

Bank Asset/Liability Management



Prepared by Mary Brookhart

The *Other Side* of FAS 159: Valuing Non-Demand Core Deposits

The Fair Value Option for Financial Assets and Financial Liabilities (FAS 159) permits financial institutions to apply fair value measurements to a wide range of financial assets and liabilities. Recent discussions in banking literature, however, are overwhelmingly asset-centric, an unusual outcome in light of the neutrality of FAS 159 with respect to the valuation of financial assets and liabilities. This article demonstrates that there is substantial value in focusing on the liability side of the balance sheet when considering FAS 159 election, especially regarding a certain class of indeterminate maturity deposits.

Fair value measurements of typical contractual maturity liabilities, such as certificates of deposit and FHLB wholesale funding, are largely straightforward. For indeterminate maturity deposits, the situation is more complex. FASB specifically excludes from the allowable set of financial liabilities demand deposits held in banks, thrifts, and credit unions. A standard contractual clause in NOW, savings, and MMDA accounts, however, defines balances in these categories as not *on demand*. Hence, these deposits, with appropriate quantification of their underlying term-related behaviors, qualify for fair value treatment under FAS 159 as financial liabilities.

Valuing non-demand core deposits in FAS 159 applications has significant advantages. The initial valuation typically defines a positive one-time increment to earnings. Ongoing changes in values contribute to earnings stability as changes in core deposit values offset contemporaneous changes in asset side values. Contrary to general consensus (based on an asset side only focus), FAS 159 can be a stabilizing factor with respect to financial institution earnings performance.

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Conceptual Background. The balance sheet is composed of assets and liabilities with contractual or indeterminate maturities. Valuations of contractual maturity instruments, in most cases, hold few controversial elements, although in cases other than actively traded investments, Level 2 or Level 3 valuations apply. (Three levels of valuations are recognized in FAS 157/159. Level 1 values are from prices obtained directly from active markets. Level 2 values are based on current valuations of similar financial instruments. Level 3 values are dependent on financial modeling that employs unobservable inputs and institution specific assumptions.) The specialized assumptions used for some contractual maturity balance sheet categories (e.g., prepayments on loans) need to be quantified at high levels of institution specific precision.

Indeterminate maturity instruments on both sides of the balance sheet require special consideration. For loans, expected term-related behaviors need to be established to provide a basis for fair value calculations. This can be accomplished in the same manner as for non-demand core deposits.

For indeterminate maturity deposits, the non-demand nature of the categories under review must first be established because demand deposits are specifically excluded from FAS 159 valuations. This is readily done by examining the contract language governing account withdrawals. NOW, savings, and MMDA contracts normally include a *reservation requirement* embedded in the fine print. This specifies that the financial institution reserves the right to require a seven-day notice of withdrawal on interest-bearing accounts. It is this contract clause that explicitly defines these balances as non-demand.

With that enabling definition in hand, the term-related dimensions of the non-demand core deposits must next be determined. As the contract provides no guidance as to effective term, this requires analyzing historic depositor behaviors and forecasting future runoff as the basis for calculating average life. This process sets statistically determinate maturities for non-demand core deposits, overcoming their contractual indeterminacy.

Non-demand core deposits (excluding high-rate premium categories) are normally low-cost and long-term sources of funding in banks, thrifts, and credit unions. For their given term, they are much less expensive funding than wholesale funds with comparable terms. Because of this, initial FAS 159 fair value measurements normally produce fair values less than book values. The difference can be taken as an adjustment to earnings at the point of election. Subsequent revaluations (e.g., quarterly) pro-

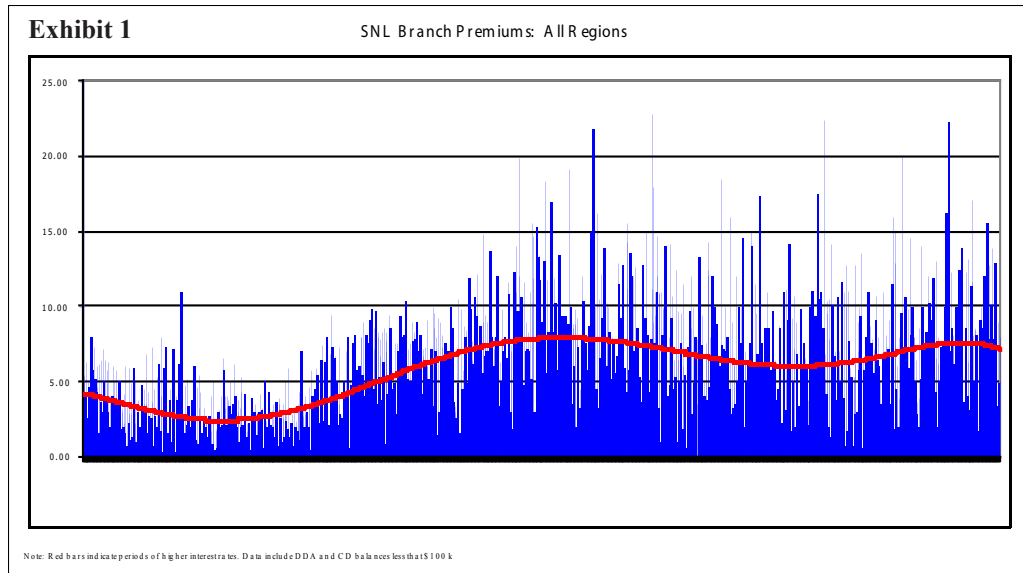
duce changes in non-demand core deposit fair values as discount rate and rate paid changes interact over time. The changes in fair values create adjustments to earnings in each period.

The initial earnings' impact of valuing non-demand core deposits recognizes their embedded economic advantage compared to wholesale funds. This is not a form of *own credit worthiness* as practiced by some FAS 159 adopters in regards to their own debt instruments. The advantage rather reflects the value that depositors place on the non-rate value proposition represented by the deposits in question (i.e., the service, convenience, and product dimensions of the deposit relationship). A portion of the advantage may also reflect the time involved with closing the account. There is no sleight of hand involved; the economic advantage implied by fair value lower than book value for non-demand core deposits is based on sound fundamentals.

Changes in non-demand core deposit fair values affect earnings each time they are recalculated. These changes, however, are normally expected to be in a direction that offsets concurrent changes in asset-side fair values. (Changes in non-demand core deposit fair values will be an offset to asset-side fair value changes as long as discount rates vary by a greater degree than rates paid. This is essentially a sure bet.) Net FAS 159 adjustments to earnings are thus muted if non-demand core deposit valuations are included in the election. This crucial financial management positive needs to be recognized in the debate over FAS 159 and fair value accounting in general.

That core deposit fair values are normally less than book values (i.e., there is an embedded premium in these balances) and that fair values (and premiums) are sensitive to changes in interest rate environments are not just theoretic concepts. Rather, there is clear evidence of these behaviors in the historic record of their closest analog, premiums paid on branch transactions. Exhibit 1 presents branch premium data for the period. Premiums are positive in all but one case (not charted for display clarity) and premiums are higher in periods of higher interest rates and vice versa. The conclusion: Valuations of non-demand core deposits as financial liabilities *as per* FAS 159 have a solid basis in broad market-based outcomes.

Current Field Experience: Non-Demand Core Deposit FAS 159 Valuations. There is a limited amount of current field experience with FAS 159 valuations of non-demand core deposits. Evidence, to date, supports



to mid-2007 is reflected in the minimal premium variations. The steep reductions in short-term interest rates first seen in the 09/30/07 valuations push down premiums in that period. This effect accelerates at year-end and 03/31/08, owing to additional short-term interest rate cuts but only limited repricing. That repricing anomaly was owed to the unusual demands made on deposit markets in those periods by the *mortgage zombie*

the value claims above (i.e., fair values are less than book values and fair values vary across time as interest rates change). It also provides important insights into the earnings implications of FAS 159 fair value measurements of non-demand core deposits.

institutions, large mortgage banking-oriented institutions whose access to wholesale funds was shut off due to credit concerns. Relief is expected in mid-2008, as deposit pricing has recently moved closer to equilibrium and interest rate reductions have moderated.

Exhibit 2 presents outcomes for non-demand core

Exhibit 3 presents hypothetical earnings adjustments

associated with the premiums reviewed above. The initial valuation creates a one-time significant adjustment to earnings. This recognizes the economic advantage embedded in the institution's non-demand core deposits, which reflects

Exhibit 2

Indicative FAS 159 Non-Dem and Core Deposit Premium Valuations

| | 12/31/06 | 03/31/07 | 06/30/07 | 09/30/07 | 12/31/07 | 03/31/08 |
|---------------|----------|----------|----------|----------|----------|----------|
| NOW | 6.50% | 6.65% | 6.70% | 6.15% | 5.50% | 4.05% |
| Savings | 7.00% | 6.85% | 6.90% | 6.35% | 5.65% | 3.25% |
| MMDA Low | 3.75% | 3.85% | 3.95% | 3.25% | 2.25% | 1.95% |
| MMDA High | 1.25% | 1.35% | 1.30% | 1.15% | 0.45% | 0.75% |
| W Avg Premium | 3.93% | 4.00% | 4.02% | 3.60% | 2.85% | 2.19% |

Note: Values are approximate mid-range outcomes of limited observed experience
 Rates paid, interest rates, and yield curve shape changed over the period
 Constant mix of 25% NOW, 15% savings, 20% MMDA Low, and 40% MMDA high is assumed

deposit FAS 159 valuations for reference. Data are for personal categories only to simplify the display. Premiums are rounded, not actual, values to respect confidentiality. The premiums presented are fully representative, however, of the favorable difference between fair value and book value by category in each period.

the favorable depositor valuations of the non-rate value proposition attached to these funds.

The benign interest rate environment from year-end 2006

Adjustments to earnings at subsequent valuation

Exhibit 3

Indicative FAS 159 Non-Dem and Core Deposit Earnings Adjustments

| | 12/31/06 | 03/31/07 | 06/30/07 | 09/30/07 | 12/31/07 | 03/31/08 |
|------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| NOW | 1,625,000 | 1,662,500 | 1,675,000 | 1,537,500 | 1,375,000 | 1,012,500 |
| Savings | 1,050,000 | 1,027,500 | 1,035,000 | 952,500 | 847,500 | 487,500 |
| MMDA Low | 750,000 | 770,000 | 790,000 | 650,000 | 450,000 | 390,000 |
| MMDA High | 500,000 | 540,000 | 520,000 | 460,000 | 180,000 | 300,000 |
| Total Adjustment | 3,925,000 | 75,000 | 20,000 | -420,000 | -747,500 | -662,500 |

Note: Values are based on mid-range premium outcomes, assuming no growth in a \$100 million portfolio
 Constant mix of 25% NOW, 15% savings, 20% MMDA Low, and 40% MMDA high is assumed
 Adjustment at 12/31/06 is hypothetical election date. Adjustments after that are changes in value.

points (here quarterly) reflect changes in premium values over time that derive from the interactions of varying rates paid and discount rates (all other value inputs, total portfolio balances, and category mix are held constant for simplicity). The almost constant interest rate environment from year-end 2006 to mid-2007 drives the limited earnings adjustments in those periods. The steep reductions in short-term interest rates beginning in 09/30/07 and continuing through 03/31/08 result in adverse earnings adjustments, with the highest adjustment levels seen at year-end and 03/31/08. As noted above, this is expected to change. Recent deposit-market data suggest pricing is moving towards equilibrium in relation to more stable interest rates and, as a result, smaller earnings adjustments are expected by mid-2008.

There are several important points to make about the data presented in Exhibits 2 and 3. First, the initial FAS 159 valuation provides a significant positive earnings adjustment. This is fully justified; it appropriately quantifies embedded value in the balance sheet that, heretofore, was unrecognized. Second, even across one of the most unusual periods in interest-rate and deposit-pricing history, the periodic adjustments to earnings arising from varying FAS 159 valuations of non-demand deposits are not unduly large. Finally, those variations are simultaneously being offset (all or in part) by earnings adjustments from changing valuations in assets. The net is potentially positive to earnings stability, although the specifics of the balance sheet will decide that.

— William J. McGuire, Ph. D.
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The Necessity of Contingency Funding Plans

The formulation of plausible liquidity stress scenarios dictates that action plans need to be formulated in order to mitigate the potential downside risk resulting from the manifestation of the stress scenario. This article investigates how a contingency funding plan (CFP) can be formulated and applied in managing liquidity risk for a bank under conditions of stress.

Contingency Funding Plans. A contingency funding plan is required as part of a comprehensive liquidity risk management program. All banks should develop

and maintain contingency funding plans. A CFP is a comprehensive cash flow projection and funding plan that forecasts funding needs and funding sources under various market scenarios. It should represent the bank's best estimate of potential balance sheet changes that may result from a liquidity or credit event.

A contingency funding plan is required as part of a comprehensive liquidity risk management program.

Banks should have contingency plans in place that address early warning signals of a potential liquidity crisis. The CFP should contain the strategy and tactics used in normal business scenarios to prevent the escalation of any liquidity concerns. Furthermore, it should highlight possible strategies for dealing with different levels of severity and types of liquidity stress events that may cause liquidity shortfalls. CFPs are linked to specific stress-testing scenarios. It is not uncommon to establish a CFP for each stress-specific scenario that highlights the proposed actions for accessing liquidity under a specific scenario. Banks should have a contingency plan in place that clearly directs the strategy of how to handle liquidity crises, which should include the procedures to follow to attempt closing liquidity shortfalls in emergency situations. The CFP should, therefore, address two major questions:

- Does management have a strategy for handling a crisis?
- Does management have procedures in place for accessing funds in an emergency?

Management Strategy. The most critical component of the CFP is the one dealing with managerial coordination. The CFP needs to spell out the procedures to ensure that the information flows of precise and accurate decision-quality information to senior management remain timely and uninterrupted. A clear division of responsibility must be set out to ensure that all personnel understand exactly what is required of them during a period of liquidity strain or a stress event. Policies and procedures and clear divisions of roles and responsibilities must be established for liquidity events to avoid any confusion or a lack of coordination and clarity during times of stress.

Valuing Non-Demand Core Deposits for FAS 159 Applications — A Continuation

Financial Accounting Standards Board Statement No. 159, The Fair Value Option for Financial Assets and Financial Liabilities (FAS 159), permits financial institutions to apply fair value measurements to a wide range of financial assets and liabilities. But as was discussed in *BALM*, August 2008, recent banking literature is overwhelmingly asset-centric. This is an unusual outcome in light of the neutrality of FAS 159 regarding the valuation of financial assets and liabilities. There is substantial value in focusing on the liability side of the balance sheet when considering FAS 159 election, especially regarding a certain class of indeterminate maturity deposits.

The field experience that was reviewed in the August *BALM* issue derives from actual FAS 159 fair values delivered over the period reviewed. There are many moving pieces to these valuations, but a general framework can be constructed to illustrate their derivation.

The indeterminate maturity nature of non-demand core deposits mandates a Level 3-type FAS 159 valuation. The use of specialized financial modeling, which is reliant on unobservable inputs and institution specific assumptions, creates the need for both analysis precision and comprehensive documentation. These are surmountable hurdles in light of advances in data and analytical methodologies, and high levels of quantification are possible. Constructing FAS 159 fair values for non-demand core deposits is a multi-step process, as follows.

Step 1: Identify Non-Demand Core Deposit Categories. Term related behaviors vary by core deposit type. Thus, overall non-demand core deposit balances must be segregated into specific categories. Typical practice is to separate personal from business balances and to stratify tiered categories into their underlying components (e.g., low, middle, and high balance groupings). Other segmentations may also be needed in special cases.

Step 2: Define Term-Related Dimensions by Category. Average life is the measure most often used to describe the term of a non-demand core deposit category in fair value calculations. Average life is calculated by creating a weighted average of the expected future runoff balances forecast for each category.

In best practice solutions, future runoff balances are based on advanced statistical analyses of recent retention

experience of fixed pools of accounts tracked over time. This approach defines an underlying equation system that can forecast unique future runoff behaviors in any specified interest rate environment (i.e., forecasts are not only precise at initial election but also reset over time to maintain maximum ongoing valuation accuracy). This is a key compliance element in FAS 159 Level 3 fair value measurements because it unambiguously establishes the statistical determinacy of non-demand core deposit maturities, overcoming their contractually indeterminate maturities.

Institution-specific, statistically based category level runoff forecasts have been confirmed accurate in more than 12 years of diverse financial sector applications, proven through favorable back tests comparing forecasted versus subsequent actual runoff and other testing. They are the best possible basis for valuing non-demand core deposits in FAS 159 applications.

There is substantial value in focusing on the liability side of the balance sheet when considering FAS 159 election, especially regarding a certain class of indeterminate maturity deposits.

Standard practice solutions use statistical analyses of peer group institution behaviors, averaged to create *typical* runoff forecasts by category. This approach has proven satisfactory in diverse applications, again as evidenced in successful back tests. Peer group-based runoff data clearly have a greater degree of variance to actuals, as one would expect, and in extreme situations (e.g., a highly specialized category) may not predict well. If a peer group runoff solution is chosen, be sure to closely examine the match of institution categories vis-à-vis peer group categories.

Traditional *rule of thumb* or national averages of runoff estimates are not acceptable in FAS 159 valuations of non-demand core deposits. The disconnect between such gross approximations and institution-specific, category-level behaviors is likely very large and with an unknown bias.

Note that runoff forecasts, either institution-specific statistical analysis or peer-group based, often need to be truncated (runoff ballooned) at some distant point. This

is because such forecasts can be mechanically projected beyond the point of acceptable forecast risk. Specific truncation points should be determined in light of industry experience and management input.

Step 3: Calculate Fair Values and Earnings Adjustments by Category. Fair values are normally calculated in a standard single path modeling framework. Monte Carlo (stochastic) approaches can be applied, but option behaviors are generally so limited that minimal precision gains are found. The fair value model includes the category book value (general ledger) balance as of the valuation date, forecasted runoff from that balance, current rate paid, and a non-interest expense input. These cash flows, so defined, are discounted by an alternate cost of funds rate in each future time period.

The resulting fair value is compared to current book value to calculate the earning adjustment in the current period. As noted, at election the entire difference is the adjustment to earnings. In each future valuation period, changes from the prior period are the applicable adjustments to earnings.

Sources for non-interest expense inputs (the all-in cost of raising, retaining, and servicing non-demand core deposits, inclusive of the opportunity cost of float and reserves, minus direct fee income) are national experience estimates or (preferred) institution-specific data derived from internal cost accounting systems. Common choices for discount rates are FHLB bullet term advances, the brokered CD rate curve, or other time value of money curves plus a spread. An advantage of FHLB rates is that market-based pricing is available at longer terms than can be found on the brokered CD curve. Note that recent developments in the brokered CD market, in particular regulatory displeasure with their extreme use, cast a further shadow on their standard application as discount rates in FAS 159 applications.

Best Practice Compliance Activities. As Level 3 valuations, non-demand core deposit FAS 159 fair value measurements carry high compliance mandates for documentation, maintenance, and risk control processes. Documentation includes special activities at election, at each valuation period, and annually. Maintenance and risk controls are ongoing, with activities in each valuation period.

Documentation Mandates. At election of FAS 159, the entire process of valuing non-demand core deposits must be explicated and justified. This includes the valuation

methodology and all unobservable inputs and institution specific assumptions. In applications using peer group runoff data, the specific source(s) of the runoff information needs to be specially noted, as well as a clear justification for its use instead of institution-specific data.

In each valuation period, key inputs and assumptions must be documented. Also, an alert process needs to be created if changes in inputs, assumptions, or the valuation methodology create material impacts to calculated fair values. Annually, the detailed documentation produced at election needs to be recreated or reaffirmed as a special documentation element.

Early fair value measurement mandates, such as FAS 107 and FAS 115, were justifiably criticized for their narrow focus. FAS 159 overcomes almost all of those criticisms by allowing ongoing valuations of a very wide range of financial assets and liabilities, including non-demand core deposits.

Maintenance Best Practices. At each FAS 159 valuation point, statistically based forecasts of runoff need to be refreshed. The existing equation based forecast system is loaded with current book balances, rates paid, and interest rates and revised runoff forecasts produced. These are input into the fair value model, ensuring that any influences from evolving rate environments are captured in the valuations. Peer group-based runoff data are typically refreshed annually, although more frequent updates can be applied if conditions warrant. At each valuation point, other fair value inputs are also updated as needed (e.g., book balances, rates paid, and discount rates).

On an annual basis, the institution-specific equation system should be updated. This adds the most recent 12 months of data to the time series, reruns the statistical analysis, and produces updated coefficients in the forecast equations. The updated system now becomes the basis for forecasting runoff in the fair value model. Once every three years, a new statistical study is recommended to capture possible structural changes in the deposit behaviors analyzed.

Risk Management Best Practices. As with any financial modeling solution, FAS 159 fair value measurements

of non-demand core deposits need to be supported by user control environment and governance solutions. Checklists to document user update activities, detailed methodology, inputs, assumptions documentation, and reporting guidance are required along the same lines as ALM model governance. Be sure to specify as part of these processes a periodic independent review of the fair value program and mandate oversight reporting to ALCO and the board at appropriate intervals.

Because of the indeterminate nature of the deposits being analyzed, an annual back test comparing prior forecasts of runoff values to subsequent actual values needs to be part of supporting risk management practices. Best practice is to conduct rolling quarterly *Early Alert* reviews and produce an annual formal 12-month back test. Such reviews not only assess prior forecast accuracy, they also (when successful) build confidence in the FAS 159 fair value measurement process.

Closing Notes and Comments. Early fair value measurement mandates, such as FAS 107 and FAS 115, were justifiably criticized for their narrow focus. FAS 159 overcomes almost all of those criticisms by allowing ongoing valuations of a very wide range of financial assets and liabilities, including non-demand core deposits. Viewed correctly from both sides of the balance sheet, FAS 159 represents an opportunity to properly recognize embedded value and potentially stabilize earnings - twin positives for financial institutions.

— *William J. McGuire, Ph. D.*
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IMPORTANT NOTICE — ALM SOFTWARE SURVEY

The annual asset/liability management software listing will appear in the October issue of *BALM*. Any vendors who have not responded to the request for changes to this important listing should contact Mary Brookhart at 704-541-0489, or SECI@aol.com.

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