Market and Liquidity Risk Examination Techniques

Federal Reserve System
Review: Linking Risk Hypothesis to Exams

- High Risk
  - Weak RM Process

- High Risk
  - Strong RM Process

- Low Risk
  - Weak RM Process

- Low Risk
  - Strong RM Process
Areas for Review

- Effectiveness of board and senior management oversight
- Suitability of policies, procedures and limits
- Appropriateness of risk measurement and monitoring
- Effectiveness of internal controls and audit
Board and Senior Management Oversight

- Responsibilities of the Board
  - Determine Risk Profile and Tolerance
  - Establish a System of Controls
  - Understand Activities
Reviewing Board and Senior Management Oversight

- Review reports
- Read minutes (board and ALCO)
- Talk with senior management and selected board members
Board Oversight

- Determine Risk Profile and Tolerance
  - Determine permissible activities
  - Set limits on those activities
Board Oversight

- Establish a System of Sound Controls
  - Require audit issues to be elevated to the Board
  - Question activities of Senior Management
  - Engage in private discussions with external auditors/examiners
Board Oversight

- Understand the Business
  - Review and approve financial data
  - Assess quality of information received
    - Facts or assumptions?
  - Require overviews from business lines
  - Seek an independent perspective
Senior Management Oversight

- Execute Board’s Strategic Plan
  - Ensure adequate staffing and operational support
  - Collect sufficient data to monitor activities
  - Enforce adherence to board’s chosen risk profile and tolerance
Policies, Procedures and Limits

- Approved by Board
- Describe company strategy
- Define permissible products
  - Security types, derivatives, funding
- Set explicit limits.
  - Gap, EaR, EVE, VaR
- Define separation of responsibilities.
Assessing Policies and Procedures

- Coverage of policies
- Relevance of policies
- Written procedures
- Updated and approved annually
Assessing Limits

- Limits are absolutely necessary for market/liquidity risks.
- Limits should exist for each measure relevant to the institution’s exposure
  - Gap - EaR
  - EVE - VaR
- Limits should truly reflect institutional risk tolerance
- There should be a process for tracking, elevating and resolving exceptions
Assessing Modeling

- Approach should match the complexity of the institution’s activities
  - Basic banking activities
  - Short-term exposure
  - Long-term exposure
  - Trading book
- Important to understand how the institution makes money
- Gap Schedule
- EaR Simulations
- EVE Simulations
- VaR
Gap Schedule – Exam issues

- What time buckets are used?
  - Sufficient to describe exposures

- Are all rate sensitive assets/liabilities included?
  - Need catch-all (over 5-years) to tie to balance sheet.

- Are results consistent with what actually happens?
  - Exposed to rising rates and rates increased in the past 6-months—earnings should have weakened.
EaR Simulation – Exam Issues

- Are core deposits viewed as interest sensitive?
  - No incentive to move idle money when rates are low.
  - During rising rates, money might move.

- Are imbedded options included?
  - Some loans have caps and floors (limit on rates charged).
  - Some bonds are callable (disappear when rates fall).

- Does the simulation include sufficiently large rate shocks?
  - 100bp, 200bp, 300bp or larger.
EVE Simulation – Exam Issues

- Assumed maturities of indeterminate maturity liabilities affect results
- Appropriate metric for limit
  - Should be some variant of capital
- EVE by itself doesn't provide much value
  - Use scenario analysis and stress tests to reveal changes in economic value
VaR Analysis – Exam Issues

- Most implementations assume normal distribution
  - 4 sigma events occur on average about once a year
  - In a crisis all correlations go to 1
- VaR should be used in conjunction with other tools.
  - Position limits
  - Tests for ability to withstand extreme events like the 1998 Asian crisis.
All Complex Models – Exam Issues

- They are opaque (“black box”).
- Board & senior management may not fully understand them.
- Internal audit often not qualified to review their use.
- Management may be unwilling to pay for external review
Internal Controls and Audit

- What is an audit?
- What are internal controls?
- Audit and internal controls are not the same thing
Internal Controls and Audit

- Internal controls are a system of procedures aimed at limiting risk.
  - Business lines implement controls.
  - Controls help limit risk or establish compensating factors.
  - Audit validates existing controls.
  - Audit may recommend new controls.
Internal Controls and Audit

- Controls over market and liquidity risk
  - Restrictions on activity
  - Strong policies and procedures
  - Clear lines of authority and responsibility
  - Segregation of duties
    - Separation of risk taking and risk measurement
  - Two-weeks mandatory leave and job rotation
Internal Controls and Audit - Modeling

- Controls & Audit
- Information Inputs
- Processing
- Reporting
- Risk Management Responses
Internal Controls and Audit - Modeling

- Information inputs
- Processing
- Reporting
- Audit
Modeling – Information Inputs

- Information inputs
  - Accuracy of input – minimize potential for human error.
  - Clear owners of data – users or data processing?
  - Sufficiency of data – capture all fields.
  - “Garbage in, garbage out”
Modeling - Processing

- Is the model accurate?
- Is the model sufficient
  - Are all material risks captured?
  - Are rate shifts sufficient?
  - Are non-parallel rate moves considered?
- Are scenarios and assumptions reasonable?
  - Documented
  - Controls over changes
  - Tested through time
Modeling - Reporting

- Clarity for each audience
  - Board packages
    - Broad outline of positions and sensitivities
  - Management reports
    - Used in decision-making
    - Effect of changes in assumptions and sensitivities
  - Administrative reports
    - Parameters, assumptions, equations
    - Used to run model; track data flow
Modeling - Auditing

- Rigorous review by skilled, *independent* personnel – internal or external.
- Assess design and conceptual soundness; perform pre-implementation statistical tests.
- Review or generate back-test.
  - Comparing expectations with actual events.
- Benchmark results
  - Compare select outcomes against a similar model.
Questions?
References

- Rating the Adequacy of Risk Management Processes and Internal Controls at State Member Banks and Bank Holding Companies
- Joint Policy Statement on Interest Rate Risk
  http://www.occ.treas.gov/OCC_current.htm
- Principles for the Management and Supervision of Interest Rate Risk
  http://www.bis.org/publ/bcbs108.htm