



WHAT IS A MODEL VALIDATION?

HBP Analytics, LLC's (HBP) review process is based on the guidelines established in the *Joint Agency Policy Statement on Interest Rate Risk*, *OCC Bulletin 2011-12 on Risk Modeling*, and the *Joint Agency Advisory on Interest Rate Risk Management*.

Per the FDIC's Supervisory Insights: Model Governance: "OCC Bulletin 2011-12, 'Risk Modeling,' (April 4, 2011) is the primary source for formal regulatory guidance on model governance available." Therefore, HBP believes the review of ALM systems for all banks, including banks not supervised by the OCC, should incorporate standards set by OCC Bulletin 2011-12, especially since the OCC's standards do not conflict with, but rather compliment, standards set by other regulatory agencies.

REVIEW PROCESS & METHODOLOGY

In performing the review, HBP:

1. Gathers materials for review on and off site, including source data files from Bank's host application systems for loans, deposits, investments, and general ledger.
2. Compiles specific concerns and questions that needed to be addressed in this review as well as any features unique to the Bank's ALM system or processes.
3. Tests the Bank's file downloads for accuracy by reconciling data from the Bank's application systems to its general ledger (OCC 2011-12).
4. Verifies the Bank's source data has all relevant instrument-level data for each loan, deposit, and security, which generally includes current balance, contractual interest rate, principal payments, interest reset dates, maturities, specific indices used for repricing, and contractual interest rate ceilings and/or floors (Joint Agency Policy Statement).
5. Tests the Bank's income simulation and economic valuation calculations by:
 - Loading, reconciling, and processing all relevant instrument-level detail through income simulation and economic valuation testing models,
 - Compiling test results for interest income and economic value projections for the following individual balance sheet segments: investments, loans, non-maturity deposits, certificates-of-deposit (CDs), and other interest-sensitive items,



- Comparing results generated by the independent testing models with results generated by the Bank's ALM system (OCC 2011-12, Joint Agency IRR Advisory),
 - Assessing key assumptions for prepayments, discount rates, etc. used by the Bank to generate income and economic value projections (Joint Agency Policy Statement, Joint Agency IRR Advisory),
6. Assesses the validity of the scenarios used in the Bank's ALM system (Joint Agency IRR Advisory, Joint Agency Policy Statement),
 7. Reviews the Bank's policies regarding interest rate risk management in relation to standards set forth in the Joint Agency Policy Statement and the Joint Agency Advisory,
 8. Reviews the Bank's policies regarding ALM system documentation, validation, and controls in relation to standards set forth in OCC 2011-12,
 9. Reviews the Bank's ALM reports in relation to standards set forth in the Joint Agency Policy Statement,
 10. Prepares and submits a preliminary report to bank management,
 11. Reviews HBP's preliminary report with bank management to ensure accuracy,
 12. Submits HBP's final report.

PRESENTATION OF FINDINGS AND RECOMMENDATIONS

HBP's final report will include the following:

1. Findings regarding the appropriateness of the Bank's risk measurement system given the nature, scope and complexity of its activities,
2. Findings regarding the accuracy and completeness of the assumptions and data inputs into the Bank's risk measurement system,
3. Findings regarding the reasonableness and validity of scenarios used in the risk measurement system,
4. Findings regarding the validity of the risk measurement calculations,



5. Findings regarding the adequacy of, and personnel's compliance with, the Bank's internal control system,
6. Findings related to compliance with OCC 2011-12, and
7. Summary conclusions.