

Bank Asset/Liability Management

Vol. 22, No. 2
February 2006

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Now is Not the Time

Over the past 18 months, the Federal Reserve Board (Fed) has increased the target federal funds rate 14 times from 1 percent to 4.5 percent. Many banks have been able to manage their funding costs throughout this Fed tightening by significantly lagging rates paid on customer deposits and funding either growth, or deposit outflows, *at the margin*.

Recently, a number of financial institutions, frustrated by anemic deposit growth, have begun to abandon their deposit pricing discipline in favor of aggressive CD specials and new account introductions. These strategies are placing pressures not only on their own cost of funds, but are creating significant ripples within the marketplace. Unfortunately, once tile dust settles, there will be no overall increase in deposits, just increased interest costs for everyone.

In the current environment, attempting to increase deposit market share can be very expensive. Before embarking on CD specials or new account introductions, bankers should quantify just what new money will cost as well as the cost of *paying up* to protect existing deposits. Two types of analyses that should be considered are outlined below: the marginal cost of protecting deposits and the cost of new funds, taking conversion from existing customer deposits into consideration.

Marginal Cost of Funds Analysis. The first example outlined below is for a \$500 million bank that is facing a new competitor entering its marketplace. Over the past two years this bank has been successful in starting almost \$115 million in a premium money market account (MMA), for which it is currently paying 3.5 percent.

The new competitor has no existing deposit market share, and to attract new business, is offering a similarly structured MMA at an introductory rate of 4.25 percent. How does the \$500 million bank decide whether or

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not to pay up to protect the current \$115 million deposit base? Their analysis is shown in Exhibit 1 on page 2.

The first issue is a financial one. If the bank does not pay up the 75 bps and match the 4.25 percent rate, it will probably lose some level of deposits to the new competitor. The first question is: *How much will it cost to replace monies that move to the new offering as compared to increasing the rate on the entire \$115 million?* Exhibit 1 measures the rate that could be paid to replace deposit runoff before the bank would be better off raising the rate on all deposits to 4.25 percent. It also displays the same trade-offs for raising the rate paid by 50 and 100 bps.

As an example, if the bank holds the rate at 3.5 percent rather than paying up 75 bps and, as a result, loses 10 percent of its current deposit base, as long as the 10

EXHIBIT 1. MARGINAL COST OF FUNDS ANALYSIS

The chart to the right identifies the effective marginal cost associated with increasing rates in an effort to protect various levels of expected runoff in the bank's account balances. For example, the incremental cost of increasing the rate 0.5 percent to protect the most volatile 10 percent of the balances is 8.5 percent. The effective cost of protecting these balances should be compared to the incremental cost of alternative funding sources.

BALANCE: \$113,948,000

CURRENT RATE: 3.5%

RUNOFF PROTECTED		RATE INCREASE			
		0.50%	0.75%	1.00%	
10.00%		8.50%	11.00%	13.50%	
20.00%		6.00%	7.25%	8.50%	
30.00%		5.17%	6.00%	6.83%	
40.00%		4.75%	5.38%	6.00%	
50.00%		4.50%	5.00%	5.50%	

percent can be replaced at a rate of 11 percent or less then, financially, it is better to absorb the run-off than it is to pay up on the entire base. If the bank loses 30 percent and can replace these funds at 6 percent or less, it is still better off financially than paying up on the entire account base.

The second issue that must be addressed in this analysis is, *what is the customer relationship worth to the bank?* Using the same Exhibit 1, a new question must be asked: *If the bank does not match the 4.25 percent rate on the competitive offering, what is likely to be the maximum deposit loss?* If the answer is 20 percent, then if 20 percent of the customers approached the bank and demanded an interest rate of 7.25 percent, would the bank be willing to pay that rate to keep them? Or, what if 30 percent demanded a 6 percent rate, etc. This analysis clearly allows the bank to determine how much the client relationship is worth, because if the bank pays up on the entire deposit base to protect 20 to 30 percent, then they are actually paying the equivalent of 7.25 percent and 6 percent, respectively, to keep them.

New Cost of Funds Analysis. The second example analyzed in Exhibit 2 is for a bank that has offered a new money market savings account at an introductory rate of 4 percent. The objective was to attract new monies into the bank without cannibalization (too much conversion) of the existing deposit base. The analysis of the new product at the end of the first 45 days showed that only 30 percent of the balances in the account were from outside the bank, and 70 percent of the balances had been converted from existing accounts that were costing 2.15 percent before the promotion. As a result, cost of the new funds attracted by the promotion was an astonishing 8.31 percent. Looking further, even at a 50 percent conversion rate the new funds would have cost 5.85 percent. Herein lies the problem,

EXHIBIT 2. NEW FUNDS ANALYSIS

Rate to be paid on new deposits: 4%
 Weighted average weight paid on funds converted: 2.15%

Conversion Pct.*	Marginal Cost of New Money
90 %	10.65 %
85 %	14.48 %
80 %	11.40 %
75 %	9.55 %
70 %	8.31 %
65 %	7.43 %
60 %	6.77 %
55 %	6.26 %
50 %	5.85 %

*Percent of existing deposit base converted to new deposit product.
 Note: The marginal cost of new money should be compared to the incremental cost of alternative funding sources.

whenever banks run deposit specials, the first people to see these specials are usually existing customers

Conclusion. In the current environment, it is more important than ever to realistically measure the true cost of *paying up* on existing deposits and/or introducing higher rate specials. This is probably not a time to attempt to grow market share on a broad base. It is a time to purchase monies at the margin to fund new asset growth or fund deposit outflows.

GEORGE K. DARLING
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ALM Model Certification Program

Asset/liability management (ALM) model users frequently ask their model vendor for a formal confirmation that the fundamental forecast accuracy of the model has been attested to. Unfortunately, such confidence building testimonials are virtually unheard of. Lack of a sophisticated reviewer qualified in both model dynamics and ALM theory is the reason most often cited by vendors for the lack of action in this regard. But confidentiality, cost and other issues are noted as constraint.

To address user needs, a *Model Certification Program* was recently developed by McGuire Performance Solutions, Inc. (MPS), in concert with a prominent ALM model vendor. Program deliverables certify that a given model possesses the technical design characteristics, functionality, and features required to accurately forecast financial performance and value, and analyze interest rate risk (IRR), in financial institution balance sheets. Based on the certification, users of that model can have solid confidence that category-level modeling capabilities and forecasts are complete and accurate across a wide range of interest rate scenarios and balance sheet assessment environments.

At press time, several popular models have successfully completed all of the requirements for an MPS ALM model certification. These models now carry an MPS *ALM Model Certification Seal*. Other vendor models are in the process.

Key elements of this ALM Model Certification Program are reviewed in this article. However, note that the certification applies only to the model's fundamental analytical and forecast capabilities. Because of the customization that characterizes institution-specific model implementations, a certification does not take the place of a periodic model verification as may be mandated by business and regulatory needs.

Overview. MPS Model Certification Methodology. MPS takes physical possession of the ALM model during the certification process. MPS ALM model certification is based on three types of review, evaluation and testing:

- Assessment of the model's fundamental modeling competence;
- Technical verification of the model's *theoretical capabilities* to capture and forecast balance sheet behaviors; and
- Validation of the model's *actual capabilities* to accurately forecast behaviors.

Certification activities are completed for all model categories that have unique individual contractual and forecast behaviors. These are referred to as parent categories. Categories that are directly derivative of parent categories

are also considered certified (e.g., if the one-year CD is certified, then the three-year CD is also certified). Directly derivative means that (a) all parent model definitions exactly apply to the sub-category and (b) the sub-category cannot be redefined differently from the parent category in any dimension, such as for CD's term can be the only difference, not callable, step up, etc.

Once a draft certification process is complete, results are shared with the vendor and any issues found are examined. In many cases, functionality is confirmed upon further review. In other cases, needed upgrades to the model are immediately forthcoming. In instances where immediate model changes cannot be made, issues with very low levels of seriousness are entered into the formal record for appropriate categories. Serious issues, if unresolved, would of course preclude certification. Upon satisfactory completion of all tests, an MPS Letter of ALM Model Certification and a certification seal are released.

Assessment of General Modeling Competence. To provide initial perspective on model competencies, a set of general modeling-related issues are first assessed. These are discussed below.

❑ *Data Intake and Processing.* A model can only be as precise as the balance sheet data put into it. Thus, reviewing data at intake, in processing and current position building competencies is the first step taken. The accuracy and reasonableness of the balance sheet information employed in the model was examined at specific *control points* in the model. This includes footing balances within the current position (i.e., book balances and rates, maturing and repricing balances and rates, and category level contractual input, behavior assumption and reporting areas).

❑ *Quantification of Balance Sheet Behavior Sources.* Model forecasts must precisely reflect the contractual terms of all underlying categories. The model's competencies are assessed in this next step.

The model's ability to effectively capture repricing balances (the primary determinant of performance and earnings at risk IRR) and maturing balances (the primary determinate of equity at risk IRR) are assessed on both sides of the balance sheet. The model's ability to read and respond to embedded options is assessed in its ability to properly define cash flows in every time period and in all rate environments. The ability to model core deposit behaviors is particularly assessed because interest expense and present value forecasts for core deposits strongly influence model performance and risk outcomes. The functionality relating to these categories must be confirmed as detailed, flexible and all-inclusive.

EXHIBIT 3. ALM MODEL VALIDATION ASSESSMENT

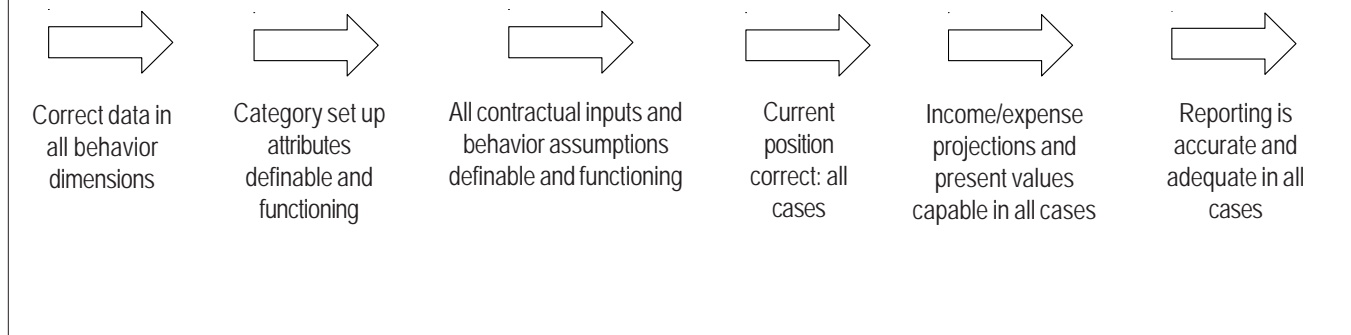
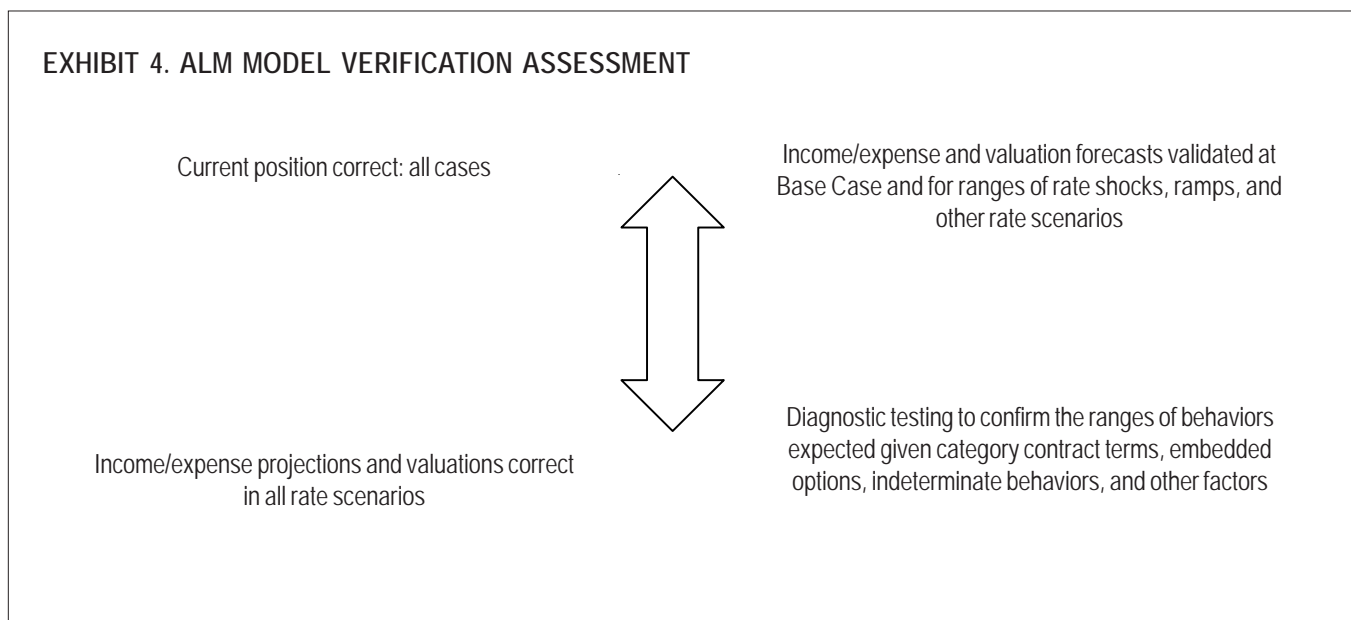


EXHIBIT 4. ALM MODEL VERIFICATION ASSESSMENT



□ *Reporting in Multiple Performance/Risk Test Environments.* The model must be able to forecast and report accurately across a wide range of interest rate scenarios and balance sheet growth paths. Easy-to-use and accurate reports are thus a model necessity. Model reporting competencies are assessed in detail as a final step.

Reports are reviewed with respect to their ability to preserve model forecast accuracy in any plausible interest rate environment for static or dynamic balance sheets. A wide range of model reports and forecasting environments is thus considered.

Model Verification Assessment. Detailed reviews of category-level data definitions and data, set up attributes, contractual inputs, behavior assumptions, and reporting accuracy were conducted to establish the theoretical forecast capabilities of the model (see Exhibit 3). The model verification is conducted by examining line-by-line all model

components that are or could be associated with modeling category behaviors and producing forecasts.

Functionality examined to assess the *theoretical capability* of the model to accurately forecast category level behaviors in multiple interest rate scenarios include:

1. Data foots to underlying source(s) and across all control points in the model.
2. Set up attributes are definable for all possible category behavior specifications.
3. Contractual inputs (spreads, repricing limits, etc.) can be completely specified.
4. Behavior assumptions (prepayments, core deposits, etc.) can be completely specified.
5. Model documentation and reporting are accurate and adequate in all dimensions.

Model Validation Assessment. Validation of category-level forecast data across multiple types of interest rate

scenarios and balance sheet growth patterns empirically demonstrates the actual capabilities of the model to accurately forecast (see Exhibit 4 on page 4). To validate category level forecasts, a proprietary MPS diagnostic system and specific testing procedures are employed.

Forecasts are assessed at Base Case (no change in interest rates) for their capability to forecast in a static environment. Model outputs are mainly assessed for regulatory type +/-200 basis point (bp) rate shock scenarios. Forecast accuracy associated with other types of projections is examined also, however, including rate ramps and true rate forecasts. Constant (no growth) and dynamic (changes in size and mix) balance sheets are reviewed.

In Base Case (no change in interest rates), forecasts of interest income, expense and present values are confirmed to accurately reflect underlying cash flows. Across interest rate scenarios, changes in interest income and expense and present values are confirmed to accurately reflect underlying cash flows, including rate-related changes associated with embedded options. Behavior examinations are conducted for continuous options such as mortgage prepayments, repricing limits (caps/floors), and switch options such as calls or puts on investments or borrowing. Core deposit behaviors are particularly scrutinized, given the importance of these balances to forecast accuracy.

In addition to the steps above, in many cases additional validation testing was conducted to affirm certain capabilities. For example, the specific progression of periodic, annual and lifetime repricing limits is verified. This is also the case for loan prepayment effects by period, core deposit repricing lags, and otherwise as considered necessary.

Closing Notes. Feedback on the MPS ALM Model Certification Program from both model vendors and model users has been favorable. A previously gray area is now made transparent for all parties, including regulators. Once again, however, note that a model certification does not take the place of a periodic model verification as may be mandated by business and regulatory needs. This is because of the high levels of customization that characterizes institution-specific model implementations.

MPS also offers a more limited model qualifications review, primarily for third-party providers of outsourced ALM services who use their own proprietary model. This confirms the ability of the model to accurately forecast interest income/expense and value in a specific modeling example, usually the model set up for the most complex balance sheet in the provider's client base. The resulting MPS Model Qualifications Statement is a much more limited affirmation of model capabilities than is a model certification, but that level is satisfactory in some cases.

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Discount Rates on the Risk-Free Curve

During the third quarter of 2005, we had a very unusual event occur. One of our clients contacted us and said they wanted to run their ALM model with all discount rates set at the risk-free curve. We sell the Risk Analytics® ALM Model.

They did not want to make any credit adjustments to the curve; just present for discounting every instrument at the yield associated with their maturity or effective duration point on the U.S. Treasury curve. The client knew how to set the model up to do that, but was questioning what results they would see if he followed that path.

We explained the pitfalls of such a scenario and counseled against such a format. In most imaginable cases, assets will increase greatly in present value if they are valued at the risk-free curve. Such an action usually results in a gross misstatement of net present value, not to mention other problems.

After speaking with the client and sensing stress over this situation, it became clear that he also had a problem with this. After probing, we discovered that the primary regulator had enforced this approach. After encouraging our client to discuss this further with the regulator, we went about our business assuming that this discussion was ended; it was not. Armed with the solace that we agreed with the points being made by the client and with us providing other points against such action, they once again contacted their regulator and presented their original arguments against the wisdom of using the specified assumptions within their ALM model. The approach still stood.

To make the point, the client finally did a model run utilizing the risk-free discount rate approach, insisted upon by their regulator. Obviously the net present value of the balance sheet rose dramatically. One might believe that this would flatten the relative risk exposure as the current level of net economic value (NEV) rose dramatically. However, the contrary occurred.

The concern is on the asset side, not so much on the liability side. Since most insured institutions fund their balance sheet at or very near the risk free curve, very little difference in liability valuation is demonstrated when re-valuing at the associated risk free rate.

Our client discovered that falling rates generated rather dramatic exposure from the asset side. This is a result of our old friend optionality raising its head. At a lower discount rate, amortizing loans and bonds rapidly lost valuation premium as prepayment rates accelerated and bonds were then in the money to be called. The reinvestment into new assets at the risk-free curve rate versus a true market spread rate really took its toll quickly on NEV. This will obviously impact projected income. Moreover,