Back Testing vs. Validation:
What is the Difference?

Jeffrey F. Caughron & Chris S. Wilson

For a number of years, bank regulators have focused on specific ALCO processes in interest rate risk exams. Banks are expected to have adequate resources and procedures in place to help them define, measure, and manage interest rate risk. With respect to the reporting system or model that is used for A/L analysis, there are certain key points that are generally considered. These will often include the following:

- Does the model possess sophistication and complexity that is appropriate for the institution?
- Do Policies reflect the modeling procedures followed?
- Are assumptions back tested regularly?
- Is data-input accurate and current?
- Are model assumptions reasonable and updated?
- Has the model been validated by an outside auditor?

All of these points are important, but we will concentrate on two of these specifically in this article: Back testing and Validation. These are entirely different processes, but equally important to the overall integrity of any modeling process and the resulting usefulness of the reports. We will first explain the modeling process and then point out the distinction between a back test and a model validation.

Any good A/L model will begin with a snapshot of the balance sheet and other key information. This includes the balances of assets and liabilities, the existing book yields and costs associated with those balances, current reinvestment rates, and the contractual re-pricing or maturity schedules. These are the known data entry characteristics. From there we must build into the model a variety of assumptions in order to account for those things we cannot know in advance. These include time lags, sensitivities or betas, behavior of non-maturity deposits, and prepayment speeds among others. Asset / Liability modeling therefore involves the input of certain known characteristics combined with certain unknown behaviors that must be assumed. The reasonableness of these behavioral assumptions is very important.

What is Back Testing?

Back Testing is the process of reviewing the projections of an A/L model after the fact and comparing those projections against actual performance. It is much like the budgeting process where we track budgeted versus actual results over a given time period. In the case of A/L back testing, we see whether and to what degree the model gave an accurate projection of bank performance, particularly with respect to interest rate risk. With the results of a back test, we can ask:

1. Were our projections different from actual bank performance?
2. If so, by how much? And...
3. What inputs, assumptions, or dynamics might explain the variance (e.g. time lags, the competitive environment, changes in the local economy, etc)?
The ultimate objective of a back test is to give guidance as to if and how management might want to adjust current assumptions within the A/L model in order to more accurately represent the performance trends of the bank. A back test, unlike model validation (the topic of the next section), does not need to be performed by an outside auditor. The back test may be done internally or with support from the vendor or model provider. In either case, back testing should be performed, assumptions should be reviewed, and adjustments should be made when necessary. The more detail that a back test provides, the better. Ideally we want to drill down to specific categories of assets and liabilities to see where projections were high or low, and scrutinize the assumptions that are applied to those categories. Importantly, all of the bank’s ALCO processes and procedures, including back testing, should be reviewed annually to ensure optimal internal control.

What is Validation?
Validation, in contrast to back testing, is completely different – validation is the audited process of “validating” the functionality and completeness of an A/L model. The validation process is essentially an independent review of the logical and conceptual soundness of the model. This involves scrutinizing the methodology and mathematical calculations that are built into the program. The cost of validation need not be incurred by the bank. Rather, the software vendor or provider of the model should make available a certification letter or proof of validation regarding the integrity of the model. That documentation should ensure that the model has been reviewed with respect to three key components identified by the OCC:

1. The information input component which delivers assumptions and data to the model
2. The processing component, which contains the theoretical model, transforms inputs into estimates via the computer instructions (code); and
3. The reporting component, which translates the mathematical estimates into useful business information

Problems with any of these three components can render the model’s output meaningless or misleading. An effective model-validation process must address all three components.

The Baker Group’s IRRM Model:
At the Baker Group, it’s always been our philosophy that sound Asset / Liability management processes should include ongoing assessment and review of assumptions and results. Our model, the Interest Rate Risk Monitor (IRRM®) allows both small and large banking institutions to measure and monitor performance and risks due to interest rate fluctuations. Reports can be back tested after twelve months to see a detailed analysis of actual versus projected results. Since the IRRM projects changes in interest income / expense over a twelve month horizon, back testing of reports can only be done after a year has passed. The integrity of our model is underscored by the validation provided by reputable outside auditors, and all IRRM clients are provided with a copy of a certification of that validation for their files.

Asset / Liability Management is perhaps more important today than ever before due to changes in the dynamics of the interest rate cycle and a new regulatory environment. Moreover, an uncertain future requires a heightened focus on contingency planning. Well-tested modeling of interest rate risk should be a key weapon in the arsenal of all prudent community banks.