



Defining Risk

What is Risk?

- Possibility of incurring loss
- Vulnerability to a negative outcome

Defining Risk

Risk Categories

- Credit Risk – the risk of non-repayment where your credit union invests or loans funds.
- **Interest Rate Risk** – the risk that your credit union won't adequately manage changes in market rates to maintain an appropriate net interest margin.
- **Liquidity Risk** – the risk your credit union won't be able to liquidate assets quickly and with minimal loss in value to meet your obligations.
- Transaction Risk – the risk that fraud or errors will cause a loss to your credit union. This risk is a function of internal controls, information systems, employee integrity, and operating processes.
- Compliance Risk – the risk that failure to comply with laws and regulations, prudent ethical standards, and contractual obligations will harm your credit union.
- **Strategic Risk** – the risk that poor business decisions or improper implementation of strategic goals will reduce your credit union's earnings and net worth.
- Reputation Risk – the risk that your credit union's public image will be tarnished due to improper actions on the part of officials, management, or staff.

Three Questions for IRR Management

In order to comply with NCUA regulations on IRR you need to be able to answer affirmatively to three key questions.

- Do you currently use an independently validated IRR measurement system?
- Do you and your Board understand how the system works?
- Do you consistently apply the system in the ongoing operation of the credit union?

Timing Differences

Cash Flows

1

Loans - Return of principle in regularly scheduled payments

2

Investments – Maturity of investments plus any payments

3

Deposits - Deposits and withdrawals of money

Two Methods Used Internationally

Discount cash flows and calculate adjust balance sheet

Simulates income statement and earnings and equity impact



Two Methods Used Internationally

Value at Risk – Calculates the “liquidation” value of the balance sheet. It is a sales related measure.

Earnings at Risk – Calculates the “ongoing concern” value of the income statement. It is an operational measure.





Regulatory Guidance

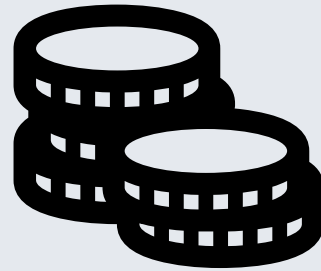
“All institutions are encouraged to use earnings simulations. Advances in technology have made simulation modeling more accessible for all institutions.”

Office of the Comptroller of the Currency

Interagency Advisory on Interest Rate Risk Management Frequently Asked Questions

January 2012

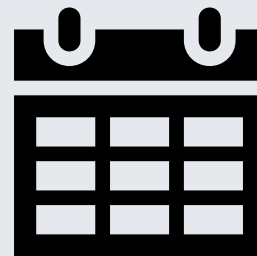
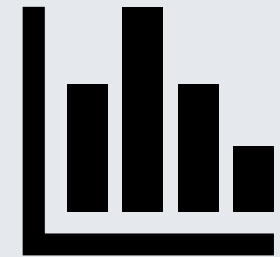
The Earning at Risk Process



Earnings At Risk

- Holds the balance sheet static
- Establishes amortization rate for earning assets
- Establishes price elasticity of deposits
- Creates a re-pricing schedule for earnings assets and deposits
- Simulates earnings and resulting equity

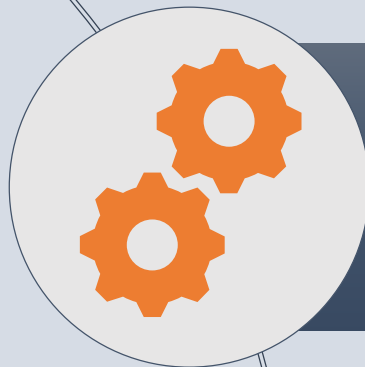
Designed to simulate actual performance and resulting income and equity



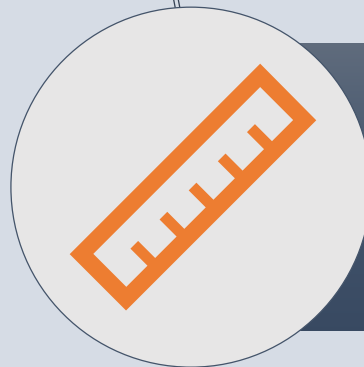
Requires:

- Amortization schedule
- Current rates and yields
- Projections of other income and operating expenses

Applying the System to Operations



Two aspects of the ALM System

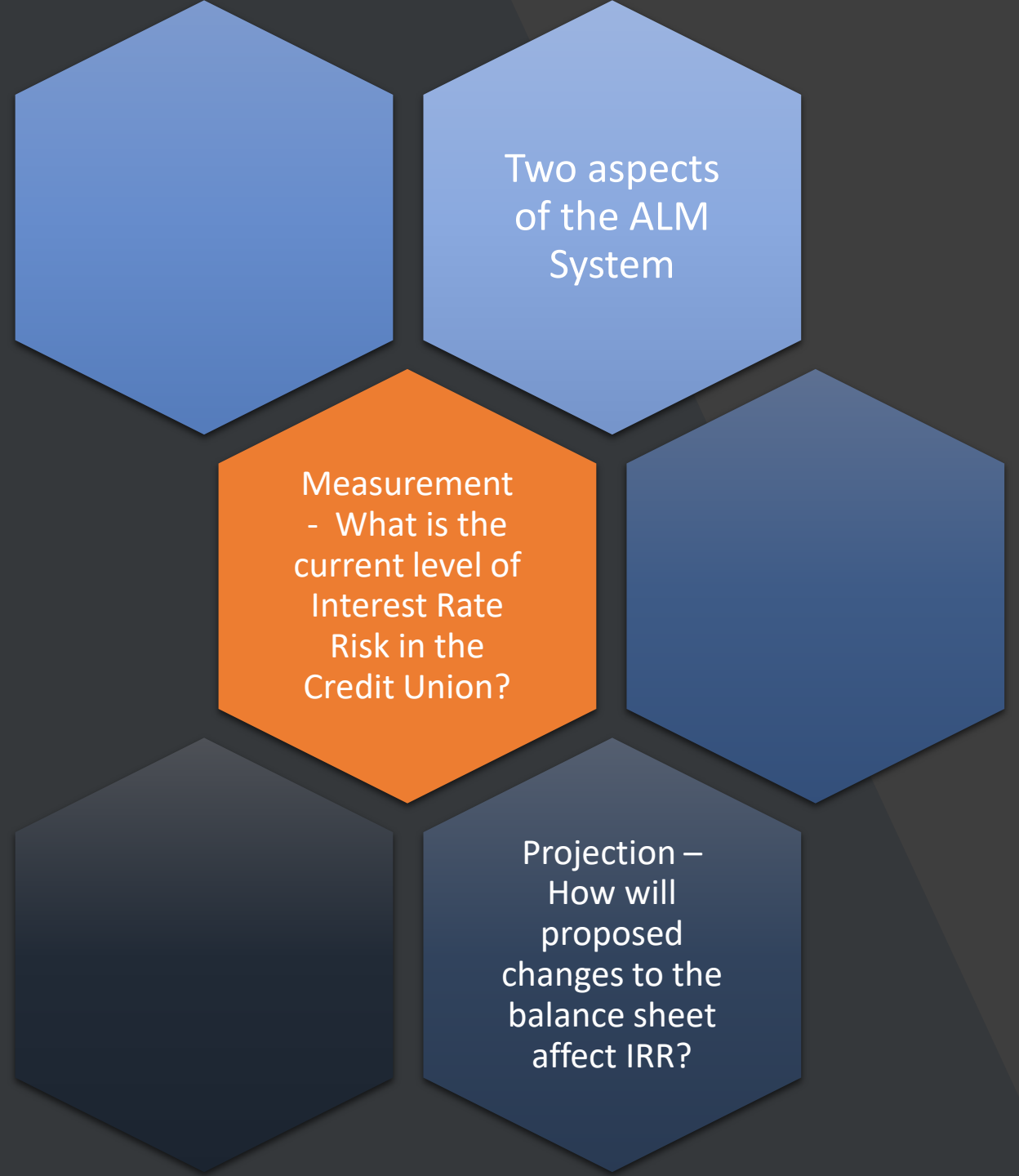


1. Measurement - What is the current level of Interest Rate Risk in the Credit Union?



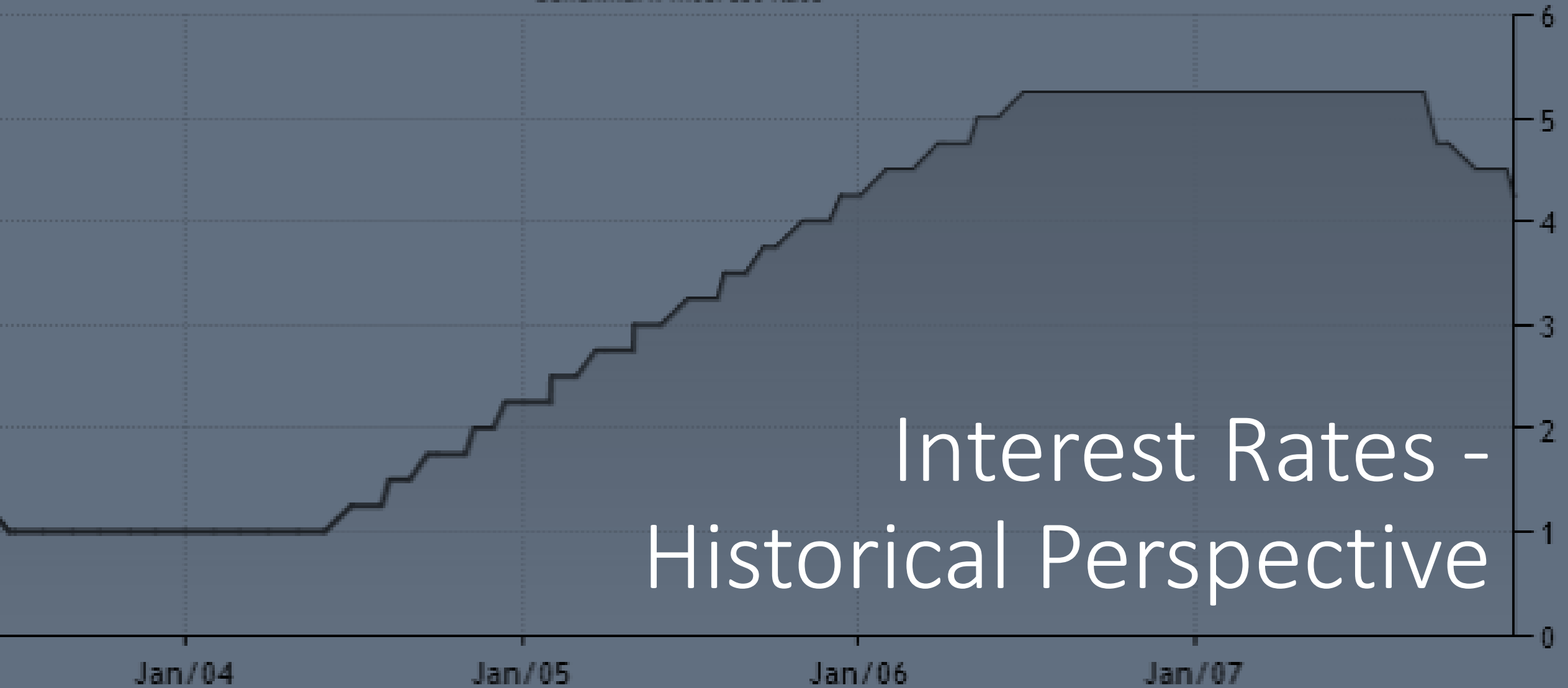
2. Projection – How will proposed changes to the balance sheet affect IRR?

Applying the System to Operations



UNITED STATES INTEREST RATE

Benchmark Interest Rate



Interest Rates -
Historical Perspective

What is IRR and Why Does it Matter?

Now what if interest rates rose by 2% over a one year period.

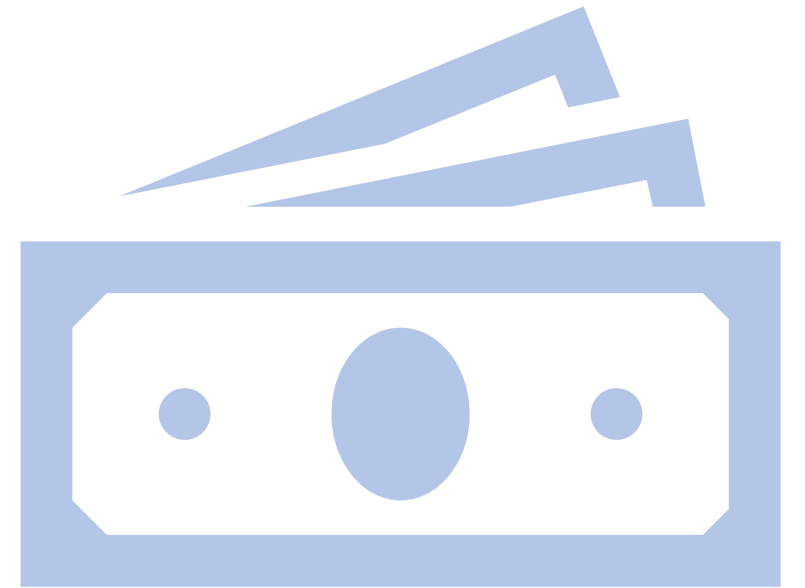
Given an average amortization rate on loans the effect would be:

	Base Quarter	Q1	Q2	Q3	Q4
Loan Yield	5.50%	5.55%	5.60%	5.65%	5.70%
Invest Yield	1.00%	1.20%	1.40%	1.60%	1.80%
Cost of Funds	0.30%	0.80%	1.30%	1.80%	2.30%
Loan Income	\$ 275,000	\$ 277,500	\$ 280,000	\$ 282,500	\$ 285,000
Invest Income	\$ 37,500	\$ 45,000	\$ 52,500	\$ 60,000	\$ 67,500
Divdidends	\$ 27,375	\$ 73,000	\$ 118,625	\$ 164,250	\$ 209,875
NII	\$ 285,125	\$ 249,500	\$ 213,875	\$ 178,250	\$ 142,625
NII at Risk		\$ (35,625)	\$ (35,625)	\$ (35,625)	\$ (35,625)
% at Risk		-12.49%	-14.28%	-16.66%	-19.99%

Cash Flows and Re-Pricing Loans

Simple example of one loan

- Balance \$10,000
- Rate 2.99%
- Term 5 years (60 months)



Cash Flows and Re-Pricing Loans

Now consider the impact of a 2% up-shock

	Base	Year 1	Year 2	Year 3	Year 4	Year 5
Original Loan	\$ 10,000	\$ 8,000	\$ 6,000	\$ 4,000	\$ 2,000	\$ -
Original Rate	2.99%	2.99%	2.99%	2.99%	2.99%	2.99%
Income	\$ 299	\$ 239	\$ 179	\$ 120	\$ 60	\$ -
New Loan	\$ -	\$ 2,000	\$ 4,000	\$ 6,000	\$ 8,000	\$ 10,000
New Rate	0.00%	4.99%	4.99%	4.99%	4.99%	4.99%
New Income	\$ -	\$ 100	\$ 200	\$ 299	\$ 399	\$ 499
Total Income	\$ 299	\$ 339	\$ 379	\$ 419	\$ 459	\$ 499
Average Rate	2.99%	3.39%	3.79%	4.19%	4.59%	4.99%

Cash Flows and Re-Pricing Loans

Simple example of one loan

- Balance \$10,000
- Rate 2.99%
- Term 30 years (360 months)

Cash Flows and Re-Pricing Loans

Now consider the impact of a 2% up-shock with 30 year maturity

	Base	Year 1	Year 2	Year 3	Year 4	Year 5
Original Loan	\$ 10,000	\$ 9,972	\$ 9,944	\$ 9,916	\$ 9,888	\$ 9,860
Rate	2.99%	2.99%	2.99%	2.99%	2.99%	2.99%
Income	\$ 299	\$ 298	\$ 297	\$ 296	\$ 296	\$ 295
New Loan	\$ -	\$ 333	\$ 672	\$ 1,008	\$ 1,344	\$ 1,680
Rate	0.00%	4.99%	4.99%	4.99%	4.99%	4.99%
New Income	\$ -	\$ 17	\$ 33	\$ 50	\$ 67	\$ 84
Total Income	\$ 299	\$ 306	\$ 312	\$ 319	\$ 326	\$ 333
Average Rate	2.99%	3.06%	3.12%	3.19%	3.26%	3.33%

Amortization and Repricing

Loans

	Balance	Amort. %	Amort/Mo	Amort/Qtr	Year 1	Year 2	Year 3	Year 4	Year 5	No Change
NEW AUTO	\$448,624	3.57%	\$16,022	\$48,067	\$192,268	\$192,268	\$64,089	\$0	\$0	\$0
USED AUTO	\$675,115	3.85%	\$25,966	\$77,898	\$311,592	\$311,592	\$51,932	\$0	\$0	\$0
RV'S	\$209,437	1.92%	\$4,028	\$12,083	\$48,332	\$48,332	\$48,332	\$48,332	\$16,111	\$0
WATERCRAFT	\$42,080	2.13%	\$895	\$2,686	\$10,744	\$10,744	\$10,744	\$9,849	\$0	\$0
MOTORCYCLES	\$100,935	3.70%	\$3,738	\$11,215	\$44,860	\$44,860	\$11,215	\$0	\$0	\$0
IHOME EQUITY	\$1,282,805	7.69%	\$98,677	\$296,032	\$1,184,127	\$98,677	\$0	\$0	\$0	\$0
FIRST MORTGAGES	\$2,469,356	1.12%	\$27,746	\$83,237	\$332,947	\$332,947	\$332,947	\$332,947	\$332,947	\$804,621
PERSONAL UNSECURED	\$291,338	4.35%	\$12,667	\$38,001	\$152,003	\$139,336	\$0	\$0	\$0	\$0
SHARE SECURE	\$140,803	7.69%	\$10,831	\$32,493	\$129,972	\$10,831	\$0	\$0	\$0	\$0
Total	\$5,660,493				\$2,406,843	\$1,189,585	\$519,258	\$391,127	\$349,057	\$804,621

Cash Flows and Re-Pricing Investments

	Base	Year 1	Year 2	Year 3	Year 4	Year 5
Original Investments	\$ 500,000	\$ 400,000	\$ 300,000	\$ 200,000	\$ 100,000	\$ -
Rate	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%
Income	\$ 4,500	\$ 3,600	\$ 2,700	\$ 1,800	\$ 900	\$ -
New Investments	\$ -	\$ 100,000	\$ 200,000	\$ 300,000	\$ 400,000	\$ 500,000
Rate	0.00%	2.90%	2.90%	2.90%	2.90%	2.90%
New Income	\$ -	\$ 2,900	\$ 5,800	\$ 8,700	\$ 11,600	\$ 14,500
Total Income	\$ 4,500	\$ 6,500	\$ 8,500	\$ 10,500	\$ 12,500	\$ 14,500
Average Rate	0.90%	1.30%	1.70%	2.10%	2.50%	2.90%

Amortization and Repricing

Investments

	Balance	Year 1	Year 2	Year 3	Year 4	Year 5	No Change
1-12 Months	\$3,826,000	\$3,826,000	\$0	\$0	\$0	\$0	\$0
13-24 Months	\$2,702,000	\$0	\$2,702,000	\$0	\$0	\$0	\$0
25-36 Months	\$1,269,000	\$0	\$0	\$1,269,000	\$0	\$0	\$0
37-48 Months	\$1,538,000	\$0	\$0	\$0	\$1,538,000	\$0	\$0
49-60 Months	\$2,014,000	\$0	\$0	\$0	\$0	\$2,014,000	\$0
Total	\$12,429,000	\$3,826,000	\$2,702,000	\$1,269,000	\$1,538,000	\$2,014,000	\$1,080,000

Regular Share	Base	Q1	Q2	Q3	Q4
Balance	\$ 4,000,000	\$ 4,000,000	\$ 4,000,000	\$ 4,000,000	\$ 4,000,000
Rate	0.10%	0.60%	1.10%	1.60%	2.10%
Interest Exp.	\$ 1,000	\$ 6,000	\$ 11,000	\$ 16,000	\$ 21,000
				Total Annual	\$ 54,000

Money Market	Base	Q1	Q2	Q3	Q4
Balance	\$ 4,000,000	\$ 4,000,000	\$ 4,000,000	\$ 4,000,000	\$ 4,000,000
Rate	0.10%	1.10%	2.10%	2.10%	2.10%
Interest Exp.	\$ 1,000	\$ 11,000	\$ 21,000	\$ 21,000	\$ 21,000
				Total Annual	\$ 75,000

Cash Flow and Re-Pricing Deposits

Amortization and Repricing

Input Schedule

Sources of Funds

	Balance	Maturity	Shock %
Regular Shares	\$14,171,540	12 Months	65.00%
Share Draft	\$2,331,397	12 Months	0.00%
Money Market	\$0	6 Months	80.00%
Certificates	\$102,029	At Maturity	90.00%
Other	\$1,498,324	6 Months	90.00%
Total	\$18,103,290		

Calculation of Yield Curves

Average Yield on Loans (see page 24)

	Base Yr.	Year 1	Year 2	Year 3	Year 4	Year 5
5% Upshock	5.65%	7.78%	8.83%	9.29%	9.63%	9.94%
4% Upshock	5.65%	7.35%	8.19%	8.56%	8.84%	9.08%
3% Upshock	5.65%	6.93%	7.56%	7.83%	8.04%	8.23%
1% Upshock	5.65%	6.08%	6.29%	6.38%	6.45%	6.51%
-1% Downshock	5.65%	5.23%	5.02%	4.93%	4.86%	4.79%

Average Yield on Investments (see page 24)

	Base Yr.	Year 1	Year 2	Year 3	Year 4	Year 5
5% Upshock	1.28%	2.82%	3.91%	4.42%	5.03%	5.84%
4% Upshock	1.28%	2.51%	3.38%	3.79%	4.28%	4.93%
3% Upshock	1.28%	2.20%	2.86%	3.16%	3.53%	4.02%
1% Upshock	1.28%	1.59%	1.80%	1.91%	2.03%	2.19%
-1% Downshock	1.28%	0.97%	0.75%	0.65%	0.53%	0.37%

Cost of Funds (see page 24)

	Base Yr.	Year 1	Year 2	Year 3	Year 4	Year 5
5% Upshock	0.10%	3.03%	3.03%	3.03%	3.03%	3.03%
4% Upshock	0.10%	2.44%	2.44%	2.44%	2.44%	2.44%
3% Upshock	0.10%	1.86%	1.86%	1.86%	1.86%	1.86%
1% Upshock	0.10%	0.69%	0.69%	0.69%	0.69%	0.69%
-1% Downshock	0.10%	0.03%	0.03%	0.03%	0.03%	0.03%

Calculating Interest Income

Interest income and expense are calculated with the following formulas:

Earning Asset (Loans or Investments) x Yield = Interest Income

Deposit Balances (Shares, Share Draft, etc.) x yield = Interest Expense

Simulation of Income Statement

	Dollars		Change
Interest Income Loans	\$365,080		14.10%
Interest Income Investments	\$230,762		45.11%
Dividend Expense	\$201,472		966.97%
Net Margin	\$394,370		-14.28%
Other Income	\$250,219		10.00%
Operating Expense	\$631,842		2.00%
Net Income	\$12,748		-81.28%
Equity Valuation		6.29%	

3.00% Up shock

	Base Year	Year 1	Year 2	Year 3	Year 4	Year 5
Interest Income Loans	\$437,740	\$473,353	\$528,615	\$577,582	\$613,071	\$634,968
Interest Income Investments	\$425,553	\$494,538	\$595,863	\$681,023	\$741,282	\$809,464
Dividend Expense	\$114,622	\$394,776	\$599,872	\$608,167	\$608,167	\$608,167
Interest on Borrowed Funds	\$0	\$0	\$0	\$0	\$0	\$0
Net Margin	\$748,671	\$573,115	\$524,607	\$650,439	\$746,187	\$836,266
Other Income	\$640,337	\$631,692	\$623,165	\$614,752	\$606,453	\$598,266
Operating Expense	\$1,182,960	\$1,226,138	\$1,270,892	\$1,317,279	\$1,365,360	\$1,415,196
Provision for Loan Loss	\$6,000	\$6,060	\$6,121	\$6,182	\$6,244	\$6,306
Net Income	\$200,048	-\$27,391	-\$129,241	-\$58,271	-\$18,964	\$13,030
Equity Valuation	12.68%	12.60%	12.25%	12.09%	12.03%	12.07%

Simulation of Income Statement

Net Interest Margin

	Base Yr.	Year 1	Year 2	Year 3	Year 4	Year 5
5.00% Upshock	\$ 748,670.76	\$ 451,211.87	\$ 363,692.43	\$ 569,129.11	\$ 728,973.39	\$ 883,246.14
4.00% Upshock	\$ 748,670.76	\$ 512,958.40	\$ 446,056.52	\$ 612,482.61	\$ 740,461.72	\$ 861,621.81
3.00% Upshock	\$ 748,670.76	\$ 573,114.52	\$ 524,606.68	\$ 650,438.59	\$ 746,186.99	\$ 836,265.61
1.00% Upshock	\$ 748,670.76	\$ 691,189.29	\$ 676,429.37	\$ 719,014.71	\$ 750,618.42	\$ 780,302.99
-1.00% Downshock	\$ 748,670.76	\$ 772,500.34	\$ 742,262.80	\$ 697,611.97	\$ 666,806.57	\$ 636,826.09

Net Interest Margin Percent Change

	Base Yr.	Year 1	Year 2	Year 3	Year 4	Year 5
5.00% Upshock	0.00%	-39.73%	-51.42%	-23.98%	-2.63%	17.98%
4.00% Upshock	0.00%	-31.48%	-40.42%	-18.19%	-1.10%	15.09%
3.00% Upshock	0.00%	-23.45%	-29.93%	-13.12%	-0.33%	11.70%
1.00% Upshock	0.00%	-7.68%	-9.65%	-3.96%	0.26%	4.23%
-1.00% Downshock	0.00%	3.18%	-0.86%	-6.82%	-10.93%	-14.94%

Net Interest Income at Risk

Equity Valuation

	Base Yr.	Year 1	Year 2	Year 3	Year 4	Year 5
5.00% Upshock	12.68%	12.27%	11.47%	11.09%	10.99%	11.15%
4.00% Upshock	12.68%	12.44%	11.87%	11.60%	11.53%	11.64%
3.00% Upshock	12.68%	12.60%	12.25%	12.09%	12.03%	12.07%
1.00% Upshock	12.68%	12.93%	12.99%	13.02%	12.98%	12.86%
-1.00% Downshock	12.68%	13.15%	13.39%	13.36%	13.09%	12.58%

Equity at Risk

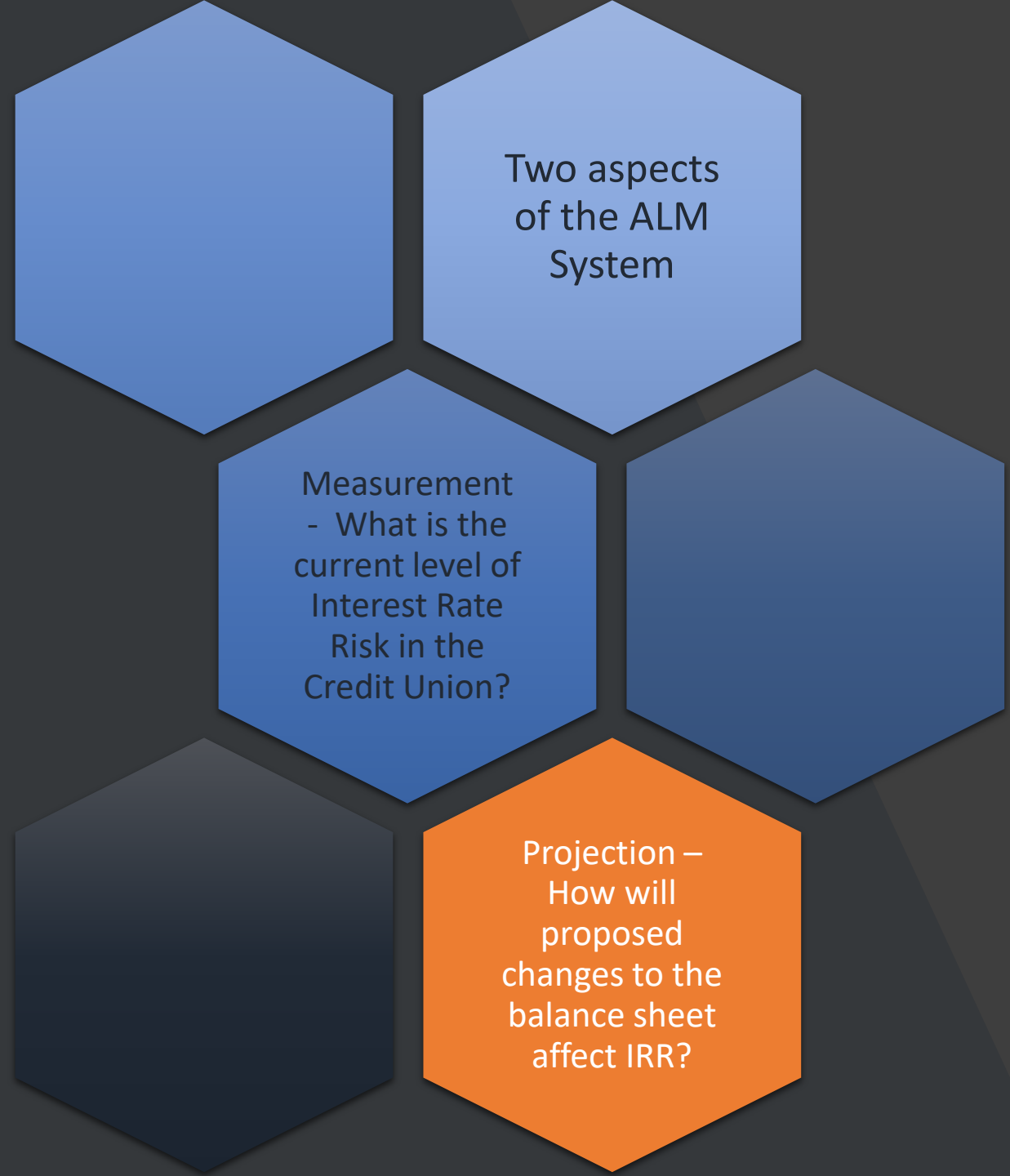
	Base Yr.	Year 1	Year 2	Year 3	Year 4	Year 5
5.00% Upshock	0.00%	-3.23%	-9.52%	-12.54%	-13.33%	-12.03%
4.00% Upshock	0.00%	-1.90%	-6.40%	-8.48%	-9.02%	-8.19%
3.00% Upshock	0.00%	-0.59%	-3.39%	-4.66%	-5.07%	-4.78%
1.00% Upshock	0.00%	1.96%	2.45%	2.68%	2.36%	1.43%
-1.00% Downshock	0.00%	3.73%	5.64%	5.40%	3.27%	-0.77%

Equity at Risk

Calculation of Equity Valuation

	5% Upshock	4% Upshock	3% Upshock	1% Upshock	-1% Downshock
Base Year Equity	\$ 1,201,679	\$ 1,201,679	\$ 1,201,679	\$ 1,201,679	\$ 1,201,679
Year 1 Profit/Loss	\$ (31,068)	\$ (9,160)	\$ 12,748	\$ 56,563	\$ 53,186
Year 1 Equity	\$ 1,170,611	\$ 1,192,519	\$ 1,214,427	\$ 1,258,242	\$ 1,254,866
Year 2 Profit/Loss	\$ (3,191)	\$ 15,619	\$ 34,428	\$ 72,047	\$ 17,900
Year 2 Equity	\$ 1,167,420	\$ 1,208,138	\$ 1,248,855	\$ 1,330,289	\$ 1,272,765
Year 3 Profit/Loss	\$ 140,189	\$ 133,249	\$ 126,310	\$ 112,430	\$ 6,785
Year 3 Equity	\$ 1,307,609	\$ 1,341,387	\$ 1,375,164	\$ 1,442,720	\$ 1,279,550
Year 4 Profit/Loss	\$ 248,964	\$ 223,695	\$ 198,427	\$ 147,889	\$ 5,585
Year 4 Equity	\$ 1,556,574	\$ 1,565,082	\$ 1,573,591	\$ 1,590,609	\$ 1,285,135
Year 5 Profit/Loss	\$ 379,110	\$ 331,791	\$ 284,471	\$ 189,833	\$ 3,428
Year 5 Equity	\$ 1,935,683	\$ 1,896,873	\$ 1,858,063	\$ 1,780,442	\$ 1,288,564
Cumulative Equity Change	\$ 734,004	\$ 695,194	\$ 656,383	\$ 578,762	\$ 86,885
Equity Ratio	5% Upshock	4% Upshock	3% Upshock	1% Upshock	-1% Downshock
Base Year	6.23%	6.23%	6.23%	6.23%	6.23%
Year 1	6.07%	6.18%	6.29%	6.52%	6.50%
Year 2	6.05%	6.26%	6.47%	6.89%	6.60%
Year 3	6.78%	6.95%	7.13%	7.48%	6.63%
Year 4	8.07%	8.11%	8.16%	8.24%	6.66%
Year 5	10.03%	9.83%	9.63%	9.23%	6.68%

Applying the System to Operations



Guidance Letter 12-CU-11 August 2012

Frequently Asked Questions

What should the policy include?

A written policy should:

- Identify parties responsible for review of the credit unions IRR exposure.
- Direct appropriate actions to ensure management identifies, measures, monitors, and controls IRR exposure.
- State the frequency with which monitoring and measurement will be reported to the board.
- Set risk limits for IRR exposure based on selected measurement. (for example GAP, NII or NEV)
- Choose tests such as interest rate shocks, that the credit union will perform using the selected measures.
- Provide for periodic review of material changes in IRR exposure and compliance with board approved policy and risk limits.
- **Provide for assessment of the IRR impact of any new business activities PRIOR TO IMPLEMENTATION.**
- Provide for an annual review of policy to ensure it is commensurate with size, complexity and risk profile of the credit union.
- When appropriate, establish monitoring limits for individual portfolios, activities, and lines of business.



Projections Using the IRR System

- With the Base Case IRR measured we can now simulate changes to aspects of the balance sheet and project the effect on IRR.
- Balance Sheet Adjustments
- Loans
 - Increases, decrease, mix, term, yield
- Deposits
 - Increase, decrease, mix, term, rate
- Investments
 - Ladder, increase, decrease, yield
- Operating expenses
- Non-Interest Income

Projections Using IRR Simulations

Examples:

- 1. Adding a \$450,000, 30 year mortgage loan
- 2. Adding \$2,000,000 in 15 year fixed rate 1st mortgages
- 3. Extending the investment ladder to move \$5,000,000 into 7-10 year maturities.
- 4. Decreasing deposits by running off \$1,500,000 in IRA deposits



Projections Using IRR Simulations

Steps

Identify the change(s) you contemplate making

Identify the impacted areas in the balance sheet

Input the changes

Run the model

Read and compare the IRR indicators (NII at Risk & Equity at Risk)

Input data into the Liquidity Shock Test

Compute the liquidity measures

Make decision on the advisability of the change(s)

Loan Breakout	Base Year Balance	Amort. %	Amort/Mo	Amort/Qtr	Year 1	Year 2	Year 3	Year 4	Year 5	No Change
Share Secured	\$118,011	6.67%	\$7,867	\$23,602	\$94,409	\$23,602	\$0	\$0	\$0	\$0
Certificate Secured	\$6,813	3.85%	\$262	\$786	\$3,144	\$3,144	\$524	\$0	\$0	\$0
Vehicles	\$882,779	2.70%	\$23,859	\$71,577	\$286,307	\$286,307	\$286,307	\$23,859	\$0	\$0
Non-Prime Vehicle Loans	\$504,757	0.00%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$504,757
Lines of Credit	\$130,459	5.26%	\$6,866	\$20,599	\$82,395	\$48,064	\$0	\$0	\$0	\$0
Unsecured	\$130,122	2.86%	\$3,718	\$11,153	\$44,613	\$44,613	\$40,895	\$0	\$0	\$0
Student Member	\$5,317	1.72%	\$92	\$275	\$1,100	\$1,100	\$1,100	\$1,100	\$917	\$0
VISA	\$647,680	4.55%	\$29,440	\$88,320	\$353,280	\$294,400	\$0	\$0	\$0	\$0
1st Mortgages Fixed	\$2,114,258	1.12%	\$23,756	\$71,267	\$285,068	\$285,068	\$285,068	\$285,068	\$285,068	\$688,916
1st Mortgages Variable	\$572,542	8.33%	\$47,712	\$143,136	\$572,542	\$0	\$0	\$0	\$0	\$0
1st Mortgages 15 Year	\$248,113	1.37%	\$3,399	\$10,196	\$40,786	\$40,786	\$40,786	\$40,786	\$40,786	\$44,185
2nd Mortgages Fixed	\$88,995	1.75%	\$1,561	\$4,684	\$18,736	\$18,736	\$18,736	\$18,736	\$14,052	\$0
Home Equity VISA	\$539,919	2.86%	\$15,426	\$46,279	\$185,115	\$185,115	\$169,689	\$0	\$0	\$0
Commercial Member Business	\$2,713,939	1.64%	\$44,491	\$133,472	\$533,890	\$533,890	\$533,890	\$533,890	\$533,890	\$44,491
Business Participation Loans	\$2,113,539	1.59%	\$33,548	\$100,645	\$402,579	\$402,579	\$402,579	\$402,579	\$402,579	\$100,645
Real Estate Participation Loans	\$3,328,585	1.27%	\$42,134	\$126,402	\$505,608	\$505,608	\$505,608	\$505,608	\$505,608	\$800,546
Student Participation Loans	\$1,346,364	1.69%	\$22,820	\$68,459	\$273,837	\$273,837	\$273,837	\$273,837	\$251,017	\$0
Total Loans	\$15,492,192				\$3,683,409	\$2,946,849	\$2,559,018	\$2,085,462	\$2,033,916	\$2,183,538

Base Case Stepped Shock

Simulation with Projected Loans

Loans											
	Base Year Balance	Amort. %	Amort/Mo	Amort/Qtr		Year 1	Year 2	Year 3	Year 4	Year 5	No Change
Share Secured	\$118,011	6.67%	\$7,867	\$23,602		\$94,409	\$23,602	\$0	\$0	\$0	\$0
Certificate Secured	\$6,813	3.85%	\$262	\$786		\$3,144	\$3,144	\$524	\$0	\$0	\$0
Vehicles	\$882,779	2.70%	\$23,859	\$71,577		\$286,307	\$286,307	\$286,307	\$23,859	\$0	\$0
Non-Prime Vehicle Loans	\$504,757	2.56%	\$12,942	\$38,827		\$155,310	\$155,310	\$155,310	\$38,827	\$0	\$0
Lines of Credit	\$130,459	5.26%	\$6,866	\$20,599		\$82,395	\$48,064	\$0	\$0	\$0	\$0
Unsecured	\$130,122	2.86%	\$3,718	\$11,153		\$44,613	\$44,613	\$40,895	\$0	\$0	\$0
Student Member	\$5,317	1.72%	\$92	\$275		\$1,100	\$1,100	\$1,100	\$1,100	\$917	\$0
VISA	\$647,680	4.55%	\$29,440	\$88,320		\$353,280	\$294,400	\$0	\$0	\$0	\$0
1st Mortgages Fixed	\$2,114,258	1.12%	\$23,756	\$71,267		\$285,068	\$285,068	\$285,068	\$285,068	\$285,068	\$688,916
1st Mortgages Variable	\$572,542	8.33%	\$47,712	\$143,136		\$572,542	\$0	\$0	\$0	\$0	\$0
1st Mortgages 15 Year	\$248,113	1.37%	\$3,399	\$10,196		\$40,786	\$40,786	\$40,786	\$40,786	\$40,786	\$44,185
2nd Mortgages Fixed	\$88,995	1.75%	\$1,561	\$4,684		\$18,736	\$18,736	\$18,736	\$18,736	\$14,052	\$0
Home Equity VISA	\$539,919	2.86%	\$15,426	\$46,279		\$185,115	\$185,115	\$169,689	\$0	\$0	\$0
Commercial Member Business	\$2,713,939	1.64%	\$44,491	\$133,472		\$533,890	\$533,890	\$533,890	\$533,890	\$533,890	\$44,491
Business Participation Loans	\$2,113,539	1.59%	\$33,548	\$100,645		\$402,579	\$402,579	\$402,579	\$402,579	\$402,579	\$100,645
Real Estate Participation Loans	\$3,328,585	1.27%	\$42,134	\$126,402		\$505,608	\$505,608	\$505,608	\$505,608	\$505,608	\$800,546
Student Participation Loans	\$1,346,364	1.69%	\$22,820	\$68,459		\$273,837	\$273,837	\$273,837	\$273,837	\$251,017	\$0
Participation Owner Portion	\$100,000	2.56%	\$2,564	\$7,692		\$30,769	\$30,769	\$30,769	\$7,692	\$0	\$0
Non-Prime Vehicle Loans	\$500,000	2.56%	\$12,821	\$38,462		\$153,846	\$153,846	\$153,846	\$38,462	\$0	\$0
Loan Participation Pool	\$1,000,000	2.33%	\$23,256	\$69,767		\$279,070	\$279,070	\$279,070	\$162,791	\$0	\$0
Total Loans	\$17,092,192					\$4,302,404	\$3,565,844	\$3,178,013	\$2,333,234	\$2,033,916	\$1,678,781

Net Interest Margin (See pages 8-17)

	Base Yr.	Year 1	Year 2	Year 3	Year 4	Year 5
5.00% Upshock	\$ 1,267,435.75	\$ 1,059,739.68	\$ 1,041,824.65	\$ 1,192,152.59	\$ 1,384,733.37	\$ 1,583,367.99
4.00% Upshock	\$ 1,267,435.75	\$ 1,105,839.10	\$ 1,096,964.95	\$ 1,221,445.90	\$ 1,378,449.58	\$ 1,536,629.86
3.00% Upshock	\$ 1,267,435.75	\$ 1,148,721.95	\$ 1,145,028.38	\$ 1,240,695.73	\$ 1,359,636.16	\$ 1,478,138.21
1.00% Upshock	\$ 1,267,435.75	\$ 1,229,567.92	\$ 1,231,113.50	\$ 1,265,070.15	\$ 1,304,999.58	\$ 1,345,103.77
-1.00% Downshock	\$ 1,267,435.75	\$ 1,220,028.44	\$ 1,169,559.25	\$ 1,130,566.98	\$ 1,090,846.64	\$ 1,050,080.10

Interest Margin Percent Change (See pages 8-17)

	Base Yr.	Year 1	Year 2	Year 3	Year 4	Year 5
5.00% Upshock	0.00%	-16.39%	-17.80%	-5.94%	9.25%	24.93%
4.00% Upshock	0.00%	-12.75%	-13.45%	-3.63%	8.76%	21.24%
3.00% Upshock	0.00%	-9.37%	-9.66%	-2.11%	7.27%	16.62%
1.00% Upshock	0.00%	-2.99%	-2.87%	-0.19%	2.96%	6.13%
-1.00% Downshock	0.00%	-3.74%	-7.72%	-10.80%	-13.93%	-17.15%

Simulation 1 NII Output

Loans

	Base Year Balance	Amort. %	Amort/Mo	Amort/Qtr	Year 1	Year 2	Year 3	Year 4	Year 5	No Change
Share Secured	\$118,011	6.67%	\$7,867	\$23,602	\$94,409	\$23,602	\$0	\$0	\$0	\$0
Certificate Secured	\$6,813	3.85%	\$262	\$786	\$3,144	\$3,144	\$524	\$0	\$0	\$0
Vehicles	\$882,779	2.70%	\$23,859	\$71,577	\$286,307	\$286,307	\$286,307	\$23,859	\$0	\$0
Non-Prime Vehicle Loans	\$504,757	2.56%	\$12,942	\$38,827	\$155,310	\$155,310	\$155,310	\$38,827	\$0	\$0
Lines of Credit	\$130,459	5.26%	\$6,866	\$20,599	\$82,395	\$48,064	\$0	\$0	\$0	\$0
Unsecured	\$130,122	2.86%	\$3,718	\$11,153	\$44,613	\$44,613	\$40,895	\$0	\$0	\$0
Student Member	\$5,317	1.72%	\$92	\$275	\$1,100	\$1,100	\$1,100	\$1,100	\$917	\$0
VISA	\$647,680	4.55%	\$29,440	\$88,320	\$353,280	\$294,400	\$0	\$0	\$0	\$0
1st Mortgages Fixed	\$2,114,258	1.12%	\$23,756	\$71,267	\$285,068	\$285,068	\$285,068	\$285,068	\$285,068	\$688,916
1st Mortgages Variable	\$572,542	8.33%	\$47,712	\$143,136	\$572,542	\$0	\$0	\$0	\$0	\$0
1st Mortgages 15 Year	\$248,113	1.37%	\$3,399	\$10,196	\$40,786	\$40,786	\$40,786	\$40,786	\$40,786	\$44,185
2nd Mortgages Fixed	\$88,995	1.75%	\$1,561	\$4,684	\$18,736	\$18,736	\$18,736	\$18,736	\$14,052	\$0
Home Equity VISA	\$539,919	2.86%	\$15,426	\$46,279	\$185,115	\$185,115	\$169,689	\$0	\$0	\$0
Commercial Member Business	\$2,713,939	1.64%	\$44,491	\$133,472	\$533,890	\$533,890	\$533,890	\$533,890	\$533,890	\$44,491
Business Participation Loans	\$2,113,539	1.59%	\$33,548	\$100,645	\$402,579	\$402,579	\$402,579	\$402,579	\$402,579	\$100,645
Real Estate Participation Loans	\$3,328,585	1.27%	\$42,134	\$126,402	\$505,608	\$505,608	\$505,608	\$505,608	\$505,608	\$800,546
Student Participation Loans	\$1,346,364	1.69%	\$22,820	\$68,459	\$273,837	\$273,837	\$273,837	\$273,837	\$251,017	\$0
Participation Owner Portion	\$100,000	2.56%	\$2,564	\$7,692	\$30,769	\$30,769	\$30,769	\$7,692	\$0	\$0
Non-Prime Vehicle Loans	\$500,000	2.56%	\$12,821	\$38,462	\$153,846	\$153,846	\$153,846	\$38,462	\$0	\$0
Loan Participation Pool	\$1,000,000	2.33%	\$23,256	\$69,767	\$279,070	\$279,070	\$279,070	\$162,791	\$0	\$0
1st Mortgage Fixed	\$5,000,000	0.44%	\$21,834	\$65,502	\$262,009	\$262,009	\$262,009	\$262,009	\$262,009	\$3,689,956
Total Loans	\$22,092,192				\$4,564,412	\$3,827,852	\$3,440,022	\$2,595,243	\$2,295,925	\$5,368,738

Simulation 2 with Mortgage Loans

Net Interest Margin (See pages 8-17)

	Base Yr.	Year 1	Year 2	Year 3	Year 4	Year 5
5.00% Upshock	\$ 1,513,089.38	\$ 1,283,039.44	\$ 1,238,531.29	\$ 1,382,703.43	\$ 1,535,048.34	\$ 1,666,261.84
4.00% Upshock	\$ 1,513,089.38	\$ 1,333,887.34	\$ 1,304,183.02	\$ 1,424,183.68	\$ 1,549,442.99	\$ 1,654,130.70
3.00% Upshock	\$ 1,513,089.38	\$ 1,381,322.79	\$ 1,362,248.60	\$ 1,454,797.72	\$ 1,550,171.88	\$ 1,628,796.52
1.00% Upshock	\$ 1,513,089.38	\$ 1,470,998.38	\$ 1,467,621.50	\$ 1,500,743.15	\$ 1,533,021.57	\$ 1,560,037.70
-1.00% Downshock	\$ 1,513,089.38	\$ 1,469,734.29	\$ 1,423,914.04	\$ 1,385,483.24	\$ 1,353,140.39	\$ 1,325,188.39

Interest Margin Percent Change (See pages 8-17)

	Base Yr.	Year 1	Year 2	Year 3	Year 4	Year 5
5.00% Upshock	0.00%	-15.20%	-18.15%	-8.62%	1.45%	10.12%
4.00% Upshock	0.00%	-11.84%	-13.81%	-5.88%	2.40%	9.32%
3.00% Upshock	0.00%	-8.71%	-9.97%	-3.85%	2.45%	7.65%
1.00% Upshock	0.00%	-2.78%	-3.00%	-0.82%	1.32%	3.10%
-1.00% Downshock	0.00%	-2.87%	-5.89%	-8.43%	-10.57%	-12.42%

Simulation 2 NII Output

Three Questions for IRR Management

In order to comply with NCUA regulations on IRR you need to be able to answer affirmatively to three key questions.

Do you currently use an independently validated IRR measurement system?

Do you and your Board understand how the system works?

Do you consistently apply the system in the ongoing operation of the credit union?



FOR MORE INFORMATION OR TO SCHEDULE A DEMO

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