

# What is IRR and how does it affect your Credit Union?

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ACUIA ANNUAL MEETING  
TCT RISK SOLUTIONS



## Defining Risk

### What is Risk?

- Possibility of incurring loss
- Vulnerability to a negative outcome

# Defining Risk

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## 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.

1

Do you currently use an independently validated IRR measurement system?

2

Do you and your Board understand how the system works?

3

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

# What is IRR and why does it matter?

Interest Rate Risk is the risk to earnings and capital arising from movement of interest rates.

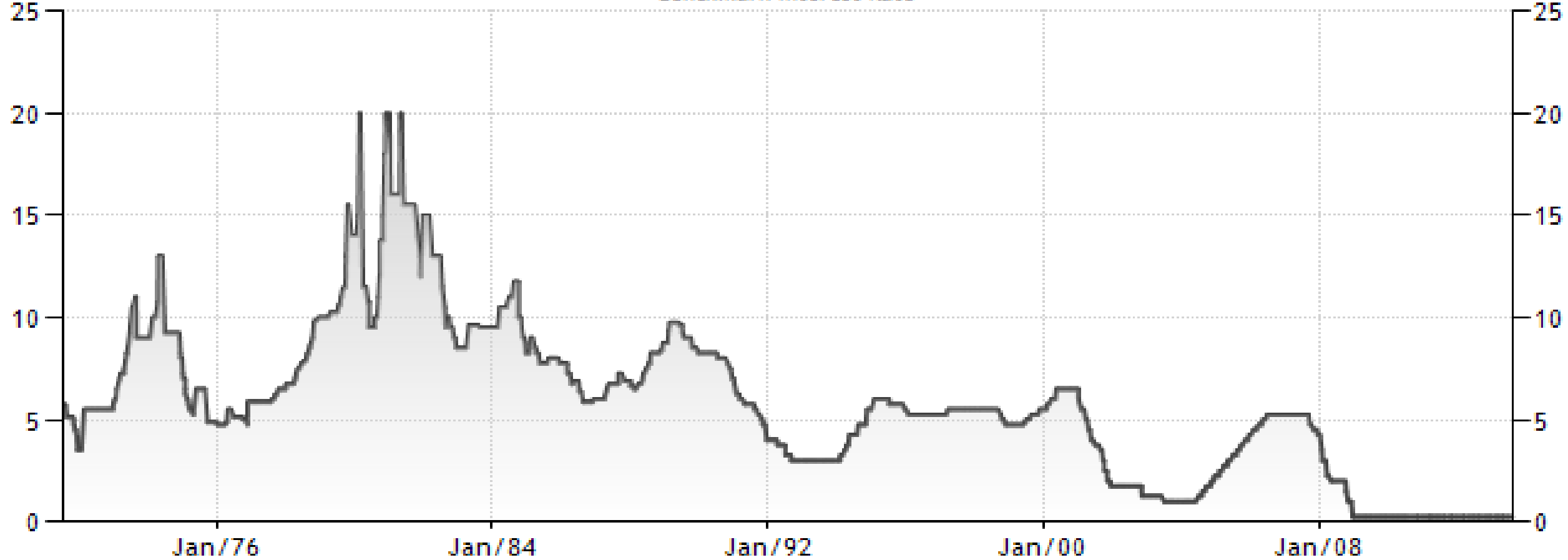
It arises from the differences between the timing of rate changes and the timing of cash flows.

The primary issue driving interest rate risk is long-term loans.

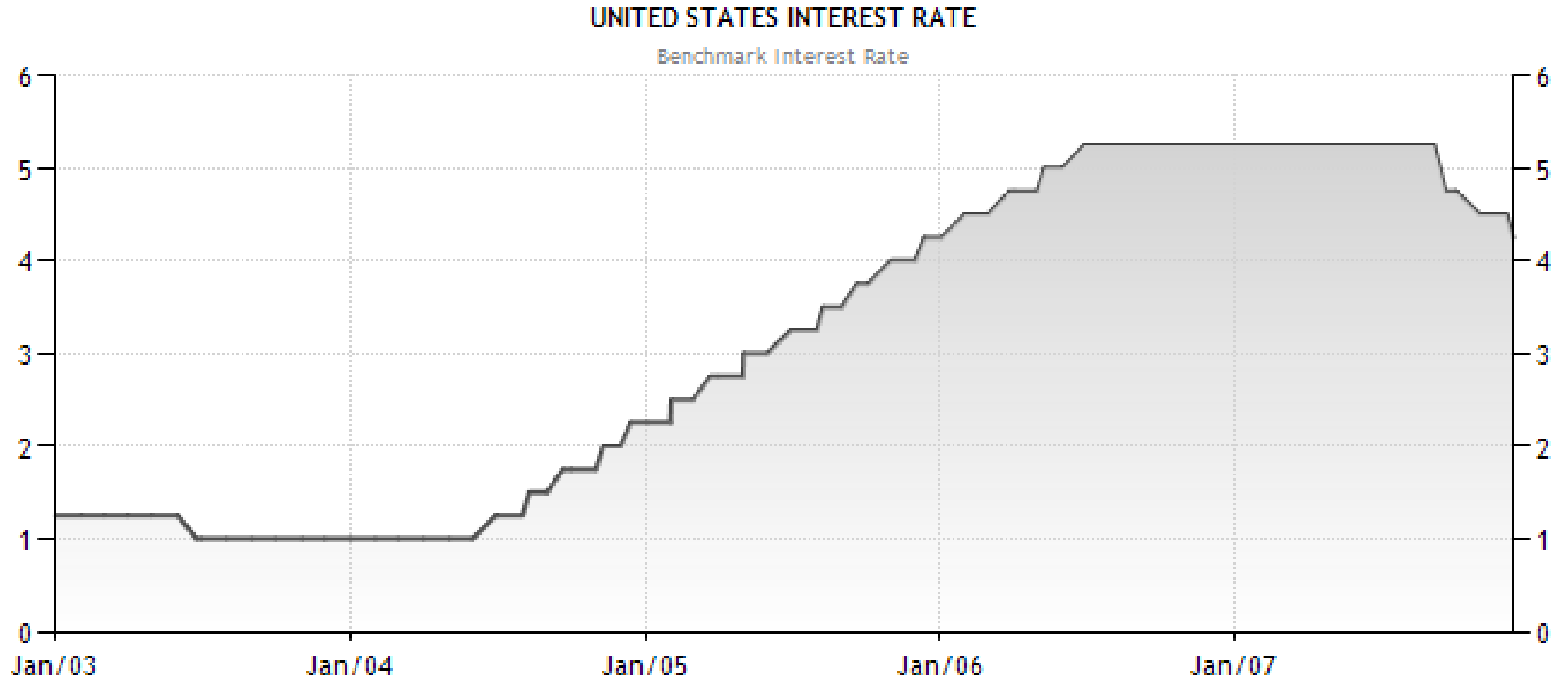
# Interest Rates – Historical Perspective

## UNITED STATES INTEREST RATE

Benchmark Interest Rate



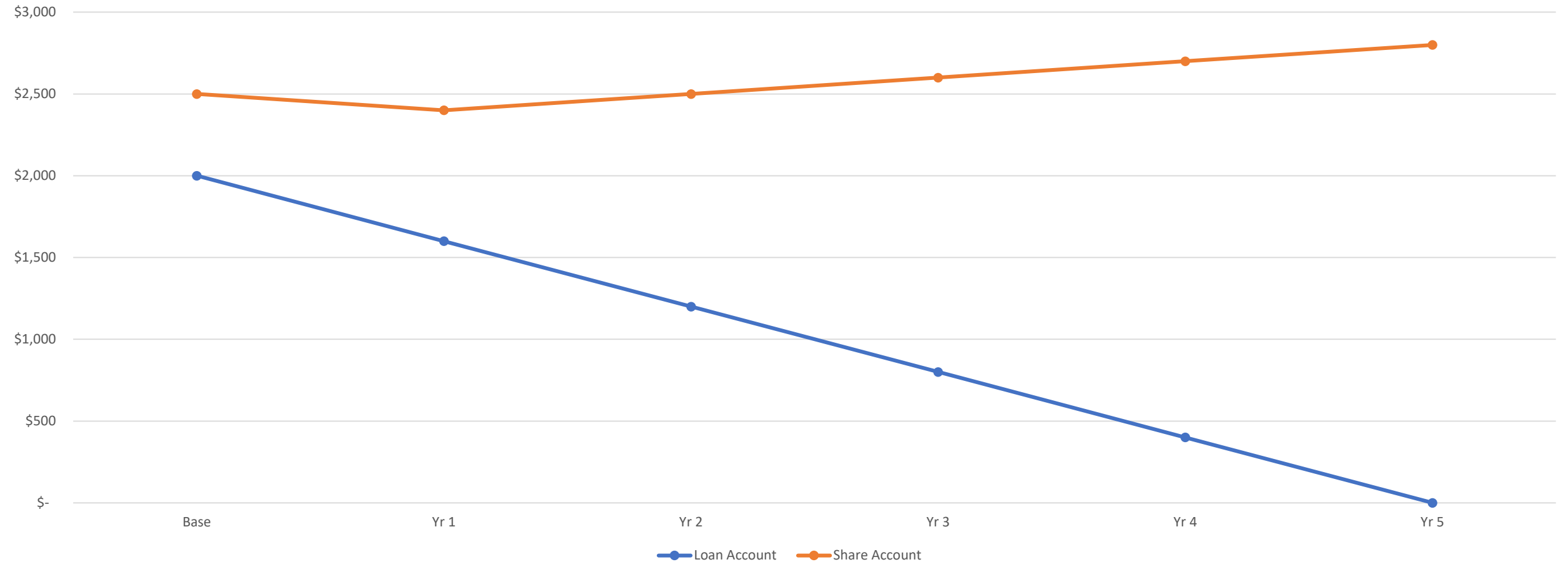
# Interest Rates – Historical Perspective





# Measurement Models

Comparative Cash Flows





# What is **IRR** and why does it matter?

Consider a credit union with these balances and yields

Loans -	\$20,000,000	Loan Yield	5.50%
Investments -	\$15,000,000	Investment Yield	1.00%
Deposits -	\$36,500,000	Cost of Funds	0.30%

Most Recent Quarter Interest Income and Margin (NII) would be:

Loan Yield	5.50%
Invest Yield	1.00%
Cost of Funds	0.30%
Loan Income	\$ 275,000
Invest Income	\$ 37,500
Dividends	\$ 27,375
<b>NII</b>	<b>\$ 285,125</b>

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

Simple  
example  
of one loan

Rate  
2.99%

Balance  
\$10,000

Term  
5 Years

Cash Flows  
And  
Re-Pricing  
Loans

# 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
<b>Original Loan</b>	<b>\$ 10,000</b>	<b>\$ 8,000</b>	<b>\$ 6,000</b>	<b>\$ 4,000</b>	<b>\$ 2,000</b>	<b>\$ -</b>
Original Rate	2.99%	2.99%	2.99%	2.99%	2.99%	2.99%
Income	\$ 299	\$ 239	\$ 179	\$ 120	\$ 60	\$ -
<b>New Loan</b>	<b>\$ -</b>	<b>\$ 2,000</b>	<b>\$ 4,000</b>	<b>\$ 6,000</b>	<b>\$ 8,000</b>	<b>\$ 10,000</b>
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%

Simple  
example  
of one loan

Rate  
2.99%

Cash Flows  
And  
Re-Pricing  
Loans

Balance  
\$10,000

Term  
30 Years

# Cash Flows and Re-Pricing Loans

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

	Base	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Original Loan</b>	<b>\$ 10,000</b>	<b>\$ 9,972</b>	<b>\$ 9,944</b>	<b>\$ 9,916</b>	<b>\$ 9,888</b>	<b>\$ 9,860</b>
Rate	2.99%	2.99%	2.99%	2.99%	2.99%	2.99%
Income	\$ 299	\$ 298	\$ 297	\$ 296	\$ 296	\$ 295
<b>New Loan</b>	<b>\$ -</b>	<b>\$ 333</b>	<b>\$ 672</b>	<b>\$ 1,008</b>	<b>\$ 1,344</b>	<b>\$ 1,680</b>
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
<b>NEW AUTO</b>	\$448,624	3.57%	\$16,022	\$48,067	\$192,268	\$192,268	\$64,089	\$0	\$0	\$0
<b>USED AUTO</b>	\$675,115	3.85%	\$25,966	\$77,898	\$311,592	\$311,592	\$51,932	\$0	\$0	\$0
<b>RV'S</b>	\$209,437	1.92%	\$4,028	\$12,083	\$48,332	\$48,332	\$48,332	\$48,332	\$16,111	\$0
<b>WATERCRAFT</b>	\$42,080	2.13%	\$895	\$2,686	\$10,744	\$10,744	\$10,744	\$9,849	\$0	\$0
<b>MOTORCYCLES</b>	\$100,935	3.70%	\$3,738	\$11,215	\$44,860	\$44,860	\$11,215	\$0	\$0	\$0
<b>IHOME EQUITY</b>	\$1,282,805	7.69%	\$98,677	\$296,032	\$1,184,127	\$98,677	\$0	\$0	\$0	\$0
<b>FIRST MORTGAGES</b>	\$2,469,356	1.12%	\$27,746	\$83,237	\$332,947	\$332,947	\$332,947	\$332,947	\$332,947	\$804,621
<b>UNSECURED</b>	\$291,338	4.35%	\$12,667	\$38,001	\$152,003	\$139,336	\$0	\$0	\$0	\$0
<b>SHARE SECURE</b>	\$140,803	7.69%	\$10,831	\$32,493	\$129,972	\$10,831	\$0	\$0	\$0	\$0
<b>Total</b>	<b>\$5,660,493</b>				<b>\$2,406,843</b>	<b>\$1,189,585</b>	<b>\$519,258</b>	<b>\$391,127</b>	<b>\$349,057</b>	<b>\$804,621</b>



# 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
<b>Loan Yield</b>	5.50%	5.55%	5.60%	5.65%	5.70%
<b>Invest Yield</b>	1.00%	1.20%	1.40%	1.60%	1.80%
<b>Cost of Funds</b>	0.30%	0.80%	1.30%	1.80%	2.30%
<b>Loan Income</b>	\$ 275,000	\$ 277,500	\$ 280,000	\$ 282,500	\$ 285,000
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# Cash Flows and Re-Pricing Deposits

	Base	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Original Investments</b>	\$ 500,000	\$ 400,000	\$ 300,000	\$ 200,000	\$ 100,000	\$ -
<b>Rate</b>	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%
<b>Income</b>	\$ 4,500	\$ 3,600	\$ 2,700	\$ 1,800	\$ 900	\$ -
<b>New Investments</b>	\$ -	\$ 100,000	\$ 200,000	\$ 300,000	\$ 400,000	\$ 500,000
<b>Rate</b>	0.00%	2.90%	2.90%	2.90%	2.90%	2.90%
<b>New Income</b>	\$ -	\$ 2,900	\$ 5,800	\$ 8,700	\$ 11,600	\$ 14,500
<b>Total Income</b>	\$ 4,500	\$ 6,500	\$ 8,500	\$ 10,500	\$ 12,500	\$ 14,500
<b>Average Rate</b>	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
<b>1-12 Months</b>	\$3,826,000	\$3,826,000	\$0	\$0	\$0	\$0	\$0
<b>13-24 Months</b>	\$2,702,000	\$0	\$2,702,000	\$0	\$0	\$0	\$0
<b>25-36 Months</b>	\$1,269,000	\$0	\$0	\$1,269,000	\$0	\$0	\$0
<b>37-48 Months</b>	\$1,538,000	\$0	\$0	\$0	\$1,538,000	\$0	\$0
<b>49-60 Months</b>	\$2,014,000	\$0	\$0	\$0	\$0	\$2,014,000	\$0
<b>Total</b>	<b>\$12,429,000</b>	<b>\$3,826,000</b>	<b>\$2,702,000</b>	<b>\$1,269,000</b>	<b>\$1,538,000</b>	<b>\$2,014,000</b>	<b>\$1,080,000</b>

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# Cash Flows and Re-Pricing Deposits

Regular Share	Base	Q1	Q2	Q3	Q4
<b>Balance</b>	\$ 4,000,000	\$ 4,000,000	\$ 4,000,000	\$ 4,000,000	\$ 4,000,000
<b>Rate</b>	0.10%	0.60%	1.10%	1.60%	2.10%
<b>Interest Exp.</b>	\$ 1,000	\$ 6,000	\$ 11,000	\$ 16,000	\$ 21,000
				<b>Total Annual</b>	<b>\$ 54,000</b>
Money Market	Base	Q1	Q2	Q3	Q4
<b>Balance</b>	\$ 4,000,000	\$ 4,000,000	\$ 4,000,000	\$ 4,000,000	\$ 4,000,000
<b>Rate</b>	0.10%	1.10%	2.10%	2.10%	2.10%
<b>Interest Exp.</b>	\$ 1,000	\$ 11,000	\$ 21,000	\$ 21,000	\$ 21,000
				<b>Total Annual</b>	<b>\$ 75,000</b>

# Amortization and Repricing

## Input Schedule

### Sources of Funds

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



# Examples of Shock Application

Consider a  
3% up-shock

65% x 3%

1.95%

70% x 3%

2.10%

75% x 3%

2.25%

80% x 3%

2.40%

85% x 3%

2.55%

90% x 3%

2.70%



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# Content Review - Think/Pair/Share

- **THINK** about and answer the following questions:
  - On the following slide, how did the loan yield change over the 4 quarters? What about the investment yield? Cost of funds?
  - Of the 3, which changed the most? And how much did it change, as a percent and a dollar amount?
  - What was the bottom line effect on net interest income?
  - Contrast the principal reduction and average rate on a 5 year loan versus a 30 year loan, on the last slide.
  - What are the two factors that impact the way we reprice deposits?
- Discuss answers as **PAIRS** and then **SHARE** as a whole group.

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FOR MORE INFORMATION OR TO SCHEDULE A DEMO

Contact Donna Jensen

[djensen@tctrisk.com](mailto:djensen@tctrisk.com)

[tctrisk.com](http://tctrisk.com)

208.939.8366