



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

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

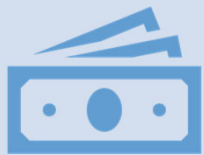


- **Net Economic Value:** Estimates change in market values of the balance sheet and the resulting impact on capital as interest rates change

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

NEV LOAN ASSUMPTIONS



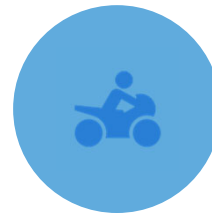
Focus on long term fixed rate loans like mortgages – Identify the % of total assets



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 60-130 months depending on the original term and rate



Mortgage loans have extension risk and prepayment risk as rates move up or down

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

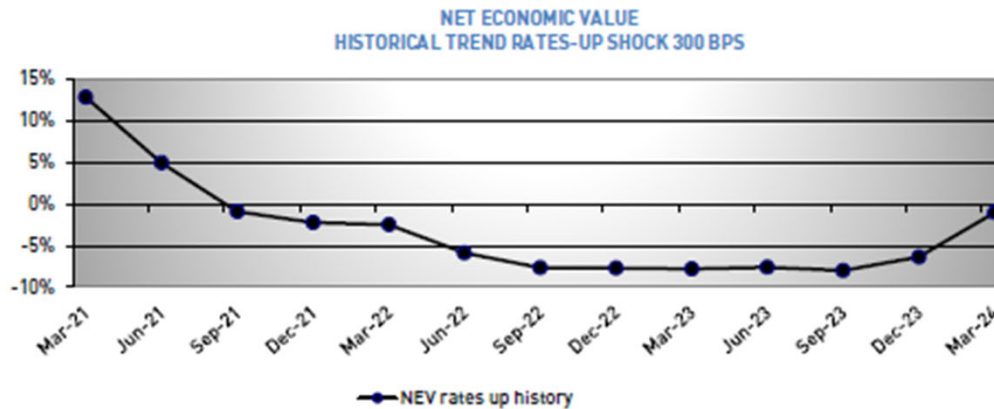


Conceptually more difficult than income simulation

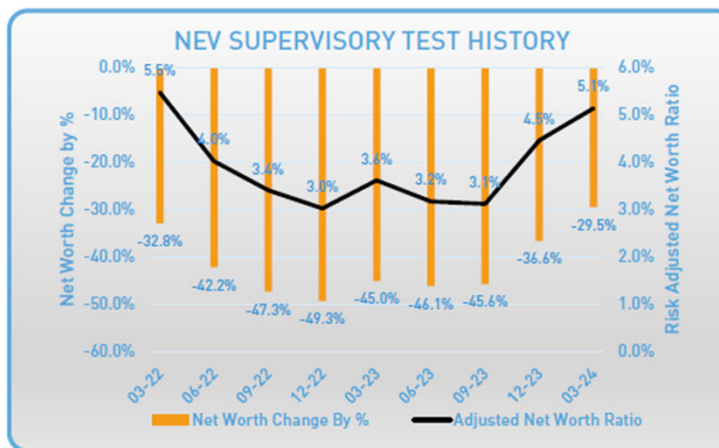
POLL QUESTION #1

NEV TREND GRAPHS

ALMPro Report page 6



ALMPro Report page 31



----- ANTICIPATED NCUA RISK RATING -----

MODERATE

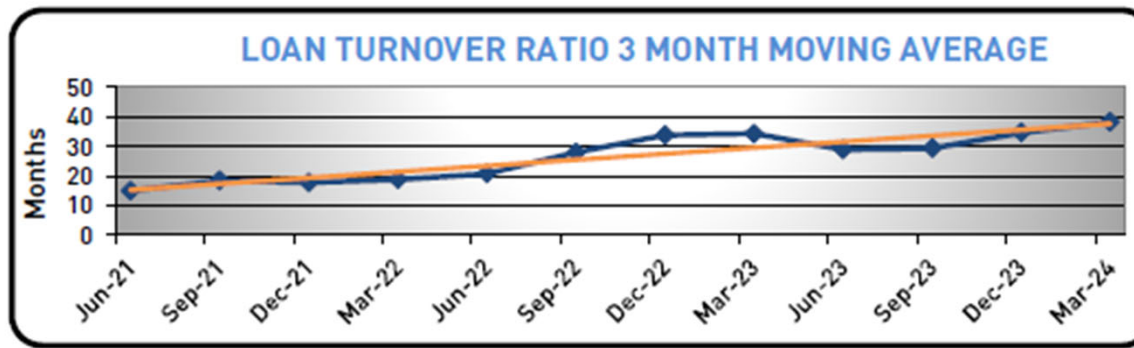
MORTGAGE LOAN REPAYMENT TRENDS

CREDIT UNION INDUSTRY TRENDS OBSERVED FROM CALL REPORT DATA

Mortgage repayment speeds have continued to extend over the last year in this higher rate environment. Review your loan payment behaviors found on page 10 and 38 of this report and determine if you should adjust your mortgage loan assumptions.

Loan Type	2022 Base	2023 Base
1 st Lien 20-30 yr fixed	114 months	129 months
1 st Lien 10-15 yr fixed	55 months	61 months
HELOC Adj Rate	48 months	50 months
Jr. Lien Fixed	43 months	49 months

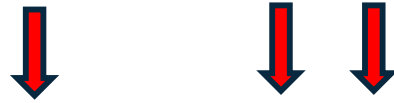
CREDIT UNION ACTUAL TRENDS – PAGE 37



LOANS KEY ASSUMPTIONS

FOCUS ON LONG TERM ASSETS (OVER 5 YEARS)

ALMPro Report
page 10



	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	
New vehicle loans	16,575	14.4%	4.74%	6.78%	34	34	34	34	34	34	34	Fixed-rate consumer collateral
Used vehicle loans	4,596	4.0%	5.55%	7.60%	23	23	23	23	23	23	23	Fixed-rate consumer collateral
Other vehicle loans	160	0.1%	7.56%	8.01%	27	27	27	27	27	27	27	Fixed-rate consumer collateral
Share/certificate secured loans	102	0.1%	3.35%	6.26%	28	28	28	28	28	28	28	Indexed to share/certificate rates
Unsecured loans	2,040	1.8%	10.68%	12.08%	20	20	20	20	20	20	20	Fixed-rate consumer unsecured
Lines of credit	57	0.0%	8.66%	10.83%	12	12	12	12	12	12	12	Revolving credit
First mortgages fixed rate greater than 15 years	38,934	33.7%	3.65%	7.15%	60	72	84	96	108	120	132	30 years fixed rate
First mortgages fixed rate 15 years or less	12,339	10.7%	4.12%	7.00%	34	43	52	61	70	79	88	15 years fixed rate
First mortgages balloons greater than 5 years	484	0.4%	3.90%	7.16%	0	0	0	0	0	0	0	
First mortgages balloons 5 years or less	220	0.2%	3.90%	7.16%	28	32	36	40	44	48	52	Balloons 5 years or less
First mortgages ARMs	2,531	2.2%	4.50%	5.97%	49	49	49	49	49	49	49	ARMs 1 year or less
Second mortgages fixed rate	4,666	4.0%	5.35%	7.47%	41	42	43	44	45	46	47	Up to 15 years fixed rate
Home equity lines of credit (1st and 2nd)	8,561	7.4%	8.49%	8.46%	35	35	35	35	35	35	35	Variable monthly
Credit card loans	1,278	1.1%	11.29%	8.37%	36	36	36	36	36	36	36	Variable monthly
	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
	0	0.0%	0.00%	0.00%	0	0	0	0	0	0	0	0
Allowance for loan losses	(213)	-0.2%	0.00%	0.00%	0	0	0	0	0	0	0	0
Net Loans	92,329	80.0%	4.83%		45	51	57	64	70	76	83	Weighted Average

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INVESTMENTS KEY ASSUMPTIONS

FOCUS ON LONG TERM ASSETS (OVER 5 YEARS)

ALMPro Report
page 10

	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	
Daily accounts	10,984	9.6%	4.51%	4.51%	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	1,500	1.3%	5.05%	4.90%	3	3	3	3	3	3	3	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	0	0.0%	0.00%	0.00%	0	0	0	0	0	0	0	
Securities step/callable	0	0.0%	0.00%	0.00%	0	0	0	0	0	0	0	
Securities DUS bonds (pass thru)	331	0.3%	3.07%	4.95%	13	13	13	19	19	19	19	Average life; prepayment penalties
Securities CMOs	1,398	1.2%	1.69%	4.31%	31	38	43	51	49	51	52	Average life
	0	0.0%	0.00%	0.00%	0	0	0	0	0	0	0	
Membership shares	152	0.1%	5.09%	5.09%	1	1	1	1	1	1	1	Adjusts monthly
Total Investments	14,365	12.5%	4.26%									

ASSETS NET ECONOMIC VALUE

RATE UP SHOCK 3%



Assets loose value

Book yield mtg loans = 3.65%

Step 1

Current market yield = 7.15%

Difference from current loan yield to
current market rate = 3.50%

Step 2

Shock market yield = 10.15%

difference from current market rate to
the shock market rate = 3%

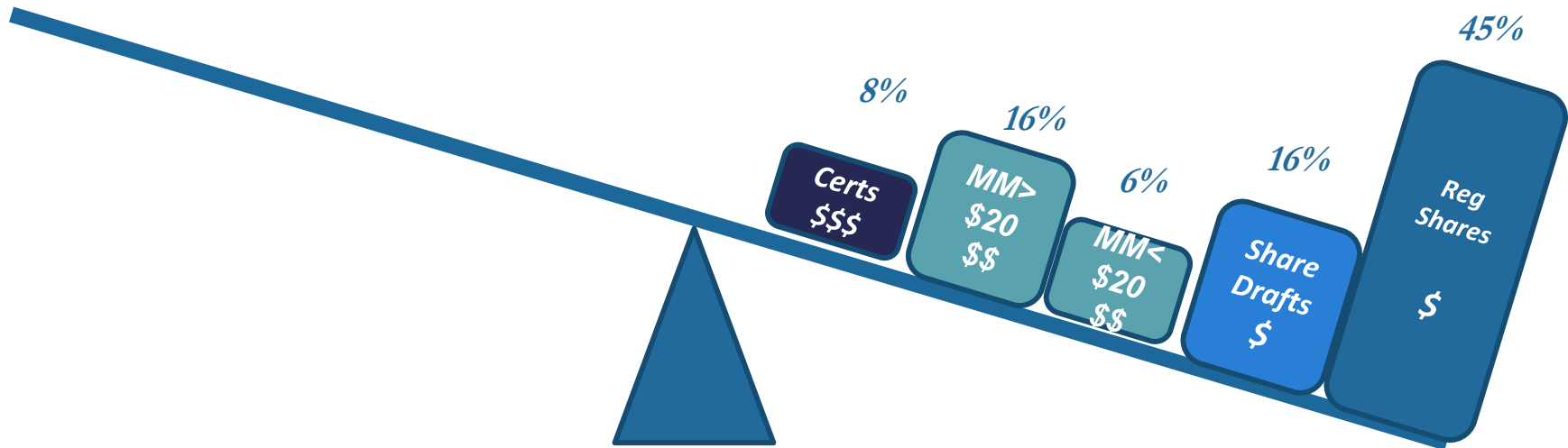
- Assets lose value.
- The larger the difference between current loan yield and market rate the greater the discount or premium.
- The longer the term the greater the discount.

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

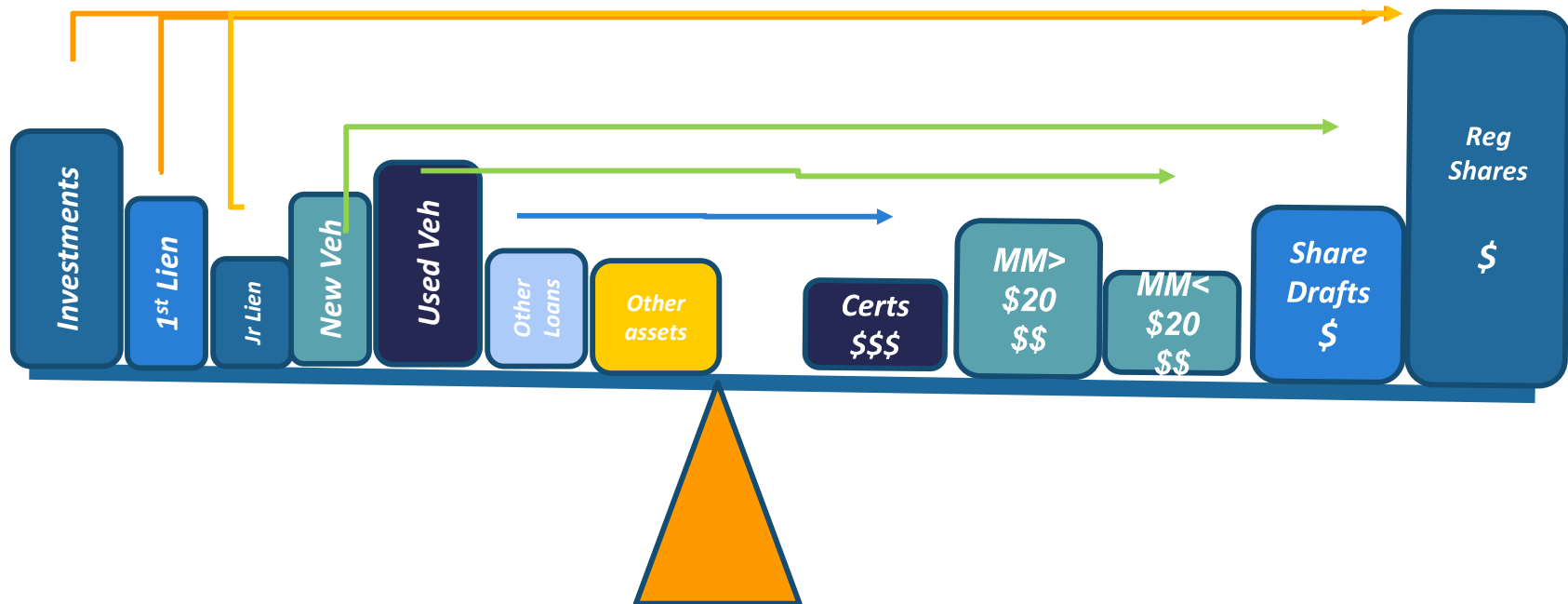


ALMPro Report page 11

BALANCE SHEET PRICE MATCH UP

CONSIDER COST AND TERMS

FOCUS ON HOW DEPOSIT AVERAGE LIVES TO MATCH UP ASSET TERMS



ALMPro Report page 10

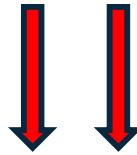
NMS TRENDS

Non-maturity share assumptions have been updated as of December 31, 2023. The betas and average lives are from credit union deposit data accumulated by MHSI. We have additional documentation to support these assumptions if needed.

Account Type	2022 Beta	2022 Avg Life-Base	2023 Beta	2023 Avg Life-Base
Regular Shares	.167%	7.01 years	.15%	6.7 years
Share Drafts-interest bearing	.08%	6.69 years	.08%	6.52 years
Money Market < \$50,000	.480%	4.06 years	.417%	4.07 years
Money Market > \$50,000	.575%	2.86 years	.452%	2.81 years
IRA	.248%	4.18 years	.245%	4.09 years

MEMBER DEPOSIT TYPES AND MIX HAVE A SIGNIFICANT IMPACT ON THE NEV RESULTS

ALMPro Report page 11



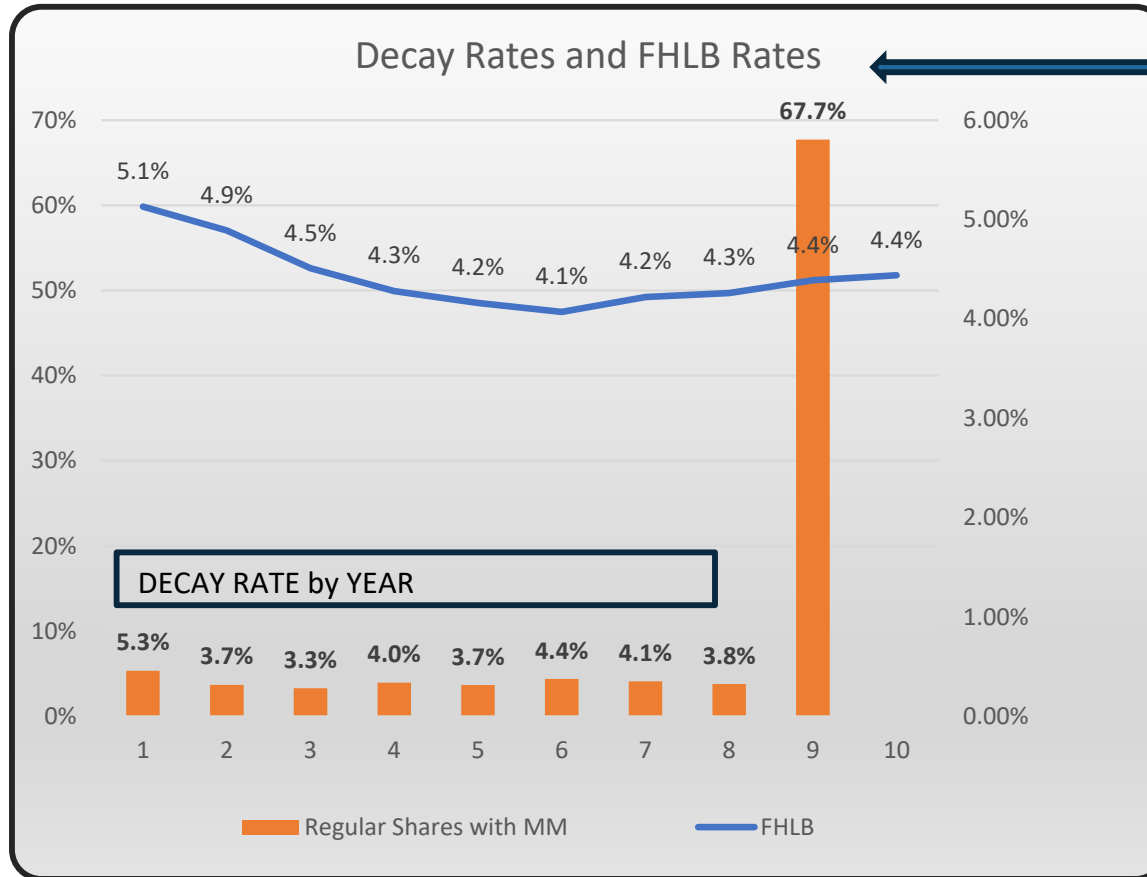
Liability & Share Classification	Balance in Thousands	% to Total Assets	Non-Interest Expense	Market Yield for NEV**	Average life in Months for NEV						Rate Sensitivity	
					Shock Down -300 BP	Shock Down -200 BP	Shock Down -100 BP	Bench mark	Shock Up 100 BP	Shock Up 200 BP		Shock Up 300 BP
Notes payable	0	0.0%		0.0%	1	1	1	1	1	1	1	Adjusts daily
Liabilities	649	0.4%										
Regular shares	30,290	26.2%	0.75%	4.79%	86	86	83	80	78	75	72	Core shares-low by definition
Share drafts interest bearing	5	0.0%	1.80%	4.80%	84	82	80	78	76	74	72	Low by definition
Share drafts non-interest bearing	11,151	9.7%	1.80%	4.80%	84	82	80	78	76	74	72	Not rate sensitive
IRA shares	2,012	1.7%	0.86%	4.78%	52	51	50	49	48	47	46	Moderate by definition
Club accounts	1,452	1.3%	0.00%	2.07%	12	12	12	12	12	12	12	Low by definition
Member certificates	43,627	37.8%	0.00%	3.26%	9	9	9	9	3	3	3	Defined by maturity date
High reward checking	2,042	1.8%	0.86%	4.78%	49	49	49	49	49	49	49	Moderate by definition
Non-member certificates	250	0.2%	0.00%	3.33%	16	16	16	16	16	16	16	Defined by maturity date
Money markets - \$0-2,499	34	0.0%	0.86%	4.78%	49	49	49	49	49	49	49	Moderate by definition
Money markets - \$2,500-24,999	630	0.5%	0.86%	4.78%	49	49	49	49	49	49	49	Moderate by definition
Money markets - \$25,000-49,999	1,285	1.1%	0.86%	4.78%	49	49	49	49	49	49	49	Moderate by definition
Money markets - \$50,000-99,999	1,534	1.3%	0.86%	4.77%	39	39	36	34	31	29	26	High by definition
Money markets - \$100,000 and up	10,905	9.4%	0.86%	4.77%	39	39	36	34	31	29	26	High by definition
Total Shares & Deposits	105,218	91.2%	0.56%									
Owner's Equity (Capital)	9,750	8.4%										
Total Liabilities & Capital	115,416	100.0%										

Money markets - \$100,000 and up	10,905	9.4%	2.96%	0
Total Shares & Deposits	105,218	91.2%	2.20%	

All in cost of deposits = dividend 2.2% plus non-interest expense .56% = 2.76%. Dividend yields on upper part of page 11

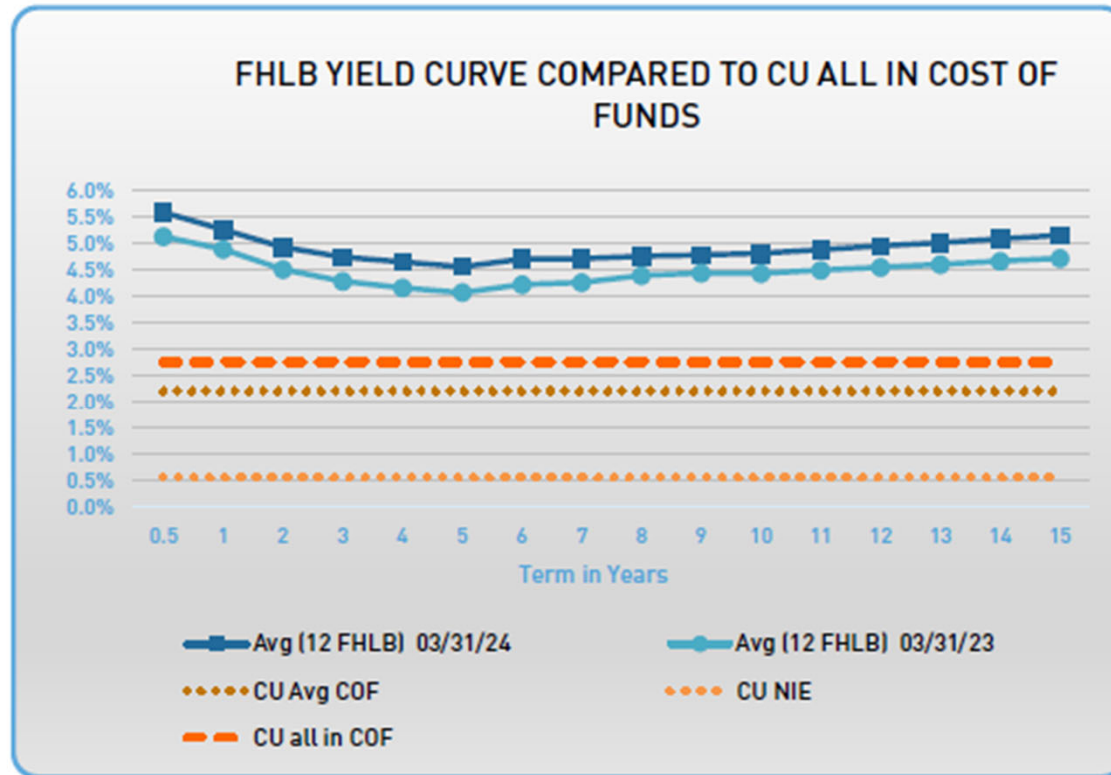
Decay is the rate deposits leave and average life is how long the deposits stay at the credit union

NET ECONOMIC NON-MATURITY SHARE DECAY RATE AND FHLB MARKET RATE REVIEW



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.

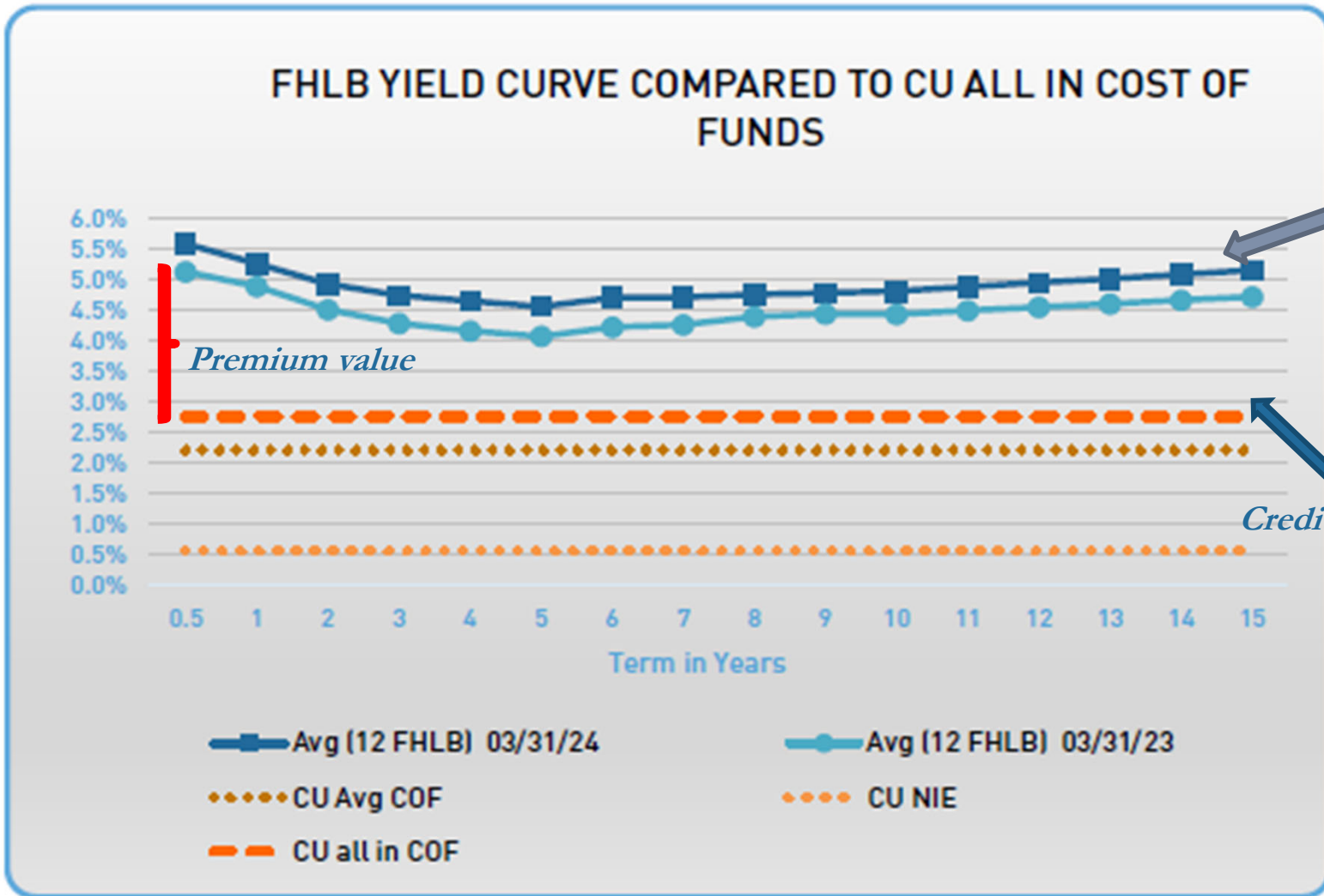
NET ECONOMIC NON-MATURITY SHARE MARKET RATE USED



COF - Cost of Funds NIE - Non Interest Expense

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.

NMD PREMIUM ACCUMULATION



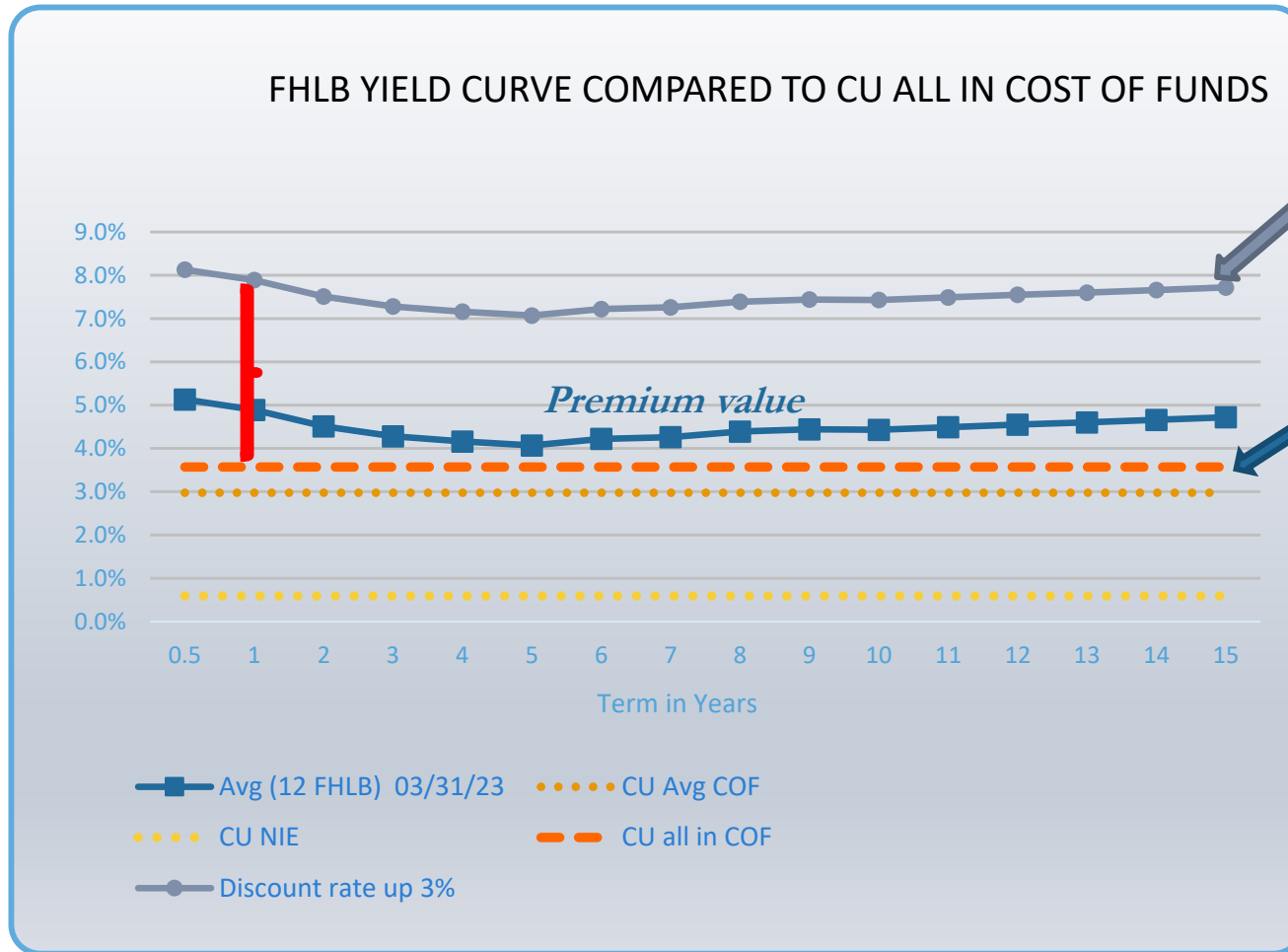
FHLB *yield curve*

Credit union all in cost

COF - Cost of Funds

NIE - Non Interest Expense

NMD PREMIUM ACCUMULATION AFTER 3% RATE SHOCK



*Yield curve
after rate
shock*

*Credit union all
in cost of funds
after rate shock*

NON MATURITY SHARES NET ECONOMIC VALUE

ALMPro Report
page 11 & 29

RATE UP SHOCK 3%

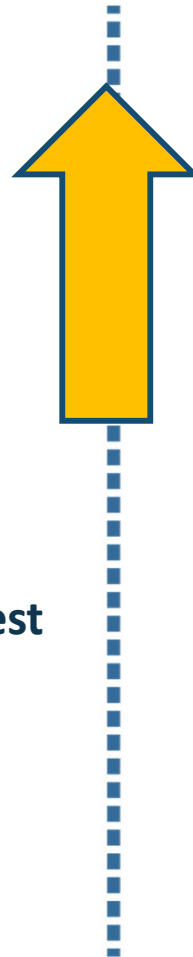
**Regular shares &
share drafts gain the most value**

**Current rates ~ 2.20% + non-interest
expense of .56% = all in cost ~ 2.76%**

**FHLB Avg at current rates 4.78%
= difference of 2.02%**

**Shock rates +300 bps ~ 5.20% + non-interest
expense of .56% = all in cost of ~ 5.76%**

**FHLB Avg at Shock market 7.77% =
difference of 2.01%**



**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.**

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 the shock scenario to benchmark

	Rates-Up Shock								
	Current Balance Sheet	Benchmark Current Economic Value	\$ 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
					3.0%				
Net Loans	92,329	85,310	(7,020)	-7.6%	77,084	(8,226)	-9.6%		
Total Investments	13,545	13,579	33	0.2%	13,261	(317)	-2.3%		
All other assets	9,541	9,541	0	0.0%	9,541	0	0.0%		
Total Assets	115,416	108,429	(6,986)	-6.1%	99,886	(8,543)	-7.9%		
Borrowed funds	0	0	0	0.0%	0	(0)	-0.7%		
All other liabilities	448	448			448				
Total Deposits	105,218	95,818	(9,400)	-8.9%	91,011	(4,807)	-5.0%		
Unrealized gain/loss on investments	-152	0	152	-100.0%	0	0	0.0%		
NET WORTH	9,902	12,163	2,261	22.8%	8,427	(3,736)	-30.7%	-40.0%	9.3%
Total Liab & Net Worth	115,416	108,429	(6,986)	-6.1%	99,886	(8,543)	-7.9%		

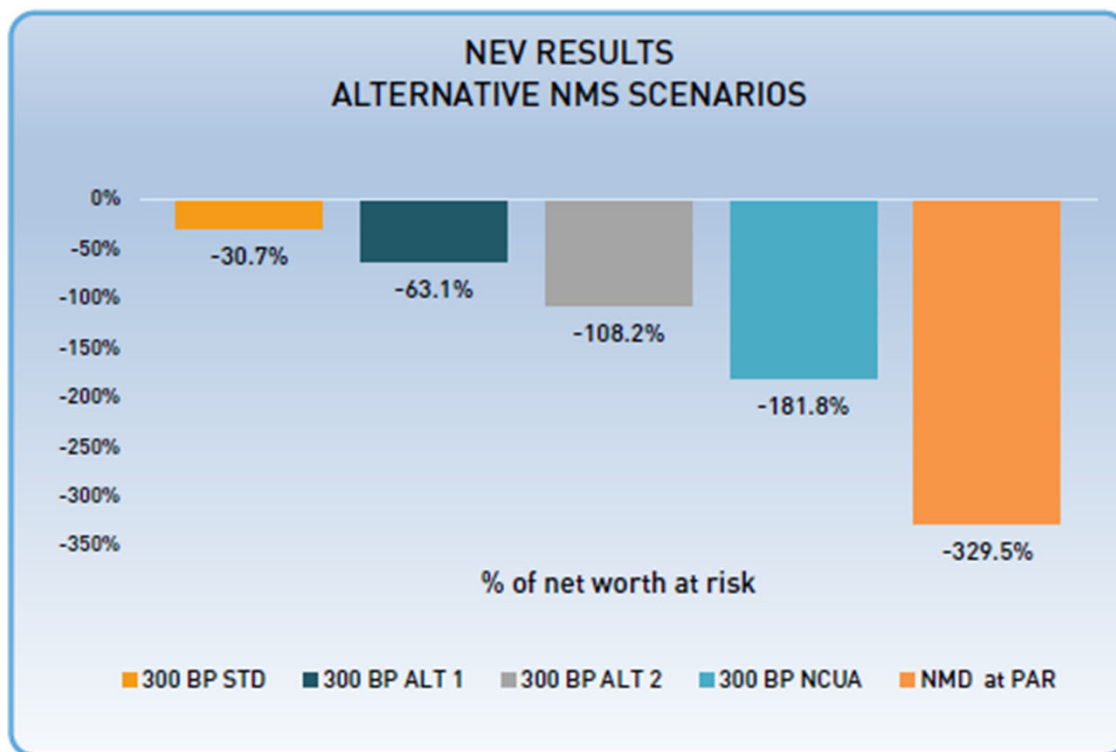
NET WORTH ANALYSIS UP RATE SHOCK

Book NW Ratio	Net Economic Value Ratio
8.6%	11.2%

3.0% Rate Shock		
Post Shock Net Economic Value Ratio	Minimum Post Shock NEV Ratio	Variance
8.4%	6%	2.4%

POLL QUESTION #2

NEV – ALTERNATIVE SCENARIOS



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

Std- Ave life of Regular shares 78 months – page 29

Alt 1 is approximately 30% shorter at 52 months – page 32

Alt 2 is approximately 60% shorter at 32 months – page 33

NCUA pre-defined premiums at up 300 scenario – page 32

NMD at par or book value – page 34

ALMPro Report
page 8

NEV – NCUA SUPERVISORY TEST

Assets valuations are from the ALMPro model.

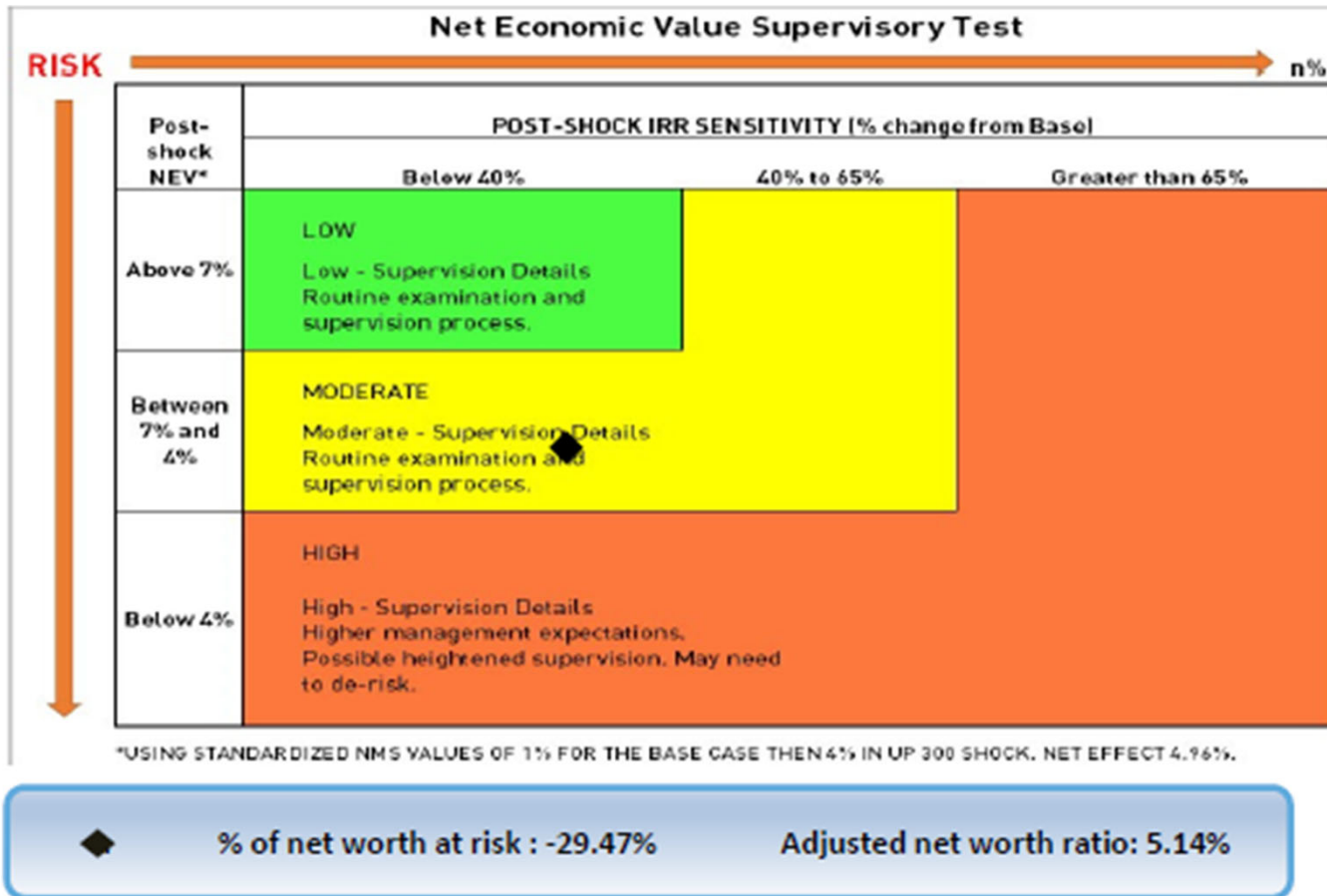
For liabilities, NCUA limits the premium value for non-maturity deposits (NMD)

- 1% in the base case
- and 4% in the up 300 shock scenario.
- The result is a 4.96% economic value premium for NMDs.

The post-shock net worth ratio and percentage change from the base case define interest rate risk and determine the scope of the exam.

Changes in interest rates are market-driven risks that credit unions can't control, but they can take actions to limit the effect of rates moving on their balance sheet.

NEV – NCUA SUPERVISORY MATRIX



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.

NEV – NCUA SUPERVISORY TEST

Effective September 2022, NCUA removed the extreme classification and modified their approach to the high-risk level.

The examiners will evaluate if the migration to high risk is a result of interest rate movement and/or the result of management actions.

Changes in interest rates are market-driven risks that credit unions can't control, but they can take actions to limit the effect of rates moving on their balance sheet.

Management actions, on the other hand, are not market-driven and high IRR due to management actions may cause increased scrutiny on the credit union's management.

Examiners have discretion to apply professional judgement when determining the appropriate response to a high-risk level.

The trend of the NEV Supervisory test as interest rates change helps to determine whether the migration of interest rate risk results are rate driven.

POLL QUESTION #3

POLICY LIMIT REVIEW

● NII at Risk — Maximum Allowed % Change from Benchmark NII

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)				\$9,902			
EV of Net Worth (\$000) - Benchmark	\$10,284	\$11,645	\$12,303	\$12,163	\$11,405	\$10,031	\$8,427
\$ Change EV of Net Worth from Benchmark (\$000)	(\$1,879)	(\$519)	\$139	\$2,261	(\$758)	(\$2,132)	(\$3,736)
% Change in EV of Net Worth from Benchmark	-15.5%	-4.3%	1.1%		-6.2%	-17.5%	-30.7%
Maximum Allowed % Change in EV of Net Worth	-40.0%	-40.0%	-40.0%		-40.0%	-40.0%	-40.0%
Book Net Worth Ratio				8.6%			
Post Shock Net Economic Value Ratio	8.9%	10.3%	11.1%	11.2%	10.8%	9.8%	8.4%
Minimum Post Shock Net Economic Value Ratio	6.0%	6.0%	6.0%		6.0%	6.0%	6.0%

- 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
- NMS ASSUMPTIONS ALSO SHOULD BE CONSIDERED

REMINDERS

- Income and increasing net worth ratio essential to CU longevity
- **NEV is a paper entry and losses will not be realized unless investments are sold**
- As the instruments age, and get closer to maturity their discount will be less
- New investments or new loans at higher rates will improve the analysis
- Improvements will be slow – years

RESPONSES AND RESOLUTIONS

- Measure and monitor regularly
- Track trends
- Discuss results and compare to policy limits
- Review alternative scenarios including NCUA Supervisory test
- Compare results to policy limits
- Discuss cause of increasing risk
- Develop corrective action
- Monitor progress

FINAL THOUGHTS

- Document discussion
- Assumption review – supportable and reasonable
- Identify key assumptions
- Sensitivity test key assumptions - such as increasing betas or extending repayment terms on loans.
- May require more than one model run

ANALYSIS ONLY VALUABLE IF USED

- Use IRR modeling to guide strategic decisions
- Utilize the analysis for new products, strategies, and other “what if” scenarios.
- Control exposure to changing interest rates.
- Regularly review and update IRR model assumptions
- Re-evaluate policy limits annually
- Ensure policy limits reflect board tolerance for risk
- Set policy limits to match operational goals
- Develop response to negative trends.
- Document the process.

OUTSOURCE BENEFITS TO YOU AND YOUR CREDIT UNION

Easy

Save time

Delegate to the experts

Extensive experience

Regulator responses

Reliable

Reputable



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