



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

# **UNDERSTANDING AND UTILIZING YOUR IRR ANALYSIS**

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

*(Webinar will begin on the hour)*

## LEARNING OBJECTIVE:

- Look at how balance sheet composition can affect IRR analysis
- Discuss data input and assumptions
- Explore ways to better utilize the results of your IRR Analysis
- Discuss whether your policy limits are reasonable, too restrictive, or liberal.

## DURING THIS PRESENTATION

- Compare two different sample credit unions starting at a high level and then dive deeper into the balance sheet composition, income and interest rate risk.
- Revisit the importance of data input
- Review the importance of reasonable and supportable assumptions to maintain confidence in the IRR analysis.
- Explore utilizing the results to better manage your CU instead using it to just satisfy the regulator or avoid interest rate risk.
- Look at policy limits compared to IRR results and discuss reasonableness.

# BIG PICTURE - SAMPLE CREDIT UNION #1

PANEL 5

INTEREST MARGIN & NET INCOME ANALYSIS			
Expanded Analysis Begins at 5.1			
SPREAD ANALYSIS OF INCOME AND EXPENSES LAST 12 MONTHS			
Divided by average assets	Basis Points	Operational Guideline	Variance
Interest income	414		
Cost of funds	30		
Net interest margin	385		
Fees & misc income	184		
Total margin	569		
Provision for loan loss	34		
Operating expenses	412		
Total Operating Expenses	446		
ROA - ongoing operations	123		
NCUSIF recovery/(writeoff)	6		
Other gains(loss)	(10)		
ROA - NET INCOME	129		
Possible variance due to rounding			
Guidelines are in balance YES			
NET INTEREST MARGIN TREND			

PANEL 4

NET WORTH ANALYSIS		
Expanded Analysis Begins at 4.1		
Beg. Net Worth Ratio	March 31, 2018	12.1%
12 Month Change in Net Worth Ratio		1.0%
Ending Net Worth Ratio	March 31, 2019	13.1%
Guideline		7.0%
NCUA Classification Well Capitalized		
NET WORTH TO TOTAL ASSETS RATIO *		

Key points

1. ROA very strong
2. Net interest margin increasing
3. Fee and misc. income very strong
4. Net worth - solid
5. Overnight & 1-year liquidity good
6. Loan to total asset ratio good
7. Loan turnover 40 months

PANEL 3

LIQUIDITY RISK ANALYSIS			
Expanded Analysis Begins at 3.1			
PART 1-STATIC LIQUIDITY INDICATORS			
	Actual	Guidelines	Variance
Overnight Liquidity Ratio	10.1%	3.0%	7.1%
1 Year liquidity Ratio	15.1%	5.0%	10.1%
Avg. loan turnover (months)	40	48	8
Unfunded LOC (\$000)	\$11,261	\$25,000	\$13,739
Unfunded LOC to total assets	6.2%	13.8%	7.6%
Total loans to total assets	66.7%	95.0%	28.3%
Total loans to total shares	77.4%	95.0%	17.6%

SCO



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# BIG PICTURE - SAMPLE CREDIT UNION #1

## INCOME

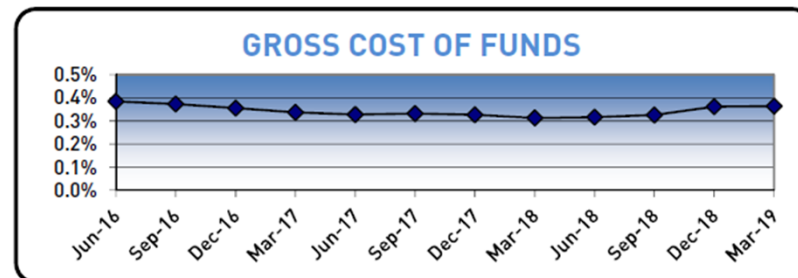
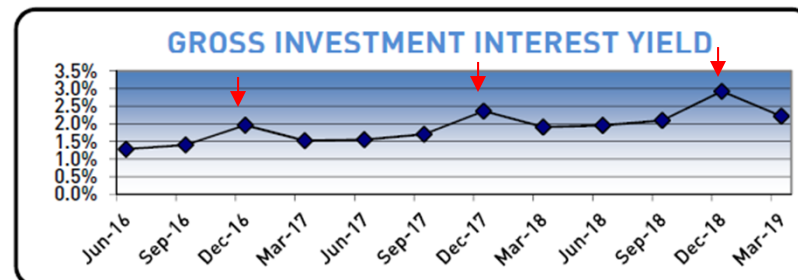
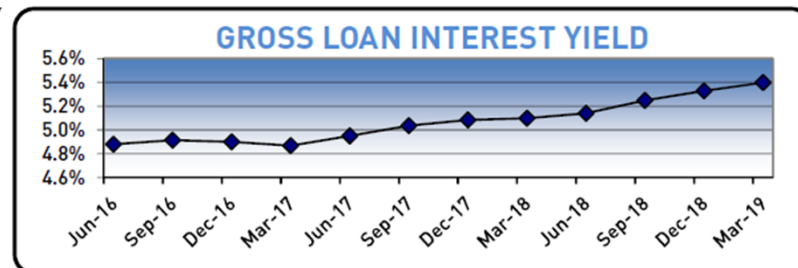


### SPREAD ANALYSIS

	LAST 3 YEARS					
	Expressed in Basis Points*					
	12 Mo Ending 3/31/17	Change	12 Months Ending 3/31/18	Change	12 Months Ending 3/31/19	
<b>Revenue &amp; Cost of Funds:</b>						
1 Total loan interest	315	22	337	22	359	
2 Total interest on investments	45	4	49	6	55	
3 Total interest income	360	26	385	29	414	
4 Total cost of funds	32	(4)	28	1	30	
5 Net interest margin NII	328	29	357	28	385	
6 Total other income	191	(4)	187	(2)	184	
7 Total margin	519	25	544	25	569	
<b>Operating Expenses:</b>						
8 Employee compensation	198	(2)	196	17	212	
9 Travel and conference	6	1	7	(1)	6	
10 Office occupancy	17	18	35	(13)	21	
11 Office operations	110	(8)	102	4	105	
12 Education/promotion	11	0	11	0	11	
13 Loan servicing	37	7	44	0	45	
14 Professional services	5	(1)	4	0	4	
15 NCUSIF premium	0	0	0	0	0	
16 Provision for loan losses	(1)	16	15	19	34	
17 Operating fees	2	(0)	2	0	2	
18 Miscellaneous expenses	5	(0)	4	1	5	
19	0	0	0	0	0	
20	0	0	0	0	0	
21 Total operating expenses	388	31	419	27	446	
22 ROA from Ongoing Operations	130	(6)	125	(1)	123	
23 NCUSIF writeoff	0	0	0	0	0	
24	0	0	0	0	0	
25 NCUSIF recovery	0	0	0	6	6	
26	0	0	0	0	0	
27 Other gains (losses)	0	(1)	(1)	0	(0)	
28						
29 ROA - NET INCOME	130	(6)	124	5	129	

\* See Glossary

Possible variance due to rounding

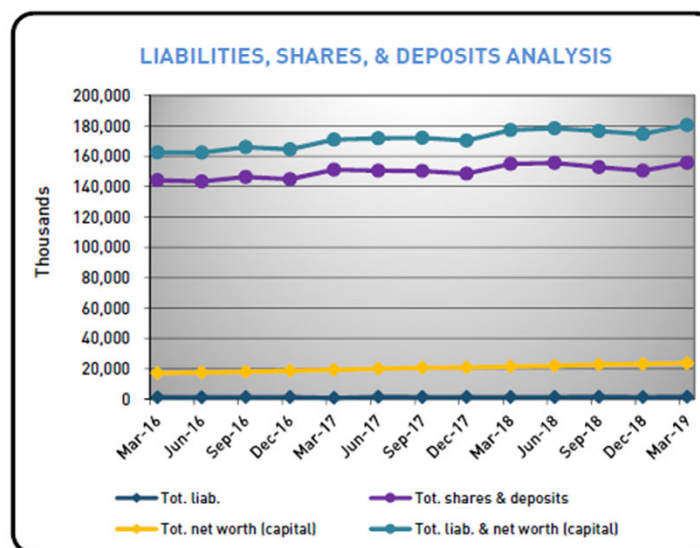
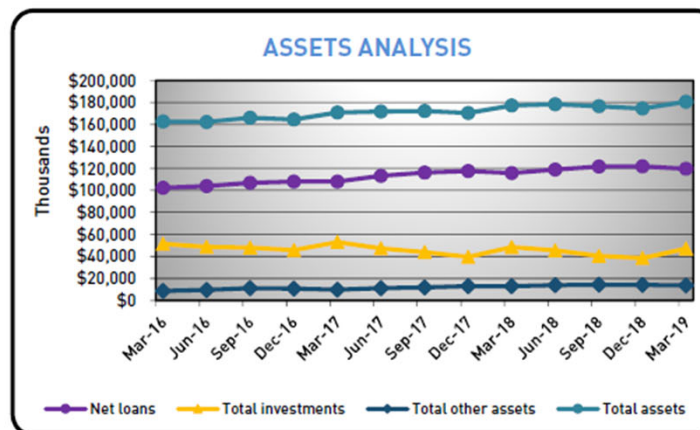


# BIG PICTURE - SAMPLE CREDIT UNION #1

## BALANCE SHEET

COMPARATIVE BALANCE SHEETS				
	03/31/16	03/31/17	03/31/18	03/31/19
Net loans	102,426	107,955	115,796	119,693
Investments	51,378	53,035	48,472	47,199
Cash	3,479	4,135	4,020	3,845
Fixed assets	1,965	1,987	4,799	5,275
Other assets	3,282	3,780	4,071	4,551
<b>Total Assets</b>	<b>162,530</b>	<b>170,891</b>	<b>177,157</b>	<b>180,563</b>
Borrowed funds	0	0	0	0
Other liabilities	1,125	757	1,273	1,449
Shares & Deposits	144,237	151,051	154,968	155,603
Unrealized Gain/Loss	55	-185	-495	-197
<b>Total Net Worth</b>	<b>17,114</b>	<b>19,268</b>	<b>21,411</b>	<b>23,708</b>
<b>Total Liab &amp; Equity</b>	<b>162,530</b>	<b>170,891</b>	<b>177,157</b>	<b>180,563</b>

FINANCIAL ANALYSIS				
	03/31/16	03/31/17	03/31/18	03/31/19
Total Loans to Assets	63.5%	63.6%	65.7%	66.7%
Total Investments to Assets	31.6%	31.0%	27.4%	26.1%
Cash to Assets	2.1%	2.4%	2.3%	2.1%
Income Producing Assets to Assets	94.6%	94.2%	92.7%	92.4%
Land & Bldgs to Total Assets	1.2%	1.2%	2.7%	2.9%
Total Loans to Total Deposits	71.6%	71.9%	75.1%	77.4%
Regular Shares to Total Deposits	38.0%	39.6%	41.2%	43.0%
Net Worth to Total Loans	16.8%	17.7%	18.1%	19.6%
Net Worth to Total Assets	10.5%	11.3%	12.1%	13.1%
Loans Delinq. 60-180 Days	0.19%	0.18%	0.28%	0.25%
Loans Delinq. 181-360 Days	0.18%	0.13%	0.01%	0.09%
Loans Delinq. over 360 Days	0.00%	0.00%	0.00%	0.17%
Total Delinquent Loans	0.37%	0.31%	0.29%	0.51%
Net C/O last 12 mo to Avg Total Loans		0.12%	0.25%	0.35%

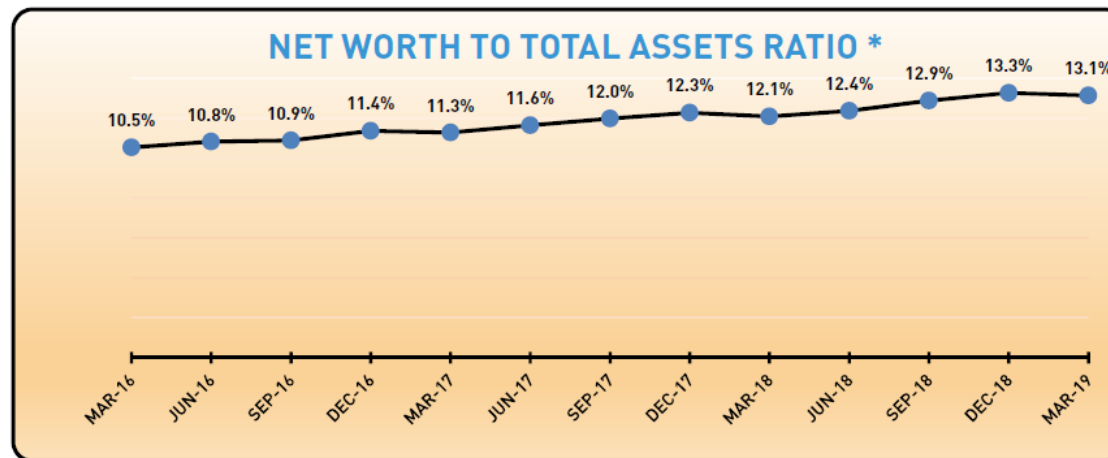


# BIG PICTURE - SAMPLE CREDIT UNION #1

## NET WORTH

### NET WORTH HISTORY

	03/31/16				03/31/17				03/31/18				03/31/19	
	Balance	% of Total	\$ Change	% Chng	Balance	% of Total	\$ Change	% Chng	Balance	% of Total	\$ Change	% Chng	Balance	% of Total
Regular reserve	2,792	16.3%	0	0.0%	2,792	14.6%	0	0.0%	2,792	13.3%	0	0.0%	2,792	11.9%
Retained earnings	14,322	83.4%	2,154	15.0%	16,476	86.3%	2,143	13.0%	18,619	89.0%	2,297	12.3%	20,916	89.0%
Unrealized Gain/Loss	55	0.3%	-239	-437.4%	-185	-1.0%	-310	167.9%	-495	-2.4%	298	-60.2%	-197	-0.8%
Total reserves	17,169	100.0%	1,914	11.1%	19,083	100.0%	1,833	9.6%	20,916	100.0%	2,595	12.4%	23,511	100.0%
Total assets	162,530		8,361	5.1%	170,891		6,266	3.7%	177,157		3,405	1.9%	180,563	
Net Worth Ratio	10.5% *				11.3% *				12.1% *				13.1% *	



# BIG PICTURE - SAMPLE CREDIT UNION #1 INVESTMENTS

## INVESTMENT PORTFOLIO ANALYSIS

(In thousands)

	03/31/16				03/31/17				03/31/18				03/31/19	
Description	Balance	% of Total	\$ Change	% Change	Balance	% of Total	\$ Change	% Change	Balance	% of Total	\$ Change	% Change	Balance	% of Total
Daily	18,567	36.1%	(4,101)	-22.1%	14,467	27.3%	(3,210)	-22.2%	11,257	23.2%	3,196	28.4%	14,453	30.6%
Investment certificates	19,686	38.3%	(3,265)	-16.6%	16,421	31.0%	(2,432)	-14.8%	13,989	28.9%	(7,984)	-57.1%	6,005	12.7%
Securities	12,095	23.5%	7,033	58.1%	19,128	36.1%	1,008	5.3%	20,136	41.5%	3,439	17.1%	23,575	49.9%
Other investments	1,030	2.0%	1,990	193.2%	3,020	5.7%	70	2.3%	3,090	6.4%	76	2.5%	3,166	6.7%
<b>Total Investments</b>	<b>51,378</b>	<b>100.0%</b>	<b>1,657</b>	<b>3.2%</b>	<b>53,035</b>	<b>100.0%</b>	<b>(4,543)</b>	<b>-8.6%</b>	<b>48,472</b>	<b>100.0%</b>	<b>(1,273)</b>	<b>-2.6%</b>	<b>47,199</b>	<b>100.0%</b>

Daily accounts	5,201	2.9%	2.08%	2.08%	1	1	1	1	1	1	1	Adjusts daily
EBA account	9,251	5.1%	2.25%	2.25%	1	1	1	1	1	1	1	Adjusts daily
Investment CDs - non callable	6,005	3.3%	1.78%	2.25%	6	6	6	6	6	6	6	Defined by maturity date
Securities - non callable	3,935	2.2%	1.42%	2.32%	22	22	22	22	22	22	22	Defined by maturity date
Securities - callable	4,938	2.7%	2.14%	2.72%	1	1	1	44	44	44	44	Defined by maturity date
US treasury bond	0	0.0%	0.00%	0.00%	0	0	0	0	0	0	0	Defined by maturity date
Corporate bond	300	0.2%	2.04%	2.52%	1	1	1	1	1	1	1	Defined by maturity date
Muni bond	11,630	6.4%	2.51%	2.90%	37	37	37	37	37	37	37	Defined by maturity date
NCUA guaranteed note	1,662	0.9%	1.53%	2.49%	10	10	10	10	10	10	10	Defined by maturity date
CMOs	1,110	0.6%	2.95%	2.75%	24	33	39	48	60	72	84	Average life
COLI	2,684	1.5%	2.95%	2.95%	60	60	60	60	60	60	60	Not rate sensitive
Membership shares	482	0.3%	2.45%	2.45%	1	1	1	1	1	1	1	Adjusts monthly
<b>Total Investments</b>	<b>47,199</b>	<b>26.1%</b>	<b>2.19%</b>									

# BIG PICTURE - SAMPLE CREDIT UNION #1 LOANS

	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	15,172	8.4%	3.02%	3.70%	29	29	29	29	29	29	29	Up to 84 months fixed rate
Used vehicle loans	36,287	20.1%	5.30%	5.37%	27	27	27	27	27	27	27	Up to 72 months fixed rate
Recreational vehicle loans	14,714	8.1%	4.52%	5.44%	33	33	33	33	33	33	33	Up to 120 months fixed rate
Share secured loans	377	0.2%	3.00%	3.17%	24	24	24	24	24	24	24	Indexed to share/certificate rates
Signature loans	6,146	3.4%	8.77%	9.47%	16	16	16	16	16	16	16	Up to 72 months fixed rate
Lines of credit	2,572	1.4%	10.19%	10.47%	36	36	36	36	36	36	36	Revolving credit
First mtg - 10 yr fixed rate	659	0.4%	3.60%	3.99%	13	22	31	40	49	58	67	10 years fixed rate
First mtg - 15 yr fixed rate	6,075	3.4%	3.68%	3.99%	39	48	57	66	75	84	93	15 years fixed rate
First mtg - 30 yr fixed rate	191	0.1%	6.00%	4.50%	54	66	78	90	102	114	126	30 years fixed rate
First mtg - 3 yr balloons	883	0.5%	5.16%	3.95%	21	23	25	27	29	31	33	3 year balloons
First mtg - 5 yr balloons	15,090	8.4%	5.66%	5.67%	22	26	30	34	38	42	46	5 year balloons
First mtg - other	365	0.2%	6.30%	6.50%	6	6	6	6	6	6	6	Short term construction loans
Second mtg - 5 yr balloon	425	0.2%	5.97%	5.94%	37	38	39	40	41	42	43	5 year balloons
Home equity lines of credit	8,863	4.9%	5.53%	5.54%	48	48	48	48	48	48	48	Variable rate - adjust every January
Visa loans	8,410	4.7%	8.93%	8.69%	36	36	36	36	36	36	36	Revolving credit
CUSO loan	37	0.0%	12.00%	12.00%	3	3	3	3	3	3	3	Excluded from interest rate risk analysis
First mtg - 5 yr ARM	3,799	2.1%	7.07%	3.92%	49	49	49	49	49	49	49	5 year ARM
First mtg - 10 yr prime	346	0.2%	5.71%	5.50%	49	49	49	49	49	49	49	10 year variable rate - tied to prime
	0	0.0%	0.00%	0.00%	0	0	0	0	0	0	0	
Allowance for loan losses	(716)	-0.4%	0.00%	0.00%	0	0	0	0	0	0	0	
Net Loans	119,693	66.3%	5.48%		31	32	33	34	35	36	37	Weighted Average



# BIG PICTURE - SAMPLE CREDIT UNION #1

## DEPOSITS

Liability & Share Classification	Balance in Thousands	% to Total Assets	Current Yield	Income Simulation Beta (rate sensitivity) and Lag for NMS				Average Life in Months - NEV			
				Benchmark		Shock Up 300 BP		Non-Interest Expense	Market Yield for NEV**	Benchmark	Shock Up 300 BP
				Beta	Lag	Beta	Lag				
Notes payable	0	0.0%	0.00%	1.00%	1	1.00%	1		0.0%	1	1
Liabilities	1,449	0.8%									
Shares \$0 to \$49,999.99	43,552	24.1%	0.15%	0.15%	1	0.15%	1	0.75%	3.08%	96	91
Shares \$50,000 and over	23,376	12.9%	0.15%	0.35%	1	0.35%	1	1.25%	2.79%	58	55
Share drafts	30,284	16.8%	0.05%	0.10%	1	0.10%	1	2.00%	3.09%	97	93
IRA shares	1,597	0.9%	0.25%	0.60%	1	0.60%	1	1.00%	2.65%	38	35
Health savings accounts	183	0.1%	0.25%	0.60%	1	0.60%	1	1.00%	2.65%	38	35
Member certificates	27,616	15.3%	1.41%	1.00%	28	1.00%	12	0.00%	1.81%	28	12
Money market \$.01 to \$9,999.99	460	0.3%	0.15%	0.35%	1	0.35%	1	1.25%	2.79%	58	55
Money market \$10,000.00 - \$99,999.99	11,878	6.6%	0.25%	0.60%	1	0.60%	1	1.00%	2.65%	38	35
Money market \$100,000.00- over	15,773	8.7%	0.35%	0.80%	1	0.80%	1	0.50%	2.61%	30	29
Money market checking	811	0.4%	0.34%	0.60%	1	0.60%	1	1.00%	2.65%	38	35
Money Plus accounts	73	0.0%	0.25%	0.35%	1	0.35%	1	1.25%	2.79%	58	55
	0	0.0%	0.00%	0.00%	0	0.00%	0	0.00%	0.00%	0	0
	0	0.0%	0.00%	0.00%	0	0.00%	0	0.00%	0.00%	0	0
Total Shares & Deposits	155,603	86.2%	0.38%					0.93%			
Owner's Equity (Capital)	23,511	13.0%									
Total Liabilities & Capital	180,563	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.

# BIG PICTURE - SAMPLE CREDIT UNION #1

## INTEREST RATE RISK

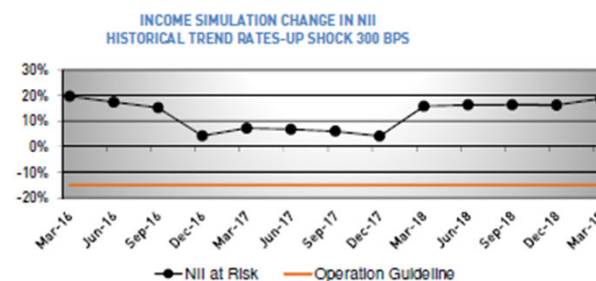
## INCOME SIMULATION

### PANEL 1 INCOME SIMULATION

3-Year Cumulative (\$000)	SHOCK DOWN -100 BP	Benchmark	SHOCK UP 300 BP
Net Interest Income	\$19,837	\$22,454	\$26,676
\$ Change from benchmark NII	(2,617)		4,222
% Change from benchmark NII	-11.7%		18.8%
Operational Guideline	-15.0%		-15.0%
Net income:	\$5,325	\$7,942	\$12,164
ROA:	0.95%	1.42%	2.17%

#### INCOME SIMULATION ANALYSIS - PANEL 1

The results are presented in a 3 year cumulative format. This analysis simulates interest income and interest expense (dividends) in benchmark and shock scenarios. It is designed as a stress test to evaluate sensitivity interest rate changes. In order to keep the impact of variables under control, many elements of the simulation remain static. Growth, asset and share mix, operating expenses, and fee income fall in this category. For this reason the benchmark simulation should not be considered a likely scenario; nor should it be used to forecast likely results for the coming year. DETAIL OF ANALYSIS IN SECTION 1





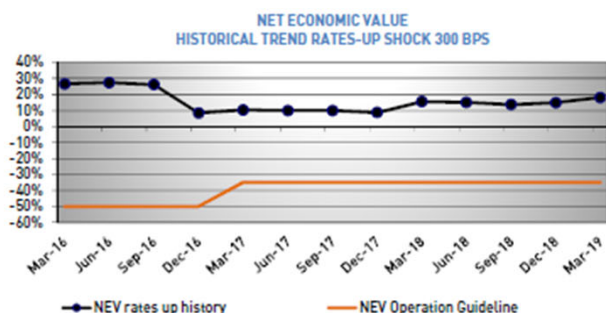
# BIG PICTURE - SAMPLE CREDIT UNION #1

## INTEREST RATE RISK

## NET ECONOMIC VALUE

PANEL 2 NET ECONOMIC VALUE

	SHOCK DOWN -100 BP	CURRENT NET WORTH RATIO	SHOCK UP 300 BP
Book Value Net Worth (\$000)		\$23,708	
Market Net Worth (\$000)	\$30,689	\$35,261	\$41,615
Net Worth at Risk from Market (\$000)	(\$4,573)	\$11,553	\$6,354
% Net Worth Change	-13.0%		18.0%
Operational Guideline	-35.0%		-35.0%
Book Value of Net Worth Ratio		13.1%	
Market Risk Adjusted NW Ratio	16.9%	19.6%	24.0%
Minimum Net Worth Guideline	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

# POLL QUESTION #1

**NOTE: IF YOU ARE SEEKING CPE CREDIT, IT IS IMPORTANT THAT YOU PARTICIPATE IN THE POLLS.**

# BIG PICTURE - SAMPLE CREDIT UNION #2

PANEL 5

INTEREST MARGIN & NET INCOME ANALYSIS			
Expanded Analysis Begins at 5.1			
SPREAD ANALYSIS OF INCOME AND EXPENSES LAST 12 MONTHS			
Divided by average assets	Basis Points	Operational Guideline	Variance
Interest income	319		
Cost of funds	122		
Net interest margin	197		
Fees & misc income	19		
Total margin	215		
Provision for loan loss	4		
Operating expenses	155		
Total Operating Expenses	159		
ROA - ongoing operations	56		
NCUSIF recovery	0		
Other gains(loss)	0		
ROA - NET INCOME	56		
Possible variance due to rounding			
Guidelines are in balance	n/a	* Not established	

NET INTEREST MARGIN TREND

Net interest margin NII

3/31/17 3/31/18 3/31/19

PANEL 4

NET WORTH ANALYSIS		
Expanded Analysis Begins at 4.1		
Beg. Net Worth Ratio	March 31, 2018	25.7%
12 Month Change in Net Worth Ratio		-0.6%
Ending Net Worth Ratio	March 31, 2019	25.1%
Guideline		10.0%
NCUA Classification	Well Capitalized	

NET WORTH TO TOTAL ASSETS RATIO \*

\* For this analysis the Net Worth to Total Assets Ratio is calculated using the total assets at the end of each period. It may exclude the unrealized gain/loss if the credit union has this allowance in the reserve.

## Key points

1. ROA moderate
2. Net interest margin decreasing
3. Fee and misc. income low
4. Net worth - high - too high????
5. Overnight & 1-year liquidity good
6. Loan to total asset - average
7. **Loan turnover 88 months**

PANEL 3

LIQUIDITY RISK ANALYSIS			
Expanded Analysis Begins at 3.1			
PART 1-STATIC LIQUIDITY INDICATORS			
	Actual	Guidelines	Variance
Overnight Liquidity Ratio	8.2%	3.0%	5.2%
1 Year liquidity Ratio	22.3%	5.0%	17.3%
Avg. loan turnover (months)	88	*	*
Unfunded LOC (\$000)	\$2,518	*	*
Unfunded LOC to total assets	4.5%	*	*
Total loans to total assets	42.3%	*	*
Total loans to total shares	57.1%	*	*

\* Not available

# BIG PICTURE - SAMPLE CREDIT UNION #2

## INCOME

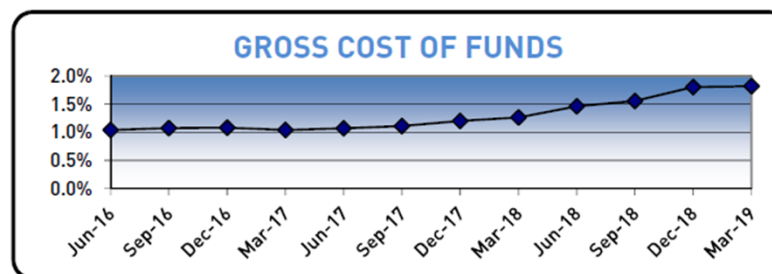
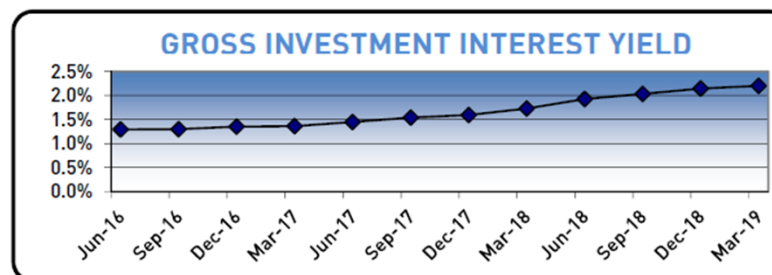
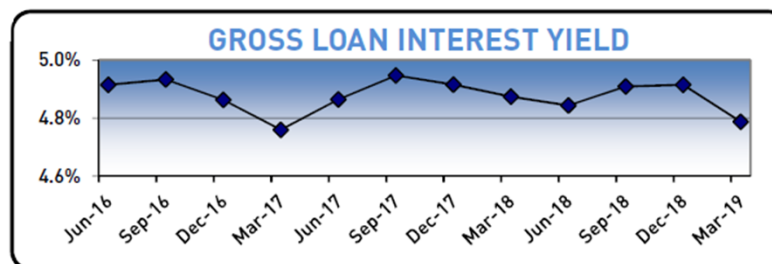


### SPREAD ANALYSIS

	LAST 3 YEARS				
	Expressed in Basis Points*				
	12 Mo Ending 3/31/17	Change	12 Months Ending 3/31/18	Change	12 Months Ending 3/31/19
<b>Revenue &amp; Cost of Funds:</b>					
1 Total loan interest	242	(20)	222	(12)	210
2 Total interest on investments	59	19	78	31	109
3 Total interest income	301	(1)	300	19	319
4 Total cost of funds	75	9	84	38	122
5 Net interest margin NII	226	(10)	216	(19)	197
6 Total other income	13	0	14	5	19
7 Total margin	239	(10)	229	(14)	215
<b>Operating Expenses:</b>					
8 Employee compensation	126	(30)	96	(18)	77
9 Travel and conference	2	0	3	1	4
10 Office occupancy	10	(1)	9	(0)	9
11 Office operations	42	2	43	0	43
12 Education/promotion	0	0	1	0	1
13 Loan servicing	12	(1)	11	2	13
14 Professional services	4	0	4	1	5
15 Member insurance/NCUSIF Premium	0	0	0	0	0
16 Provision for loan losses	5	(1)	4	(0)	4
17 Miscellaneous expenses	2	0	2	0	3
18 Member insurance	0	0	0	0	0
19	0	0	0	0	0
20	0	0	0	0	0
21 Total operating expenses	203	(29)	173	(14)	159
22 ROA from Ongoing Operations	36	20	56	1	56
23 NCUSIF Impairment	0	0	0	0	0
24 NCUSIF Premium	0	0	0	0	0
25 NCUSIF Recovery	0	0	0	0	0
26 Other Corporate write off	0	0	0	0	0
27 Other gains (losses)	0	0	0	0	0
28 Other Corporate write off					
29 <b>ROA - NET INCOME</b>	<b>36</b>	<b>20</b>	<b>56</b>	<b>1</b>	<b>56</b>

\* See Glossary

Possible variance due to rounding

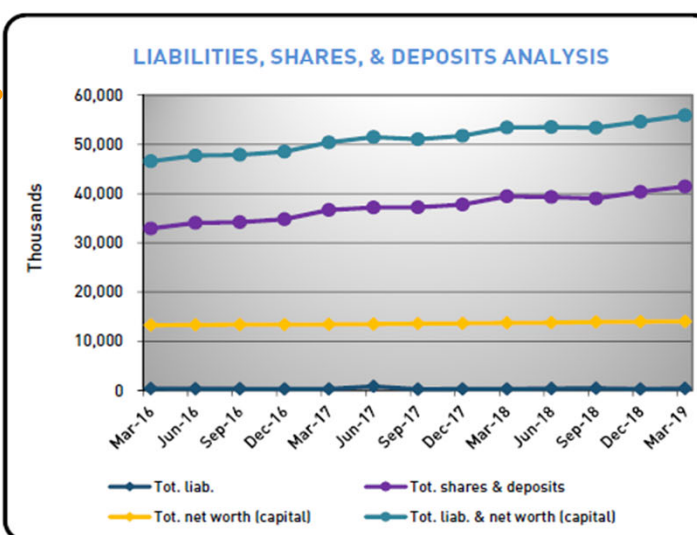
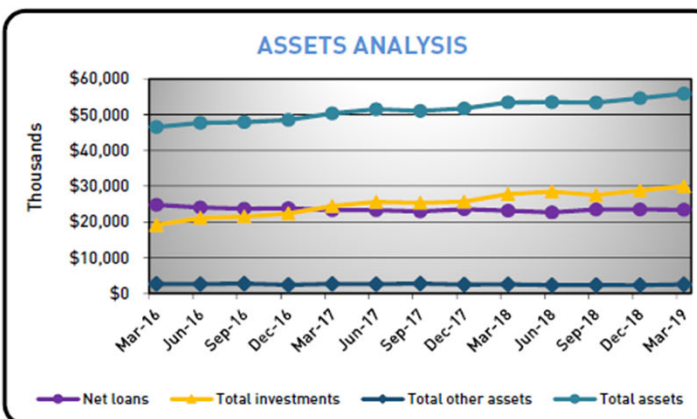


# BIG PICTURE - SAMPLE CREDIT UNION #2

## BALANCE SHEET

COMPARATIVE BALANCE SHEETS				
	03/31/16	03/31/17	03/31/18	03/31/19
Net loans	24,776	23,288	23,163	23,420
Investments	19,130	24,411	27,758	29,947
Cash	478	518	363	402
Fixed assets	1,608	1,576	1,545	1,515
Other assets	556	572	596	591
<b>Total Assets</b>	<b>46,549</b>	<b>50,365</b>	<b>53,426</b>	<b>55,876</b>
Borrowed funds	0	0	0	0
Other liabilities	379	283	288	410
Shares & Deposits	32,910	36,648	39,414	41,436
Unrealized Gain/Loss	0	0	0	0
<b>Total Net Worth</b>	<b>13,259</b>	<b>13,434</b>	<b>13,723</b>	<b>14,029</b>
<b>Total Liab &amp; Equity</b>	<b>46,549</b>	<b>50,365</b>	<b>53,426</b>	<b>55,876</b>

FINANCIAL ANALYSIS				
	03/31/16	03/31/17	03/31/18	03/31/19
Total Loans to Assets	53.7%	46.7%	43.8%	42.3%
Total Investments to Assets	41.1%	48.5%	52.0%	53.6%
Cash to Assets	1.0%	1.0%	0.7%	0.7%
Income Producing Assets to Assets	94.3%	94.7%	95.3%	95.5%
Land & Bldgs to Total Assets	3.5%	3.1%	2.9%	2.7%
Total Loans to Total Deposits	76.0%	64.2%	59.4%	57.1%
Regular Shares to Total Deposits	37.1%	41.2%	38.3%	39.3%
Net Worth to Total Loans	53.5%	57.7%	59.2%	59.9%
Net Worth to Total Assets	28.5%	26.7%	25.7%	25.1%
Loans Delinq. 60-180 Days	0.63%	0.10%	0.29%	0.70%
Loans Delinq. 181-360 Days	0.01%	1.17%	1.11%	0.11%
Loans Delinq. over 360 Days	0.00%	0.00%	0.02%	0.00%
Total Delinquent Loans	0.65%	1.27%	1.43%	0.82%
Net C/O last 12 mo to Avg Total Loans		-0.02%	0.12%	0.14%



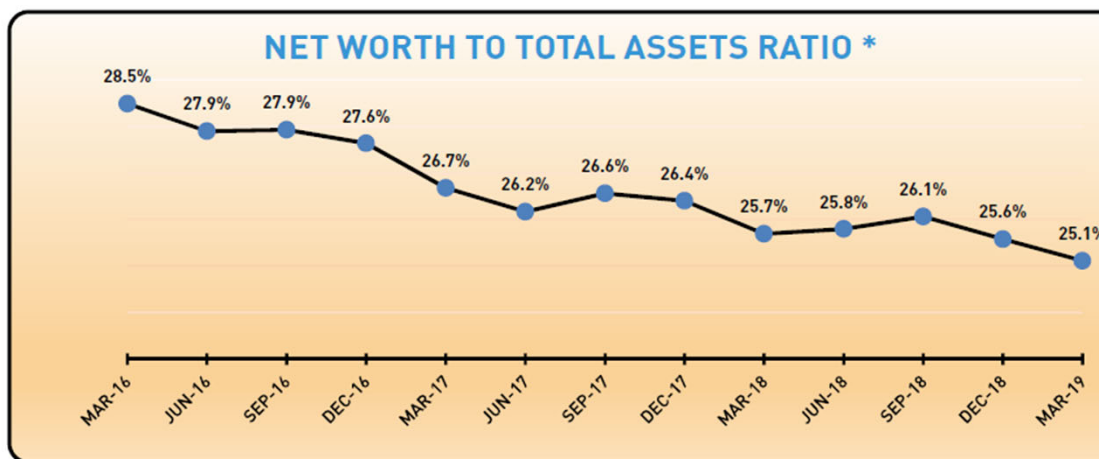


# BIG PICTURE - SAMPLE CREDIT UNION #2

## NET WORTH

### NET WORTH HISTORY

	03/31/16				03/31/17				03/31/18				03/31/19	
	Balance	% of Total	\$ Change	% Chng	Balance	% of Total	\$ Change	% Chng	Balance	% of Total	\$ Change	% Chng	Balance	% of Total
Regular reserve	952	7.2%	0	0.0%	952	7.1%	0	0.0%	952	6.9%	0	0.0%	952	6.8%
Retained earnings	12,307	92.8%	175	1.4%	12,482	92.9%	290	2.3%	12,771	93.1%	306	2.4%	13,077	93.2%
Unrealized Gain/Loss	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total reserves	13,259	100.0%	175	1.3%	13,434	100.0%	290	2.2%	13,723	100.0%	306	2.2%	14,029	100.0%
Total assets	46,549		3,816	8.2%	50,365		3,061	6.1%	53,426		2,451	4.6%	55,876	
Net Worth Ratio	28.5% *				26.7% *				25.7% *				25.1% *	



\* For this analysis the Net Worth to Total Assets Ratio is calculated using the total assets at the end of each period. It also excludes the unrealized gain/loss if the credit union has this allowance in the reserve.

# BIG PICTURE - SAMPLE CREDIT UNION #2

## INVESTMENTS

(In thousands)

	03/31/16				03/31/17				03/31/18				03/31/19	
Description	Balance	% of Total	\$ Change	% Change	Balance	% of Total	\$ Change	% Change	Balance	% of Total	\$ Change	% Change	Balance	% of Total
Daily	2,880	15.1%	(73)	-2.5%	2,807	11.5%	551	19.6%	3,358	12.1%	812	24.2%	4,169	13.9%
Investment certificates	16,250	84.9%	5,354	32.9%	21,604	88.5%	2,796	12.9%	24,400	87.9%	1,378	5.6%	25,778	86.1%
Securities	0	0.0%	0	na	0	0.0%	0	na	0	0.0%	0	na	0	0.0%
Other investments	0	0.0%	0	na	0	0.0%	0	na	0	0.0%	0	na	0	0.0%
<b>Total Investments</b>	<b>19,130</b>	<b>100.0%</b>	<b>5,281</b>	<b>27.6%</b>	<b>24,411</b>	<b>100.0%</b>	<b>3,347</b>	<b>13.7%</b>	<b>27,758</b>	<b>100.0%</b>	<b>2,190</b>	<b>7.9%</b>	<b>29,947</b>	<b>100.0%</b>

Members United	0	0.0%	0.00%	0.00%	1	1	1	1	1	1	1	Adjusts daily
Money market accounts	1,152	2.1%	2.30%	2.30%	1	1	1	1	1	1	1	Adjusts daily
Vizo	290	0.5%	2.50%	2.50%	1	1	1	1	1	1	1	Adjusts daily
Vizo FCU PSA	2,500	4.5%	2.38%	2.38%	1	1	1	1	1	1	1	Adjusts daily
Investment CDs - non callable	25,778	46.1%	2.30%	2.53%	22	22	22	22	22	22	22	Defined by maturity date
Investment CDs - Midatlantic	0	0.0%	0.00%	0.00%	3	3	3	3	3	3	3	Defined by maturity date
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 - callable/stepup	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	227	0.4%	2.40%	2.40%	1	1	1	1	1	1	1	Adjusts monthly
<b>Total Investments</b>	<b>29,947</b>	<b>53.6%</b>	<b>2.31%</b>									



# BIG PICTURE - SAMPLE CREDIT UNION #2

## LOANS

	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	
Unsecured loans	1,089	1.9%	12.46%	12.47%	18	18	18	18	18	18	18	Up to 60 months fixed rate
First mortgages	19,896	35.6%	4.29%	4.50%	99	111	123	135	147	159	171	15-30 years fixed rate
Home equity loans	934	1.7%	4.97%	5.77%	45	46	47	48	49	50	51	5-15 years fixed rate
New car loans	593	1.1%	4.30%	4.54%	30	30	30	30	30	30	30	36-72 months fixed rate
Used car loans	192	0.3%	6.44%	6.37%	24	24	24	24	24	24	24	36-60 months fixed rate
Motorcycle loans	0	0.0%	0.00%	5.40%	24	24	24	24	24	24	24	36-60 months fixed rate
Share secured loans	104	0.2%	2.09%	2.40%	21	21	21	21	21	21	21	Tied to share maturity
VISA	838	1.5%	8.50%	10.44%	36	36	36	36	36	36	36	Revolving credit
	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	
	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	
	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	
	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	
	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	
	0	0.0%	0.00%	0.00%	0	0	0	0	0	0	0	
Allowance for loan losses	(228)	-0.4%	0.00%	0.00%	0	0	0	0	0	0	0	
Net Loans	23,420	41.9%	4.85%		89	99	110	120	130	140	150	Weighted Average

# BIG PICTURE - SAMPLE CREDIT UNION #2

## DEPOSITS

Liability & Share Classification	Balance in Thousands	% to Total Assets	Current Yield	Income Simulation Beta (rate sensitivity) and Lag for NMS				Average Life in Months - NEV			
				Benchmark		Shock Up 300 BP		Non-Interest Expense	Market Yield for NEV**	Benchmark	Shock Up 300 BP
				Beta	Lag	Beta	Lag				
Notes payable	0	0.0%	0.00%	0.00%	1	0.00%	1		0.00%	1	1
Liabilities	410	0.7%									
Regular shares ← \$25,000	3,121	5.6%	1.25%	0.15%	1	0.15%	1	0.75%	3.08%	96	91
Regular shares ← \$100,000	4,322	7.7%	1.25%	0.35%	1	0.35%	1	1.25%	2.79%	58	55
Regular shares → \$100,000	8,840	15.8%	1.25%	0.60%	1	0.60%	1	1.00%	2.65%	38	35
Share drafts	1,785	3.2%	1.25%	0.10%	1	0.10%	1	2.00%	3.09%	97	93
IRAs	7,942	14.2%	3.00%	0.80%	1	0.80%	1	0.50%	2.61%	30	29
Member certificates	14,795	26.5%	2.03%	1.00%	10	1.00%	6	0.00%	1.16%	10	6
Escrow accounts	134	0.2%	1.25%	0.15%	1	0.15%	1	0.00%	0.41%	12	12
Club accounts	497	0.9%	1.25%	0.15%	1	0.15%	1	0.00%	0.41%	12	12
	0	0.0%	0.00%	0.00%	0	0.00%	0	0.00%	0.00%	0	0
	0	0.0%	0.00%	0.00%	0	0.00%	0	0.00%	0.00%	0	0
	0	0.0%	0.00%	0.00%	0	0.00%	0	0.00%	0.00%	0	0
	0	0.0%	0.00%	0.00%	0	0.00%	0	0.00%	0.00%	0	0
	0	0.0%	0.00%	0.00%	0	0.00%	0	0.00%	0.00%	0	0
<b>Total Shares &amp; Deposits</b>	<b>41,436</b>	<b>74.2%</b>	<b>1.86%</b>					<b>0.58%</b>			
Owner's Equity (Capital)	14,029	25.1%									
<b>Total Liabilities &amp; Capital</b>	<b>55,876</b>	<b>100.0%</b>									

\* 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.

# BIG PICTURE - SAMPLE CREDIT UNION #2

## INTEREST RATE RISK

## INCOME SIMULATION

### PANEL 1 INCOME SIMULATION

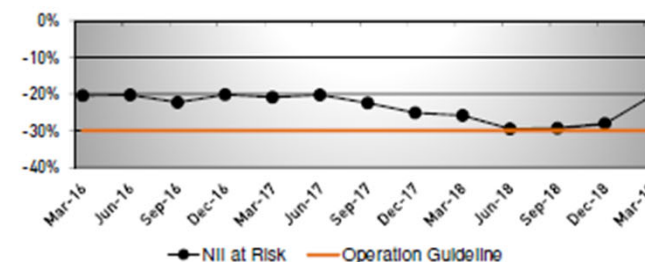
3-Year Cumulative (\$000)	SHOCK DOWN -100 BP	Benchmark	SHOCK UP 300 BP
Net Interest Income	\$3,551	\$3,423	\$2,725
\$ Change from benchmark NII	128		(697)
% Change from benchmark NII	3.7%		-20.4%
Operational Guideline	-30.0%		-30.0%
Net income:	\$1,164	\$1,036	\$338
ROA:	0.68%	0.61%	0.20%

#### INCOME SIMULATION ANALYSIS - PANEL 1

The results are presented in a 3 year cumulative format. This analysis simulates interest income and interest expense (dividends) in benchmark and shock scenarios. It is designed as a stress test to evaluate sensitivity interest rate changes. In order to keep the impact of variables under control, many elements of the simulation remain static. Growth, asset and share mix, operating expenses, and fee income fall in this category. For this reason the benchmark simulation should not be considered a likely scenario; nor should it be used to forecast likely results for the coming year. **DETAIL OF ANALYSIS IN SECTION 1**



INCOME SIMULATION CHANGE IN NII  
HISTORICAL TREND RATES-UP SHOCK 300 BPS



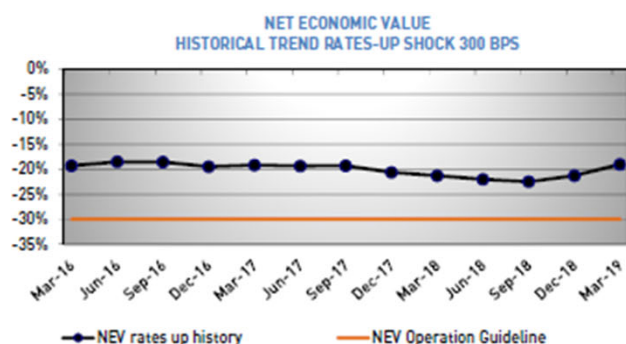
# BIG PICTURE - SAMPLE CREDIT UNION #2

## INTEREST RATE RISK

## NET ECONOMIC VALUE

PANEL 2 NET ECONOMIC VALUE

	SHOCK DOWN -100 BP	CURRENT NET WORTH RATIO	SHOCK UP 300 BP
Book Value Net Worth (\$000)		\$14,029	
Market Net Worth (\$000)	\$14,697	\$13,948	\$11,294
Net Worth at Risk from Market (\$000)	\$749	(\$81)	(\$2,654)
% Net Worth Change	5.4%		-19.0%
Operational Guideline	-30.0%		-30.0%
Book Value of Net Worth Ratio		25.1%	
Market Risk Adjusted NW Ratio	25.8%	25.1%	22.1%
Minimum Net Worth Guideline	13.0%		13.0%

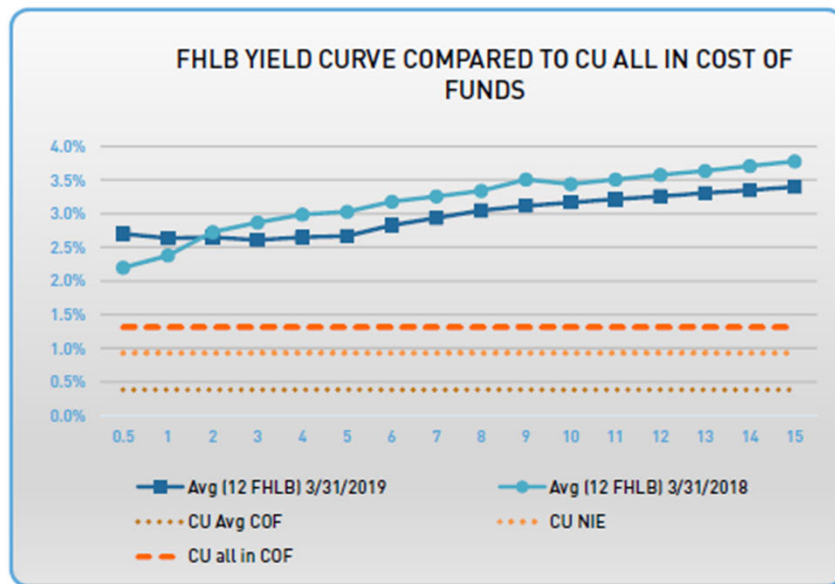


### NET ECONOMIC VALUE - PANEL 2

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

# NON MATURITY DEPOSITS AND HOW THEY EFFECT IRR RESULTS

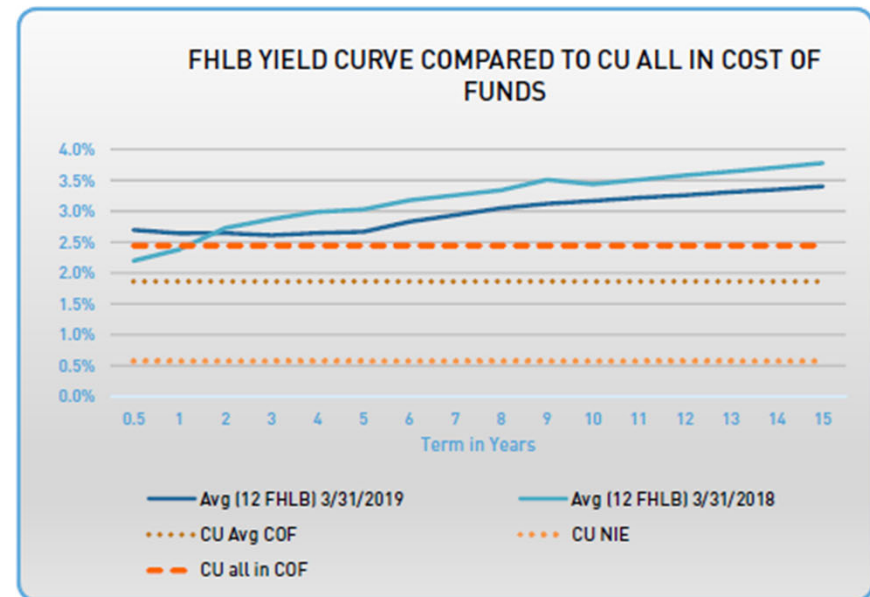
Sample credit union #1



COF - Cost of Funds

NIE - Non Interest Expense

Sample credit union #2

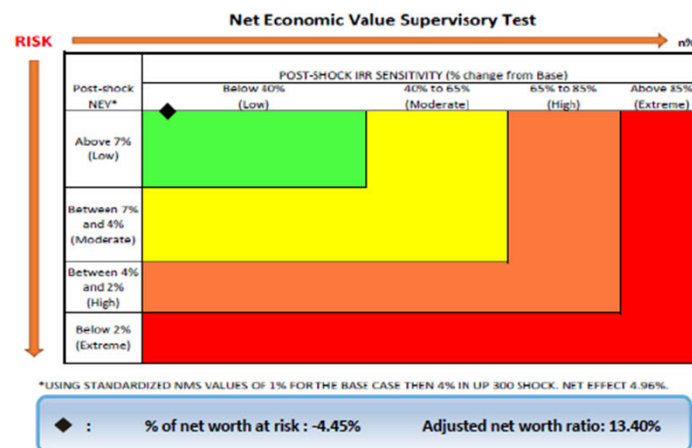
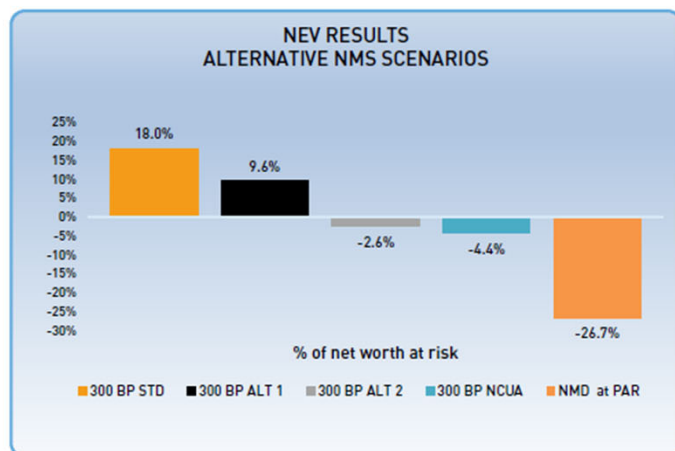


COF - cost of funds

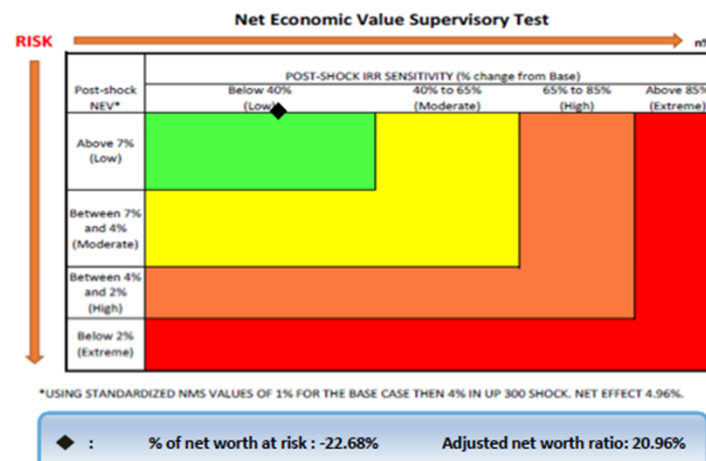
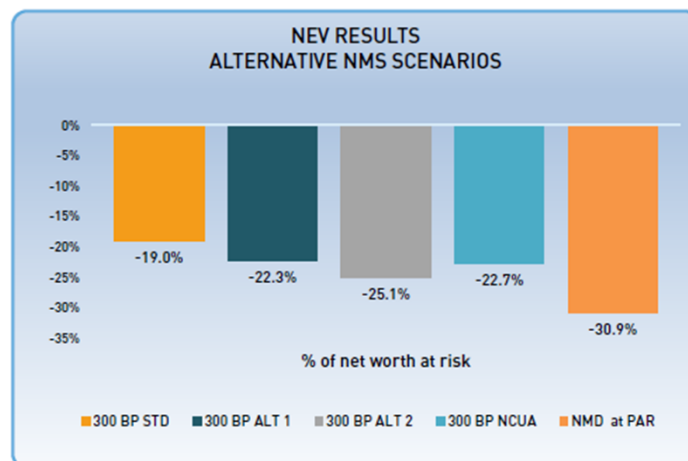
NIE - Non Interest Expense

# NON MATURITY DEPOSITS & IRR RESULTS

## Sample credit union #1



## Sample credit union #2





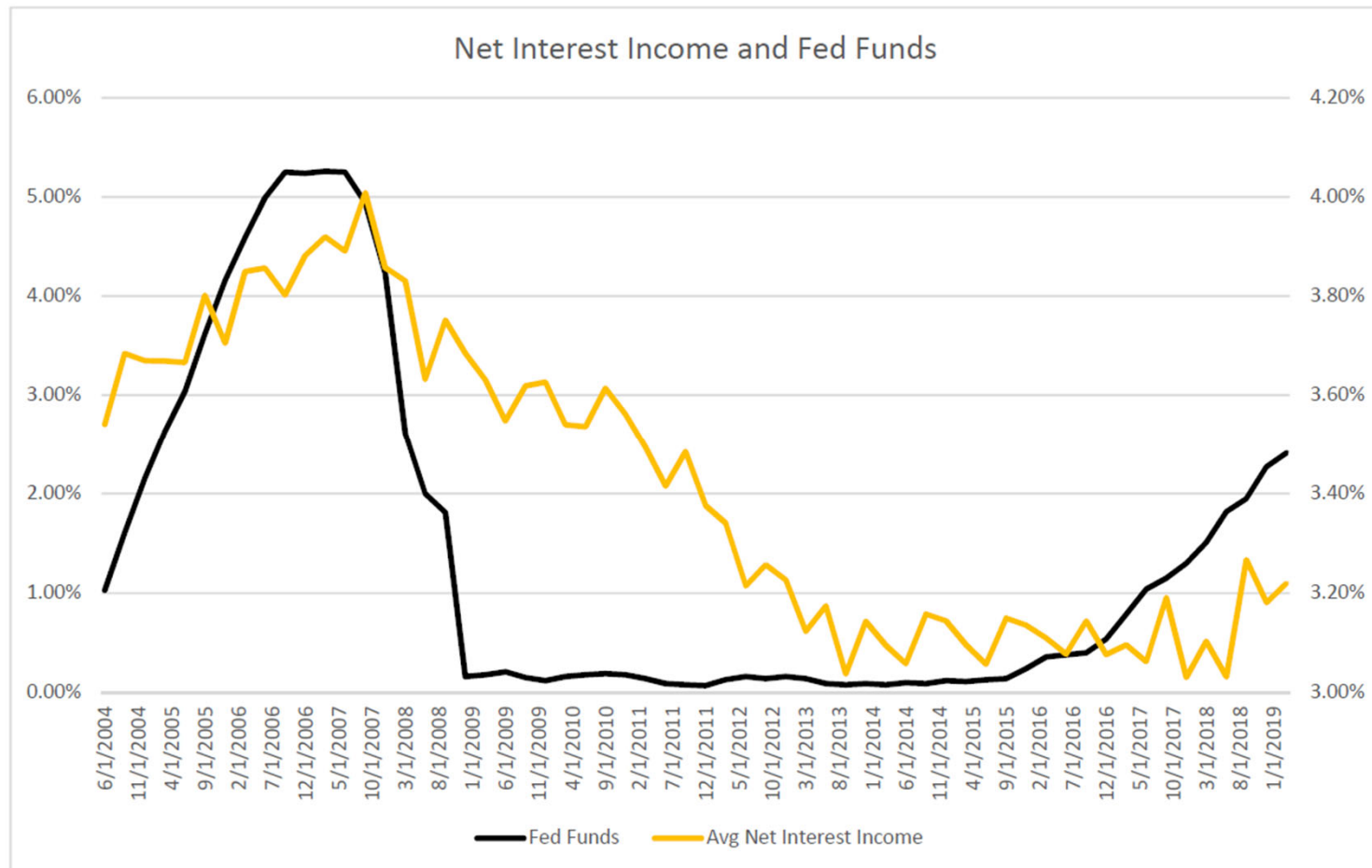
# POLL QUESTION #2

**NOTE: IF YOU ARE SEEKING CPE CREDIT, IT IS IMPORTANT THAT YOU PARTICIPATE IN THE POLLS.**

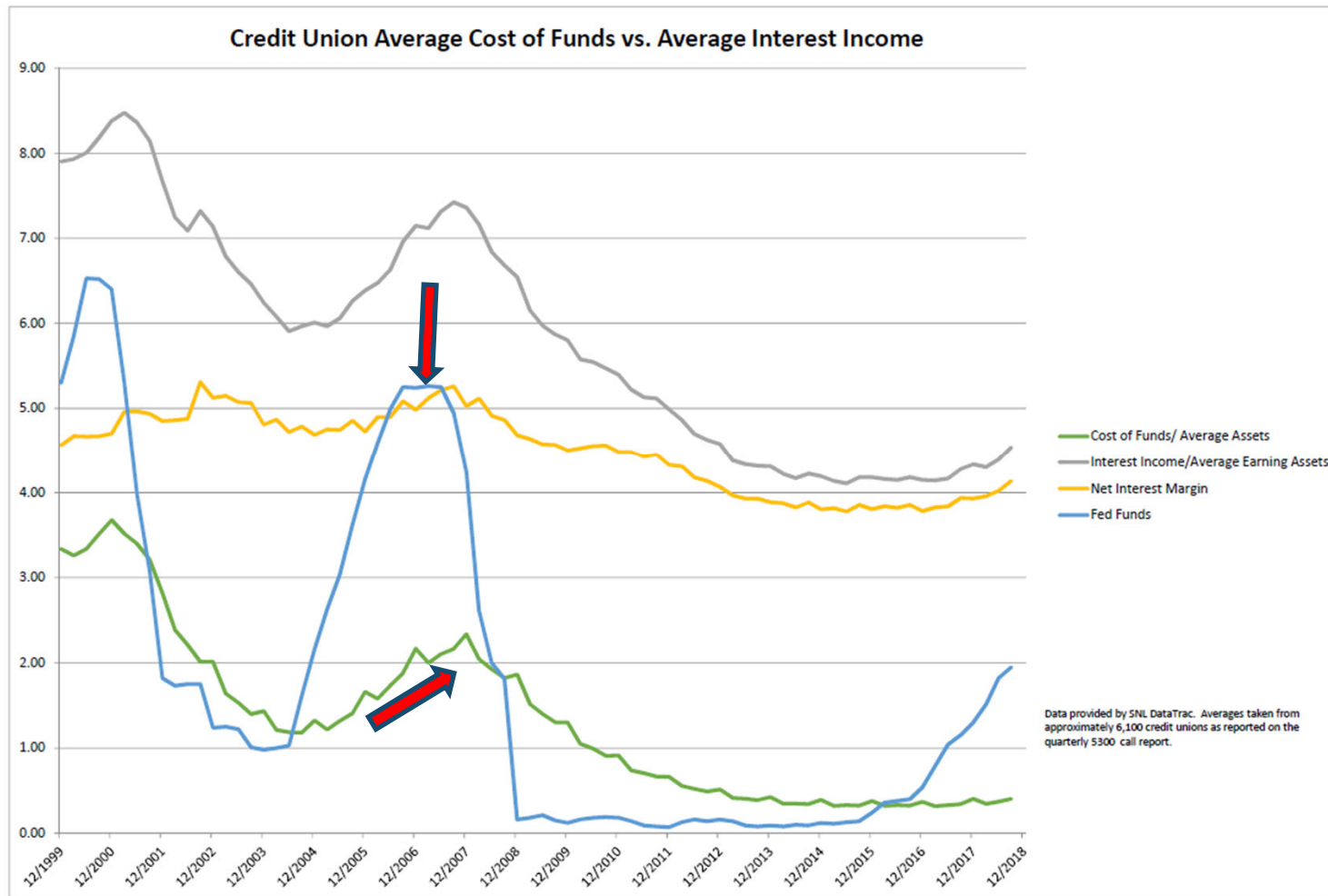




# CREDIT UNION NII AND FED FUNDS



# INDUSTRY DATA – BETA ~25%



## TWO PRIMARY COMPONENTS FOR NII INCREASE WHEN RATES WENT UP

- Regular shares and share drafts are a high percentage of non-maturity deposits
- Short-term investment portfolio

# REVIEW DATA INPUT AND ASSUMPTIONS

It is possible that the data contains errors making the outputs misleading

## Data input

- **Model vs data & general ledger**
  - Net Income
  - Total Assets
  - Total Loans
  - Totals Investments
  - Total Shares and Deposits

# REVIEW DATA INPUT AND ASSUMPTIONS

## Major Assumptions - Assets

- **Loans**
  - Prepayment 
  - Loan classifications
    - Variable
    - balloon
  - Current yields
  - Market rates (NEV)
- **Investments**
  - Terms
  - Rate
  - Options – steps, calls

# REVIEW DATA INPUT AND ASSUMPTIONS

## Major Assumptions - Liabilities

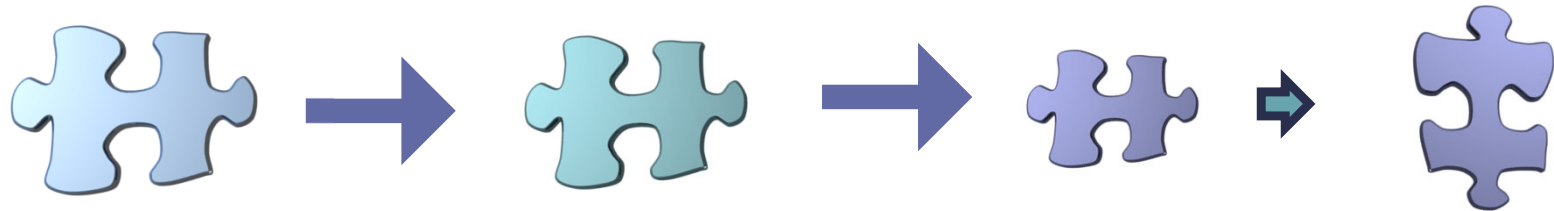
- **Member Deposits**
  - Beta or rate sensitivities
  - Decay – runoff rates
  - Rate
- **Member Certificates**
  - Terms
  - Rate
  - Early redemption assumption



# CONFIDENCE IN OUTPUT

## BACK-TESTING ALM MODEL FORECASTS

Test forecasted interest income/expense for major balance sheet categories



Net Loans vs. Forecasted Net Loans  
Total Investments vs. Forecasted  
Total Assets vs. Forecasted  
Net Worth vs. Forecasted  
Net Income vs. Forecasted  
Net Margin vs. Forecasted

*We suggest a percentage +/- tolerance level of actual results versus forecasted.*

*Important note: the further the forecast in the future the more difficult to predict.  
We suggest going back two most recent quarters to compare against actual results.*



# BACK-TESTING ALM MODEL FORECAST

How well does the model predict actual results?

ADDENDUM 4  
BACKTEST  
FORECASTED VS ACTUAL QUARTERLY INCOME STATEMENTS  
Last 2 Reports

	ALMPro forecast compared to actual						ALMPro forecast compared to actual					
	Actual 12/31/18	Projected 12/31/2018	Difference \$	Difference %	Tolerance %	Outside Tolerance ?	Actual 3/31/19	Projected 3/31/2019	Difference \$	Difference %	Tolerance %	Outside Tolerance ?
Total loan interest	291,357	288,791	2,566	0.9%	5.0%	N/A	283,396	288,783	(5,387)	-1.9%	5.0%	N/A
Total interest on investments	150,884	142,331	8,553	5.7%	5.0%	0.7%	161,670	156,370	5,300	3.3%	5.0%	N/A
Total interest income	442,241	431,122	11,119	2.5%	5.0%	N/A	445,066	445,154	(88)	0.0%	5.0%	N/A
Total other income	19,058	24,928	(5,870)	-30.8%			18,136	25,325	(7,189)	-39.6%		
Total income	461,299	456,050	5,249	1.1%			463,202	470,478	(7,276)	-1.6%		
Total cost of funds	179,237	171,173	8,064	4.5%	5.0%	N/A	186,161	184,329	1,832	1.0%	5.0%	N/A
Total margin	282,062	284,876	(2,814)	-1.0%			277,041	286,150	(9,109)	-3.3%		
Total operating expenses	220,784	214,932	5,852	2.7%			209,327	219,640	(10,313)	-4.9%		
Net income	61,278	69,944	(8,666)	-14.1%			67,714	66,509	1,205	1.8%		
Total assets	54,599,552	53,517,031	1,082,521	2.0%			55,875,511	54,766,911	1,108,600	2.0%		

	ALMPro forecast compared to actual				ALMPro forecast compared to actual			
	Actual 12/31/18	Projected 12/31/2018	Difference		Actual 3/31/19	Projected 3/31/2019	Difference	
Loan balance	23,710,291	23,789,726	(79,435)		23,647,994	23,782,972	(134,978)	
Loan rate	4.87%	4.87%	0.00%		4.85%	4.87%	-0.02%	
Investment balance	28,811,176	27,614,073	1,197,103		29,947,126	28,899,485	1,047,641	
Investment rate	2.14%	2.00%	0.14%		2.31%	2.14%	0.17%	
Deposit balance	40,337,302	39,110,573	1,226,729		41,436,081	40,438,150	997,931	
Deposit rate	1.83%	1.76%	0.07%		1.86%	1.83%	0.04%	

Is the model predictive?

# IMPROVE CONFIDENCE APPROPRIATE CORRECTIVE MEASURES

There will always be variation between the model and *real life results!*

It may be necessary to make updates to the assumptions or add more detail to the data.

Art and science combined

Back-test demonstrates the credit union is paying attention!

Document discussions, if you don't record your steps or actions then in the eyes of the regulator... it didn't happen.

# RECAP OF CU #1 AND CU #2

## Credit Union 1

Loan to assets	66.7%
Net worth ratio	13.1%
Net interest margin increasing	
ROA	129 bps
Fee & misc. income	184 bps
Asset growth	1.9%
Loan turnover	40 months
Loan interest yield	5.48% and increasing
RE as a % of total assets	20.4%
1 year liquidity ratio	15.1%
Investment interest yield	2.19%
Investment maturities	22-84 months
Cost of funds stable at	.38%
RS & SD	53.8%
Certificates	15.3%
Income Sim +300	18.8%
NEV +300	18%

## Credit Union 2

Loan to assets	42.3%
Net worth ratio	25.1%
Net interest margin decreasing	
ROA	56 bps
Fee & misc. income	19 bps
Asset growth	4.6%
Loan turnover	88 months
Loan interest yield	4.85% and decreasing
RE as a % of total assets	37.3%
1 year liquidity ratio	22.3%
Investment interest yield	2.31%
Investment maturities	22 months
Cost of funds	1.86%
RS & SD	8.8%
Certificates	26.5%
Income Sim +300	-20.4%
NEV +300	-19%

# CONTINUE TESTING AND IMPROVING STRATEGY AS RATE INCREASE

- Control cost of funds and maintain NII
- Preserve funds for the various lending programs offered and planned
- Manage for liquidity
- Discourage deposits that will work contrary to the credit unions profitability and net worth
- Serve the credit union's owners/depositors

# PLAN TO MANAGE COST OF FUNDS

- Don't follow-the-leader
- Complete product offerings
- Develop effective segmentation
- Identify saving motivations
- Make decisions based on fact not emotion
- Modeling or test options
- Don't pay for or attract undesirable funding

# IRR AND RELATED POLICY

## Does my IRR Policy have all the right elements?

Key elements:

- Consistent with credit union's business strategies.
- Consistent with credit union's financial condition.
- Not too restrictive or too liberal.
- Adequately reflect board's risk tolerance.
- Establish framework for effective IRR program.
- Include limits and controls.



# POLL QUESTION #3

**NOTE: IF YOU ARE SEEKING CPE CREDIT, IT IS IMPORTANT THAT YOU PARTICIPATE IN THE POLLS.**



# WEAKNESSES OBSERVED

- High liquidity
- Risk avoidant not risk management
- Low fee income
- Policies that do not accurately reflect credit union practices
- Don't utilize the ALM results in managing the credit union
- Don't understand the reports

# PROGRAM EFFECTIVENESS AND USE IN DECISION-MAKING

- Utilize the analysis for new products, strategies, and other “what if” scenarios.
- Utilize to make decisions
- Assist in improving or maintaining profitability
- Control exposure to changing interest rates.
- Help to better managing the credit union.
- 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





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

**PLEASE VISIT OUR WEBSITE**

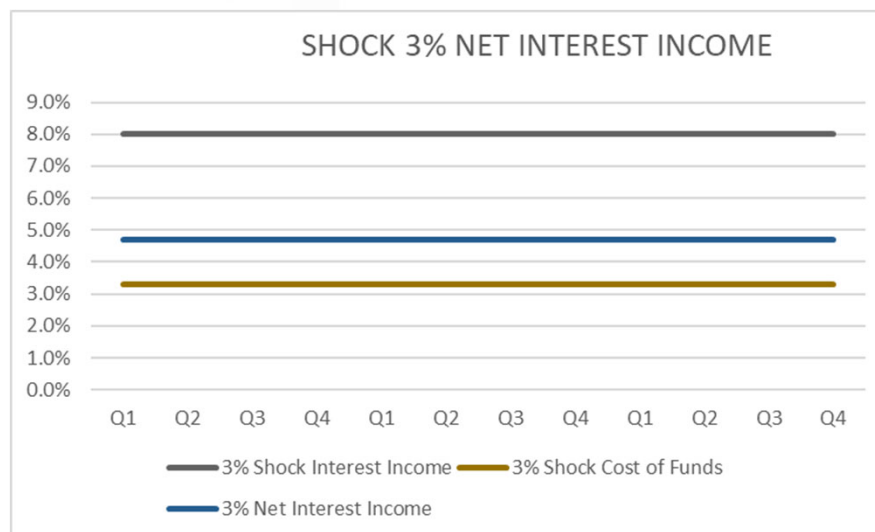
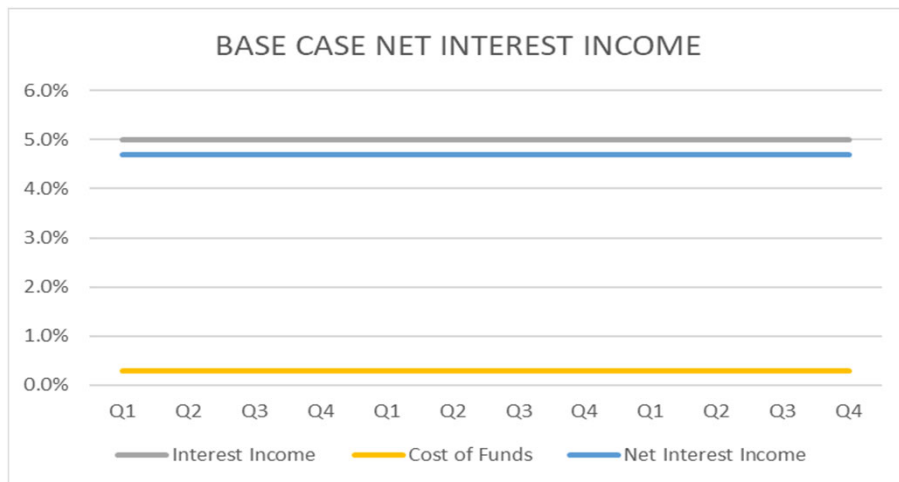
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**CONTACT INFO**

**800 268-7795**

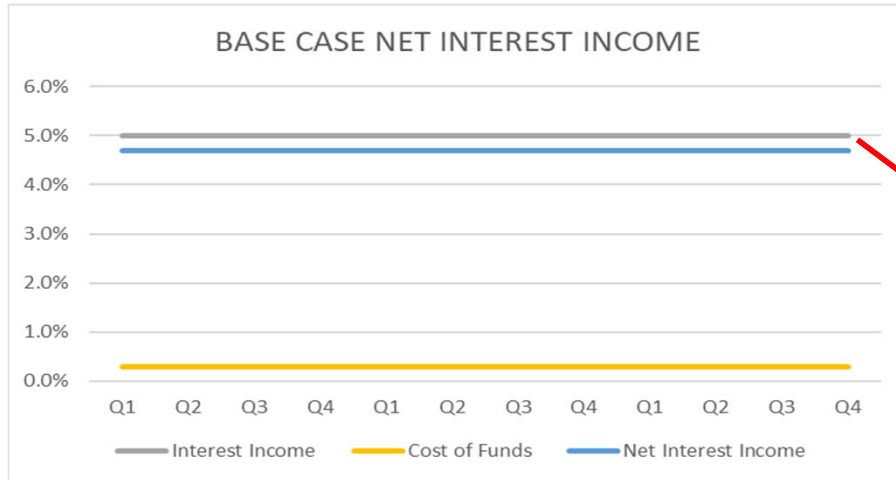
**CYNTHIA@MARKHSMITH.COM**

# EXAMPLE 3% INSTANTENOUS AND PARALLEL





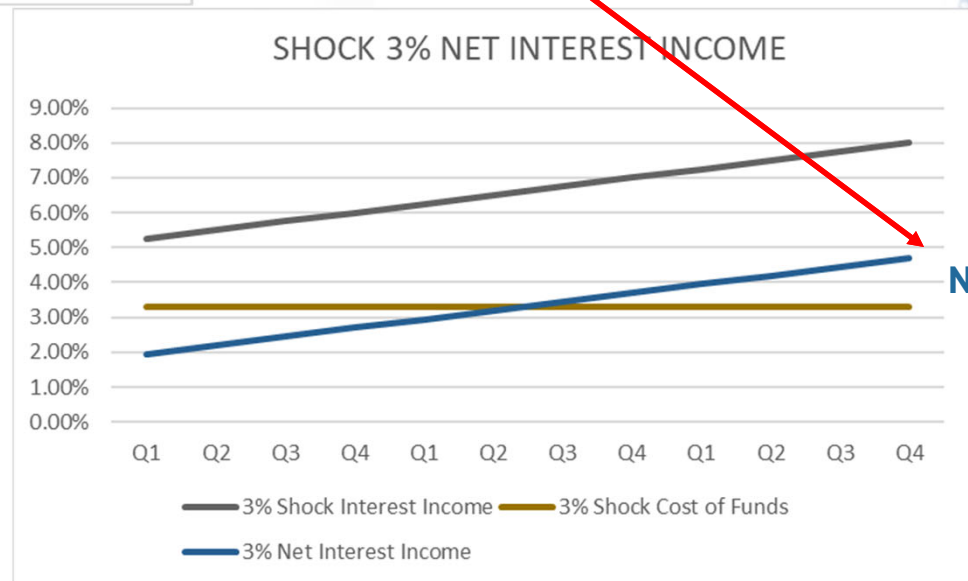
# EXAMPLE 3% INSTANTENOUS AND PARALLEL 36 MONTH REPRICING OF ASSETS



NII 4.7

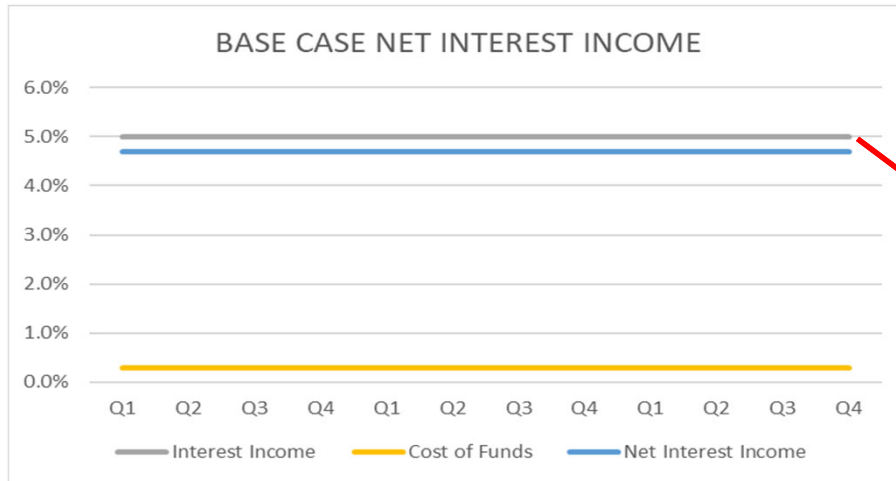
LOAN YIELDS AND INVESMENT  
YIELDS TAKE 36 MONTHS TO REPRICE

COST OF FUNDS GO UP IMMEDIATELY



NII 4.7

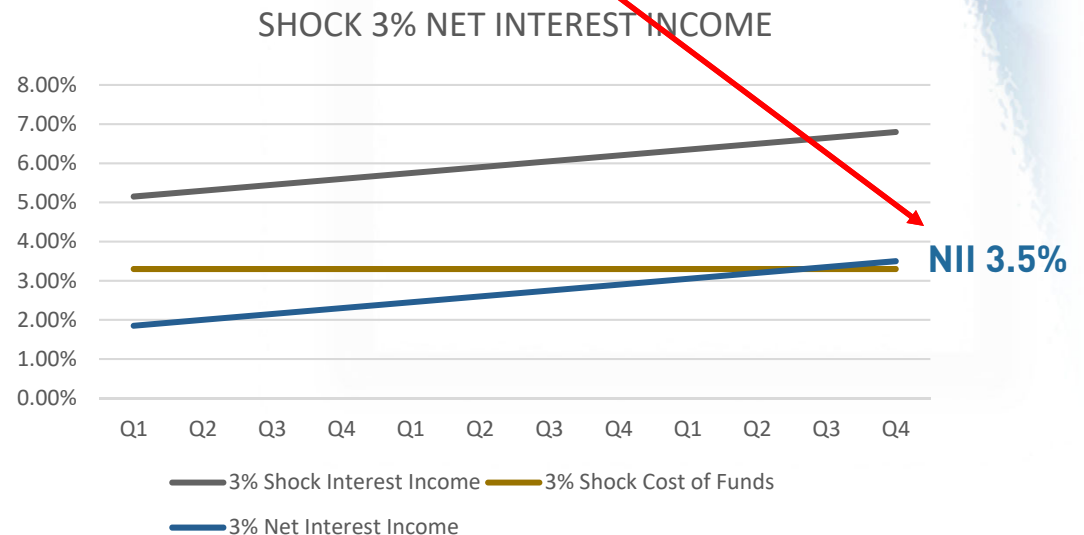
# EXAMPLE 3% INSTANTENOUS AND PARALLEL 60 MONTH REPRICING OF ASSETS



NII 4.7%

LOAN YIELDS AND INVESTMENT  
YIELDS TAKE 60 MONTHS TO REPRICE

COST OF FUNDS GO UP IMMEDIATELY



NII 3.5%