OBJECTIVE

Provide useful and actionable knowledge
TODAY’S AGENDA

• Define an ideal Interest Rate Risk (IRR) tool
• GAP analysis
• Income Simulation

MOST MODELS AND GUIDANCE

• Written for large financial institutions
• Might not be realistic for this audience
AN IDEAL SYSTEM

Suitable for your credit union:

- Complexity
- Size
- Balance sheet makeup

AN IDEAL SYSTEM (CON’T)

A quantified estimate of IRR:

- Reasonable
- Supportable
Meaningful Metrics:
- Future net interest income
- Future net income
- Economic value (Webinar Oct 28th)

Captures all of the meaningful components which impact IRR
AN IDEAL SYSTEM (CON’T)

Focuses and reports on what is really important to the user:

• Comprehensive analysis
• Executive summary
• Summary or dashboard

AN IDEAL SYSTEM (CON’T)

Actionable
DEPENDENCY ON ASSUMPTIONS

• Models are totally dependent on the assumptions which you enter

• Almost any outcome can be achieved by manipulating the assumptions

REPRICING OPTIONALITY

• Loans (Installment) – prepayments & extensions

• Investments – calls by issuer, redemption by the owner

• Deposits – betas, lags, decay & early CD redemptions (Webinar Oct 21st)

• Off Balance Sheet – whatever
**GAP ANALYSIS DEFINITION**

The concept that compares asset amounts repricing in a specified timeframe and liabilities that reprice in the same timeframe.

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**POLL QUESTION #1**

(Note: If you are seeking CPE credit, it is important that you participate in the polls.)
### GAP ANALYSIS (CON’T)

#### Three Year Static Gap Analysis (300 basis point up)

<table>
<thead>
<tr>
<th>Balance Date</th>
<th>First Mortgage loans</th>
<th>Repricing in Year 1</th>
<th>Repricing in Year 2</th>
<th>Repricing in Year 3</th>
<th>Total Repriced</th>
<th>Total Not Repriced</th>
</tr>
</thead>
<tbody>
<tr>
<td>(000)</td>
<td>1,284</td>
<td>125</td>
<td>148</td>
<td>152</td>
<td>422</td>
<td>832</td>
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<td>1,334</td>
<td>512</td>
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<td>511</td>
<td>1,534</td>
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<td>2,513</td>
<td>517</td>
<td>642</td>
<td>741</td>
<td>1,900</td>
<td>615</td>
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<td></td>
<td>1,392</td>
<td>152</td>
<td>182</td>
<td>199</td>
<td>533</td>
<td>659</td>
</tr>
<tr>
<td></td>
<td>587</td>
<td>349</td>
<td>175</td>
<td>63</td>
<td>587</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>489</td>
<td>291</td>
<td>110</td>
<td>88</td>
<td>489</td>
<td>0</td>
</tr>
<tr>
<td>Total Loans</td>
<td>7,569</td>
<td>1,946</td>
<td>1,765</td>
<td>1,754</td>
<td>5,465</td>
<td>2,104</td>
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</table>

| Overnight deposits | 535 | 535 | 0 | 0 | 535 | 0 |
| Investment CDs     | 800 | 800 | 0 | 0 | 800 | 0 |
| Agencies           | 1,535 | 0 | 0 | 0 | 1,535 | 0 |
| Mortgage backed    | 587 | 58 | 63 | 66 | 187 | 400 |
| Total Investments  | 3,457 | 1,933 | 63 | 66 | 1,522 | 1,935 |
| Other Assets       | 534 | 0 | 0 | 0 | 534 | 0 |
| Total Assets       | 11,560 | 3,339 | 1,828 | 1,820 | 6,987 | 4,573 |
| Mise liabilities   | 125 | 0 | 0 | 0 | 125 | 0 |
| Checking accounts  | 1,348 | 0 | 0 | 0 | 1,348 | 0 |
| Regular shares     | 3,354 | 1,118 | 1,118 | 1,118 | 3,354 | 0 |
| Money market       | 1,734 | 1,734 | 0 | 0 | 1,734 | 0 |
| IRAs               | 1,189 | 1,189 | 0 | 0 | 1,189 | 0 |
| Share certificates | 2,323 | 2,323 | 0 | 0 | 2,323 | 0 |
| Total shares       | 11,073 | 6,364 | 1,118 | 1,118 | 8,600 | 1,473 |
| Net worth          | 1,487 | 0 | 0 | 0 | 1,487 | 0 |
| Total Liabilities & Net Worth | 13,560 | 6,364 | 1,118 | 1,118 | 8,600 | 2,900 |

| Static Gap          | (3,025) | 710 | 702 | (1,635) |

### Challenges in GAP analysis:

- Repricing
- Aggregation and disaggregation
- Identifying appropriate time buckets
- Estimating the amount of risk
GAP ANALYSIS (CON’T)

Summary:
• Infers a level of IRR
• Does not use desired metrics
• Straightforward
• Short term
• Probably not what we really need

INCOME SIMULATION
DEFINITION

Income simulation defined objective:
• Identify and estimate sensitivity of future net interest income and net income.
POLL QUESTION #2

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

INCOME SIMULATION

DEFINITION (CON’T)

• Future looking
• Base case vs. alternative future scenarios
• Risk is defined as a percent of base case
• Often referred to as future earnings at risk or EAR
COMPARING SCENARIOS

The base case:
  • Static
  • Dynamic/likely

COMPARING SCENARIOS (CON’T)

The What If’s:
  • Static
  • Dynamic/likely
  • Regulatory
  • One thing at a time
HOW FAR INTO THE FUTURE

Variables:

• Interest rates
• Changes in balance sheet components
• Member behavior

POLL QUESTION #3

(NOTE: IF YOU ARE SEEKING CPE CREDIT, IT IS IMPORTANT THAT YOU PARTICIPATE IN THE POLLS.)
HOW FAR INTO THE FUTURE (CON’T)

• We suggest three years
• You?

MAKING BEST ESTIMATES

Underestimating IRR:
• Lower earnings
• Possible operating losses
• Savings and Loan failure in 1980s
MAKING THE BEST ESTIMATES (CONT)

Overestimating risk:

• Lower earnings unnecessarily
• Lose potential net worth

POLL QUESTION #4

(NOTE: IF YOU ARE SEEKING CPE CREDIT, IT IS IMPORTANT THAT YOU PARTICIPATE IN THE POLLS.)
REPORTING THE RESULTS

Board of Directors:
• IRR process
• Risk limits
• Policy
• Documented
• Summarized analysis

REPORTING THE RESULTS (CON’T)

Asset & Liability Committee (ALCO):
• Pricing
• Competition
• Documented
REPORTING THE RESULTS (CON’T)

CFO & CEO:
• Access to everything

INCOME SIMULATION (CON’T)
COMPARATIVE EXAMPLE SUMMARY

Summary Income Simulation Analysis
Three Years Cumulative

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Benchmark NII</td>
<td>$9,000</td>
</tr>
<tr>
<td>Stressed NII 300 bp</td>
<td>$7,968</td>
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<td>NII at risk</td>
<td>$1,032</td>
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<tr>
<td>% NII at risk</td>
<td>(11%)</td>
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<tr>
<td>Guideline</td>
<td>(15%)</td>
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<tr>
<td>Benchmark net income</td>
<td>$500</td>
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<tr>
<td>Stressed net income</td>
<td>($532)</td>
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</table>
INCOME SIMULATION (CON’T)
COMPARATIVE EXAMPLE 1

Forecasted Net Interest Margin

<table>
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<th>Quart</th>
<th>Benchmark NII</th>
<th>Stressed NII</th>
<th>Guideline</th>
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<tr>
<td>12</td>
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</tbody>
</table>

Forecasted Quarterly Net Income

Net income
Stressed net income
INCOME SIMULATION (CONT’)

SUMMARY

• Ideal characteristics, most
• Desired metrics
• Conceptually straightforward
• Operationally difficult
• Short term
• May be best option

TODAY’S WEBINAR

SUMMARY

• Much of the guidance is too complex
• Ideal system
• GAP compares repricing quantities in a bucket of time, probably not enough
• Income simulations, responsive to most issues, responsive to most issues but short term weakness
• Reporting, appropriate to audience
FALL 2015
MHSI WEBINARS
Absolutely Free—No Obligation

October 21  Noon-1:00 pm (MDT)
The Increasing importance of Deposit Analysis

October 28  Noon-1:00 MDT
Net Economic Value (NEV): Why It’s Important and Why You Should Pay Attention

November 4  Noon-1:00 MST
Know When to Hold ‘em: Utilizing Segmentation Strategies to Manage the Deposit Base

November 10  Noon-1:00 MST
Asset and Liability Management (ALM): In-House or Outsource?

November 24  Noon-1:00 MST
Implementing ALM Policies that are Functional

December 3  Noon-1:00 MST
Organizing and Utilizing an Effective ALCO

Watch for additional webinars for 2016 posted on our Website

THANK YOU!

Who we are:
Mark H. Smith, Inc. has been sharing risk management advice with credit unions for over 30 years. We’ve gained significant insight from working with hundreds of credit unions through multiple rate cycles during that time.

What we do:
☆ We provide ALM and Liquidity Risk Management advice to credit unions through our quarterly ALMPro® service.

☆ We take a common-sense approach to help credit unions prepare for regulators and offer comprehensive client support toward that end.

☆ We offer Third-Party ALM Policy and Process Validation and can provide complete Deposit Analysis services.

Contact us at:  Mark@MarkHSmith.com
or call (800) 268-7795