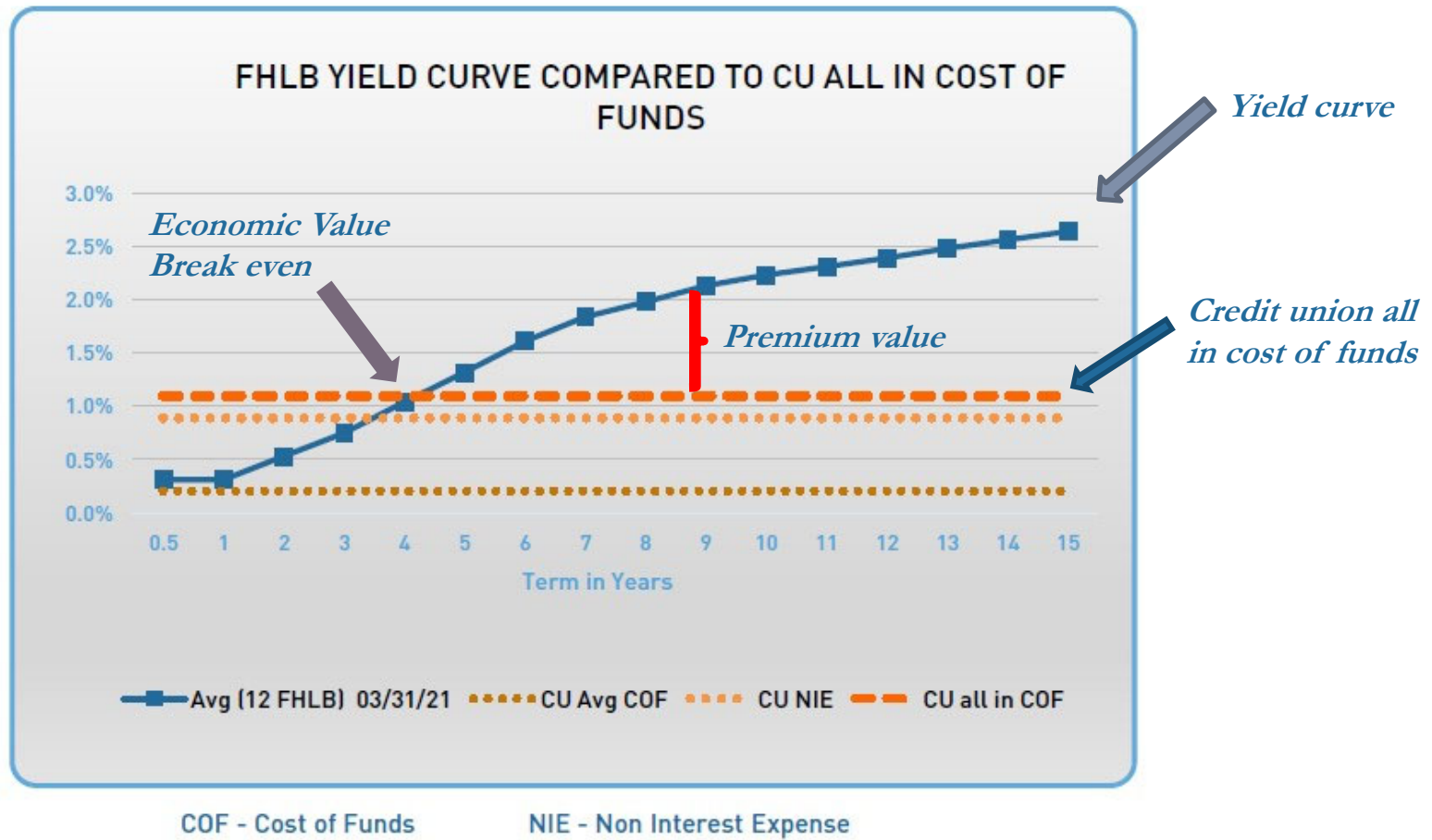
Current 6-year FHLB rate 1.61%
Difference .67%

After 3% shock (beta .15%) + NIE .89% = 1.39
Shock 3-yr FHLB rate 3.75%
Difference 2.36%

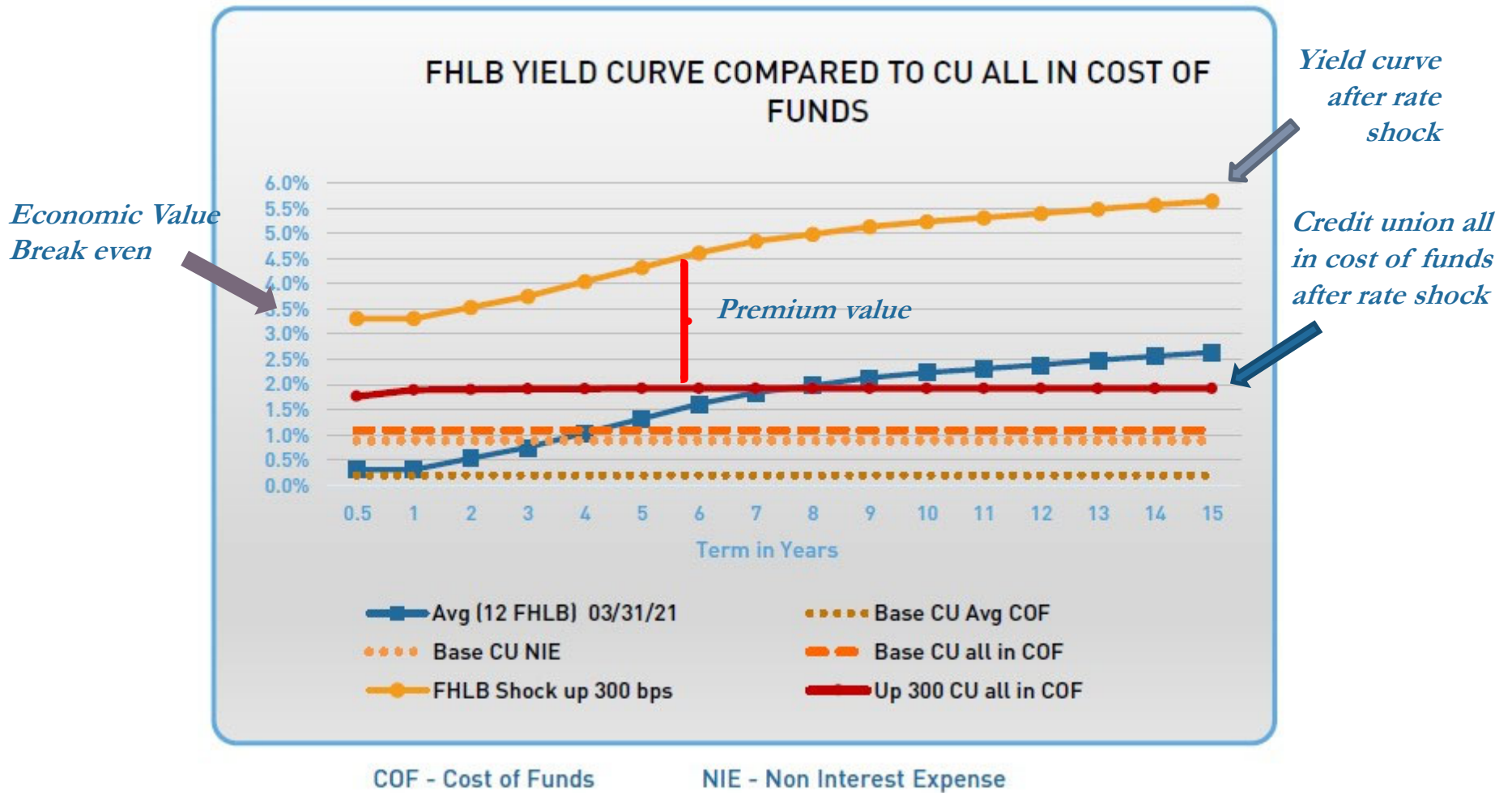
Shock 6-yr FHLB rate 4.61%
Difference 3. 22%

NIE – non-interest expense to reflect the all-in cost of deposits

NMD PREMIUM ACCUMULATION



NMD PREMIUM ACCUMULATION AFTER RATE SHOCK



POLL QUESTION #2

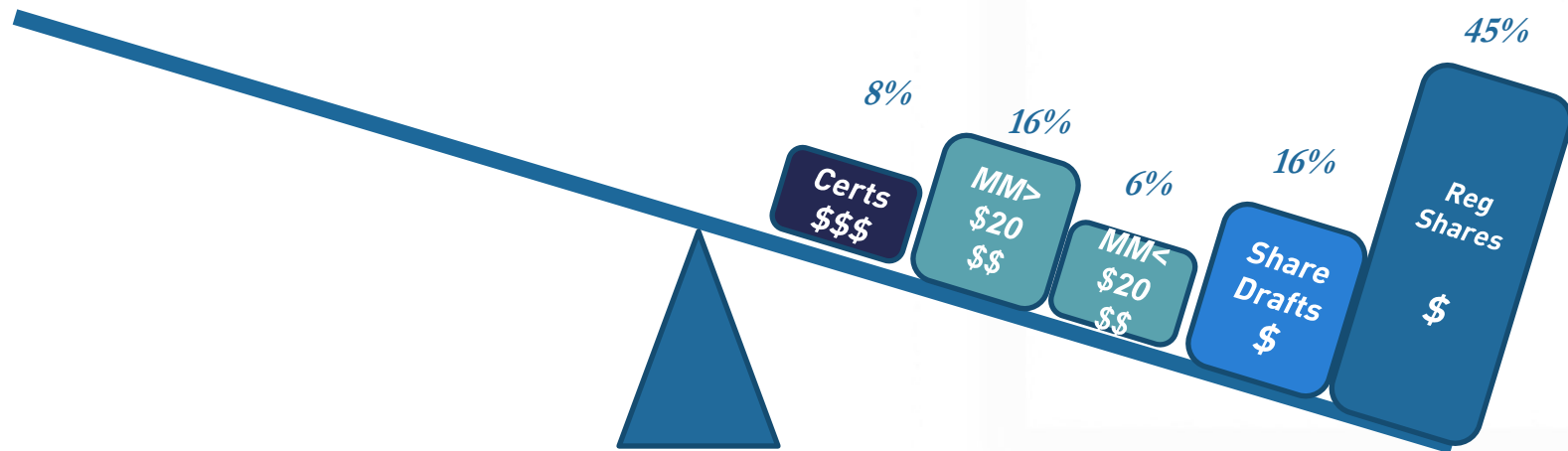


BALANCE SHEET

FUNDING/DEPOSITS/LIABILITIES

\$ = cost ranking

Think of how long these deposits have been there and how long they will remain in the future



NEV LOAN ASSUMPTIONS

Focus on long term fixed rate loans like mortgages – Identify the % of total assets

Focus on largest balances

The estimated repayment speeds for consumer loans is typically 24-36 months

Extension risk minimal for consumer loans

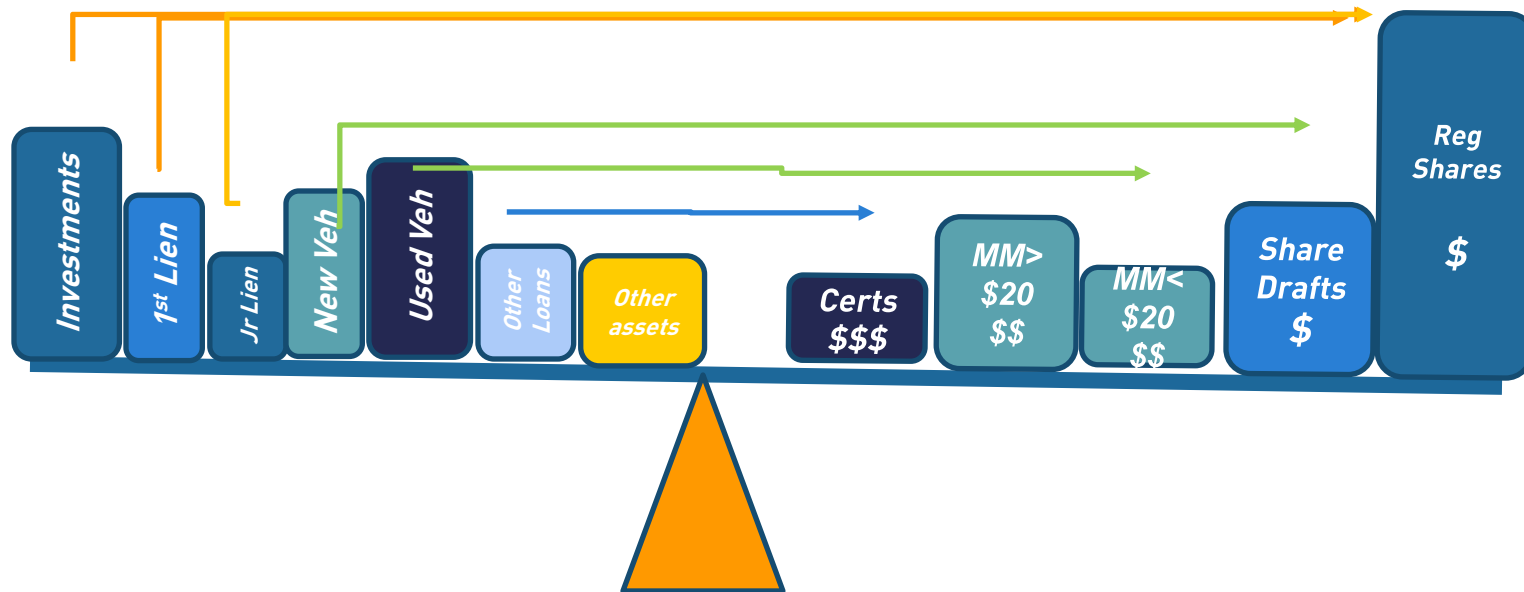
Repayment speeds for mortgages range from 60-120 months

Mortgage loans have extension or prepayment as rates go up or down

BALANCE SHEET PRICE MATCH UP

CONSIDER COST AND TERMS

FOCUS ON HOW DEPOSIT AVERAGE LIVES TO MATCH UP ASSET TERMS



SAMPLE CREDIT UNION

Total assets \$151 million – Growth last 12 months 20%

Asset Composition

- Loan to Asset Ratio 61% with average yield 3.6%
- First mortgage & HELOC fixed rate 21.4% of total assets
- Overnight funds 11.7% of total assets yield .07%
- Investment CD 18% of total assets with avg yield .70% and avg term 12 months
- Investment Securities 5% of total assets with avg yield .56% avg term 50 months

Liability Composition as percent of total assets

Weighted average beta .32%

- | | |
|----------------------|-------------------|
| • Regular shares 45% | beta .16% |
| • Share drafts 16% | beta 0% |
| • Certificates 8% | beta 1.0% |
| • Money Markets 18% | beta .29% to .59% |
| • IRA 1.0% | beta .42% |

Net Worth Ratio 9.6% was 10.6% 12 months ago

NET ECONOMIC VALUE

Step 1 – Calculate the change in net worth from book to current market rates (benchmark)

Step 2 – Calculate the change in net worth of shock scenario to benchmark

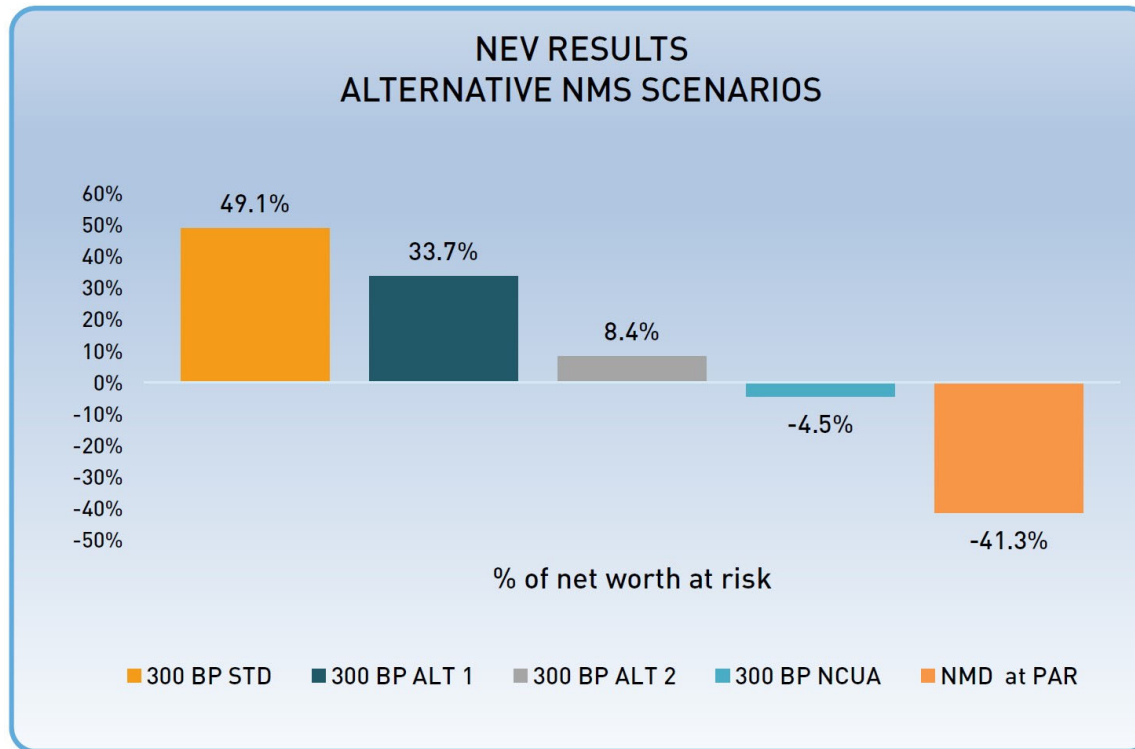
	Current Balance Sheet	Rates-Up Shock							
		Benchmark	\$ Amount Change from Book	% Change from Book	Post Shock Economic Value	\$ Change in EV from Benchmark	% Change in EV from Benchmark	Maximum Allowed % Change in EV Ratio*	Variance
		Current Economic Value			3.0%				
Net Loans	93,008	92,135	(873)	-0.9%	87,697	(4,438)	-4.8%		
Total Investments	52,657	52,790	133	0.3%	51,189	(1,601)	-3.0%		
All other assets	5,917	5,917	0	0.0%	5,917	0	0.0%		
Total Assets	151,582	150,842	(740)	-0.5%	144,803	(6,039)	-4.0%		
Borrowed funds	0	0	0	0.0%	0	(0)	-0.7%		
All other liabilities	-164	-164			(164)				
Total Deposits	137,206	132,231	(4,975)	-3.6%	116,979	(15,251)	-11.5%		
NET WORTH	14,517	18,775	4,258	29.3%	27,988	9,213	49.1%	-30.0%	79.1%
Total Liab & Net Worth	151,582	150,842	(740)	-0.5%	144,803	(6,039)	-4.0%		

NET WORTH ANALYSIS UP RATE SHOCK

Book NW Ratio	Net Economic Value Ratio
9.6%	12.4%

3.0% Rate Shock		
Post Shock Net Economic Value Ratio	Minimum Post Shock NEV Ratio	Variance
19.3%	7%	12.3%

NEV – ALTERNATIVE SCENARIOS



Only change is to shorten the average weighted lives of non-maturity deposits

Std- Ave life of Regular shares 85 months

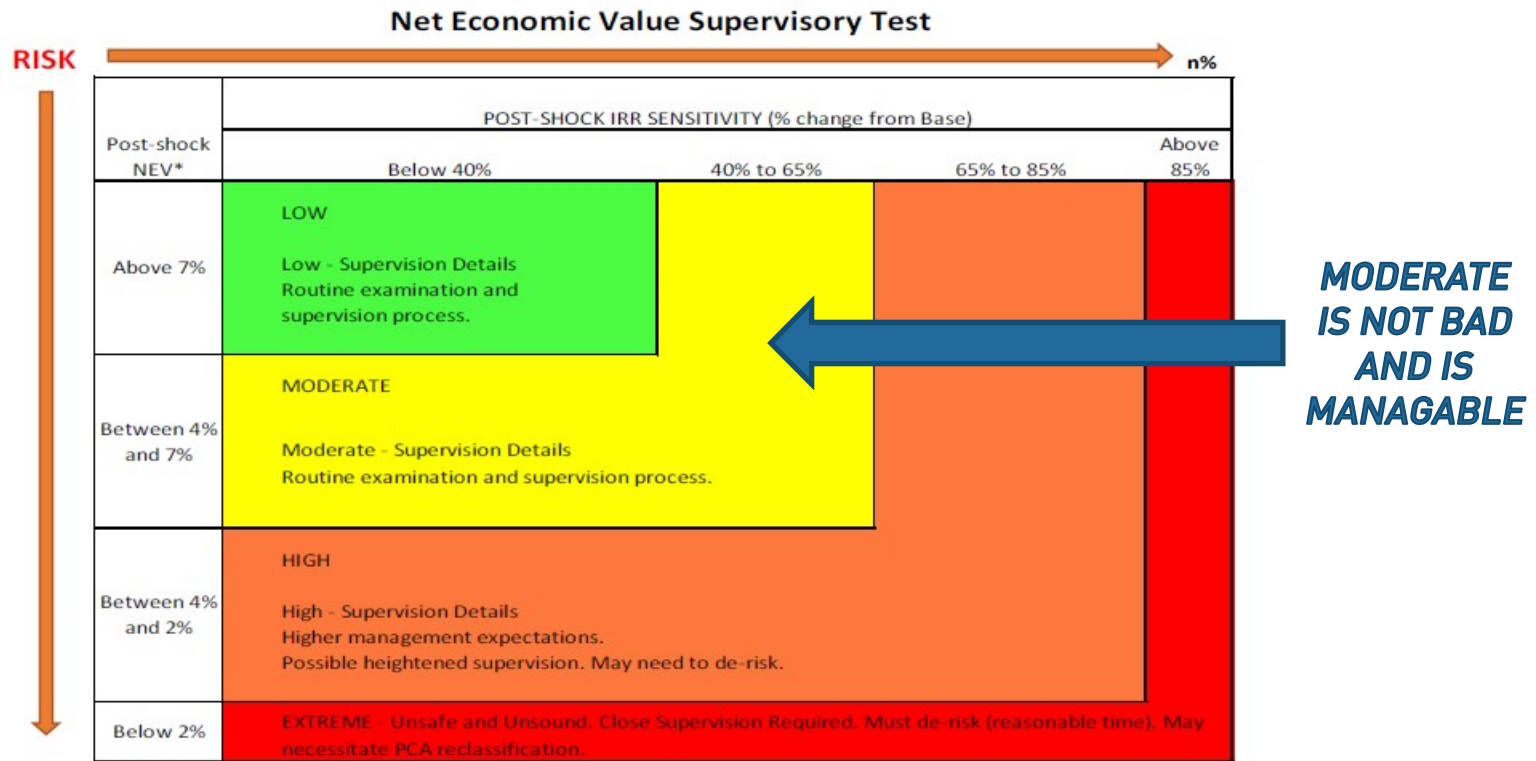
Alt 1 approximately 25% shorter

Alt 2 approximately 50% shorter

NCUA pre-defined premiums at 1% in the base and additional 4% in the up 300 scenario

NMD at par or book value

NEV – NCUA SUPERVISORY MATRIX



*USING STANDARDIZED NMS VALUES OF 1% FOR THE BASE CASE THEN 4% IN UP 300 SHOCK. NET EFFECT 4.96%.

NCUA SUPERVISORY NON-MATURITY DEPOSIT VALUATION (For examination purpose).

For non-maturity deposits a 1% premium in the base case and a 4% premium in the up 300 shock scenario from the base. Resulting in a 4.96% economic value premium for NMDs. NCUA has also adjusted the post shock NEV limits and post shock % change from base to accommodate for the limitations used in the NMD valuation.

NET ECONOMIC VALUE ADD \$25 MILLION

30 YR. FIXED RATE MORTGAGES

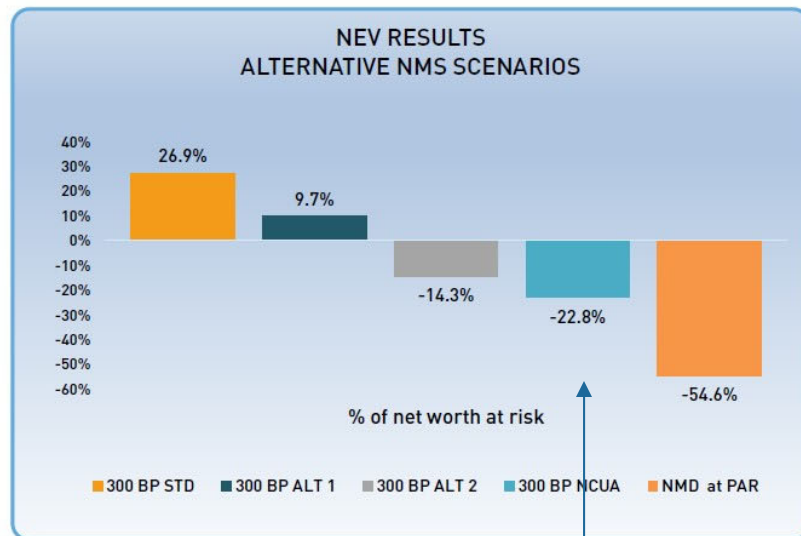
	Current Balance Sheet	Rates-Up Shock							
		Benchmark	\$ Amount Change from Book	% Change from Book	Post Shock Economic Value	\$ Change in EV from Benchmark	% Change in EV from Benchmark	Maximum Allowed % Change in EV Ratio*	Variance
		Current Economic Value			3.0%				
Net Loans	118,008	115,032	(2,976)	-2.5%	107,177	(7,855)	-6.8%		
Total Investments	27,657	32,786	5,129	18.5%	31,228	(1,558)	-4.8%		
All other assets	5,917	5,917	0	0.0%	5,917	0	0.0%		
Total Assets	151,582	153,735	2,152	1.4%	144,322	(9,412)	-6.1%		
Borrowed funds	0	0	0	0.0%	0	(0)	-0.7%		
All other liabilities	-164	-164			(164)				
Total Deposits	137,206	132,231	(4,975)	-3.6%	116,979	(15,251)	-11.5%		
NET WORTH	14,517	21,668	7,151	49.3%	27,506	5,839	26.9%		30.0%
Total Liab & Net Worth	151,582	153,735	2,152	1.4%	144,322	(9,412)	-6.1%		

NET WORTH ANALYSIS UP RATE SHOCK

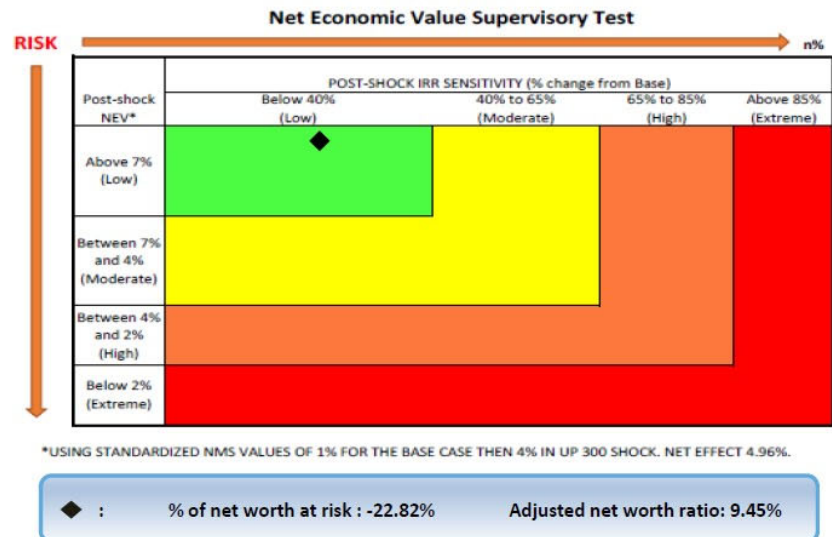
Book NW Ratio	Net Economic Value Ratio
9.6%	14.1%

3.0% Rate Shock		
Post Shock Net Economic Value Ratio	Minimum Post Shock NEV Ratio	Variance
19.1%	7%	12.1%

NEV ADD \$25M FIXED RATE 30YR MTG LONG TERM FIXED ASSET RATIO >35%



*Watch as
we change
betas*



NEV SCENARIO PREVIOUS SCENARIOS & REGULAR SHARES BETA OF .48% AND SHARE DRAFTS BETA .15%

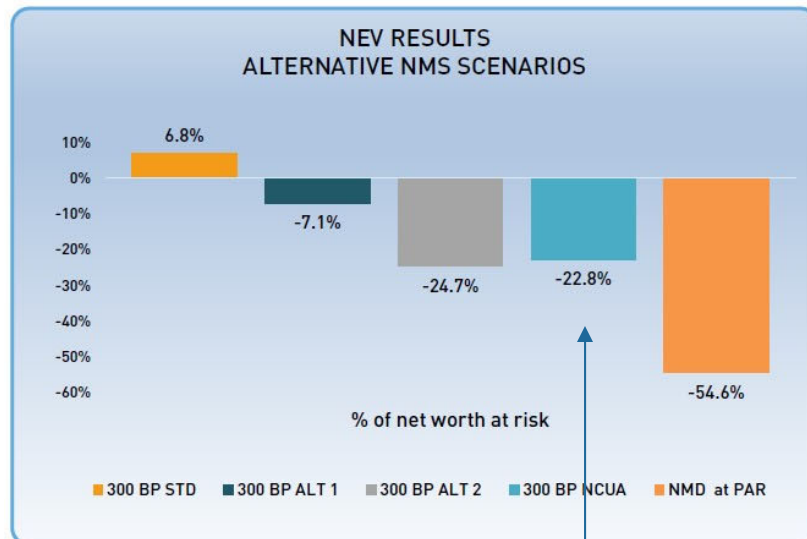
Rates-Up Shock									
	Current Balance Sheet	Benchmark Current Economic Value	\$ Amount Change from Book	% Change from Book	Post Shock Economic Value 3.0%	\$ Change in EV from Benchmark	% Change in EV from Benchmark	Maximum Allowed % Change in EV Ratio*	Variance
Net Loans	118,008	115,032	(2,976)	-2.5%	107,177	(7,855)	-6.8%		
Total Investments	27,657	32,786	5,129	18.5%	31,228	(1,558)	-4.8%		
All other assets	5,917	5,917	0	0.0%	5,917	0	0.0%		
Total Assets	151,582	153,735	2,152	1.4%	144,322	(9,412)	-6.1%		
Borrowed funds	0	0	0	0.0%	0	(0)	-0.7%		
All other liabilities	-164	-164			(164)				
Total Deposits	137,206	132,314	(4,892)	-3.6%	121,437	(10,877)	-8.2%		
NET WORTH	14,517	21,584	7,067	48.7%	23,049	1,465	6.8%	-30.0%	36.8%
Total Liab & Net Worth	151,582	153,735	2,152	1.4%	144,322	(9,412)	-6.1%		

NET WORTH ANALYSIS UP RATE SHOCK

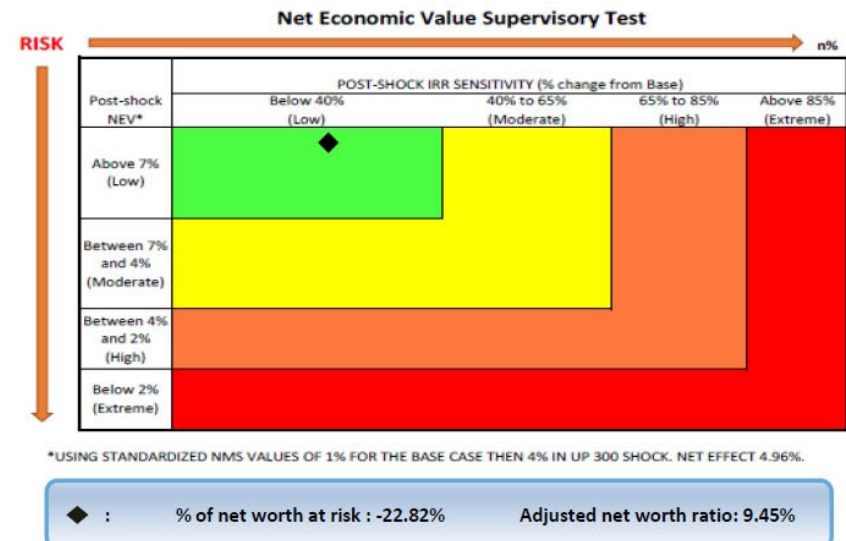
Book NW Ratio	Net Economic Value Ratio
9.6%	14.0%

3.0% Rate Shock		
Post Shock Net Economic Value Ratio	Minimum Post Shock NEV Ratio	Variance
16.0%	7%	9.0%

NEV SCENARIO PREVIOUS SCENARIOS & REGULAR SHARES BETA OF .60% AND SHARE DRAFTS BETA .15%



*Beta assumption change did
not change NCUA
Supervisory test results*



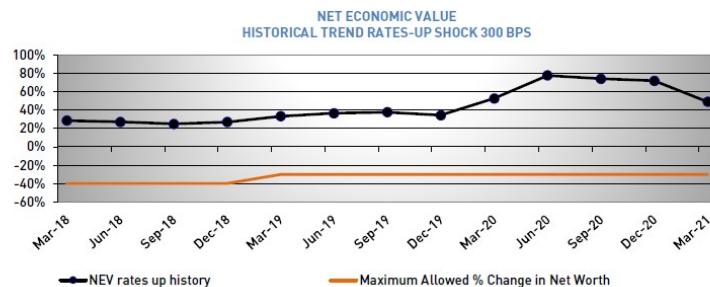
POLL QUESTION #3



NET ECONOMIC VALUE EXAMPLE

PANEL 2 NET ECONOMIC VALUE (EV)

	SHOCK DOWN -300 BP	SHOCK DOWN -200 BP	SHOCK DOWN -100 BP	CURRENT NET WORTH	SHOCK UP 100 BP	SHOCK UP 200 BP	SHOCK UP 300 BP
Book Net Worth (\$000)				\$14,517			
EV of Net Worth (\$000) - Benchmark	\$8,896	\$9,232	\$13,850	\$18,775	\$22,453	\$25,455	\$27,988
\$ Change EV of Net Worth from Benchmark (\$000)	(\$9,879)	(\$9,543)	(\$4,925)	\$4,258	\$3,678	\$6,680	\$9,213
% Change in EV of Net Worth from Benchmark	-52.6%	-50.8%	-26.2%		19.6%	35.6%	49.1%
Maximum Allowed % Change in EV of Net Worth	-30.0%	-30.0%	-30.0%		-30.0%	-30.0%	-30.0%
Book Net Worth Ratio				9.6%			
Post Shock Net Economic Value Ratio	5.8%	6.0%	9.1%	12.4%	15.1%	17.3%	19.3%
Minimum Post Shock Net Economic Value Ratio	7.0%	7.0%	7.0%		7.0%	7.0%	7.0%



NET ECONOMIC VALUE - PANEL 2

This analysis estimates the impact of Market Risk on the Credit Unions Net Worth (capital)* as of the above date. The Net Worth remaining after the impact of Market Risk is applied is referred to as the CU's Net Economic Value (NEV) DETAIL OF NEV ANALYSIS IN SECTION 2

*Formerly Operational Guidelines

- **WHAT IS A GOOD POLICY LIMIT?**
- **POLICY LIMIT SHOULD REFLECT YOUR PRACTICES AND RISK APPETITE.**
- **COMMON -40% NW AT RISK AND MARKET ADJUSTED NET WORTH RATIO OVER 7%**
- **CURRENT NET WORTH ALWAYS A CONSIDERATION**

DUE DILIGENCE

Discuss and document the results
Realistic and supportable assumptions
Identify key assumptions and stress test
Strong analysis
Solid reasoning
Ask lots of questions
May require more than one model run

ANALYSIS ONLY VALUABLE IF USED

- Use IRR modeling to guide strategic decisions
- Regularly review and update IRR model assumptions
- Re-evaluate policy limits annually
- Appropriate for your CU
- Ensure policy limits reflect board tolerance for risk

OUTSOURCE BENEFITS TO YOU AND YOUR CREDIT UNION

Easy

Save time

Delegate to the experts

Extensive experience

Regulator responses

Reliable

Reputable





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**

**A CREDIT WILL BE GIVEN FOR THE FEE WITH
AGREEMENT PRIOR TO 12/31/2022**



Mark H. Smith
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