Interest Rate Risk and Non-Maturity Deposits

Presented by Al Forrester, Co-Founder and CEO
Interest Rates and Sensitivity

The Critical Importance of Modeling Assumptions
Outline

• Sensitivity and the Sources of Risk
• History of Interest Rate Risk Management
• How to Effectively Manage Risk – Six Questions
• The Difference between Planning and Risk Management
• The Importance of Stress Testing
• Unpacking your Risk Profile
• Focusing on Non Maturity Deposits
What is Sensitivity

The degree to which changes in:
• interest rates,
• foreign exchange rates,
• commodity prices, or
• equity prices

can adversely affect a financial institution’s earnings or economic capital.
Primary Sources of Risk

The primary source of market risk arises from the projected cash flows of loans, investments, deposits and borrowings.

In some cases off-balance sheet items are critical.
Critical Considerations

• Management’s ability to identify, measure, monitor, and control market risk;
• The institution’s size; the nature and complexity of its activities; and
• The adequacy of its capital and earnings in relation to its level of market risk exposure.
How the Regulators Classify You

<table>
<thead>
<tr>
<th>RATING</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GREAT JOB! Everything is under control. There is not a lot of risk and management knows what it is doing.</td>
</tr>
<tr>
<td>2</td>
<td>OK, I SUPPOSE. Risk is adequately under control. A slight chance that you can be hurt (&quot;adversely affected&quot;). Management understanding is adequate but not great. Earnings and capital possibly might not support your level of risk.</td>
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<tr>
<td>3</td>
<td>NEEDS IMPROVEMENT! Get some help - management practices are not adequate. There is a good chance that you are going be hurt (&quot;adversely affected&quot;). Earnings and capital might not support your level of risk.</td>
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<tr>
<td>4</td>
<td>UNACCEPTABLE! Being “adversely affected” is pretty much a sure thing. Management doesn’t understand. Earnings and capital are not sufficient to support the lack of understanding.</td>
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<tr>
<td>5</td>
<td>UH OH! REALLY UNACCEPTABLE! Market risk is an “imminent threat” to viability. Management is less knowledgeable that 4. Earnings and capital “wholly inadequate”!</td>
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A History of the Fed Funds Rate Since 1979

Paul Volcker
6'7"
August 6, 1979 to August 11, 1987

Alan Greenspan
5'11"
August 11, 1987 to January 31, 2006

Ben Bernanke
5'8"
February 1, 2006 to January 31, 2014

Janet Yellen
5'0"
February 1, 2014 to present
BOTH THE HEIGHT OF THE FED CHAIR AND RATES HAVE FALLEN OVER TIME, COULD A TALLER FED CHAIR MEAN RATES RISE?

10-Year Yield (Left Scale)  
Alan Greenspan  
Paul Volcker  
Ben Bernanke  
Janet Yellen  
Jay Powell?

Source: LPL Research, Bloomberg 10/22/17

We don’t actually believe that interest rates are determined by the height of the Fed chair, but it has been an interesting coincidence.
The History of IRR
January 2010

• 2010 was Pivotal

• FFIEC Issues an Advisory on Interest Rate Risk

• Interest Rate Risk Prior to the Advisory “IRR, so what, who cares?”

• After the advisory, “You better care, OR ELSE!”
What did the FFIEC Advisory Say

- Material weakness in risk management processes or high levels of IRR exposure relative to capital will require corrective action.

- Such actions could include recommendations or directives to:
  - Raise additional capital
  - Reduce levels of IRR exposure
  - Strengthen IRR management expertise
  - Improve IRR management information and measurement systems
Banks that are found to have high levels of exposure and/or weak management practices will be directed by the agencies to take corrective action.

Such actions will include directives to:

- Raise additional capital,
- Strengthen management expertise,
- Improve management information systems,
- Reduce levels of exposure, or a combination thereof.
What Changed in 2010

- In Principle – Nothing
- Practically Speaking – Everything
- Now the Board and Management have to: Understand IRR
- The Concern of the Regulators is: Capital - EVE
What Changed in 2012 - FAQ

• In Principle - Nothing
  – Specific guidance on:
  – Model validation,
  – Model assumptions,
  – Levels of Stress and time horizons to consider...

• Clear attempt to resolve problem areas many banks were facing in implementing IRR analysis and modeling.
What Changed in 2013 - FIL

• In Principle - Nothing

• Clear instruction to “reemphasize” the importance of IRR management program in light of “challenging IRR environment” (read, since rates are about to go up....)

• Directly addressed risk of securities valuation deterioration, and the impact of unrealized losses

• Clear reminder to Board, of its oversight responsibilities
Understanding & Managing Risk

Six Key Questions

1. What is my risk?

2. What is causing my risk?

3. What material assumptions I am making?

4. Where did I get those assumptions?

5. What happens if I am wrong about those assumptions?

6. What is my plan if I am wrong?
What is Planning?

- *What I think* is going to happen.
- *What I want* to happen.
- *What I hope* will happen.
- *What better* happen if I want to keep my job!
A Key Distinction

Risk vs. Planning

• What is Risk?
  • What happens if I am wrong?
  • What causes me to blow up?
  • When does my institution collapse?
A Key Distinction

Risk vs. Planning

• You have to do both.
  • Plan
  • Manage Risk

• Planning is Educated Guessing

• Risk Management is Stress Testing your Guessing
Stress vs. Guess

What does the Advisory say about Stress Testing?

- Stress Testing
  - should include a sensitivity analysis to help determine which assumptions have the most influence on model output
  - can be used to determine the conditions under which key business assumptions and model parameters break down
Stress vs. Guess

• Stress Testing is the Heart of Risk Management

• Stress Testing Answers the Three Questions
  • What happens if I am wrong?
  • What causes me to blow up?
  • When does my institution collapse?
How Do You Stress Test?

• There are Two Ingredients in every Risk Model

  • Facts
  
  • Assumptions
How Do You Stress Test?

• What are the Facts?

• Balance Sheet and Market Facts

• Contractual Facts
  • Balance
  • Rate
  • Repricing characteristics
  • Payment characteristics, etc.
How Do You Stress Test?

• What are the Assumptions?

• Things that are “made up”
  
  • Rate scenarios
  
  • Discount rates
  
  • Non maturity deposit behavior
  
  • Prepayments
How Do You Stress Test?

- **Assumptions:**
  - Are elements of the Planning Process *because* they are *made up*
  - *This means your Risk Profile is NOT a Scientific Fact*
  - *Your Risk Profile is a Belief System*
How Do You Stress Test?

- Determine which Assumptions are Most Critical
- *Stress Test Critical Assumptions*
What do Regulators Want?

• Management and the Board should be able to:
  
  • Understand and
  
  • Explain your Risk

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What do You Want?

• The Regulators to *go away*

• *If you want them to go away, see previous slide.*
What Should You Do?

- Demonstrate you Understand
- Cooperate and Graduate
Unpacking Your Risk
EVE Volatility – All Assumptions

As of Date: December 31, 2014
Model Group: STATIC

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Unpacking Your Risk
EVE Volatility – Removing Options

As of Date
December 31, 2014

Model Group
(Multiple values)

Model Group
OPTIONS
STATIC
Unpacking Your Risk
EVE Volatility – Removing Prepayments

Economic Value of Equity

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As of Date
December 31, 2014

Model Group
(Multiple values)

Model Group
PREPAYMENTS
STATIC
Unpacking Your Risk
EVE Volatility - Removing NMD Assumptions

As of Date
December 31, 2014

Model Group
(Multiple values)

Model Group
- CORE
- STATIC

Economic Value of Equity

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FICAST Data Corporation
Unpacking Your Risk

• The analysis identifies Non Maturity Deposit assumptions as the *MOST* critical.

• Regulators are also *VERY* concerned about these
  
  • You may be extremely liability sensitive and not asset sensitive
  
  • *Rising rates will significantly hurt you*
What do the Regulators Require?

- Non Maturity Deposit Studies

- Regulators want to make sure:
  - Your assumptions have historical validity
  - Based on your history, not someone else’s
What is Included in an NMD Study?

- A Non Maturity Deposit Study should include:
  - Estimates of Decay Terms
  - Estimates of Betas
How do You Estimate Decay Terms?

• A Non Maturity Deposit Study should include:
  • Estimates of decay terms using multiple methodologies:
    • Average Life
    • Accounts Closed
    • Balance Decay or Declining Balances
  • Decay analysis should track the behavior of individual accounts through time
Non Maturity Deposit Decay Terms

Non-Maturity Deposit Analysis

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<th>Percent Closed Decay Term</th>
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What is a Beta?

• More IRR Jargon!

• An estimate of how much you will change your NMD rates when market rates rise or fall.

• If the Fed raises rates 100 bps, how much will your Money Market rates go up?
  
  • 50% of the change (a 50% beta)?
  • 75% of the change (a 75% beta)?
How do You Estimate Betas?

• Use Statistics!

• Perform a regression analysis.

  • Analyze your deposit rates as a function of several market indices (Fed Funds, Libor Rates etc.)

  • Determine which index is the best predictor

  • Statistically it is the slope of the line through the data points
Non Maturity Deposit Betas

Money Market Rates vs. 1-Year Swap Rate

Money Market rates go up/down about 55 bps for every 100 bp change in 1-Year Swap rates
What else Does an NMD Study Measure?

• **Surge Balances!**

  • Have balances moved from time deposits into non maturity deposits – will those balances move back?

  • *Has the average balance per account grown significantly over time – will that money leave the bank?*
What are the Regulators Worried About? Surge Deposits – Change in Balance Sheet Mix
What are the Regulators Worried About? Surge Deposits – Change in Average Balance per Account
What Next?

• After you have gone through the trouble of doing an NMD study

  • Don’t believe the results!

  • After all they are still just assumptions…

  • Stress test your assumptions.

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## Non Maturity Deposit Stress Test

### Economic Value of Equity Risk Profiles

#### Accounts: Global

**Choose Scenario:** Shock +300

#### Policy: -30%

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Conclusion

The most important question: Why?

The Trade-off: Risk vs. Return

Most Banks don’t operate on their efficient frontier!
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