

fmswhitepaper

Improved Integrated Risk Modeling Through Validations

By Mark Haberland
Managing Director, Darling Consulting Group

Improved Integrated Risk Modeling Through Validations

By Mark Haberland, Managing Director, Darling Consulting Group

Deriving the key information from your independent review and maximizing its utility

As the banking industry emerges from the credit crisis, examiners are now looking for institutions to develop more substantive financial and operational risk measurement and management practices. At the heart of this crusade lies a desire to see more comprehensive integrated (enterprise) risk management – whereby multiple risks can be measured, evaluated and managed in concert with one another.

This has quickly led to increased attention paid to asset/liability management (ALM) model use, the critical assumptions that drive results and how ALCOs and Boards are examining risks and evaluating strategic opportunities.

Gone are the days of simple “check-the-box” risk measurement and management – ALCOs and boards now need to rely upon more robust ALM modeling that can not only measure interest rate risk, but can also accurately forecast liquidity, support assumption sensitivity analysis and capital (credit risk) planning efforts. Moreover, all of these added elements come with an expectation of stress testing including scenario and sensitivity analyses.

Those responsible for the ALM model are finding it increasingly difficult to adjust to the growing expectations and demands – and maintaining a broader risk management model comes with notable challenges in data management, model configuration, assumption development/support, as well as more substantive processes and controls. In addition, financial risk managers are struggling to develop a reporting and policy framework that effectively promotes focused strategic thinking and decision-making by senior management and the board.

Independent validations of the model and the entire ALM process are the most effective way of ensuring that ALCO and the board are receiving accurate and complete information upon which to make strategic decisions. However, when engaging in the validation, institutions must ensure that review will indeed accomplish that mission, both from a strategy development perspective as well as compliance with regulatory requirements.

Risk modeling has been an evolving process, particularly in recent years with the plethora of regulatory pronouncements that have been issued. Advancements in

technology and the increasing complexity of financial instruments have placed additional burden on institutions to most effectively manage their modeling processes – whether in-house or outsourced. This white paper is intended to provide an overview of what constitutes a high-performing ALCO process and enable the reader to better gauge the qualifications of the independent validations.

WHY DO WE BUILD ALM MODELS?

Before you can truly appreciate what your validation will provide your institution, you must first have clarity as to why it is you go through this grueling process on a regular basis. Is it to fulfill a regulatory requirement? Is it to act as a budget surrogate? Is it a means to predict the future? If these are the reasons that a model is being utilized, your institution is missing a golden opportunity to use this tool for its ideal purpose – to reasonably assess the embedded risk in your balance sheet and be the foundation upon which strategic discussions are born.

ALM models are now being used for far more than just assessing interest rate risk on the balance sheet. Often, high-performing ALCOs are using these models to integrate with their liquidity and capital planning models, as a base for developing internal budgeting, performing stress testing of key assumptions (as well as liquidity and capital) and preparing analyses of potential strategies or M&A activity prior to execution to gauge the impact of the transaction(s). And as the feeder for ALCO reporting, the wealth of information these models provide is what drives the decision-making process at ALCO, and, ultimately the future well-being of the institution. Getting your position right is important!

The dependence on these models as the *soul* of an integrated risk management process requires that now, more than ever, the results are as accurate as possible and the information that they provide support the decision-making process. And the scope of the validations should increase commensurately with the impact these models have on the institution. Gone are the days of high-level reviews and double checking the calculations to ensure the “math is right.” There is so much data/input that goes into the creation of each model (see Exhibit 1) and the potential for error is so high, that these validations must dig into the details to ensure that potential for “model risk” is minimized.

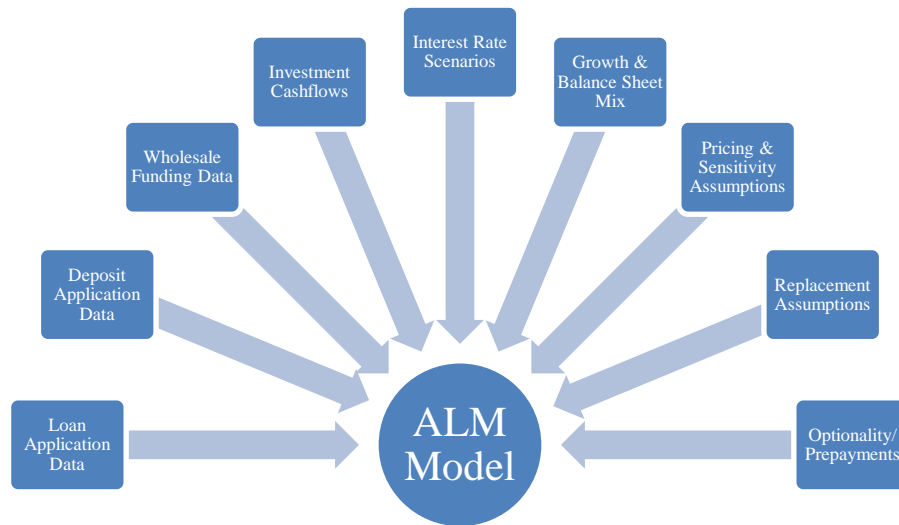


Exhibit 1 – The ALM Modeling Process

MODEL RISK

When evaluating the accuracy of, and overall utility of, an ALM model it is important for the validating party to understand the primary causes of model risk when performing the review. The most common sources of ALM model risk are:

- Source data files
- Model structure/setup
- Assumptions
- Output reporting

Each of these factors should be reviewed independently to ensure they integrate with the complete *Enterprise Risk Management* process of the institution. Due to the significance of the decisions that are made based on the model output, we have found it best to view the independent review as a “two-pronged” approach – make certain it meets the increased regulatory requirements AND make sure it provides the necessary information to ALCO and the board upon which to make the RIGHT decisions for the institution.

SOURCE DATA FILES

The source files (account level detail for loans, deposits, investments and borrowings) contain the critical information upon which the model is founded. Yet, oftentimes, the importance of the quality of these initial inputs is overlooked or ignored.

Inaccurate or incomplete data files have the potential for materially impacting the results, particularly when “blanket” assumptions are made about missing data or the fields are omitted from the modeling process altogether. Even good data can result in erroneous results. The “human error” factor could result in data being mapped

incorrectly within the model or data aggregated in such a way that accurate modeling becomes nearly impossible.

The validation of the data should actually get down to the individual account level to ensure the most accurate and complete data is being fed into the model. Systems have the capability to perform instrument level (ILP) modeling; therefore, the data should include all of the key inputs to allow for accurate reflection of cashflow and repricing characteristics at the account level. Additionally, reviews of the reconciliations to the G/L should be performed and variances examined.

MODEL STRUCTURE AND SETUP

The way an ALM model is constructed can significantly limit its functionality, and those that have been in place for many years need to evolve with the changing times. An important aspect of an effective balance sheet management process is to examine the impact of non-parallel rate movements (i.e. flattening of yield curve) on NII exposure. In order to accurately capture that impact, the categories in the model must be tied to the appropriate indices. For example, five year commercial loans may be linked in the model to the 5-year LIBOR index and a 3-year time deposit would be tied to an internally determined 3-year CD index. This allows the model manager to move indices differently in various rate scenarios to fully capture yield curve risk and basis risk in the model.

Additionally, with the technological advancements of systems, all models should be constructed at the instrument level, and not utilize call report data to “estimate” cashflow and repricing characteristics in the model. ILP allows each account in the portfolio to be modeled individually, resulting in more accurate model outputs, as information does not get skewed due to “averaging” of data as it does using data from the call report.

The validation of the setup of the ALM model has become increasingly difficult in recent years. Many times, inputs come from a variety of sources, and these sources play a role in how the model is configured. Understanding the impact these have on the model output is an important factor in the validation process. Yet, the ultimate goal of the model is to provide accurate and useful information to the decision makers and, to do so, it must have the flexibility to model a variety of rate scenarios and be configured in sufficient detail to allow for portfolio- directed “what-if” modeling (i.e. deposit tiering, loan floors or security sales) for ALCO discussions. The review of the model needs to look at the category setup to ensure the flexibility exists and be comfortable with the product mix to ensure the model reflects the proper breakout of the portfolios.

ASSUMPTIONS

While accurate data and the proper model configuration are important to ensure an effective ALM process, the model assumptions are - without a doubt - the most critical factor. The assumptions are the only part of the modeling process that includes both a quantitative AND qualitative aspect. The importance of these assumptions requires that all business lines (i.e. lending, retail, treasury) have an active role in their development, support and validation and they need to be reviewed and approved regularly by ALCO.

The ALM model consists of many assumptions, but there are three that stand out as the most critical in the process:

1) Deposit Sensitivity/Lives

For the majority of financial institutions, deposit assumptions have the greatest impact on model output, yet are the hardest to validate. Sensitivity betas for rising- and falling-rate environments are rarely, if ever, symmetrical and historical activity is not a definitive indicator of future behavior. The recent low-rate environment has resulted in strong deposit inflows for many financial institutions, but when rates begin to rise this “hot” money is expected to shift out of non-maturity accounts. How much and where it goes will have a significant impact on potential exposure as rates rise. And average life assumptions for the non-maturity accounts is a key factor in the economic value (EVE/NEV) calculations. The best way to derive much of this information is through internal historical review or a deposit study.

Validating deposit assumptions must go beyond simply confirming that a study has been performed or even that the results of the study have been implemented into the model. Deposit studies will provide perspective as to how the deposit base has acted historically and mathematical support for assumed behavior in the future. However, the results of these studies are not absolute, and a review of the qualitative analysis must also be performed and discussions with members of retail operations must take place to truly gauge the reliability of the deposit assumptions in the model.

2) New Volume Reinvestment

When ALM models are configured, all of the products in the portfolio are reflected in the chart of accounts. When discussing how to replace the runoff from all of these portfolios, there are usually only a limited amount of products currently being driven “in the market” and, especially in an environment like we find ourselves in today, current rates are significantly lower than existing portfolio levels. Therefore, the prospect of simply rolling categories over into themselves in the model is cause for concern and potentially misrepresenting income projections.

When developing the reinvestment assumptions for the model, it is imperative to include members of lending, retail and treasury to find out what is in the pipeline and what the market is dictating for structure and rate.

In order to most accurately validate the cashflow replacement assumptions, it is important to review pipeline/origination reports and talk with retail operations to determine the types of products being promoted within the branches. The models should be continuously back-tested, so by reviewing the results of these tests as part of the validation it can become apparent if a variance is due to poor assumptions (i.e. loans assumed to be booked at 5.00% were, in fact, booked at 4.25%).

3) Prepayments

In order to incorporate prepayments into the ALM model, institutions have essentially two options: 1) perform a study to determine actual experience or 2) utilize third party sources to provide instrument/portfolio prepayment estimates. Many times the prepayment estimates can vary substantially depending upon the source, so it is important to compare the estimates to actual experience to gauge the accuracy and make necessary adjustments.

The validation should perform that comparison of prepayment estimates to actual or review the internally prepared analysis. Additionally, a comparison of the prepayments applied in the model to alternative third party sources is a useful method for determining their reasonableness.

While a great deal of time and effort are expended on these most critical of assumptions to ensure they most accurately represent management's view of the current operations of the institution, a successful assumption-development process cannot stop at this point. It is critical, from both a regulatory and best practices perspective, to perform sensitivity and stress testing on these key assumptions on a regular basis.

Sensitivity testing will help determine which assumptions have the most influence on model output while the stress testing of assumptions uses the model to predict a possible future outcome given an event or series of events. It is important to conduct these analyses quarterly and include results and how the outcomes relate to current policies and "early warning triggers" with the reporting package that is presented to ALCO and the board.



Exhibit 2 – Stress-testing Framework

Stress testing of key model assumptions is vital to understanding the potential risks inherent in the balance sheet; however, it is not enough to solely perform and document the impact of the stress scenarios. The modeling of relief scenarios for each stress helps provide management with a “playbook” for understanding the steps necessary to execute in the event these scenarios become reality and it also affords regulators and the board with the comfort of knowing that management is aware of potential issues that could cause undue stress on earnings in the future.

An important factor when performing an independent validation of an ALM process is to review the stress-testing practices in place, not only for interest rate risk but for liquidity and capital, as well. The review should determine the adequacy of the scenarios being analyzed, what information it provides to the decision makers and how it contributes to the ALCO process. Do members of management and ALCO understand their roles in executing the relief scenarios and are ALCO and the board using this information as a compliment to their base model, or are decisions being made to manage to the results of the stress-scenarios? The key aspects of the ALM process (IRR, liquidity and capital) are all interrelated, and the stress-testing should take into account how one may impact another.

OUTPUT REPORTING

The models that a financial institution utilizes to manage interest rate risk, liquidity and capital provide a tremendous amount of data once the analyses have been completed. The challenge for ALCOs is transforming all of that data into the most useful information possible and presenting it in a way that promotes productive discussions with ALCO and the board. Ultimately, the reporting of data should:

- Assess the current position.
- Provide an understanding of the key contributors of risk.
- Present information that promotes decision-making.

If the output data is presented in such a way as to be confusing to the user, or if the data is incomplete, the risk of incorrect strategic decisions being made increases. If the users do not understand the current profile or risk exposure, how it relates to policy thresholds or how potential transactions would impact IRR, liquidity or capital, then the reporting can be deemed unacceptable.

When validating/reviewing the process of reporting the results of the modeling analyses, it is important to keep in mind the three criteria noted above, and determine if the reports accomplish that goal. An institution should understand both its near- and long-term risk exposure:

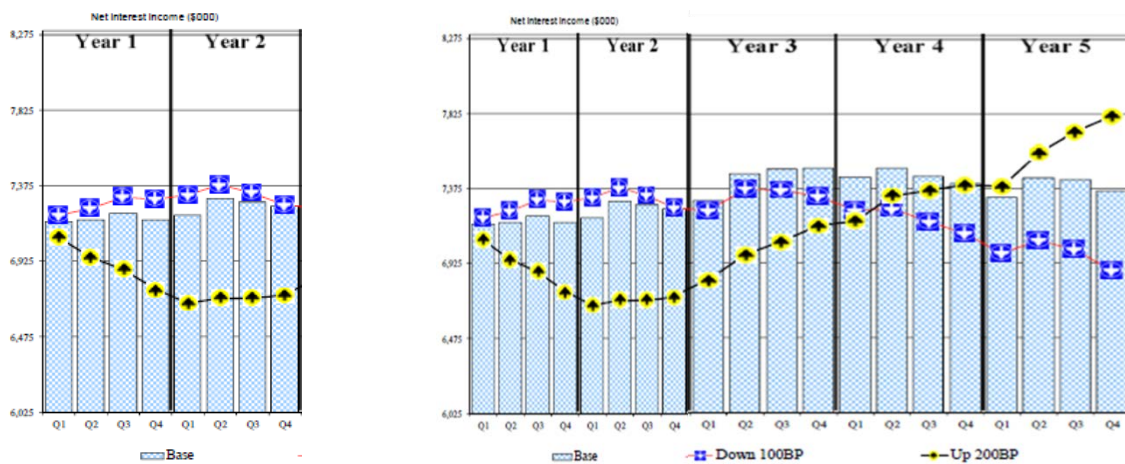


Exhibit 3 – NII Sensitivity: Short-term vs. Long-term

By limiting the horizon to two years, institutions can sometimes miss potential longer-term mismatches. The risk is ALCO making strategic decisions based solely on near-term data and, inadvertently, exacerbating an exposure they did not know existed. The independent review can examine the information provided to help provide guidance on what information should be discussed if ALCO is making decisions based on reasonable and accurate results, and if they have all the necessary information in hand to make the right decisions for the institution. Before any decisions are made, make certain that the risks/rewards are weighed and understood by all deciding parties involved.

THE COMPLETE ALM PROCESS

The development of a high-performing ALCO process has never been more important, yet has never been more challenging to accomplish. The increased complexity of financial instruments, the utilization of technology and the heightened regulatory requirements have made the modeling and reporting of balance sheet risks a difficult endeavor for even the most seasoned financial executives.



Exhibit 4 – The Complete ALM Process

When performing independent validations of models and ALCO processes, we have found it beneficial to examine the process from two points of view: regulatory compliance and financial performance. The review should ensure that all of the requirements of recent regulatory guidance have been met and that management is aware of recent regulatory “hot button” topics during recent examinations. ALCOs have the potential for higher performance by going above and beyond regulatory requirements and putting a process in place that provides the following to the ultimate decision makers:

- a clear and concise understanding of the current risk profiles
- information on potential exposure under various stressed scenarios
- an appreciation of the integration of the risks and how they impact one another
- a vehicle upon which to conduct pertinent strategic discussions that lead to making the right decision at the right time

These are the characteristics of a high-performing ALCO, and a thorough independent review and validation of the models and process that culminates in ALCO strategies is vital to the ongoing success of the institution. The stakes have never been higher, so make certain that when it comes time to have your next independent review, you know that the feedback you receive will help develop the ALCO you need to succeed. The selection of your validation is a key strategic decision that ALCO makes, so make the right decision at the right time!

ABOUT THE AUTHOR AND DCG

Mark is Managing Director at Darling Consulting Group (DCG). He works directly with financial institutions throughout the country helping them improve their ALM process, meet regulatory requirements and understand the key components to asset/liability management. In addition, Mark works directly with clients to aide in their ALM outsourcing and ALCO process development and conducts education for client ALCO committees, boards and senior management.

DCG provides balance sheet management solutions for banks and credit unions across the United States. Our 80+ person professional team offers a unique and comprehensive approach to balance sheet management that incorporates specialized tools, educational programs, and unbiased advice for institutions between \$20 million and \$200 billion in assets. Working in partnership with senior management and boards of directors, we produce significant, quantifiable results for hundreds of financial institutions throughout the country.

Published by:

Financial Managers Society, Inc.

100 W. Monroe, Suite 1700

Chicago, IL 60603

312-578-1300

info@fmsinc.org

www.fmsinc.org