

Managing Liquidity Risk

By Michael R. Guglielmo

Six ways to strengthen your liquidity risk-management process.

Managing liquidity risk is becoming more challenging as balance sheets grow in complexity and dependence upon the capital markets for funding continues to rise. What were once considered contingency sources of liquidity such as the Federal Home Loan Bank (FHLB advances), broker-dealers (repurchase agreements and brokered deposits) and national CD listing services (QuikRate) are now mainstream and integral parts of liquidity management processes used by many financial institutions today. Examiners understand the market forces that have led bankers to seek alternative funding sources and acknowledge their contribution to an effective liquidity management process (and profitability). But this increased dependence introduces additional issues and risks that institutions must understand and actively manage.

Regulatory agencies have been actively updating their handbooks and are arming their examiners with a new set of liquidity risk-management guidelines and standards. These guidelines appropriately emphasize the need to use a liquidity risk-management process that is commensurate with the liquidity management activities and risk profile of the institution being examined. Institutions that plan to rely on the capital markets to fund future growth need to demonstrate their understanding of the risks involved and have the appropriate measurement and management processes in place. The credit crunch that occurred in the summer of 2007 was a wake-up call to many liquidity managers in the finance industry: Times are changing and we need to be prepared.

There are eight key questions your asset-liability management committee (ALCO) and the board should be able to answer relative to your current liquidity and liquidity risk-management process:

1. How much liquidity (operational, reserve and contingency) do we have?
2. How accessible is it and what are the relative costs?
3. How much operational liquidity may we need short term and longer term?
4. If market or economic conditions change, how could our liquidity needs and cash availability change?
5. What crisis or events could markedly affect our operational needs and impede our access to reserves and/or contingency sources?
6. Do we have a sufficient early warning system that could prompt actions prior to a problem?
7. What actions would we take in the event of a liquidity crisis, and how long could we sustain operations?
8. Do we have adequate processes and controls in place that will ensure action plans will be executed successfully?

If you or your management team has difficulty answering any of these questions, your liquidity and liquidity risk-management process may be in need of a makeover. Here are six steps you can take to strengthen your liquidity and liquidity risk-management process.

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Step 1: Determine How Much Liquidity You Have

To fully understand your liquidity position, you need to begin with a working definition with which everyone in your organization agrees—and one upon which measures can be established. A definition we find works well is “the ability to raise cash quickly (within 30 days) with minimal principal loss and at a reasonable cost.”

The next step is to evaluate your current liquidity measures to see if they support this definition. For those institutions using the traditional regulatory measures such as the *loan/deposit ratio* or the *volatile liability dependency ratio*, you should quickly conclude that neither of these backward-looking measures can truly quantify an institution’s future cash availability or accessibility. Organizations that rely primarily upon traditional cash flow projections (a sources and uses forecast) can fail in meeting this definition as well, since future cash flows (beyond 30 days) will not help when you need cash most—quickly. Moreover, all of these measures focus just on on-balance-sheet liquidity and do not factor in access to off-balance-sheet sources, which most financial institutions employ and rely on with regularity.

The approach that we find best encompasses both on- and off-balance-sheet liquidity is the basic surplus (deficit) method. The basic surplus (deficit) approach has been effectively used for the last 25 years by financial institutions throughout the United States and the world to manage their liquidity and funding. Exhibit 1 shows a typical basic surplus (deficit) schedule.

This report begins with quantifying your liquid assets. This section is essentially an inventory of the assets that can be converted to cash within the next 30 days either because (1) they are cash equivalents (for example, federal funds sold), (2) they can be sold with a minimum of principal loss, (3) they can be pledged as collateral for borrowings, or (4) they mature within the next 30 days.

For cash and cash equivalents, you can include cash-related assets not required for operational purposes (federal funds sold, overnight deposits or investments, money market mutual funds, *etc.*). Assets that can be sold quickly with minimal or no loss

may include student loans, the guaranteed portion of Small Business Administration (SBA) loans and the like. Assets that can be used as collateral for borrowings are primarily U.S. government and agency securities and agency-issued mortgage-backed securities and collateralized mortgage obligations (MBS and CMOs). These assets are considered liquid regardless of their accounting classifications (held to maturity [HTM] or available for sale [AFS]), since use as collateral does not require or constitute a sale.

Since assets that may be used for borrowings cannot already be pledged for other purposes, the balances of each asset category must be reduced by the amount of pledges already made. In addition, only the market value of the pledgeable assets should be used in the calculation, along with the related haircut that would

be applied, since borrowing capacity would be based upon these two elements.

Once the liquid assets have been inventoried, it is important to identify and categorize any liabilities that might create liquidity exposure, particularly those that would arise should customers or lenders lose confidence in the financial stability of the bank. In this short-term liabilities section, we would include (1) total unsecured borrowings maturing within 30 days and (2) coverage for potential deposit runoff.

In the case of unsecured borrowings, we would include outstanding balances in federal funds purchased and unsecured borrowings from other financial institutions. Because they are unsecured, they would be extremely vulnerable to runoff in the event of a loss of confidence. Therefore, runoff (for contingency coverage) should always be maintained at 100 percent.

The parameters defined for deposit coverage should be broken down into two components: time deposits and nonmaturity deposits (NMD). For time deposits, an assumption for runoff should be applied to deposits scheduled to mature within the next 30 days, with sources, concentrations, relative costs, stability and reliability influencing the coverage defined. In general, banks typically use 25 percent for stable/reliable retail sources and anywhere from 25 percent to 100 percent for other products depending upon the relative risks. For NMD, banks typically will use anywhere from five percent to 10 percent depending upon the coverage de-

Look for measures that are easily accessible or already reported.

Exhibit 1. Basic Surplus (Deficit) Schedule

I. LIQUID ASSETS			
Overnight Funds Sold & Short-Term Investments (avg. balance, if wide daily fluctuations)			4,000
Security Collateral	<u>UST & Agency</u>	<u>MBS/CMOs (-5% Haircut)</u>	
Total Market Value of Securities	450,000	125,000	
Less Securities Pledged to:			
FHLB	-22,500	-10,500	
Wholesale Repos	0	0	
Retail Repos/Sweeps	-150,000	-50,000	
Municipal Deposits	0	0	
Other	0	0	
Available/Unencumbered Security Collateral	277,500	61,275	338,775
Overcollateralized Securities Pledging Position			50,000
Government & Agency Guaranteed Loans (SLMA/SBA unpledged)			5,000
Cash flow (< 30 Days) from securities not listed above			0
Other Liquid Assets (Interest-Bearing Deposits, Money-Market Mutual Funds, etc.)			5,000
TOTAL LIQUID ASSETS			402,775
II. SHORT-TERM/POTENTIALLY VOLATILE LIABILITIES & COVERAGES			
Maturing Unsecured Liabilities (< 30 Days)			0
Deposit Coverages			
25% of Regular CDs maturing < 30 Days		6.2 %	2,500
30% of Jumbo CDs maturing < 30 Days		of total	5,000
10% of Other Deposits of Total Deposits		deposits	30,000
Additional Liquidity Reserve(s)			0
TOTAL SHORT-TERM/POTENTIALLY VOLATILE LIABILITIES & COVERAGES			37,500
BASIC SURPLUS			365,275 36.5%
III. QUALIFYING FHLB LOAN COLLATERAL			
A. Maximum Borrowing Line at FHLB is Not Available			
B. Qualifying Loan Collateral at the FHLB (net of haircut)			150,000
C. Excess Loan Collateral (if A < B)			
Maximum Borrowing Capacity (Lesser of A or B)			150,000
Collateral Currently Encumbered by Outstanding Advances			100,000
REMAINING FHLB LOAN-BASED BORROWING CAPACITY			50,000
BASIC SURPLUS W/FHLB			415,275 41.5%
IV. BROKERED DEPOSIT ACCESS			
Maximum Board-Authorized Brokered CD Capacity (per policy)			190,000
Current Brokered CD Balances			25,000
REMAINING CAPACITY TO UTILIZE BROKERED CDs			165,000
BASIC SURPLUS W/FHLB & BROKERED CDs			580,275 58.0%

sired and the historical stability of these funding sources. While core deposit studies help in identifying historical trends and evaluating the stability of the deposit base for a given institution, a broader industry perspective of historical liquidity events or runs should be taken into consideration. It is important to keep in mind that the assumptions used for deposits represent *contingency* coverage. Management and the board must ultimately use judgment in developing the assumptions and relate the liquidity results to the assumptions applied. In the case of Exhibit 1, the assumptions used for deposit contingency coverage can be off by over 900 percent before the core liquidity profile approaches a negative result.

To calculate the basic surplus (available or excess liquidity) or the basic deficit (liquidity shortfall), short-term liabilities are subtracted from liquid assets. To provide a perspective relative to historical capacity, results can be shown as a percentage of total assets. This will allow management to effectively evaluate trends and assess the bank's capacity to fund additional growth or supplement unplanned deposit runoff (beyond the coverage already assumed).

The core basic surplus (deficit) in Exhibit 1 reflects the cash and funding available (net of contingency coverage) from brokerage firms and the FHLB (excluding loan collateral). This core basic surplus can be enhanced by incorporating a few additional liquidity sources:

- **FHLB.** Access to the FHLB (using qualifying loans as collateral) represents a just-in-time inventory management of your funding.
- **Brokered CDs.** Use of the brokered CD market can be looked at as your institution's strategic reserves, or funding that can be used when your just-in-time inventory begins to drop to levels below the policy guidelines. Brokered CDs can also be issued to pay down FHLB borrowings and increase the just-in-time inventory. While reliable and available without collateral, orders can take some time to fill and access can be restricted when there are credit concerns.
- **Federal Reserve.** Establishing a borrowing arrangement with the District Federal Reserve Bank (FRB) under the borrower in custody (BIC) program with collateral that cannot be used to support borrowings elsewhere essentially provides catastrophe insurance in the event of a systemic liquidity crisis in which the FHLB or brokered CD markets are not available.

To the extent available, other liquidity items can be summarized and footnoted in this report. These

sources may include (1) other securities that could be sold or collateralized (for example, corporate or municipal bonds), (2) unsecured lines of credit such as federal funds lines and (3) secured lines such as the FRB's BIC program.

Step 2: Estimate How Much Liquidity You Need

Once you have established your current liquidity position and can quantify your institution's capacity to fund planned growth or potential deposit runoff, it is important to understand how future changes in your balance sheet could affect your liquidity position. A projection of sources and uses would be an appropriate tool in this case. The appropriate level of detail and the time frame will vary depending upon the complexity of your balance sheet, your liquidity profile and data available. Your projection should at least extend over a three-month horizon. While examiners may encourage you to expand this forecast over six or even 12 months, the level of accuracy—and consequently the utility—for most institutions would diminish significantly. If future cash flow information is presented to the ALCO and the board in summary form, it may be worthwhile to separately maintain the details related to contractual and noncontractual cash flow runoff along with the estimates for new volume. Understanding the relative contribution of contractual cash flows, cash flows derived from your behavioral models or estimates and new volume could be important when you begin to look at contingency and stress-testing scenarios later in this process. Exhibit 2 illustrates what a core liquidity matrix may look like.

Step 3: Establish an Early Warning System

Once you know your baseline liquidity position, it is important to define a system of key warning signals or risk indicators (triggers) that can alert management to an increased state of liquidity duress. These triggers need to be institution specific, since balance sheets, liquidity sources, business practices and management philosophies vary. For example, an institution that actively relies upon securitization and

sales activities as a primary source of funding will want to establish a measure related to that practice. A bank that actively uses brokered funding will want a measure related to that activity. When developing these potential triggers, management should discuss and take into consideration relevant local and broader (national) market trends and influences. Exhibit 3 summarizes common key risk indicators.

The extent of the risk-measurement process should be commensurate with your institution's size, complexity and liquidity risk profile. In determining the specific measures or ratios, try to keep it simple and look for measures that are easily accessible or already reported. For institutions with more robust financial modeling and reporting systems or data warehousing tools, more sophisticated metrics can be derived, tracked and used as part of the risk-measurement process (for example, loan-loss migration, retail deposit stability, loan prepayment, product pricing).

Step 4: Stress-Test Your Funding Needs and Availability

Most institutions are accustomed to stress-testing analyses in the context of earnings- and value-at-risk through their interest rate risk-management practices. Surprisingly, few institutions look at the information embedded in that analysis and its potential impact on liquidity. Under varying interest rate environments, cash flows and estimated market values are changing. If they are changing a lot, your institution's liquidity capacity and funding needs could be markedly affected.

For institutions for which liquidity is of growing concern, additional alternative stress-testing analysis should be performed with some regularity. In addition to projecting existing cash flows or values in differing environments, alternative assumptions that reflect potential events can be applied. We have found this type of analysis can be highly effective in evaluating the potential severity of a liquidity event and your institution's readiness to handle that event. While general event definitions are okay, a well-designed plan that is customized to your institution is preferred by examiners.

How many scenarios or alternatives is enough? What kind of reporting should you prepare and

review? These questions depend upon your institution's risk profile (liquidity, interest-rate risk and capital). In general, institutions that are highly levered and have a notable dependence on the capital markets for funding should be doing more than an institution with high capital, low interest rate risk and strong liquidity. As with interest rate risk management, it is important not to overdo it: We typically recommend developing a set of scenarios that represent three levels of liquidity duress (moderate, high and significant). For each of these scenarios, management should evaluate the potential impact on a number of items including collateral values, tightening collateral standards that reduce borrowing capacity, deposit outflows, capital hits that affect the ability to access the brokered market, the need to securitize and sell assets at severe losses, at what point do we have to utilize our BIC line at the Federal Reserve, *etc.*

In terms of ALCO and board reporting, a liquidity scorecard that summarizes all of the liquidity measures, the key risk indicators and their levels relative to policy guidelines (perhaps color-coded red/yellow/green) would be appropriate. In addition, including historical trends would be beneficial from the standpoint of understanding how we got to the current liquidity state.

Step 5: Outline Management's Responses

Once the liquidity events are identified, management needs to outline its expected responses for each event. For larger organizations, establishing a liquidity crisis team that meets and reports periodically to ALCO and the board may be beneficial. This team of specialists should include those primarily responsible for the execution of specific activities outlined in your institution's liquidity contingency plan.

Depending upon the type, severity and duration of the liquidity events, responses will vary in terms of complexity and execution effort. Minimally, each action plan should include a prioritized sequence with procedural instructions, communication protocol and key contact information (personnel responsible, external contacts). Since actions may be staged with initial responses followed by longer-

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Exhibit 2. Sample Core Liquidity Planning Matrix

Sources and Uses of Funds									
Sources of Cash (Existing)			Total	1 Month	2 Months	3 Months	4 Months	5 Months	6 Months
Short-Term Investments			\$-	\$-	\$-	\$-	\$-	\$-	\$-
Other Liquid Assets			\$-	\$-	\$-	\$-	\$-	\$-	\$-
Bond Cash Flow / Sales—US Treasuries & Government-Sponsored Agencies			\$-	\$-	\$-	\$-	\$-	\$-	\$-
Bond Cash Flow/Sales—Other			\$-	\$-	\$-	\$-	\$-	\$-	\$-
1- to 4-Family Residential Loan Cash Flow Received			\$-	\$-	\$-	\$-	\$-	\$-	\$-
Other Loan Cash Flow Received			\$-	\$-	\$-	\$-	\$-	\$-	\$-
Planned Loans Sales			\$-	\$-	\$-	\$-	\$-	\$-	\$-
Existing Sources of Cash			\$-	\$-	\$-	\$-	\$-	\$-	\$-
Uses of Cash (Existing)		Replacement Percentage	Total	1 Month	2 Months	3 Months	4 Months	5 Months	6 Months
Bond Replacement(s)—USTs & GSAs		100.0%	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Bond Replacement(s)—Other		100.0%	\$-	\$-	\$-	\$-	\$-	\$-	\$-
	Current Balance	Decay Estimate (mos)	Total	1 Month	2 Months	3 Months	4 Months	5 Months	6 Months
DDA Balance/Monthly Outflow	\$-	0.0%	\$-	\$-	\$-	\$-	\$-	\$-	\$-
NOW Balance/Monthly Outflow	\$-	0.0%	\$-	\$-	\$-	\$-	\$-	\$-	\$-
MMDA Balance/Monthly Outflow	\$-	0.0%	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Savings Balance/Monthly Outflow	\$-	0.0%	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Other Nonmaturing Deposits/Monthly Outflow	\$-	0.0%	\$-	\$-	\$-	\$-	\$-	\$-	\$-

Exhibit 2. Sample Core Liquidity Planning Matrix

Sources and Uses of Funds									
CD Maturities— Not Replaced (6 mos.)	\$-	0.0%	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Brokered CD Maturities—Not Replaced (6 mos.)	\$-	0.0%	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Secured Borrow- ings—Not Replaced (6 mos.)	\$-	0.0%	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Unsecured Borrowings—Not Replaced (6 mos.)	\$-	0.0%	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Trust-Preferred Dividends to be Paid			\$-	\$-	\$-	\$-	\$-	\$-	\$-
Existing Uses of Cash			\$-	\$-	\$-	\$-	\$-	\$-	\$-
Existing Balance Sheet—Cash Inflow/Outflow			\$-	\$-	\$-	\$-	\$-	\$-	\$-
New Business Activity			Total	1 Month	2 Months	3 Months	4 Months	5 Months	6 Months
1- to 4-Family Residential Loan Originations			\$-	\$-	\$-	\$-	\$-	\$-	\$-
Other Loan Originations (net of unused line balances)			\$-	\$-	\$-	\$-	\$-	\$-	\$-
New Deposit Balances (Non- collateralized)			\$-	\$-	\$-	\$-	\$-	\$-	\$-
New Deposit Balances (Collateralized— including repos)			\$-	\$-	\$-	\$-	\$-	\$-	\$-
New Business Activity—Cash Inflow/Outflow			\$-	\$-	\$-	\$-	\$-	\$-	\$-
Pro Forma Cash Inflow/Outflow			\$-	\$-	\$-	\$-	\$-	\$-	\$-

term activity, identifying timelines for each activity would be appropriate. When we assist clients to develop action plans, we encourage them to initially keep it simple so it can be easily understood and executed. Over time, these plans can be enhanced to include more substantive activities such as public relations efforts and detailed marketing plans.

Step 6: Document Your Process and Periodically Test Liquidity Sources

All this effort is well and good but if it is poorly documented and not periodically tested, all of your work could be for naught. Take the time to

adequately document your liquidity risk-management process. As part of this documentation, include a complete description of what you do in terms of liquidity monitoring and management process, your liquidity management philosophy and why your institution has selected (or excluded) specific risk measures and key risk indicators. If done well, this document can (1) serve as your liquidity management playbook; (2) inform and educate all of your significant stakeholders (management, the board, funding providers, examiners and independent risk auditors); and (3) reduce the risk of poor execution.

If any of the defined action plans include use of external resources or conduits, it is imperative to periodically contact and test these sources to ensure availability in a time of need. If the first time you call an institutional broker for deposits is when you are having issues, the broker is going to be reluctant to assist. Periodically tap the brokered market, use repurchase agreements, or solicit deposits through a national CD listing service.

Exhibit 3. Key Risk Indicators

Internal	External
Basic surplus ratio(s)	Credit events
Loan-to-deposits	Economic indicators
Borrowings-to-assets	Industry trends in NPLs
Brokered CDs-to-assets	Market rates/volatility
Liquidity gap	Credit spreads
IRR measures	Geopolitical events
Capital ratios	Natural catastrophes
Deposit cash flows/decay	
NPLs/loans	
Chargeoffs/recoveries	
Growth rates	

Successfully Manage Liquidity Risk

Continuing to effectively fund asset growth is going to be one of the key challenges facing the banking industry in the years to come. All financial institutions need an approach and a plan for managing liquidity and funding that is practical and provides safeguards against an institution-specific or systemic liquidity crisis. Institutions that are most successful in managing liquidity and liquidity risk will do the following:

- Maintain an appropriately detailed measuring and monitoring process that includes a comprehensive collateral inventory management process, accurate sources/uses forecasts and alternative funding source diversity.
- Implement a liquidity stress-testing process that can quantify the bank's ability to withstand moderate, significant and severe liquidity events.
- Develop and monitor an early warning system that can detect issues before they become problems.
- Document and maintain a liquidity contingency/action plan that can be relied upon in the event of various liquidity events or crises.

It is important to recognize that one size does not fit all and that the success of a liquidity risk management process is a function of not only its design but also the people involved in its management and execution. By engaging your management team, as well as outside expertise, the right process can be developed and implemented. As stated in one of Jack Welch's rules for success, bankers need to "control [their] own destiny or someone else will."

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