

Bank Asset/Liability Management

Vol. 31, No. 1 January 2015



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ALM Model Assumptions in a World of Uncertainty – Five Steps to Improve Your Process

In January of 2014, few would have guessed that by now the 10-Year Treasury rate would be hovering 50 -75 basis points lower and short-term rate hikes by the Federal Open Market Committee (FOMC) would conceivably be on hold until late 2015 or early 2016. In fact, a look at the forward implied yield curve from early January shows the markets were assuming that the 10-Year Treasury yield would be hovering around 3.50% today!

With the *experts* so far off and with billions of dollars at stake with every basis point change, how are we, as community bank executives and asset/liability managers, expected to build interest rate risk models with reasonable and plausible assumptions? By definition, model assumptions, like the forward implied yield curve, are merely projected expectations of future behavior patterns.

Broad in nature, interest rate risk model *assumptions* encompass everything from rate paths, loan optionality and new investment purchases to assumptions as granular as defining specific Money Market account betas as rates start to rise. In reality, there are hundreds of thousands of assumptions present in any interest rate risk model. Though assumptions vary widely in importance, if models are embedded with irrational or uninformed assumptions on material items, management may be making uneducated strategic decisions.

Bad Model Assumptions Drive Bad Decisions. We were recently involved in an engagement with a multi-billion dollar institution to help improve balance sheet performance and specifically recommend strategies to increase net interest income.

In This Issue:

- **Evolution of Over-the-Counter Derivatives and Accounting Considerations** 1
- **CD Early Withdrawals: Basic Concepts and Management Perspectives** 4
- **ALM Model Assumptions in a World of Uncertainty—5 Steps to Improve Your Process** 6

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A peek inside this institution's balance sheet and internally developed interest rate risk model revealed severe exposure to a rising rate environment. Given this exposure, the majority of the investment portfolio was held in short-term securities with anemic yields, which drove performance challenges. But upon closer examination, it became apparent that the institution was not exposed to rising rates. The exposure was manufactured, driven by model assumptions that were not legitimate or reasonable. The balance sheet actually performs better as rates rise. The institution was holding short-term investments, sacrificing \$2.6 million in additional

Bank Asset/Liability Management

annualized net interest income to hedge against rising rate exposure that did not exist.

With today's technological advancements in ALM software solutions and all that has been written on ALM assumption documentation and support, how does this happen? What can management and risk modelers do to prevent these types of errors and omissions and how do we continue to build upon our current model assumption process?

The Assumptions Process. *“Dynamic simulations are highly dependent on key variables and assumptions that are extremely difficult to project with accuracy over an extended period. Furthermore, model assumptions can potentially hide certain key underlying risk exposures.”* (FFIEC 2010 Joint Advisory on Interest Rate Risk Management.) Any model that attempts to predict customer behavior into the future in various economic environments is going to have some element of inaccuracy.

However, a thorough process can minimize mistakes and maximize the model's utility. The following five steps outline a *best practices* assumptions process:

Step 1 – Engage Key Players in ALCO: In the example above, the modeling assumptions were isolated in the treasury function. There were no checks and balances or even general assumptions discussions with ALCO members. It may seem obvious, but the first step in proper model assumption development is to involve the entire ALCO team. That said, many banks and credit unions develop key model assumptions in the finance department silo. The finance department is often unable to develop accurate assumptions on loan and deposit pricing and behavior. In contrast, we notice that most of the time is being spent analyzing the investment and wholesale funding portfolios.

There is also a *hidden* benefit to involving the ALCO committee in the assumptions process. Once all are involved, the education begins. The interest rate risk model is transformed from a hypothetical model isolated in the finance department to a decision-making tool that all parties are committed to understanding and managing accordingly.

Step 2 – Analytical Due Diligence: Involving the key committee members is important. However, in order to run an effective assumptions process, you must do your homework to facilitate a meaningful discussion. A primary component of this due diligence is historical analysis. The model assumptions are by definition forward-looking inputs. It is important to recognize that, in order to be properly informed of the future, we must look to the past at least as a frame of reference.

A starting point is typically documenting variances from the prior model's net interest income in comparison to actual net interest income while analyzing key drivers to isolate potential areas of concern. Isolating drivers such as yield curve changes, unanticipated growth, data anomalies or just faulty assumptions can inform assumptions moving forward and support refinements to the approach.

From there, it can be as simple as a spreadsheet monitoring new volume activity by rate and structure or as complex as multi-factor regressions outlining statistical probabilities of deposit and loan behavior patterns in different historical economic environments. Whichever approach you choose, it is important to display the information in an easy-to-understand format that facilitates dialogue and that combines this quantitative analysis with qualitative judgment.

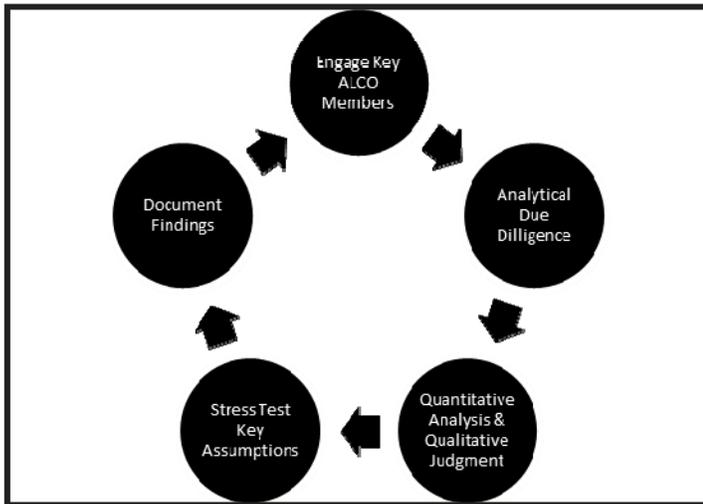
Step 3- Combine Quantitative Analysis with Qualitative Judgment: Historical quantitative analysis cannot be used in isolation for, to do so may, in fact, be dangerous. History often does not repeat itself and idiosyncratic or systemic events can distort historical data (e.g., new branch openings, management change, merger, or even financial collapse). This data can skew quantitative analysis despite best attempts to make the assumptions quantitatively robust. Involving the key members of ALCO and proper due diligence should eliminate some of this *noise* but qualitative judgment and experience must not be ignored.

Because of these unforeseen effects, interest rate risk models will never be perfect. The question is, *how wrong will the results be?* This is where the value of stress testing key assumptions plays a part in the best practice risk management process.

Step 4 – Stress Test Key Assumptions: Once management believes the assumptions are reasonable and rational, it is important to stress the key variables. It is ALCO’s responsibility to ask what assumptions drive model results and what would happen if we adjust those variables accordingly. Would our interest rate risk position change? Would our strategies change? Stress testing can often answer these critical questions.

In the current environment where economic and interest rate uncertainty is the norm, bank asset/liability managers should be stress testing and isolating key variables. These key variables may include increases in deposit betas and average lives, early withdrawals on time deposits, increased prepayment activity and defaults in the loan portfolio, as well as altering duration assumptions in the investment portfolio. In addition, each institution has unique and customized model variables based on its specific balance sheet, and stress tests of these assumptions should also be performed on a regular basis.

Exhibit 1. Assumptions Validation Process



Step 5 – Document Findings: Proper documentation is possibly the easiest step in the process. However, it is often left out. It is imperative that we document our inputs and findings in the form of minutes from the assumptions discussions. Many examiners believe that a meeting without minutes is a meeting that did not take place at all. These minutes placate the examiners, but they also serve as a communication vehicle to the ALCO committee regarding model discussion and strategic alignment. In

its purest essence, this documentation creates accountability for all members of the team.

The Cycle. Assumption development is not a one-time annual event. In order to function properly, this process needs to take place in a quarterly cycle with each update of the interest rate risk model. This approach takes commitment from the highest levels of the organization. In a properly functioning assumptions process, all key members understand the primary model drivers, the expected forecast in each segment of the balance sheet and, through stress testing, an understanding is developed regarding assumptions that can skew model results (see Exhibit 1).

Beyond Regulatory Expectations. In a world of uncertainty, the assumptions process as outlined above is what the regulatory community believes is required to properly manage interest rate risk. However, beyond regulatory expectations, inaccurate models can drive inappropriate decisions which can have bottom line impact. With minimal resources, bank asset/liability managers can adopt these assumptions enhancements and reap enormous payoffs.

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