



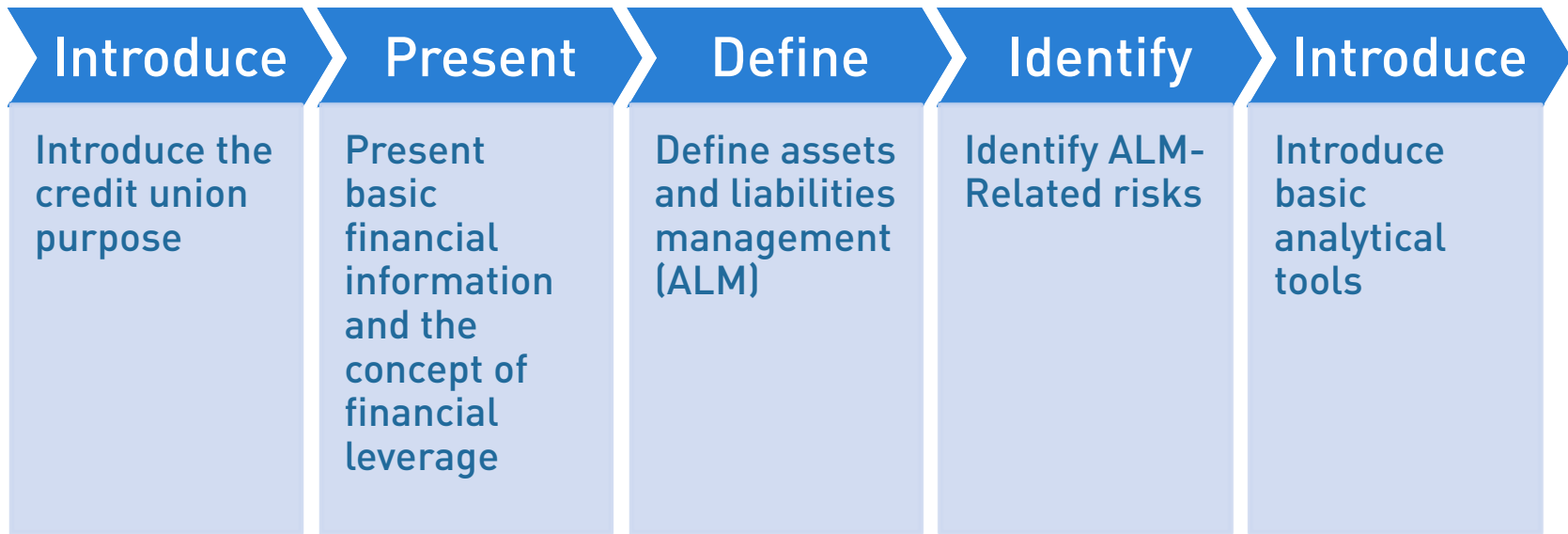
Mark H. Smith
I N C O R P O R A T E D

**BASIC
INTEREST RATE RISK
TRAINING FOR BOARD AND
ALCO**

PRESENTED BY CYNTHIA WALKER, CEO

MARK H. SMITH, INC

TODAY'S AGENDA



CREDIT UNION PURPOSE

Full service
financial
institution

Must be
profitable

Success depends
on managing the
balance sheet

The balance
sheet is
leveraged

BALANCE SHEET

- Statement of Financial Position
- Point in time
 - Assets \$100
 - =
 - Liabilities \$90
 - Net worth \$10

Loan yields typically are better than investments

Certificates are the most expensive

Assets	\$ Millions	Liabilities	\$ Millions
Loans	60	Miscellaneous	1
Investments	30	Notes payable	5
Fixed assets	7	Nonmaturity Shares (NMS)	64
Miscellaneous	3	Share certificates	20
		Total Liabilities	90
		Owner's Equity / Net Worth	10
Total Assets	\$100	Total Liabilities & Net Worth	\$100

INCOME STATEMENT

Results over a period of time

+ Interest income

- Interest expense

= **Net interest income**

NII

+ Other income

- Operating expenses

= **Net income**

INCOME STATEMENT	
LOAN & INVESTMENT INT INCOME	\$440
INTEREST EXPENSE	(\$90)
NET INTEREST INCOME	\$350
NON-INTEREST INCOME	\$125
PROVISION FOR LOAN LOSS	(\$100)
OPERATING EXPENSES	(\$325)
NET INCOME	\$50

INTEREST RATE RISK FOCUS

Balance Sheet as of 12/31/2019

ASSETS		LIABILITIES & NET WORTH	
LOANS	\$6,000	BORROWED FUNDS	
		CORPORATE	\$1,000
INVESTMENTS	\$3,000	MEMBER DEPOSITS	\$7,000
		NON MEMBER	\$1,000
OTHER ASSETS	\$1,000	TOTAL BORROWED	\$9,000
		NET WORTH	\$1,000
TOTAL ASSETS	\$10,000	TOTAL LIAB & NET WORTH	\$10,000

Income Statement 12 months ending 12/31/2020

INCOME STATEMENT	
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MANAGING NII IS A CRITICAL GOAL

Ending Balance Sheet as of 12/31/2020

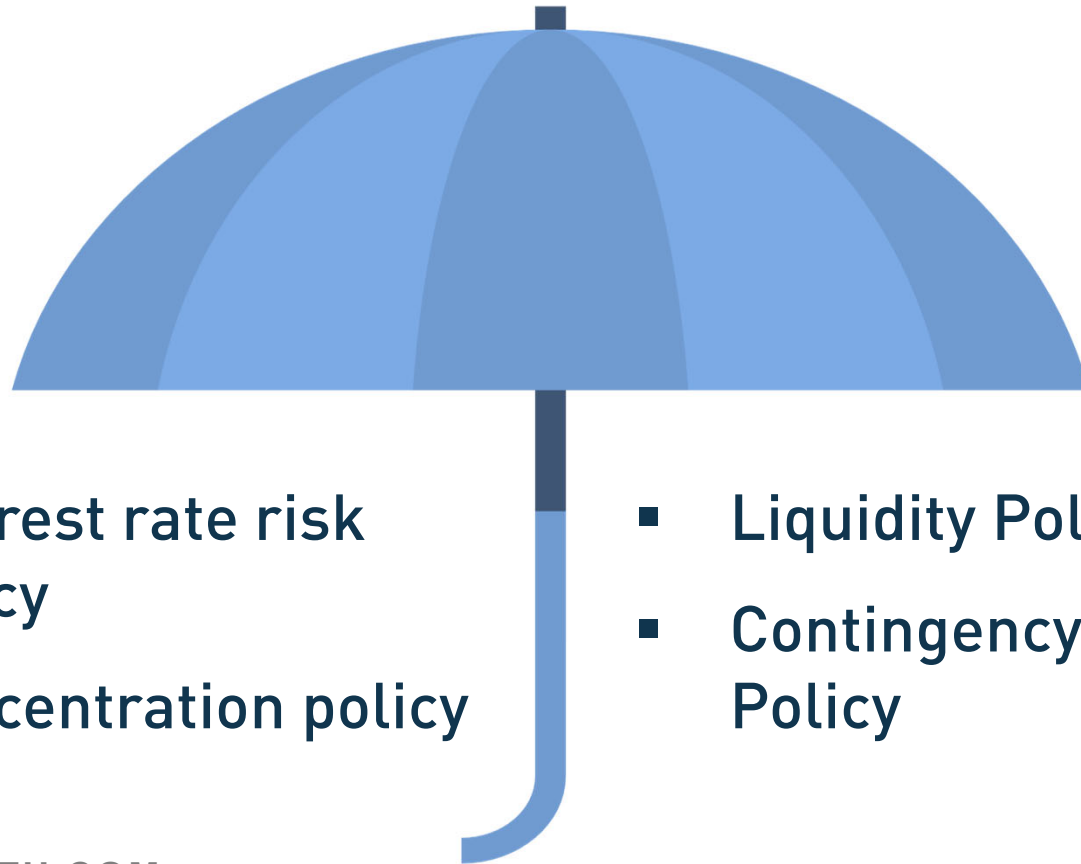
ASSETS		LIABILITIES & NET WORTH	
LOANS	\$6,000	BORROWED FUNDS	
		CORPORATE	\$1,000
INVESTMENTS	\$3,050	MEMBER DEPOSITS	\$7,000
		NON MEMBER	\$1,000
OTHER ASSETS	\$1,000	TOTAL BORROWED	\$9,000
		NET WORTH	\$1,050
TOTAL ASSETS	\$10,050	TOTAL LIAB & NET WORTH	\$10,050

FINANCIAL LEVERAGE



- Utilize borrowed funds from counterparties to produce profits
 - Members or retail funding
 - Financial Institutions, Corp. FHLB, Fed or wholesale funding
- Leverage will turn small changes in balance sheet into large changes in net worth

ASSET LIABILITY MANAGEMENT - ALM MANAGING THE ASSETS, LIABILITIES, AND CAPITAL OF THE CREDIT UNION



- Interest rate risk policy
- Concentration policy
- Liquidity Policy
- Contingency Funding Policy

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POLL QUESTION #1



THE BALANCE SHEET MISMATCH

LOANS & INVESTMENTS

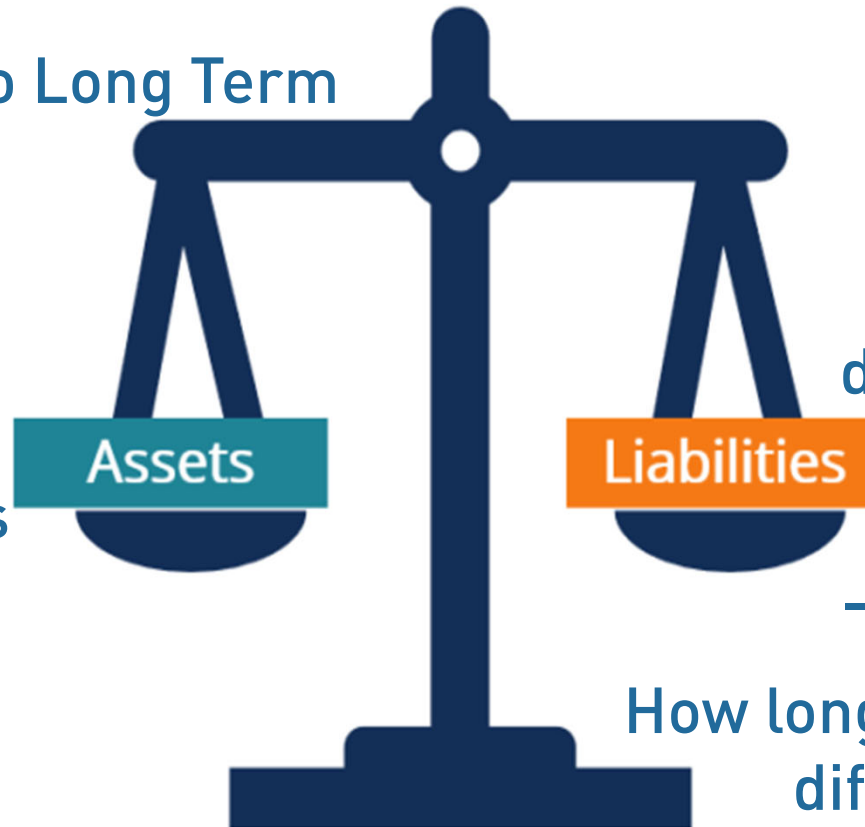
Intermediate to Long Term

1 to 30 Years

Fixed Rate

Variable Rate

Loan payments
vary



DEPOSITS

Short -Term

Variable rate
non-maturity
deposits (NMD)

Fixed rate
- member CD's

How long deposits stay
difficult to define

INTEREST RATE RISK (PART OF ALM)



Rate risk is when Net Interest Income (NII) is detrimentally impacted by a rate change

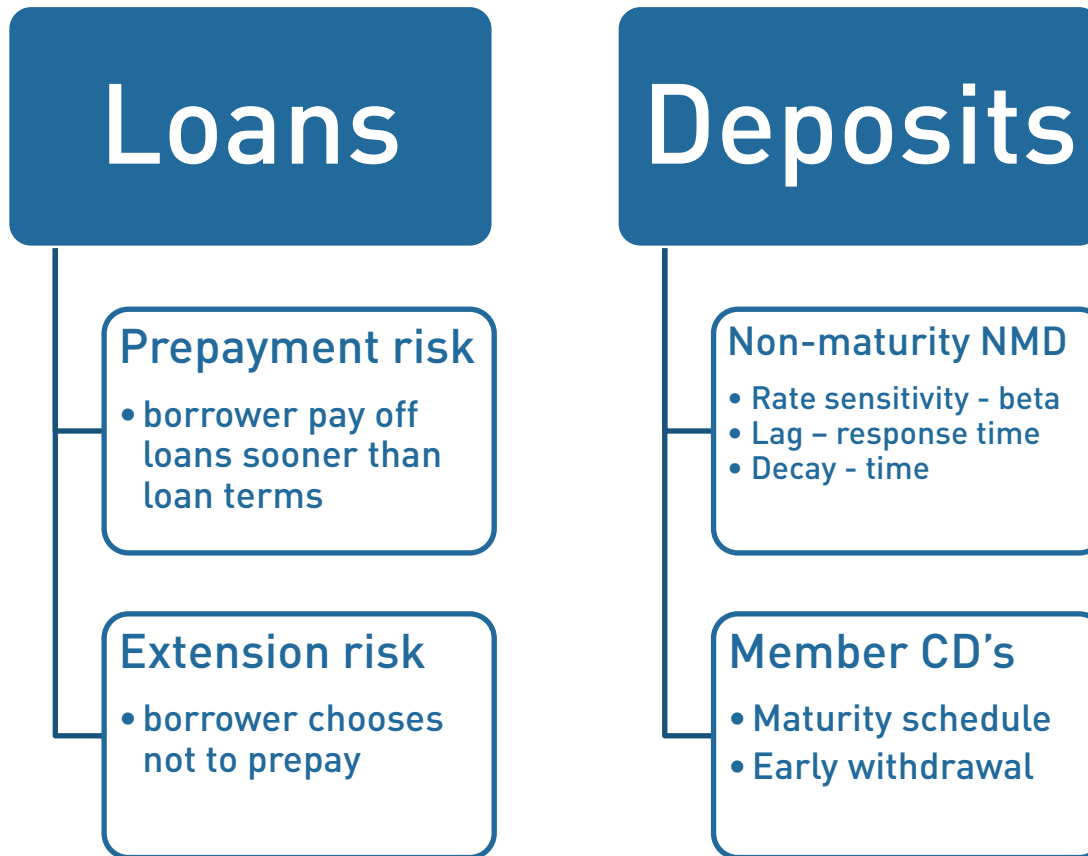


Rates may increase over time causing cost of short-term funding to increase rapidly while the yield on fixed rate loans remains static.

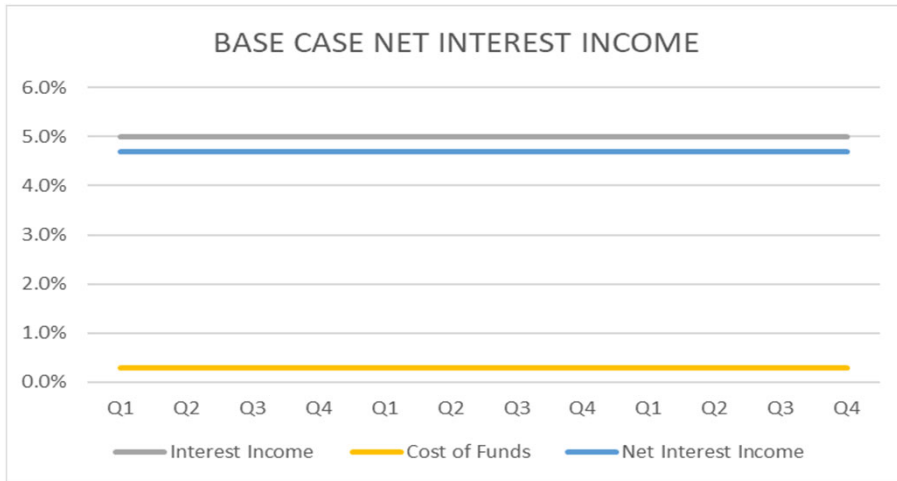


Rates may decrease over time causing borrowers to reset rates by refinancing.

MEMBER OPTIONALITY RISKS

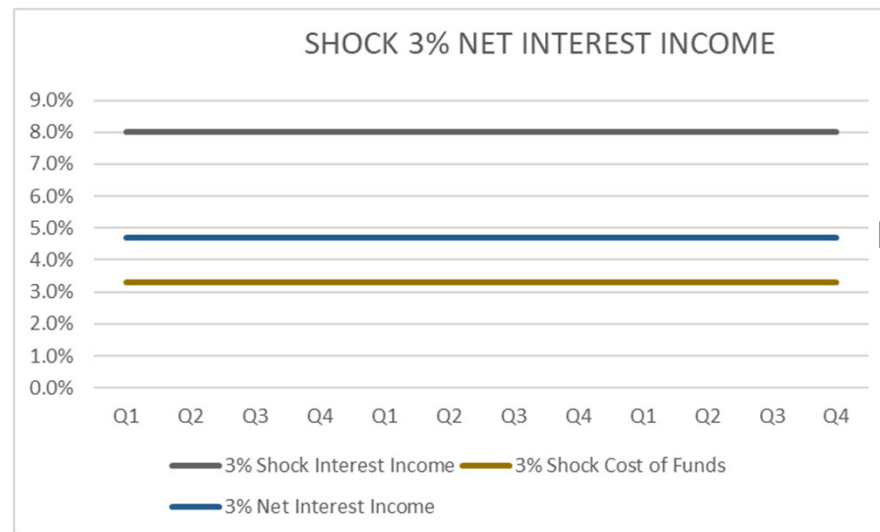


EXAMPLE 3% INSTANTENOUS AND PARALLEL



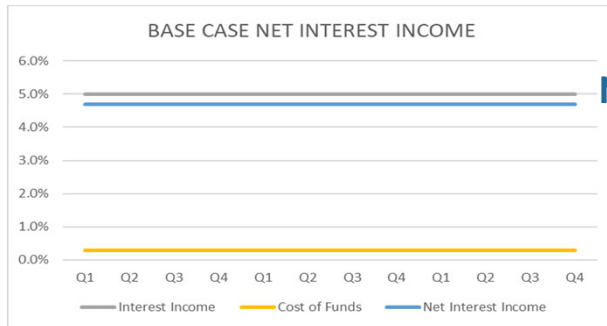
NII 4.7

**PERFECT WORLD –
Everything
reprices at the
same time**



NII 4.7

EXAMPLE 3% INSTANTENOUS AND PARALLEL 36 MONTH REPRICING OF ASSETS

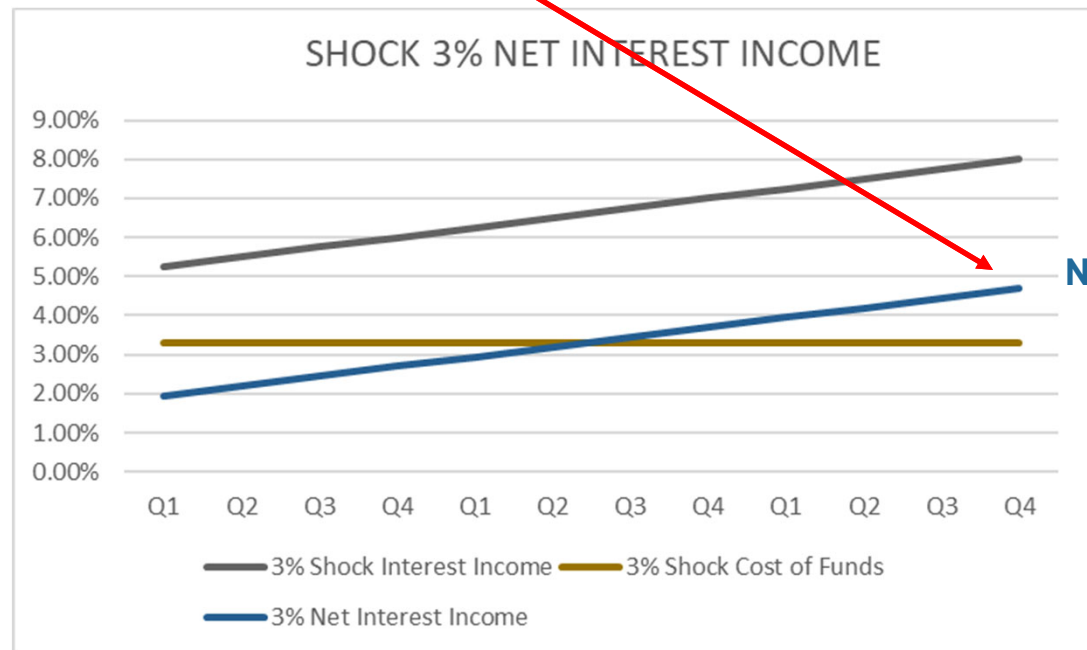


LOAN YIELDS AND INVESTMENT YIELDS TAKE 36 MONTHS TO REPRICE

COST OF FUNDS GO UP IMMEDIATELY

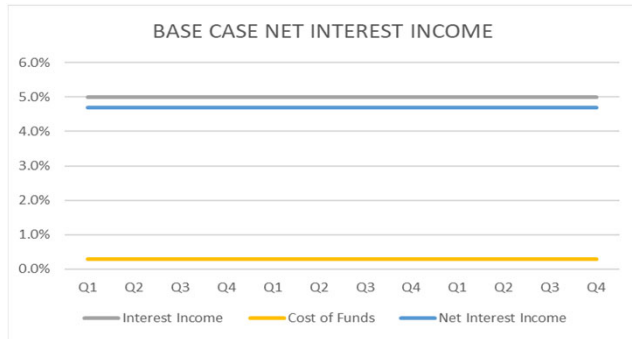
NII DECLINES AND TAKES 36 MONTHS TO FULLY RECOVER

NII 4.7



NII 4.7

EXAMPLE 3% INSTANTENOUS AND PARALLEL 60 MONTH REPRICING OF ASSETS

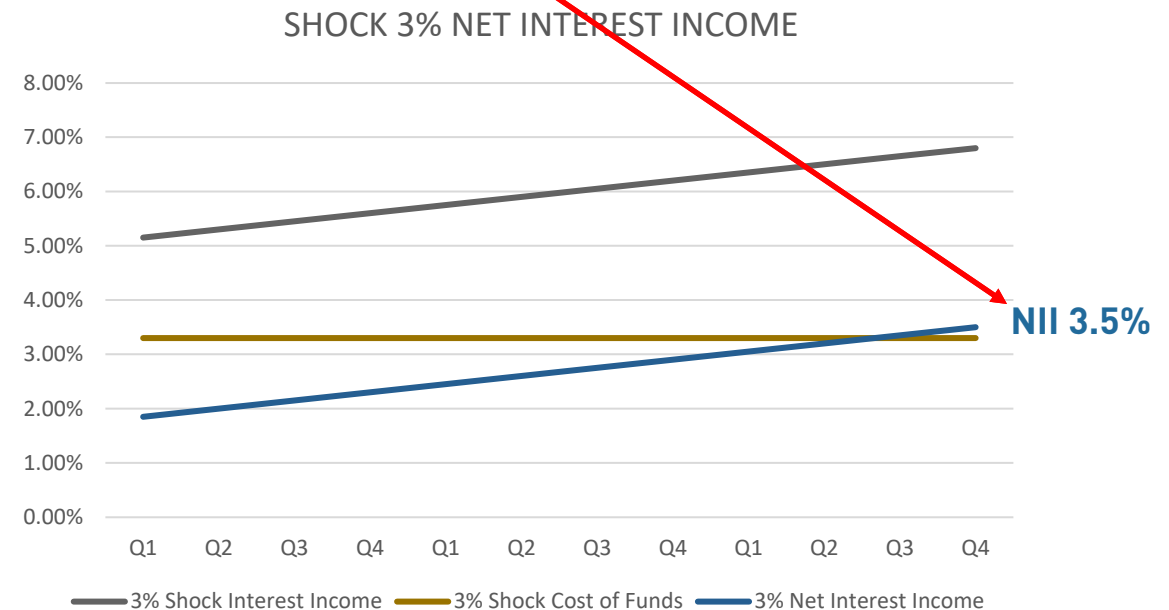


NII 4.7%

LOAN YIELDS AND INVESTMENT YIELDS TAKE 60 MONTHS TO REPRICE

COST OF FUNDS GO UP IMMEDIATELY

NII DECLINES AND TAKES LONGER THAN 36 MONTHS TO RECOVER



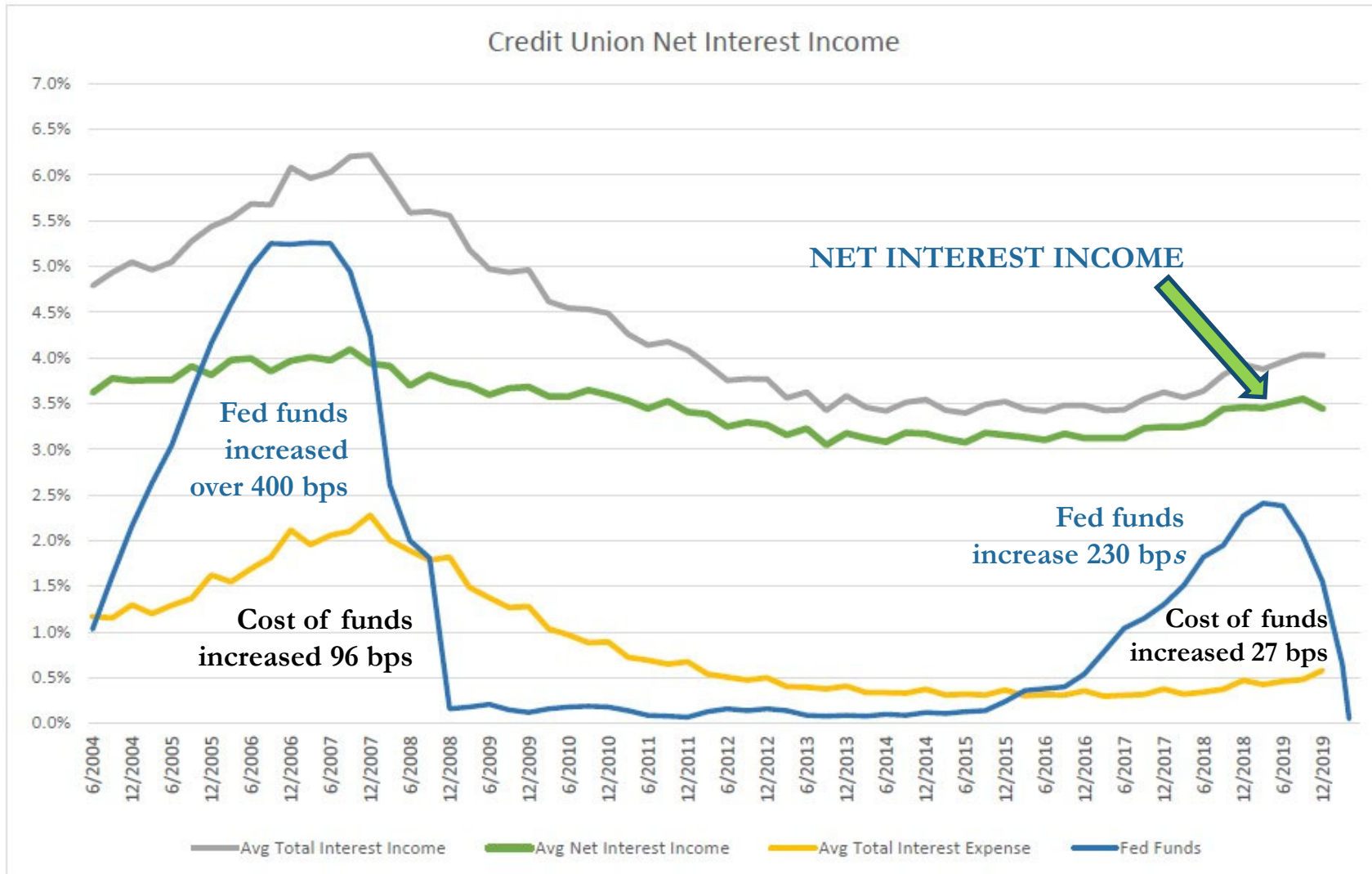
NII 3.5%

POLL QUESTION #2

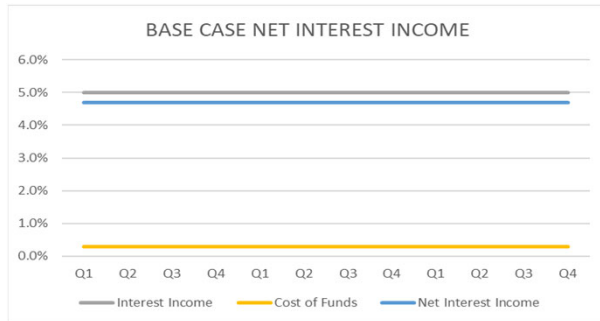


96/400=.24% beta

27/230= .12% beta



2% SHOCK 36 MONTH REPRICING OF ASSETS – LIMITS ON LOAN YIELDS AND .12% BETA ON DEPOSITS



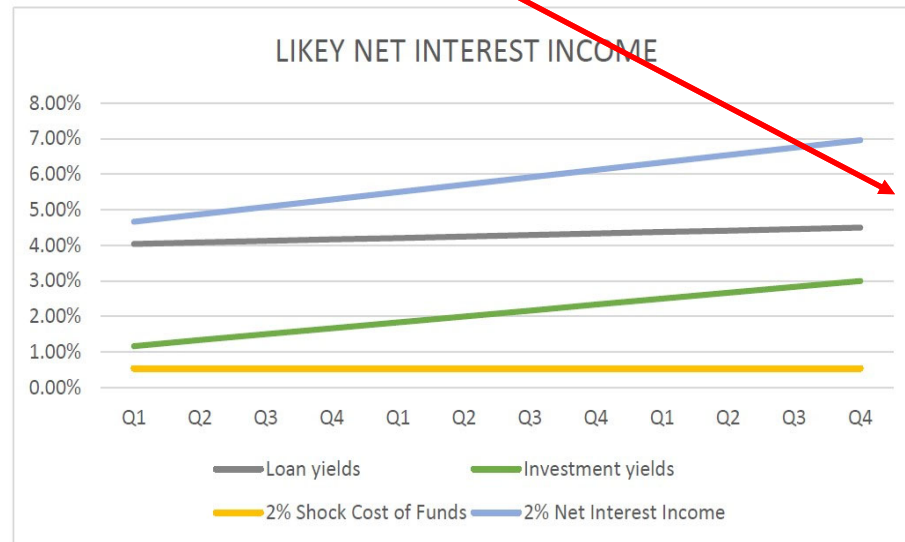
NII 4.7%

LOAN YIELDS TAKE 36 MONTHS TO REPRICE WITH .25% OF TOTAL RATE INCREASE

INVESTMENT YIELDS INCREASE FULL SHOCK OVER 36 MONTHS

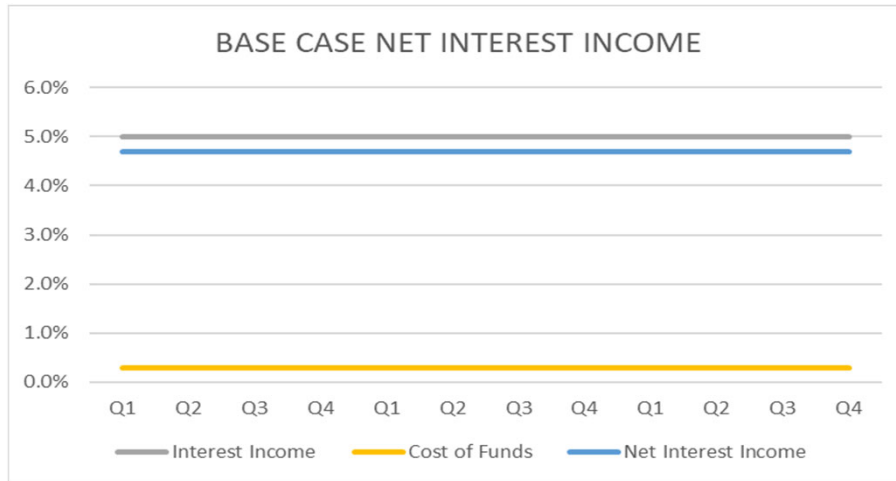
COST OF FUNDS GO UP IMMEDIATELY BY A BETA OF .12%

NII EXCEEDS BASE CASE



NII 6.96%

EXAMPLE -1% INSTANTENOUS AND PARALLEL DOWN SHOCK 18 MONTH REPRICING OF ASSETS

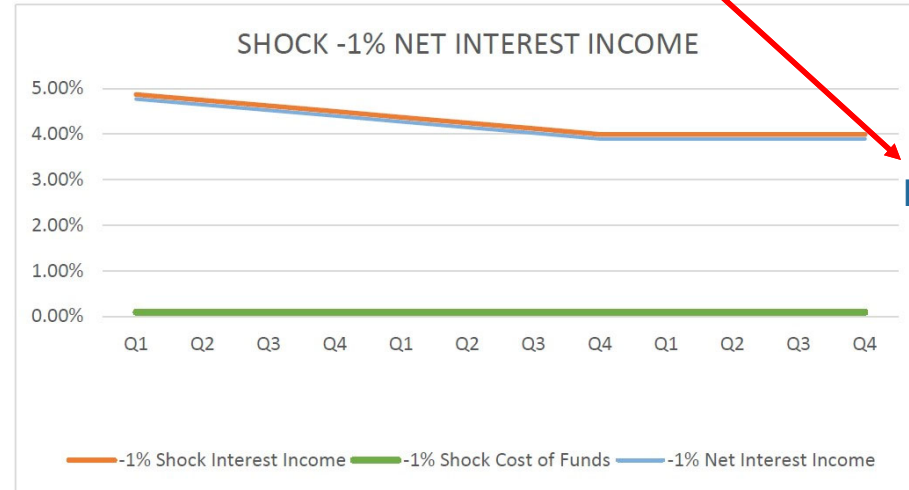


NII 4.7

Loan yield 5%
Cost of funds .30%
NII 4.7%

LOAN YIELDS AND INVESTMENT YIELDS
TAKE 18 MONTHS TO REPRICE

COST OF FUNDS GO DOWN
IMMEDIATELY TO .10%



NII 3.9

METHODOLOGIES TO ESTIMATE IRR

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

INCOME SIMULATION



Estimates future net interest income (NII) and net income



More simple in concept



Uses familiar terms



Member behavior for loans and deposits difficult to predict



Short-term (1 to 3 years)-will miss risk of longer-term assets



Very effective estimate of risk to NII

INCOME SIMULATION EXAMPLE

PANEL 1 INCOME SIMULATION

3-Year Cumulative (\$000)	SHOCK DOWN -100 BP	Benchmark	SHOCK UP 300 BP
Net Interest Income	8,369	10,310	12,254
\$ Change from benchmark NII	-1,941		1,945
% Change from benchmark NII	-18.8%		18.9%
Operational Guideline	-20.0%		-25.0%
Net income:	-\$371	\$1,570	\$3,515
ROA:	-0.10%	0.41%	0.92%

- Compare benchmark (base case) net interest income to shock rate net interest income.
- If NII decreases there is risk.
- Presented as a % decrease from base case.
- Compare to policy limits

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- WHAT IS A GOOD POLICY LIMIT?
- HOW MUCH RISK CAN THIS CREDIT UNION TAKE?
- $1570/10310 = 15\%$ DECLINE BEFORE NET INCOME ELIMINATED
- WHAT IS THE CURRENT NET WORTH RATIO?
- CAN THE NET WORTH RATIO ABSORB MORE RISK?

POLL QUESTION #3



NET ECONOMIC VALUE - NEV



Uses economic value 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

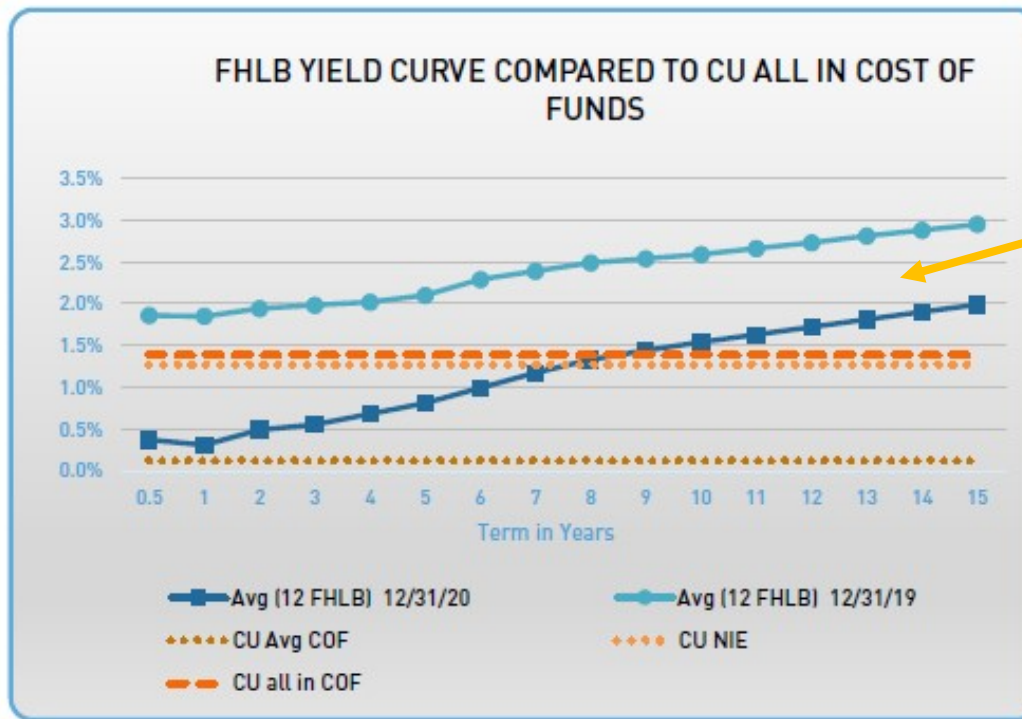


Conceptually difficult

KEY ASSUMPTIONS

- Long-term loans, 5 years +, repricing
- Long-term investments, repricing
- Non maturity shares (NMS)
 - Beta—Magnitude
 - Lag—Delay
 - Decay speed—How long
- Member Certificates –maturity

NON MATURITY DEPOSITS AND HOW THEY EFFECT IRR RESULTS



ECONOMIC VALUE

COF - Cost of Funds

NIE - Non Interest Expense

NET ECONOMIC VALUE

RATE UP SHOCK 3%

Assets loose value
Book yield = 4%
Current market yield = 4%
Shock market yield = 7%



Regular shares
Share drafts gain value
Book cost $.10\% + \text{beta } .15\% = .55\%$
Current rate 1.5%
Shock market 4.5%



RATE DOWN SHOCK 1%

Assets gain value
Book yield = 4%
Current market yield = 4%
Shock market yield = 3%



Regular shares
Share drafts loose value
Book cost $.10\% - \text{beta } .15\% = 0\%$
Current rate 1.5%
Shock market .5%



NET ECONOMIC VALUE EXAMPLE

Step 1 - Change in capital from book to current market rates
(base case)

Step 2 - Change in capital from base case to shock scenario

Step 3 - Calculate resulting Market Risk Adjusted NW Ratio

Step 4 – Compare to policy limits

PANEL 2 NET ECONOMIC VALUE

	SHOCK DOWN -100 BP	CURRENT NET WORTH RATIO	SHOCK UP 300 BP
Book Value Net Worth (\$000)		\$14,764	
Market Net Worth (\$000)	\$15,629	\$19,898	\$22,782
Net Worth at Risk from Market (\$000)	-\$4,269	\$5,133	\$2,884
% Net Worth Change	-21.5%		14.5%
Operation Guideline	-40.0%		-40.0%
Book Value of Net Worth Ratio		11.8%	
Market Risk Adjusted NW Ratio	12.6%	16.0%	19.1%
Minimum Net Worth Guideline	6.0%		6.0%

NET ECONOMIC VALUE EXAMPLE

PANEL 2 NET ECONOMIC VALUE

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Minimum Net Worth Guideline	6.0%		6.0%

WHAT IS A GOOD POLICY LIMIT

COMMON -40% NW AT RISK AND MARKET ADJUSTED NET WORTH RATIO OVER 7%

CURRENT NET WORTH ALWAYS A CONSIDERATION

STRATEGIES AS RATES DECREASE AND LIQUIDITY FLUCTUATES

- Reduce cost of funds to maintain NII (if possible)
- Do not overpay for deposits you cannot utilize
- Maintain loan yields
- Preserve investment yields
- Consider longer term loans or investments
- Manage for liquidity for potential deposit runoff
- Anticipate draws on unfunded LOC
- Preserve funds for lending programs planned or developed for the current environment

MANAGEMENT AND BOARD RESPONSIBILITIES

- ALM Policy
- Identify risk
- Quantify risk
- Control—Policy or Risk Limits
- Monitor risk
- Respond accordingly

SUMMARY

- Medium to long-term loans funded with short-term deposits
- Leverage
- Management estimates and manages IRR
- Tools: Income Simulation and NEV
- Corrective action if necessary

BENEFITS OF USING MHSI SOLUTIONS

Easy
Saves 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 GIVE FOR THE FEE WITH
AGREEMENT PRIOR TO 12/31/2022**



Mark H. Smith
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PLEASE VISIT OUR WEBSITE

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