

---

## OVERVIEW

Liquidity is a financial institution's capacity to meet its cash and collateral obligations without incurring unacceptable losses. In turn, liquidity risk is the risk to an institution's financial condition or safety and soundness arising from its inability (whether real or perceived) to meet its contractual obligations. Because banking organizations employ a significant amount of leverage in their business activities—and need to meet contractual obligations in order to maintain the confidence of customers and fund providers—adequate liquidity is critical to an institution's ongoing operation, profitability, and safety and soundness. To ensure it has adequate liquidity, an institution must balance the costs and benefits of liquidity: Too little liquidity can expose an institution to an array of significant negative repercussions arising from its inability to meet contractual obligations. Conversely, too much liquidity can entail substantial opportunity costs and have a negative impact on the firm's profitability.

Effective liquidity management entails the following three elements:

- assessing, on an ongoing basis, the current and expected future needs for funds, and ensuring that sufficient funds or access to funds exists to meet those needs at the appropriate time
- providing for an adequate cushion of liquidity to meet unanticipated cash-flow needs that may arise from a continuum of potential adverse circumstances that can range from high-probability/low-severity events that occur in daily operations to low-probability/high-severity events that occur less frequently but could significantly affect an institution's safety and soundness
- striking an appropriate balance between the benefits of providing for adequate liquidity to mitigate potential adverse events and the cost of that liquidity

---

Note: This section compiles and expands on existing Federal Reserve guidance previously published in this manual and the *Commercial Bank Examination Manual* (section 4020.1). The guidance also complements existing guidance in the *Bank Holding Company Supervision Manual* (section 4010.2) and the *Examination Manual for U.S. Branches and Agencies of Foreign Banking Organizations* and various SR-letters (see the "References" section).

The primary role of liquidity-risk management is to (1) prospectively assess the need for funds to meet obligations and (2) ensure the availability of cash or collateral to fulfill those needs at the appropriate time by coordinating the various sources of funds available to the institution. Funds needs arise from the myriad of banking activities and financial transactions that create contractual obligations to deliver funds, including business initiatives for asset growth, the provision of various financial products and transaction services, and expected and unexpected changes in assets and the liabilities used to fund assets. Liquidity managers have an array of alternative sources of funds to meet their liquidity needs. These sources generally fall within one of four broad categories:

- net operating cash flows
- the liquidation of assets
- the generation of liabilities
- an increase in capital funds

Funds obtained from operating cash flows arise from net interest payments on assets; net principal payments related to the amortization and maturity of assets; and the receipt of funds from various types of liabilities, transactions, and service fees. Institutions obtain liquidity from operating cash flows by managing the timing and maturity of their asset and liability cash flows, including their ongoing borrowing and debt-issuance programs.

Funds can also be obtained by reducing or liquidating assets. Most institutions incorporate scheduled asset maturities and liquidations as part of their ongoing management of operating cash flows. They also use the potential liquidation of a portion of their assets (generally a portion of the investment portfolio) as a contingent source of funds to meet cash needs under adverse liquidity circumstances. Such contingent funds need to be unencumbered for the purposes of selling or lending the assets and are often termed *liquidity reserves* or *liquidity warehouses* and are a critical element of safe and sound liquidity management.

Asset securitization is another method that some institutions use to fund assets. Securitization involves the transformation of on-balance-sheet loans (e.g., auto, credit card, commercial, student, home equity, and mortgage loans) into

packaged groups of loans in various forms, which are subsequently sold to investors. Depending on the business model employed, securitization proceeds can be both a material source of ongoing funding and a significant tool for meeting future funding needs.

Funds are also generated through deposit-taking activities, borrowings, and overall liability management. Borrowed funds may include secured lending and unsecured debt obligations across the maturity spectrum. In the short term, borrowed funds may include purchased fed funds and securities sold under agreements to repurchase (repos). Longer-term borrowed funds may include various types of deposit products, collateralized loans, and the issuance of corporate debt. Depending on their contractual characteristics and the behavior of fund providers, borrowed funds can vary in maturity and availability because of their sensitivity to general market trends in interest rates and various other market factors. Considerations specific to the borrowing institution also affect the maturity and availability of borrowed funds. Some sources of liquidity may be best used when liquidity is needed quickly; others may not be as readily available unless the need for liquidity is prolonged. Some liquidity sources are available only for nonacute (low-severity) liquidity needs, while others may be best used to meet acute liquidity needs.

## External Factors and Exposure to Other Risks

The liquidity needs of a financial institution and the sources of liquidity available to meet those needs depend significantly on the institution's business mix and balance-sheet structure, as well as on the cash-flow profiles of its on- and off-balance-sheet obligations. While management largely determines these internal attributes, external factors and the institution's exposure to various types of financial and operating risks, including interest-rate, credit, operational, legal, and reputational risks, also influence its liquidity profile. As a result, an institution should assess and manage liquidity needs and sources by considering the potential consequences of changes in external factors *along with* the institution-specific determinants of its liquidity profile.

## *Changes in Interest Rates*

The level of prevailing market interest rates, the term structure of interest rates, and changes in both the level and term structure of rates can significantly affect the cash-flow characteristics and costs of, and an institution's demand for, assets, liabilities, and OBS positions. In turn, these factors significantly affect an institution's funding structure or liquidity needs, as well as the relative attractiveness or price of alternative sources of liquidity available to it. Changes in the level of market interest rates can also result in the acceleration or deceleration of loan prepayments and deposit flows. The availability of different types of funds may also be affected, as a result of options embedded in the contractual structure of assets, liabilities, and financial transactions.

## *Economic Conditions*

Cyclical and seasonal economic conditions can also have an impact on the volume of an institution's assets, liabilities, and OBS positions—and, accordingly, its cash-flow and liquidity profile. For example, during recessions, business demand for credit may decline, which affects the growth of an organization and its liquidity needs. At the same time, subpar economic growth and its impact on employment, bankruptcies, and business failures often create direct and indirect incentives for retail customers to reduce their deposits; a recession may also lead to higher loan delinquencies for financial institutions. All of these conditions have negative implications for an institution's cash flow and overall liquidity. On the other hand, periods of economic growth may spur asset or deposit growth, thus introducing different liquidity challenges.

## *Credit-Risk Exposures of an Institution*

An institution's exposure to credit risk can have a material impact on its liquidity. Nonperforming loans directly reduce otherwise expected cash inflows. The reduced credit quality of problem assets impairs their marketability and potential use as a source of liquidity (either by selling the assets or using them as collateral). Moreover, problem assets have a negative impact on overall cash flows by increasing the

costs of loan-collection and -workout efforts.

In addition, the price that a bank pays for funds, especially wholesale and brokered borrowed funds and deposits, will reflect the institution's perceived level of risk exposure in the marketplace. Fund suppliers use a variety of credit-quality indicators to judge credit risk and determine the returns they require for the risk to be undertaken. Such indicators include an institution's loan-growth rates; the relative size of its loan portfolio; and the levels of delinquent loans, nonperforming loans, and loan losses. For institutions that have issued public debt, the credit ratings of nationally recognized statistical rating organizations (NRSOs) are particularly critical.

### *Other Risk Exposures of an Institution*

Importantly, exposures to operational, legal, reputational, and other risks can lead to adverse liquidity conditions. Operating risks can materially disrupt the dispersal and receipt of obligated cash flows and give rise to significant liquidity needs. Exposure to legal and reputational risks can lead fund providers to question an institution's overall credit risk, safety and soundness, and ability to meet its obligations in the future. A bank's reputation for operating in a safe and sound manner, particularly its ability to meet its contractual obligations, is an important determinant in its costs of funds and overall liquidity-risk profile.

Given the critical importance of liquidity to financial institutions and the potential impact that other risk exposures and external factors have on liquidity, effective liquidity managers ensure that liquidity management is fully integrated into the institution's overall enterprise-wide risk-management activities. Liquidity management is therefore an important part of an institution's strategic and tactical planning.

## Types of Liquidity Risk

Banking organizations encounter the following three broad types of liquidity risk:

- mismatch risk
- market liquidity risk
- contingent liquidity risk

Mismatch risk is the risk that an institution will not have sufficient cash to meet obligations in the normal course of business, as a result of ineffective matches between cash inflows and outflows. The management and control of funding mismatches depend greatly on the daily projections of operational cash flow, including those cash flows that may arise from seasonal business fluctuations, unanticipated new business, and other everyday situations. To accurately project operational cash flows, an institution needs to estimate its expected cash-flow needs and ensure it has adequate liquidity to meet small variations to those expectations. Occurrences of funding mismatches may be frequent. If adequately managed, these mismatches may have little to no impact on the financial health of the firm.

Market liquidity risk is the risk that an institution will encounter market constraints in its efforts to convert assets into cash or to access financial market sources of funds.

The planned conversion of assets into cash is an important element in an institution's ongoing management of funding cash-flow mismatches. In addition, converting assets into cash is often a key strategic tool for addressing contingent liquidity events. As a result, market constraints on achieving planned, strategic, or contingent conversions of assets into cash can exacerbate the severity of potential funding mismatches and contingent liquidity problems.

Contingent liquidity risk is the risk that arises when unexpected events cause an institution to have insufficient funds to meet its obligations. Unexpected events may be firm-specific or arise from external factors. External factors may be geographic, such as local economic factors that affect the premiums required on deposits with certain local, state, or commercial areas, or they may be market-oriented, such as increases in the price volatility of certain types of securities in response to financial market developments. External factors may also be systemic, such as a payment-system disruption or major changes in economic or financial market conditions.

The nature and severity of contingent liquidity events vary substantially. At one extreme, contingent liquidity risk may arise from the need to fund unexpected asset growth as a result of commitment requests or the unexpected runoff of liabilities that occurs in the normal course of business. At the other extreme, institution-specific issues, such as the lowering of a public debt rating or general financial market stress,

may have a significant impact on an institution's liquidity and safety and soundness. As a result, managing contingent liquidity risk requires an ongoing assessment of potential future events and circumstances in order to ensure that obligations are met and adequate sources of standby liquidity and/or liquidity reserves are readily available and easily converted to cash.

Diversification plays an important role in managing liquidity and its various component risks. Concentrations in particular types of assets, liabilities, OBS positions, or business activities that give rise to unique types of funding needs or create an undue reliance on specific types of funding sources can unduly expose an institution to the risks of funding mismatches, contingent events, and market liquidity constraints. Therefore, diversification of both the sources and uses of liquidity is a critical component of sound liquidity-risk management.

## SOUND LIQUIDITY-RISK MANAGEMENT PRACTICES

Like the management of any type of risk, sound liquidity-risk management involves effective oversight of a comprehensive process that adequately identifies, measures, monitors, and controls risk exposure. This process includes oversight of exposures to funding mismatches, market liquidity constraints, and contingent liquidity events. Both international and U.S. banking supervisors have issued supervisory guidance on safe and sound practices for managing the liquidity risk of banking organizations. International guidance advanced by the Basel Committee on Banking Supervision (BCBS) presents a unifying set of 14 basic principles for sound liquidity management that all banking organizations should adhere to.<sup>1</sup> (See section 3005.5, appendix 2.)

In summary, the critical elements of a sound liquidity-risk management process are—

- adequate corporate governance, including active involvement by the board of directors and management in liquidity-risk management;

- appropriate strategies, policies, procedures, and limits for controlling liquidity risk;
- adequate systems and processes for measuring, monitoring, and reporting liquidity risk;
- comprehensive contingency funding plans (CFPs) for addressing potential adverse liquidity events and meeting emergency cash-flow needs; and
- appropriate internal controls for all aspects of liquidity-risk management.

Each of these elements should be customized to account for the sophistication, complexity, and business activities of an institution. The following sections discuss supervisory expectations for each of these critical elements.

## Corporate Governance and Oversight

Effective liquidity-risk management requires the coordinated efforts of both an informed board of directors and capable senior management. Both groups should ensure that the organizational structures and staffing levels are appropriate, given the institution's activities and the risks they present.

### *Involvement of the Board of Directors*

The board of directors is ultimately responsible for the liquidity risk assumed by an institution. The board should understand and guide the strategic direction of liquidity-risk management. Specifically, the board of directors or a delegated committee of board members should—

- understand the nature of the institution's liquidity risks and periodically review information necessary to maintain this understanding;
- understand and approve those elements of liquidity-risk management policies that articulate the institution's general strategy for managing liquidity risk, and establish acceptable risk tolerances;
- establish executive-level lines of authority and responsibility for managing the institution's liquidity risk;
- understand and periodically review the institution's CFP for handling potential adverse liquidity events; and
- understand the liquidity-risk profile of important subsidiaries and affiliates and their

1. "Sound Practices for Managing Liquidity in Banking Organizations," Basel Committee on Banking Supervision, Publication 69, February 2000.

influence on the overall liquidity of the financial institution, as appropriate.

### *Role of Senior Management*

Senior management should ensure that liquidity-risk management strategies, policies, and procedures are adequate for the sophistication and complexity of the institution. Management should ensure that these policies and procedures are appropriately executed on both a long-term and day-to-day basis, in accordance with board delegations. Management should oversee the development and implementation of—

- an appropriate risk-measurement system and standards for measuring the institution's liquidity risk;
- a comprehensive liquidity-risk reporting and monitoring process;
- effective internal controls and review processes for the management of liquidity risk; and
- an appropriate CFP, including (1) adequate assessments of the institution's contingent liquidity risks under adverse circumstances and (2) fully developed strategies and plans for managing such events.

Senior management should periodically review the organization's liquidity-risk management strategies, policies, and procedures, as well as its CFP, to ensure that they remain appropriate and sound. Management should also coordinate the institution's liquidity-risk management with its efforts for disaster, contingency, and strategic planning, as well as with its business and risk-management objectives, strategies, and tactics.

### *Strategies, Policies, Procedures, and Limits*

Institutions should have documented strategies for managing liquidity and have formal written policies and procedures for limiting and controlling risk exposures. Strategies, policies, and procedures should translate the board's goals, objectives, and risk tolerances into operating standards that are well understood by institutional personnel and that are consistent with the board's intended risk tolerances. Policies should

also ensure that responsibility for managing liquidity is assigned throughout the corporate structure of the institution, including separate legal entities and relevant operating subsidiaries and affiliates, where appropriate. Strategies set out the institution's general approach for managing liquidity, articulate its liquidity-risk tolerances, and address the extent to which key elements of funds management are centralized or delegated throughout the institution. Strategies also communicate how much emphasis the institution places on using asset liquidity, liabilities, and operating cash flows to meet its day-to-day and contingent funding needs. Quantitative and qualitative targets, such as the following, may also be included in policies:

- guidelines or limits on the composition of assets and liabilities
- the relative reliance on certain funding sources, both on an ongoing basis and under contingent liquidity scenarios
- the marketability of assets to be used as contingent sources of liquidity

An institution's strategies and policies should identify the primary objectives and methods for (1) managing daily operating cash flows, (2) providing for seasonal and cyclical cash-flow fluctuations, and (3) addressing various adverse liquidity scenarios. The latter includes formulating plans and courses of actions for dealing with potential temporary, intermediate-term, and long-term liquidity disruptions. Policies and procedures should formally document—

- lines of authority and responsibility for managing liquidity risk,
- liquidity-risk limits and guidelines,
- the institution's measurement and reporting systems, and
- elements of the institution's comprehensive CFP.

Incorporating these elements of liquidity-risk management into policies and procedures helps internal control and internal audit fulfill their oversight role in the liquidity-risk management process. Policies, procedures, and limits should address liquidity separately for individual currencies, where appropriate and material. All liquidity-risk policies, procedures, and limits should be reviewed periodically and revised as needed.

### *Delineating Clear Lines of Authority and Responsibility*

Through formal written policies or clear operating procedures, management should define managerial responsibilities and oversight, including lines of authority and responsibility for the following:

- developing liquidity-risk management policies, procedures, and limits
- developing and implementing strategies and tactics for managing liquidity risk
- conducting day-to-day management of the institution's liquidity
- establishing and maintaining liquidity-risk measurement and monitoring systems
- authorizing exceptions to policies and limits
- identifying the potential liquidity risk associated with the introduction of new products and activities

Institutions should clearly identify the individuals or committees responsible for liquidity-risk decisions. Less complex institutions often assign such responsibilities to the CFO or an equivalent senior management official. Other institutions assign responsibility for liquidity-risk management to a committee of senior managers, sometimes called a finance committee or an asset/liability committee (ALCO). Policies should clearly identify individual or committee duties and responsibilities, the extent of the decision-making authority, and the form and frequency of periodic reports to senior management and the board of directors. In general, an ALCO (or a similar senior-level committee) is responsible for ensuring that (1) measurement systems adequately identify and quantify the institution's liquidity-risk exposure and (2) reporting systems communicate accurate and relevant information about the level and sources of that exposure.

When an institution uses an ALCO or other senior management committee, the committee should actively monitor the liquidity profile of the institution and should have sufficiently broad representation from the major institutional functions that influence liquidity risk (e.g., the lending, investment, deposit, or funding functions). Committee members should include senior managers who have authority over the units responsible for executing transactions and other activities that can affect liquidity. In addition, the committee should ensure that

(1) the risk-measurement system adequately identifies and quantifies risk exposure and (2) the reporting process communicates accurate, timely, and relevant information about the level and sources of risk exposure.

In general, committees overseeing liquidity-risk management delegate the day-to-day responsibilities to the institution's treasury department or, at less complex institutions, to the CFO, treasurer, or other appropriate staff. The personnel charged with measuring and monitoring the day-to-day management of liquidity risk should have a well-founded understanding of all aspects of the institution's liquidity-risk profile. While the day-to-day management of liquidity may be delegated, the oversight committee should not be precluded from aggressively monitoring liquidity management.

In more-complex institutions that have separate legal entities and operating subsidiaries or affiliates, effective liquidity-risk management requires senior managers and other key personnel to have an understanding of the funding position and liquidity of any member of the corporate group that might provide or absorb liquid resources from another member. Centralized liquidity-risk assessment and management can provide significant operating efficiencies and comprehensive views of the liquidity-risk profile of the integrated corporate entity as well as members of the corporate group—including depository institutions. This integrated view is particularly important for understanding the impact other members of the group may have on insured depository entities. However, legal and regulatory restrictions on the flow of funds among members of a corporate group, in addition to differences in the liquidity characteristics and dynamics of managing the liquidity of different types of entities within a group, may call for decentralizing various elements of liquidity-risk management. Such delegation and associated strategies, policies, and procedures should be clearly articulated and understood throughout the organization. Policies, procedures, and limits should also address liquidity separately for individual currencies or geographic areas, where appropriate and material.

### *Liquidity-Risk Limits and Guidelines*

Liquidity-risk tolerances or limits should be appropriate for the complexity and liquidity-risk profile of an institution. They should employ

both quantitative targets and qualitative guidelines and should be consistent with the institution's overall approach and strategy for measuring and managing liquidity. These limits, tolerances, targets, and guidelines may include items such as the following:

- *Discrete or cumulative cash-flow mismatches or gaps (sources and uses of funds) over specified future short- and long-term time horizons under both expected and adverse business conditions.* Often, these are expressed as cash-flow coverage ratios or as specific aggregate amounts.
- *Target amounts of unpledged liquid-asset reserves sufficient to meet liquidity needs under normal and reasonably anticipated adverse business conditions.* These targets are often expressed as aggregate amounts or as ratios calculated in relation to, for example, total assets, short-term assets, various types of liabilities, or projected-scenario liquidity needs.
- *Volatile liability dependence and liquid-asset coverage of volatile liabilities under both normal and stress conditions.* For example, these guidelines may include amounts of potentially volatile wholesale funding to total liabilities, volatile deposits to total deposits, potentially volatile deposit-dependency measures, or short-term borrowings as a percent of total funding.
- *Funding concentrations that address diversification issues, such as a large liability and dependency on borrowed funds, concentrations of single funds providers, funds providers by market segments, and types of volatile deposit or volatile wholesale funding dependency.* For small community banks, funding concentrations may be difficult to avoid. However, banks that rely on just a few primary sources should have appropriate systems in place to manage the concentrations of funding liquidity, including limit structures and reporting mechanisms.
- *Contingent liabilities, such as unfunded loan commitments and lines of credit supporting asset sales or securitizations.*
- *The minimum and maximum average maturity of different categories of assets and liabilities.*

Institutions may use other risk indicators to specify their risk tolerances. Some institutions may use ratios such as loans to deposits, loans to equity capital, purchased funds to total assets, or

other common measures. However, when developing and using such measures, institutions should be fully aware that some measures may not appropriately assess the timing and scenario-specific characteristics of the institution's liquidity-risk profile. *Liquidity-risk measures that are constructed using static balance-sheet amounts may hide significant liquidity risk that can occur in the future under both normal and adverse business conditions. As a result, institutions should not rely solely on these static measures to monitor and manage liquidity.*

### *Policies on Measuring and Managing Reporting Systems*

Policies and procedures should also identify the methods used to measure liquidity risk, as well as the form and frequency of reports to various levels of management and the board of directors. Policies should identify the nature and form of cash-flow projections and other liquidity measures to be used. Policies should provide for the categorization, measurement, and monitoring of both stable and potentially volatile sources of funds. Policies should also provide guidance on the types of business-condition scenarios used to construct cash-flow projections and should contain provisions for documenting and periodically reviewing the assumptions used in liquidity projections.

Moreover, policies should explicitly provide for more-frequent reporting under adverse business or liquidity conditions. Under normal business conditions, senior managers should receive liquidity-risk reports at least quarterly. If the risk exposure is more complex, the reports should be more frequent. These reports should tell senior management and the board how much liquidity risk the bank is assuming, whether management is complying with risk limits, and whether management's strategies are consistent with the board's expressed risk tolerance.

### *Policies on Contingency Funding Plans*

Policies should also provide for senior management to develop and maintain a written, comprehensive, and up-to-date liquidity CFP. Policies should also ensure that, as part of ongoing liquidity-risk management, senior management is alerted to early-warning indicators or triggers of potential liquidity problems.

### *Compliance with Laws and Regulations*

Institutions should ensure that their policies and procedures take into account compliance with appropriate laws and regulations that can have an impact on an institution's liquidity-risk management and liquidity-risk profile. These laws and regulations include the Federal Deposit Insurance Corporation Improvement Act (FDICIA) and its constraints on an institution's use of brokered deposits, as well as pertinent sections of Federal Reserve regulations A, D, F, and W. (See section 3005.5, appendix 3, for a summary of some of the pertinent legal and regulatory issues that should be factored into the management of liquidity risk.)

### *Liquidity-Risk Measurement Systems*

The analysis and measurement of liquidity risk should be tailored to the complexity and risk profile of an institution, incorporating the cash flows and liquidity implications of all the institution's material assets, liabilities, off-balance-sheet positions, and major business activities. Liquidity-risk analysis should consider what effect options embedded in the institution's sources and uses of funds may have on its cash flows and liquidity-risk measures. The analysis of liquidity risk should also be forward-looking and strive to identify potential future funding mismatches as well as current imbalances. Liquidity-risk measures should advance management's understanding of the institution's exposure to mismatch, market, and contingent liquidity risks. Measures should also assess the institution's liquidity sources and needs in relation to the specific business environments it operates in and the time frames involved in securing and using funds.

Adequate liquidity-risk measurement requires the ongoing review of an institution's sources and uses of funds and generally includes analysis of the following:

- trends in balance-sheet structure and funding vehicles
- pro forma cash-flow statements and funding mismatch gaps over varying time horizons
- trends and expectations in the volume and pricing trends for assets, liabilities, and off-balance-sheet items that can have a significant impact on the institution's liquidity

- trends in the relative costs of funds required by existing and alternative funds providers
- the diversification of funding sources and trends in funding concentrations
- the adequacy of asset liquidity reserves, trends in these reserves, and the market dynamics that could influence their market liquidity
- the sensitivity of funds providers to both financial market and institution-specific trends and events
- the institution's exposure to both broad-based market and institution-specific contingent liquidity events

The formality and sophistication of liquidity-risk measurement, and the policies and procedures used to govern the measurement process, depend on the sophistication of the institution, the nature and complexity of its funding structures and activities, and its overall liquidity-risk profile. (See section 3005.5, appendix 1, for background on the types of liquidity analysis and measures of liquidity risk used by effective liquidity-risk managers. The appendix also discusses the considerations for evaluating the liquidity-risk characteristics of various assets, liabilities, OBS positions, and other activities, such as asset securitization, that can influence an institution's liquidity.)

### *Pro Forma Cash-Flow Analysis*

Regardless of the size and complexity of an institution, pro forma cash-flow statements are a critical tool for adequately managing liquidity risk. In the normal course of measuring and managing liquidity risk and analyzing their institution's sources and uses of funds, effective liquidity managers project cash flows under expected and alternative liquidity scenarios. Such cash-flow-projection statements range from simple spreadsheets to very detailed reports, depending on the complexity and sophistication of the institution and its liquidity-risk profile.

A sound practice is to project, on an ongoing basis, an institution's cash flows under normal business-as-usual conditions, incorporating appropriate seasonal and business-growth considerations over varying time horizons. This cash-flow projection should be regularly reviewed under both short-term and intermediate-to long-term institution-specific contingent scenarios. Institutions that have more-complex liquidity-risk profiles should also assess their

exposure to broad systemic and adverse financial market events, as appropriate to their business mix and overall liquidity-risk profile (e.g., securitization, derivatives, trading, processing, international, and other activities).

The construction of pro forma cash-flow statements under alternative scenarios and the ongoing monitoring of an institution's liquidity-risk profile depend importantly on liquidity management's review of trends in the institution's balance-sheet structure and its funding sources. This review should consider past experience and include expectations for the volume and pricing of assets, liabilities, and off-balance-sheet items that may significantly affect the institution's liquidity.

Effective liquidity-risk monitoring systems should assess (1) trends in the relative cost of funds, as required by the institution's existing and alternative funds providers; (2) the diversification or concentration of funding sources; (3) the adequacy of the institution's asset liquidity reserves; and (4) the sensitivity of funds providers to both financial market and institution-specific trends and events.

### *Assumptions*

Given the critical importance of assumptions in constructing liquidity-risk measures and projections of future cash flows, institutions should ensure that all their assumptions are reasonable and appropriate. Institutions should document and periodically review and approve key assumptions. Assumptions used in assessing the liquidity risk of complex instruments and assets; liabilities; and OBS positions that have uncertain cash flows, market value, or maturities should be subject to rigorous documentation and review.

Assumptions about the stability or volatility of retail deposits, brokered deposits, wholesale or secondary-market borrowings, and other funding sources are particularly important—especially when such assumptions are used to evaluate alternative sources of funds under adverse contingent liquidity scenarios (such as a deterioration in asset quality or capital). When assumptions about the performance of deposits and other sources of funds are used in the computation of liquidity measures, these assumptions should be based on reasoned analysis considering such factors as the following:

- the historical behavior of deposit customers and funds providers
- how current or future business conditions may change the historical responses and behaviors of customers and other funds providers
- the general conditions and characteristics of the institution's market for various types of funds, including the degree of competition
- the anticipated pricing behavior of funds providers (for instance, wholesale or retail) under the scenario investigated
- haircuts (that is, the reduction from the stated value of an asset) applied to assets earmarked as contingent liquidity reserves

Institutions that have complex liquidity profiles should perform sensitivity tests to determine what effect any changes to its material assumptions will have on its liquidity.

### Liquidity-Risk Monitoring and Reporting Systems

Methods used to monitor and measure liquidity risk should be sufficiently robust and flexible to allow for the timely computation of the metrics an institution uses in its ongoing liquidity-risk management. Risk monitoring and reporting systems should regularly provide information on day-to-day liquidity management and risk control; this information should also be readily available during contingent liquidity events.

In keeping with the other elements of sound liquidity-risk management, the complexity and sophistication of management reporting and management information systems (MIS) should be consistent with the liquidity profile of the institution. For example, complex institutions that are highly dependent on wholesale funds may need daily reports on the use of various funding sources, maturities of various instruments, and rollover rates. Less complex institutions may require only simple maturity-gap or cash-flow reports that depict rollovers and mismatch risks; these reports may also include pertinent liquidity ratios. Liquidity-risk reports can be customized to provide management with aggregate information that includes sufficient supporting detail to enable them to assess the sensitivity of the institution to changes in market conditions, its own financial performance, and other important risk factors. Reportable items may include, but are not limited to—

- cash-flow gap-projection reports and forward-looking summary measures that assess both business-as-usual and contingent liquidity scenarios;
- asset and funding concentrations that highlight the institution's dependence on funds that may be highly sensitive to institution-specific contingent liquidity or market liquidity risk (including information on the types and amounts of negotiable certificates of deposit (CDs) and other bank obligations, as well as information on major liquidity funds providers);
- critical assumptions used in cash-flow projections and other measures;
- the status of key early-warning signals or risk indicators;
- the status of contingent funding sources or collateral usage;
- reports on the impact of new products and activities;
- reports documenting compliance with established policies and procedures; and
- where appropriate, both consolidated and unconsolidated reports for institutions that have multiple offices, international branches, affiliates, or subsidiaries.

The types of reports or information and their timing should be tailored to the institution's funding strategies and will vary according to the complexity of the institution's operations and risk profile. For example, institutions relying on investment securities for their primary source of contingent liquidity should employ reports on the quality, pledging status, and maturity distribution of those assets. Similarly, institutions conducting securitization activities, or placing significant emphasis on the sale of loans to meet contingent liquidity needs, should customize their liquidity reports to target these activities.

## Contingency Funding Plans

A contingency funding plan is a compilation of policies, procedures, and action plans for responding to contingent liquidity events. It is a sound practice for institutions to engage in comprehensive contingent liquidity planning. The objectives of the CFP are to provide a plan for responding to a liquidity crisis, identify a menu of contingent liquidity sources that the institution can use under adverse liquidity

circumstances, and describe steps that should be taken to ensure that the institution's sources of liquidity are sufficient to fund scheduled operating requirements and meet the institution's commitments with minimal costs and disruption. CFPs should be commensurate with an institution's complexity, risk profile, and scope of operations.

Contingent liquidity events are unexpected situations or business conditions that may increase the risk that an institution will not have sufficient funds to meet liquidity needs. These events can negatively affect any institution, regardless of its size and complexity, by interfering with or preventing the funding of asset growth, or by disrupting the institution's ability to renew or replace maturing funds. Contingent liquidity events may be institution-specific or arise from external factors. Institution-specific risks are determined by the risk profile and business activities of the institution. They generally are a result of unique credit, market, operational, and strategic risks taken by the institution. In contrast, external contingent events may be systemic financial-market occurrences, such as increases or decreases in the price volatility of certain types of securities in response to market events, major changes in economic conditions, or dislocations in financial markets.

Contingent liquidity events range from high-probability/low-impact events that occur during the normal course of business to low-probability/high-impact events that may have an adverse impact on an institution's safety and soundness. Institutions should incorporate planning for high-probability/low-impact liquidity risks into their daily management of the sources and uses of their funds. This objective is best accomplished by assessing possible variations in expected cash-flow projections and provisioning for adequate liquidity reserves in the normal course of business.

Liquidity risks driven by lower-probability, higher-impact events should be addressed in the CFP, which should—

- identify reasonably plausible stress events;
- evaluate those stress events under different levels of severity;
- make a quantitative assessment of funding needs under the stress events;
- identify potential funding sources in response to a stress event; and
- provide for commensurate management pro-

cesses, reporting, and external communication throughout a stress event.

The contingency funding plan should address both the severity and duration of contingent liquidity events. The liquidity pressures resulting from low-probability, high-impact events may be immediate and short term, or they may present sustained situations that have long-term liquidity implications. The potential length of an event should factor into decisions about sources of contingent liquidity.

### *Identifying Liquidity Stress Events*

Stress events are those events that may have a significant impact on an institution's liquidity, given its specific balance-sheet structure, business lines, organizational structure, and other characteristics. Possible stress events include changes in credit ratings, a deterioration in asset quality, a prompt-corrective-action downgrade, operating losses, negative press coverage, or other events that call into question an institution's ability to meet its obligations.

An institution should customize its CFP. Separate CFPs may be required for the parent company and the consolidated banks in a multibank holding company, for separate subsidiaries (when appropriate), or for each significant foreign currency and global political entity, as necessary. These separate CFPs may be necessary because of legal requirements and restrictions, or the lack thereof. Institutions that have significant payment-system operations should have a formal, written plan in place for managing the risk of both intraday and end-of-day funding failures. Failures may occur as a result of system failure at the institution or at an institution from which payments are expected. Clear, formal communication channels should be established between the institution's operational areas responsible for handling payment-system operations.

### *Assessing Levels of Severity and Timing*

The CFP should delineate the various levels of stress severity that can occur during a contingent liquidity event and, for each type of event, identify the institution's response plan at each stage of an event. (As an event unfolds, it often progresses through various stages and levels of

severity.) The events, stages, and severity levels identified should include those that cause temporary disruptions, as well as those that may cause intermediate- or longer-term disruptions. Institutions can use the different stages or levels of severity to design early-warning indicators, assess potential funding needs at various points during a developing crisis, and specify comprehensive action plans.

### *Assessing Funding Needs and Sources of Liquidity*

A critical element of the CFP is an institution's quantitative projection and evaluation of its expected funding needs and funding capacity during a stress event. The institution should identify the sequence of responses that it will mobilize during a stress event and commit sources of funds for contingent needs well in advance of a stress-related event. To accomplish this objective, the institution needs to analyze potential erosion in its funding at alternative stages or severity levels of the stress event, as well as analyze the potential cash-flow mismatches that may occur during the various stress scenarios and levels. Institutions should base their analyses on realistic assessments of the behavior of funds providers during the event; they should also incorporate alternative contingency funding sources into their plans. The analysis should also include all material on- and off-balance-sheet cash flows and their related effects, which should result in a realistic analysis of the institution's cash inflows, outflows, and funds availability at different time intervals throughout the potential liquidity stress event—and allow the institution to measure its ability to fund operations over an extended period.

Because of the potential for liquidity pressures to spread from one source of funding to another during a significant liquidity event, institutions should identify, well in advance, alternative sources of liquidity and ensure that they have ready access to contingent funding sources. These funding sources will rarely be used in the normal course of business. Therefore, institutions should conduct advance planning to ensure that contingent funding sources are readily available. For example, the sale, securitization, or pledging of assets as collateral requires a review of these assets to determine the appropriate haircuts and to ensure compli-

ance with the standards required for executing the strategy. Administrative procedures and agreements should also be in place before the institution needs to access the planned source of liquidity. Institutions should identify what advance steps they need to take to promote the readiness of each of their sources of standby liquidity.

### *Processes for Managing Liquidity Events*

The CFP should identify a reliable crisis-management team and an administrative structure for responding to a liquidity crisis, including realistic action plans executing each element of the plan for each level of a stress event. Frequent communication and reporting among crisis team members, the board of directors, and other affected managers optimizes the effectiveness of a contingency plan by ensuring that business decisions are coordinated to minimize further liquidity disruptions. Effective management of a stress event requires the daily computation of regular liquidity-risk reports and supplemental information. The CFP should provide for more-frequent and more-detailed reporting as a stress situation intensifies. Reports that should be available in a funding crisis include—

- a CD breakage report to identify early redemptions of CDs;
- funding-concentration reports;
- cash-flow projections and run-off reports;
- funding-availability or -capacity reports, by types of funding; and
- reports on the status of contingent funding sources.

### *Framework for Monitoring Contingent Events*

Financial institutions should monitor for potential liquidity stress events by using early-warning indicators and event triggers. These indicators should be tailored to an institution's specific liquidity-risk profile. By recognizing potential stress events early, the institution can proactively position itself into progressive states of readiness as an event evolves. This proactive stance also provides the institution with a framework for reporting or communicating among different institutional levels and to

outside parties. Early-warning signals may include but are not limited to—

- rapid asset growth that is funded with potentially volatile liabilities;
- growing concentrations in assets or liabilities;
- negative trends or heightened risk associated with a particular product line;
- rating-agency actions (e.g., agencies watch-listing the institution or downgrading its credit rating);
- negative publicity;
- significant deterioration in the institution's earnings, asset quality, and overall financial condition;
- widening debt or credit-default-swap spreads;
- difficulty accessing longer-term funding;
- increasing collateral margin requirements;
- rising funding costs in a stable market;
- increasing redemptions of CDs before maturity;
- counterparty resistance to off-balance-sheet products;
- counterparties that begin requesting backup collateral for credit exposures; and
- correspondent banks that eliminate or decrease their credit lines.

In addition to early-warning indicators, institutions that issue public debt, use warehouse financing, securitize assets, or engage in material OTC derivative transactions typically have exposure to event triggers that are embedded in the legal documentation governing these transactions. These triggers protect the investor or counterparty if the institution, instrument, or underlying asset portfolio does not perform at certain predetermined levels. An institution should incorporate these triggers into its liquidity-risk monitoring system.

Asset-securitization programs pose heightened liquidity concerns because an early-amortization event could produce unexpected funding needs. Liquidity contingency plans should address this risk, if it is material to the institution.<sup>2</sup> The unexpected funding needs associated with an early amortization of a securitization event pose liquidity concerns for the originating bank. The triggering of an early-amortization event can result in the securitization trust immediately passing principal payments through to investors. As the holder of

2. SR-02-14, "Covenants in Securitization Documents Linked to Supervisory Actions or Thresholds."

the underlying assets, the originating institution is responsible for funding new charges that would normally have been purchased by the trust. Financial institutions that engage in asset securitization should have liquidity contingency plans that address this potential unexpected funding requirement. Management should receive and review reports showing the performance of the securitized portfolio in relation to the early-amortization triggers.<sup>3</sup>

Securitization covenants that cite supervisory thresholds or adverse supervisory actions as triggers for early-amortization events are considered an unsafe and unsound banking practice that undermines the objective of supervisory actions. An early amortization triggered by a supervisory action can create or exacerbate liquidity and earnings problems that can lead to further deterioration in the financial condition of the banking organization.<sup>4</sup>

Securitized asset-backed commercial paper programs (ABCPs) are generally supported by a liquidity facility or commitment to purchase assets from the trust if funds are needed to repay the underlying obligations. Liquidity needs can result from either cash-flow mismatches between the underlying assets and scheduled payments of the overriding security or from credit-quality deterioration of the underlying asset pool. Therefore, the use of liquidity facilities introduces additional risk to the institution, and a commensurate capital charge is required.<sup>5</sup>

### *Testing the CFP*

Periodic testing of the operational elements of the CFP is an important part of liquidity-risk management. By testing the various operational elements of the CFP, institutions can prevent unexpected impediments or complications in accessing standby sources of liquidity during a contingent liquidity event. It is prudent to test the operational elements of a CFP that are associated with the securitization of assets, repurchase lines, Federal Reserve discount

window borrowings, or other borrowings, since efficient collateral processing during a crisis is especially important for such sources. Institutions should carefully consider whether to include unsecured funding lines in their CFPs, since these lines may be unavailable during a crisis.

Larger, more-complex institutions can benefit from operational simulations that test communications, coordination, and decision-making of managers who have different responsibilities, who are in different geographic locations, or who are located at different operating subsidiaries. Simulations or tests run late in the day can highlight specific problems, such as late-day staffing deficiencies or difficulty selling assets or borrowing new funds near the closing time of the financial markets.

### *Internal Controls*

An institution's internal controls consist of policies, procedures, approval processes, reconciliations, reviews, and other types of controls to provide assurances that the institution manages liquidity risk in accordance with the board's strategic objectives and risk tolerances. Appropriate internal controls should address relevant elements of the risk-management process, including the institution's adherence to policies and procedures; the adequacy of its risk identification, risk measurement, and risk reporting; and its compliance with applicable rules and regulations. The results of reviews of the liquidity-risk management process, along with any recommendations for improvement, should be reported to the board of directors, which should take appropriate and timely action.

An important element of a bank's internal controls is management's comprehensive evaluation and review. Management should ensure that an independent party regularly reviews and evaluates the components of the institution's liquidity-risk management process. In larger, complex institutions, an internal audit function usually performs this review. Smaller, less complex institutions may assign the responsibility for conducting an independent evaluation and review to qualified individuals who are independent of the function they are assigned to review. The independent review should report key issues requiring attention, including instances of noncompliance, to the appropriate level of

3. See the *Commercial Bank Examination Manual* sections 2130.1, 3020.1, and 4030.1, and the *OCC Handbook on Credit Card Lending*, October 1996.

4. SR-02-14, "Covenants in Securitization Documents Linked to Supervisory Actions or Thresholds."

5. SR-05-13, "Interagency Guidance on the Eligibility of ABCP Liquidity Facilities and the Resulting Risk-Based Capital Treatment."

management to initiate a prompt correction of the issues, consistent with approved policies.

Periodic reviews of the liquidity-risk management process should address any significant changes that have occurred since the last review, such as changes in the institution's types or characteristics of funding sources, limits, and internal controls. Reviews of liquidity-risk measurement systems should include assessments of the assumptions, parameters, and methodologies used. These reviews should also seek to understand, test, and document the current risk-measurement process; evaluate the system's accuracy; and recommend solutions to any identified weaknesses.

Controls for changes to the assumptions the institution uses to make cash-flow projections should require that the assumptions not be altered without clear justification consistent with approved strategies. The name of the individual authorizing the change, along with the date of the change, the nature of the change, and justification for each change, should be fully documented. Documentation for all assumptions used in cash-flow projections should be maintained in a readily accessible, understandable, and auditable form. Because liquidity-risk measurement systems may incorporate one or more subsidiary systems or processes, institutions should ensure that multiple component systems are well integrated and consistent with each other.

## LIQUIDITY MANAGEMENT FOR HOLDING COMPANIES AND BRANCHES AND AGENCIES OF FOREIGN BANKING ORGANIZATIONS

The sound practices described above are fully applicable to financial holding companies (FHCs) and bank holding companies (BHCs). FHCs and BHCs should develop and maintain liquidity-risk management processes and funding programs that are consistent with their level of sophistication and complexity. Small one-bank or "shell" holding companies obviously require programs that are less detailed than those required for larger multibank holding companies that have nonbank subsidiaries. Liquidity-risk management processes and funding programs should take into full account the firm's lending, investment, and other activities

and should ensure that adequate liquidity is maintained at the parent company and any of its bank and nonbank subsidiaries. These processes and programs should fully incorporate real and potential constraints on the transfer of funds among subsidiaries and between affiliates and the parent company, including legal and regulatory restrictions.

Liquidity-risk management processes should consider the responsibilities and obligations of the board of directors and senior management at subsidiaries. For example, a bank holding company may manage the liquidity of the corporate entity on a centralized basis; however, directors and senior managers at subsidiary banks remain responsible and accountable for the liquidity risks taken by their institutions. As a result, effective communication and an understanding of the interrelationships between holding company and subsidiary liquidity-management policies, practices, strategies, and tactics are critical to the safety and soundness of the entire organization. Appropriate liquidity-risk management is especially important for BHCs; liquidity difficulties at the holding company can easily spread to subsidiary banking institutions, particularly to similarly named institutions in which customers do not always understand the legal distinctions between the holding company and the bank.<sup>6</sup>

In general, BHCs do not have as many options as banks do for managing their assets and liabilities. Therefore, the liquidity-risk profile of BHCs is generally higher than the risk profile of their subsidiary banks. Another consideration is the ability of BHC management to quickly change the liquidity profile of the company by issuing or repurchasing stock, paying dividends, or investing in subsidiaries. The board of directors and senior management of the parent company should establish a clear strategic direction for the level of liquidity that should be maintained at the parent level; this strategy should include liquidity provisions for its subsidiary banks in times of stress.

---

6. See the Federal Reserve's *Bank Holding Company Supervision Manual*, sections 2010.1, 2080.0, 2080.1, 2080.2, 2080.4, 2080.5, 2080.6, 4010.0, 4010.1, 4010.2, 5010.27, and 5010.28 for in-depth information on liquidity-risk management for BHCs. The manual also discusses legal and regulatory restrictions on the flow of funds between BHCs and their subsidiaries.

Bank holding company liquidity should be maintained at levels sufficient to fund holding company and nonbank affiliate operations for an extended period of time in a stress environment—when access to normal funding sources is disrupted—without having a negative impact on insured depository institution subsidiaries. The stability, flexibility, and diversity of primary and contingent sources of funding liquidity should be identified not just at the subsidiary bank but also at the parent level. The impact of bank holding company liquidity and the composition of liquidity sources on the bank’s access to the funding markets should be considered carefully.

BHCs should have comprehensive liquidity and liquidity-risk management processes to adequately address their mismatch, market, and contingent liquidity risks. A CFP is an important element of these processes. The CFP should be tailored to the specific business mix and liquidity-risk profile of the BHC. Strategies devised to address potential contingent liquidity situations may include limiting parent company funding of long-term assets and securing reliable, long-term backup funding sources. Backup funding contracts should be reviewed to determine the extent to which any “material adverse change clauses” would constrain the company’s access to funding if the company’s financial condition deteriorated. A common stress test used by many multibank holding companies is to analyze whether the holding company has adequate liquidity to meet its potential debt obligations and cover operating expenses over the next 12 months, assuming that the firm loses access to funding markets and dividends from subsidiaries.

Many of the sound liquidity-risk management practices advanced in this guidance for banks and BHCs are applicable to U.S. branches or agencies of foreign banking organizations (FBOs). However, several unique liquidity considerations apply to these entities. The Federal Reserve’s *Examination Manual for U.S. Branches and Agencies of Foreign Banking Organizations* provides detailed guidance on supervisory expectations for the management of liquidity risk at these entities.<sup>7</sup>

7. See sections 3200 through 3330, *Examination Manual for U.S. Branches and Agencies of Foreign Banking Organizations*, Board of Governors of the Federal Reserve System.

## SUPERVISORY PROCESS FOR EVALUATING LIQUIDITY RISK

Liquidity risk is a primary concern for all banking organizations and is an integral component of the CAMELS rating system. Examiners should consider liquidity risk during the preparation and performance of all on-site safety-and-soundness examinations as well as during targeted supervisory reviews. To meet examination objectives efficiently and effectively and remain sensitive to potential burdens imposed on institutions, examiners should follow a structured, risk-focused approach for the examination of liquidity risk. Key elements of this examination process include off-site monitoring and a risk assessment of the institution’s liquidity-risk profile. These elements will help the examiner develop an appropriate plan and scope for the on-site examination, thus ensuring the exam is as efficient and productive as possible. A fundamental tenet of the risk-focused examination approach is the targeting of supervisory resources at functions, activities, and holdings that pose the most risk to the safety and soundness of an institution.

For smaller institutions that have less complex liquidity profiles, stable funding sources, and low exposures to contingent liquidity circumstances, the liquidity element of an examination may be relatively simple and straightforward. On the other hand, if an institution is experiencing significant asset and product growth; is highly dependent on potentially volatile funds; or has a complex business mix, balance-sheet structure, or liquidity-risk profile that exposes the institution to contingent liquidity risks, that institution should generally receive greater supervisory attention. Given the contingent nature of liquidity risk, institutions whose corporate structure gives rise to inherent operational risk, or institutions encountering difficulties associated with their earnings, asset quality, capital adequacy, or market sensitivity, should be especially targeted for review of the adequacy of their liquidity-risk management.

### Off-Site Risk Assessment

In off-site monitoring and analysis, a preliminary view, or *risk assessment*, is developed before initiating an on-site examination. Both the inherent level of an institution’s liquidity-

risk exposure and the quality of its liquidity-risk management should be assessed to the fullest extent possible during the off-site phase of the examination process. The following information can be helpful in this assessment:

- organizational charts and policies that identify authorities and responsibilities for managing liquidity risk
- liquidity policies, procedures, and limits
- ALCO committee minutes and reports (minutes and reports issued since the last examination or going back at least six to twelve months before the examination)
- board of directors reports on liquidity-risk exposures
- audit reports (both internal and external)
- other available internal liquidity-risk management reports, including cash-flow projections that detail key assumptions
- internal reports outlining funding concentrations, the marketability of assets, analysis that identifies the relative stability or volatility of various types of liabilities, and various cash-flow coverage ratios projected under adverse liquidity scenarios
- supervisory surveillance reports and supervisory screens
- external public debt ratings (if available)

Quantitative liquidity exposure should be assessed by conducting as much of the supervisory review off-site as practicable. This off-site work includes assessing the bank's overall liquidity-risk profile and the potential for other risk exposures, such as credit, market, operational, legal, and reputational risks, that may have a negative impact on the institution's liquidity under adverse circumstances. These assessments can be conducted on a preliminary basis using supervisory screens, examiner-constructed measures, internal bank measures, and cash-flow projections obtained from management reports received before the on-site engagement. Additional factors to be incorporated in the off-site risk assessment include the institution's balance-sheet composition and the existence of funding concentrations, the marketability of its assets (in the context of liquidation, securitization, or use of collateral), and the institution's access to secondary markets of liquidity.

The key to assessing the quality of management is an organized discovery process aimed at determining whether appropriate corporate-

governance structures, policies, procedures, limits, reporting systems, CFPs, and internal controls are in place. This discovery process should, in particular, ascertain whether all the elements of sound liquidity-risk management are applied consistently. The results and reports of prior examinations, in addition to internal management reports, provide important information about the adequacy of the institution's risk management.

## Examination Scope

The off-site risk assessment provides the examiner with a preliminary view of both the adequacy of liquidity management and the magnitude of the institution's exposure. The scope of the on-site liquidity-risk examination should be designed to confirm or reject the off-site hypothesis and should target specific areas of interest or concern. In this way, on-site examination procedures are tailored to the institution's activities and risk profile and use flexible and targeted work-documentation programs. In general, if liquidity-risk management is identified as adequate, examiners can rely more heavily on a bank's internal liquidity measures for assessing its inherent liquidity risk.

The examination scope for assessing liquidity risk should be commensurate with the complexity of the institution and consistent with the off-site risk assessment. For example, only baseline examination procedures would be used for institutions whose off-site risk assessment indicates that they have adequate liquidity-risk management processes and low levels of inherent liquidity exposure. These institutions include those that have noncomplex balance-sheet structures and banking activities and that also meet the following criteria:

- well capitalized; minimal issues with asset quality, earnings, and market-risk-sensitive activities
- adequate reserves of marketable securities that can serve as standby sources of liquidity
- minimal funding concentrations
- funding structures that are principally composed of stable liabilities
- few off-balance-sheet items, such as loan commitments, that represent contingent liquidity draws

- minimal potential exposure to legal and reputational risk
- formal adoption of well-documented liquidity-management policies, procedures, and CFPs

For these and other institutions identified as potentially low risk, the scope of the on-site examination would consist of only those examination procedures necessary to confirm the risk-assessment hypothesis. The adequacy of liquidity-risk management could be verified through a basic review of the appropriateness of the institution's policies, internal reports, and controls and its adherence to them. The integrity and reliability of the information used to assess the quantitative level of risk could be confirmed through limited sampling and testing. In general, if basic examination procedures validate the risk assessment, the examiner may conclude the examination process.

High levels of inherent liquidity risk may arise if an institution has concentrations in specific business activities, products, and sectors, or if it has balance-sheet risks, such as unstable liabilities, risky assets, or planned asset growth without an adequate plan for funding the asset growth. OBS items that have uncertain cash inflows may also be a source of inherent liquidity risk. Institutions for which a risk assessment indicated high levels of inherent liquidity-risk exposure and strong liquidity management may require a more extensive examination scope to confirm the assessment. These expanded procedures may entail more analysis of the institution's liquidity-risk measurement system and its liquidity-risk profile. When high levels of liquidity-risk exposure are found, examiners should focus special attention on the sources of this risk. When a risk assessment indicates an institution has high exposure and weak risk-management systems, an extensive work-documentation program is required. The institution's internal measures should be used cautiously, if at all.

Regardless of the sophistication or complexity of an institution, examiners must use care during the on-site phase of an examination to confirm the off-site risk assessment and identify issues that may have escaped off-site analysis. Accordingly, the examination scope should be adjusted as on-site findings dictate.

## Assessing CAMELS "L" Ratings

The assignment of the "L" rating is integral to the CAMELS ratings process for commercial banks. Examination findings on both (1) the inherent level of an institution's liquidity risk and (2) the adequacy of its liquidity-risk management process should be incorporated in the assignment of the "L" rating. Findings on the adequacy of liquidity-risk management should also be reflected in the CAMELS "M" rating for risk management.

Examiners can develop an overall assessment of an institution's liquidity-risk exposure by reviewing the various characteristics of its assets, liabilities, OBS instruments, and material business activities. An institution's asset credit quality, earnings integrity, and market risk may also have significant implications for its liquidity-risk exposure. Importantly, assessments of the adequacy of an institution's liquidity-management practices may affect the assessment of its inherent level of liquidity risk. For institutions judged to have sound and timely liquidity-risk measurement and reporting systems and CFPs, examiners may use the results of the institution's adverse-scenario cash-flow projections in order to gain insight into its level of inherent exposure. Institutions that have less-than-adequate measurement and reporting systems and CFPs may have higher exposure to liquidity risk as a result of their potential inability to respond to adverse liquidity events.

Elements of strong liquidity-risk management are particularly important during stress events and include many of the items discussed previously: communication among the departments responsible for managing liquidity, reports that indicate a diversity of funding sources, standby funding sources, cash-flow analyses, liquidity stress tests, and CFPs. Liquidity-risk management should also manage the ongoing costs of maintaining liquidity.

Liquidity risk should be rated in accordance with the Uniform Financial Institutions Rating System (UFIRS).<sup>8</sup> The assessment of the adequacy of liquidity-risk management should provide the primary basis for reaching an overall assessment on the "L" component rating since it is a leading indicator of potential liquidity-risk exposure. Accordingly, overall ratings for liquidity-risk sensitivity should be no greater

8. SR-96-38, "Uniform Financial Institutions Rating System."

than the rating given to liquidity-risk management. The liquidity-risk component rating description for the UFIRS is listed below. The description is divided into three sections: an introductory paragraph, a list of the principal evaluation factors that relate to the component, and a brief description of each numerical rating for the component.

In evaluating the adequacy of a financial institution's liquidity position, consideration should be given to the current level and prospective sources of liquidity compared with funding needs, as well as to the adequacy of funds-management practices relative to the institution's size, complexity, and risk profile. In general, funds-management practices should ensure that an institution is able to maintain a level of liquidity sufficient to meet its financial obligations in a timely manner and to fulfill the legitimate banking needs of its community. Practices should reflect the ability of the institution to manage unplanned changes in funding sources, as well as react to changes in market conditions that affect the ability to quickly liquidate assets with minimal loss. In addition, funds-management practices should ensure that liquidity is not maintained at a high cost or through undue reliance on funding sources that may not be available in times of financial stress or adverse changes in market conditions.

Liquidity is rated based upon, but not limited to, an assessment of the following evaluation factors:

- the adequacy of liquidity sources compared with present and future needs and the ability of the institution to meet liquidity needs without adversely affecting its operations or condition
- the availability of assets readily convertible to cash without undue loss
- access to money markets and other sources of funding
- the level of diversification of funding sources, both on- and off-balance-sheet
- the degree of reliance on short-term, volatile sources of funds, including borrowings and brokered deposits, to fund longer-term assets
- the trend and stability of deposits
- the ability to securitize and sell certain pools of assets
- the capability of management to properly identify, measure, monitor, and control the institution's liquidity position, including the

effectiveness of funds-management strategies, liquidity policies, management information systems, and contingency funding plans

Ratings of liquidity-risk management should follow the general framework used to rate overall risk management:

- A rating of 1 indicates strong liquidity levels and well-developed funds-management practices. The institution has reliable access to sufficient sources of funds on favorable terms to meet present and anticipated liquidity needs.
- A rating of 2 indicates satisfactory liquidity levels and funds-management practices. The institution has access to sufficient sources of funds on acceptable terms to meet present and anticipated liquidity needs. Modest weaknesses may be evident in funds-management practices.
- A rating of 3 indicates liquidity levels or funds-management practices in need of improvement. Institutions rated 3 may lack ready access to funds on reasonable terms or may evidence significant weaknesses in funds-management practices.
- A rating of 4 indicates deficient liquidity levels or inadequate funds-management practices. Institutions rated 4 may not have or be able to obtain a sufficient volume of funds on reasonable terms to meet liquidity needs.
- A rating of 5 indicates liquidity levels or funds-management practices so critically deficient that the continued viability of the institution is threatened. Institutions rated 5 require immediate external financial assistance to meet maturing obligations or other liquidity needs.

Unsafe liquidity-risk exposures and weaknesses in managing liquidity risk should be fully reflected in the overall liquidity-risk ratings. Unsafe exposures and unsound management practices that are not resolved during the on-site examination should be addressed through subsequent follow-up actions by the examiner and other supervisory personnel.

## REFERENCES

The following sources provide additional information on liquidity-risk management:

- *Bank Holding Company Supervision Manual*, Board of Governors of the Federal Reserve System.
- Basel Committee on Banking Supervision, “Sound Practices for Managing Liquidity in Banking Organisations,” publication 69, February 2000.
- *Commercial Bank Examination Manual*, Board of Governors of the Federal Reserve System.
- Federal Deposit Insurance Corporation, *Risk Management Manual of Examination Policies*, section 6.1—“Liquidity and Funds Management.”
- Federal Financial Institutions Examination Council, Uniform Bank Performance Report.
- *Examination Manual for U.S. Branches and Agencies of Foreign Banking Organizations*, Board of Governors of the Federal Reserve System.
- Matz, Leonard M., *Liquidity Risk Management*, Sheshunoff Information Services, 2004.
- Moody’s Investors Services, “Ratings Methodology: How Moody’s Evaluates US Bank and Bank Holding Company Liquidity.”
- Office of the Comptroller of the Currency, *Comptroller’s Handbook (Safety & Soundness)*, “Liquidity,” February 2001.
- Office of Thrift Supervision, *Examination Handbook*, sections 510–561.
- SR-01-08, “Supervisory Guidance on Complex Wholesale Borrowings,” Board of Governors of the Federal Reserve System, April 5, 2001.
- SR-01-14, “Joint Agency Advisory on Rate-Sensitive Deposits,” Board of Governors of the Federal Reserve System, May 31, 2001.
- SR-03-15, “Interagency Advisory on the Use of the Federal Reserve’s Primary Credit Program in Effective Liquidity Management,” Board of Governors of the Federal Reserve System, July 25, 2003.

1. To appropriately risk-focus the scope of the examination (that is, ensure that the scope is appropriate, given the institution's activities and the risks they present).
2. To assess the relative volatility or stability of the institution's liability funding sources.
3. To assess the institution's access to liquidity.
4. To assess the institution's potential liquidity needs.
5. To assess (1) the institution's exposure to mismatch risk under normal business conditions and (2) its planned strategies for addressing this risk.
6. To assess the institution's exposure to contingent liquidity risk.
7. To assess the appropriateness and integrity of the institution's corporate-governance policies for liquidity-risk management.
8. To determine whether the institution's policies, procedures, and limits are adequate, given its size, complexity, and sophistication.
9. To determine if management is adequately planning for intermediate-term and longer-term liquidity or funding needs.
10. To assess the adequacy of the institution's liquidity-risk measurement systems.
11. To assess the adequacy of the institution's liquidity-risk management information systems.
12. To assess the adequacy of the institution's contingency funding plans.
13. To assess the adequacy of the institution's internal controls for its liquidity-risk management process.
14. To determine whether the institution is complying with applicable laws and regulations.

---

## EXAMINATION SCOPE

1. Review the following documents to identify issues that may require follow-up:
  - a. prior examination findings and workpapers
  - b. audit reports
  - c. ongoing monitoring risk assessments (if available)
2. Review appropriate surveillance material, including the Uniform Bank Performance Report (UBPR) and other reports, to identify liquidity trends and the liquidity-risk profile of the institution. This review should include assessments of the marketability of assets and the relative stability or volatility of funding sources.
3. Request and review internal reports management uses to monitor liquidity risk, including the following reports:
  - a. senior management, asset/liability committee (ALCO), and board of directors report packages
  - b. cash-flow-projection reports
  - c. contingency funding plans
  - d. funding-concentration reports
4. Request and review organizational charts and liquidity-risk management policies and procedures.
5. Review the potential liquidity-risk exposure arising from the financial condition of the institution or other trends, such as asset growth, asset quality, earnings trends, capital adequacy, market-risk exposures (interest-rate risk (IRR) exposures for both the banking book and the trading book), business-line operational considerations, and the potential for legal and reputational risk.

On the basis of the hypothesis developed for both the institution's inherent liquidity-risk exposure and the adequacy of its liquidity management, select the steps necessary to meet examination objectives from the following procedures.

## ASSESSMENT OF INHERENT LIQUIDITY RISK

1. Review the institution's deposit structure. Discuss the following issues with manage-

- ment: the institution's customer base, costs, and pricing strategies, as well as the stability of various types of deposits. This review should include—
- a. assumptions about deposit behaviors the institution uses in making its cash-flow projections and in conducting its IRR analyses;
  - b. the competitiveness of rates paid on deposits, from both a national and local-market-area perspective;
  - c. lists of large depositors, potential deposit concentrations, and large deposit maturities;
  - d. the institution's use of brokered deposits and deposits from entities that may be especially sensitive to market rates and credit quality; and
  - e. public fund deposits, including pledging requirements and pricing policies.
2. Review the institution's use of nondeposit liabilities. Discuss with management its strategies for employing such funds, the sensitivity of such funds to market rates, and the credit quality of the institution. This review should include—
    - a. the types, costs, amounts, and concentrations of nondeposit liabilities used by the institution;
    - b. the strategies underlying the use of any Federal Home Loan Bank (FHLB) advances and the specific features of those borrowings, including the existence of any options, to determine if the institution adequately understands the risk profile of these borrowings;
    - c. the activities the institution funds with nondeposit liabilities;
    - d. the institution's use of short-term liabilities; and
    - e. compliance with the written agreements for borrowings.
  3. Review the institution's holdings of marketable assets as liquidity reserves. This review should include—
    - a. the quality, maturity, marketability, and amount of unpledged investment securities;
    - b. pledgable and securitizable loans and existing activities in this area; and
    - c. a discussion with management on its

- strategies for maintaining liquid asset reserves.
4. When applicable, review the institution's access to debt markets as a source of liquidity. This review should include—
    - a. the strength of current short- and longer-term debt ratings, including an assessment of the potential for “watch-listing” or downgrades;
    - b. the breadth of the investor base for the company's debt;
    - c. current and future issuance plans;
    - d. concentrations of borrowed funds;
    - e. the availability to utilize FHLB or other wholesale funds providers; and
    - f. the institution's reputation in the capital markets and with major funds providers.
  5. Review the institution's business activities that may have a significant impact on its liquidity needs. This review should include—
    - a. the institution's ability to securitize assets and the amount of its current and anticipated securitization activities;
    - b. payments- or securities-processing activities and other activities that may heighten the impact of operational risk on the liquidity of the firm;
    - c. the amount and nature of trading and OTC derivative activities that may have an impact on liquidity;
    - d. the extent of off-balance-sheet loan commitments;
    - e. the balance-sheet composition, including significant concentrations that may have an impact on liquidity; and
    - f. operational risks associated with the institution's business activities, risks inherent in the corporate structure, or external factors that may have an impact on liquidity.
  6. Review the institution's cash-flow projections.
  7. Discuss with management the institution's strategies for dealing with seasonal, cyclical, and planned asset-growth funding strategies, including its assessment of alternative funding sources.
  8. Review and discuss with management the institution's identification of potential contingent liquidity events and the various levels of stress those events entail. Determine if the chosen scenarios are appropriate, given the institution's business activities and funding structure.
  9. Review cash-flow projections the institution has constructed for selected contingent liquidity events. Review the assumptions underlying the projections, including sources of funds to be used in a contingent liquidity event and the reports and assumptions on behavioral cash flows.
  10. Review the assumptions and trends in the institution's liquidity-risk “triggers.”
  11. Review contingency funding plans.
  12. When appropriate, review reports on liquidity-risk triggers in the institution's securitization activities.
  13. On the basis of the above procedures, determine if the institution's inherent liquidity risk is low, limited, moderate, considerable, or high.

### ASSESSMENT OF THE QUALITY OF LIQUIDITY-RISK MANAGEMENT

1. Review formally adopted policies and procedures, as well as reports to the board of directors and senior management, to determine the adequacy of their oversight. This review should include whether the board and senior management—
  - a. have identified lines of authority and responsibility;
  - b. have articulated the institution's general liquidity strategies and its approach to liquidity risk;
  - c. understand the institution's liquidity contingency funding plans; and
  - d. periodically review the institution's liquidity-risk profile.
2. Review senior management structures in order to determine their adequacy for overseeing and managing the institution's liquidity. This review should include—
  - a. whether the institution has designated an asset/liability committee (ALCO) or other management decision-making body;
  - b. the frequency of ALCO meetings and the adequacy of the reports presented;
  - c. decisions made by the ALCO and validation of follow-up on those decisions, including ongoing assessment of open issues;
  - d. the technical and managerial expertise of management and personnel involved in liquidity management; and

- e. whether the institution has clearly delineated centralized and decentralized liquidity-management responsibilities.
3. Review and discuss with management the institution's liquidity-risk policies, procedures, and limits, and determine their appropriateness, comprehensiveness, and accuracy. Policies, procedures, and limits should—
  - a. identify the objectives and strategies of the institution's liquidity management and its expected and preferred reliance on various sources of funds to meet liquidity needs under alternative scenarios;
  - b. delineate clear lines of responsibility and accountability over liquidity-risk management and management decision making;
  - c. be consistent with institution practices;
  - d. identify the process for setting and reassessing limits, and communicate the rationale for the limit structure;
  - e. specify quantitative limits and guidelines that define the acceptable level of risk for the institution, such as the use of maximum and targeted amounts of cash-flow mismatches, liquidity reserves, volatile liabilities, and funding concentrations;
  - f. specify the frequency and methods used to measure, monitor, and control liquidity risk; and
  - g. define the specific procedures and approvals necessary for exceptions to policies, limits, and authorizations.
4. Review and discuss with management the bank's budget projections for the appropriate planning period. Ascertain if management has adequately—
  - a. planned the future direction of the bank, noting the projected growth, the source of funding for the growth, and any projected changes in its asset or liability mix;
  - b. developed future plans for meeting ongoing liquidity needs; and
  - c. assessed the reasonableness of its plans to achieve (1) the amounts and types of funding projected and (2) the amounts and types of asset growth projected. Determine if management has identified alternative sources of funds if plans are not met.
5. Review the reasonableness of bank-established parameters for the use of volatile liabilities.
6. Review liquidity-risk measurement policies, procedures, methodologies, models, assumptions, and other documentation. Discuss with management the—
  - a. adequacy and comprehensiveness of cash-flow projections and supporting analysis used to manage liquidity;
  - b. appropriateness of summary measures and ratios to adequately reflect the liquidity-risk profile of the institution;
  - c. appropriateness of the identification of stable and volatile sources of funding;
  - d. comprehensiveness of alternative contingent liquidity scenarios incorporated in the ongoing estimation of liquidity needs; and
  - e. the validity and appropriateness of assumptions used in constructing liquidity-risk measures.
7. Review liquidity-risk management policies, procedures, and reports. Discuss with management the frequency and comprehensiveness of liquidity-risk reporting for the various levels of management that are responsible for monitoring and managing liquidity risk. These considerations should include the following:
  - a. management's need to receive reports that—
    - determine compliance with limits and controls;
    - evaluate the results of past strategies;
    - assess the potential risks and returns of proposed strategies;
    - identify the major changes in a bank's liquidity-risk profile; and
    - consolidate holding company and bank subsidiary information.
  - b. the importance of holding company reports that contain information on—
    - the parent company (these reports should be consolidated with those of other significant nonbank legal vehicles);
    - the holding company's banks (information on all significant banks should be consolidated); and
    - the operating subsidiaries of individual banks, when significant.
  - c. the need for the reporting system to be flexible enough to—
    - quickly collect and edit data, summarize results, and adapt to changing

- circumstances or issues without compromising data integrity; and
- increase the frequency of report preparation as business conditions deteriorate.
- d. the need for reports to properly focus on monitoring liquidity and supporting decision making. These reports often help bank management to monitor—
- sources and uses of funds, facilitating the evaluation of trends and structural balance-sheet changes;
  - contingency funding plans;
  - projected cash-flow or maturity gaps, identifying potential future liquidity needs (reports should show projections using both contractual principal and interest runoffs and maturities (original maturity dates) and behavioral principal and interest runoffs and maturities (maturities attributable to the expected behaviors of customers));
  - consolidated large funds providers, identifying customer concentrations (reports should identify and aggregate major liability instruments used by large customers across all banks in the holding company); and
  - the cost of funds from all significant funding sources, enabling management to quickly compare costs.
8. Review the liquidity contingency funding plan (CFP) and the minutes of ALCO meetings and board meetings. Discuss with management the adequacy of the institution's—
- a. customization of its CFP to fit its liquidity-risk profile;
  - b. identification of potential stress events and the various levels of stress that can occur under those events;
  - c. quantitative assessment of its short-term and intermediate-term funding needs during stress events, particularly the reasonableness of the assumptions the institution used to forecast its potential liquidity needs;
  - d. comprehensiveness in forecasting cash flows under stress conditions (forecasts should incorporate OBS and payment systems and the operational implications of cash-flow forecasts);
  - e. identification of potential sources of liquidity under stress events;
  - f. operating policies and procedures, including the delineation of responsibilities, to be implemented in stress events, for communicating with various stakeholders;
  - g. prioritization of actions for responding to stress situations;
  - h. identification and use of contingent liquidity-risk triggers to monitor, on an ongoing basis, the potential for contingent liquidity events; and
  - i. testing of the operational elements of the CFP.
9. Determine whether the board and senior management have established clear lines of authority and responsibility for monitoring adherence to policies, procedures, and limits. Review policies, procedures, and reports to ascertain whether the institution's—
- a. measurement system adequately captures and quantifies risk;
  - b. limits are comprehensive, appropriately defined, and communicated to management in a timely manner; and
  - c. risk reports are regularly and formally discussed by management and whether meeting minutes are adequately documented.
10. Determine whether internal controls and information systems are adequately tested and reviewed by ascertaining if the institution's—
- a. risk-measurement tools are accurate, independent, and reliable;
  - b. testing of controls is adequate and frequent enough, given the level of risk and sophistication of risk-management decisions; and
  - c. reports provide relevant information, including comments on major changes in risk profiles.
11. Determine whether the liquidity-management function is audited internally or is evaluated by the risk-management function. Determine whether the audit and/or evaluation is independent and of sufficient scope.
12. Determine whether audit findings and management responses to those findings are fully documented and tracked for adequate follow-up.
13. Determine whether line management is held accountable for unsatisfactory or ineffective follow-up.
14. Determine whether risk managers give

- identified material weaknesses appropriate and timely attention.
15. Assess whether actions taken by management to deal with material weaknesses have been verified and reviewed for objectivity and adequacy by senior management or the board.
  16. Determine whether the board and senior management have established adequate procedures for ensuring compliance with applicable laws and regulations.
  17. Assess the institution's compliance with applicable laws and regulations as they pertain to deposit accounts.
  18. Assess the institution's compliance with laws and regulations, as well as potential risk exposures arising from interbank credit exposure.
  19. Assess the institution's compliance with regulations A, D, F, and W; statutory restrictions on the use of brokered deposits; and legal restrictions on dividends. Assess whether contingency funding plans comply with these regulations and restrictions.
  20. On the basis of the above procedures, determine whether the quality of the institution's liquidity-risk management is unsatisfactory, marginal, fair, satisfactory, or strong.

Review the bank's internal controls, policies, practices, and procedures for managing funding liquidity risk. The bank's system should be documented completely and concisely and should include, when appropriate, narrative descriptions, flow charts, copies of forms used, and other pertinent information.

1. Has the board of directors, consistent with its duties and responsibilities, reviewed and ratified funds-management policies, practices, and procedures that include—
  - a. clear lines of authority, responsibility, and accountability for liquidity-risk management decisions?
  - b. an articulated general liquidity strategy and approach to liquidity-risk management?
  - c. the review and approval of policies, including liquidity contingency funding plans?
  - d. the specific procedures and approvals necessary for exceptions to policies, limits, and authorizations?
  - e. established procedures for ensuring compliance with applicable laws and regulations?
2. Does senior management provide adequate oversight to manage the institution's liquidity risk?
  - a. Has senior management established clear lines of authority and responsibility for monitoring adherence to policies, procedures, and limits?
  - b. Are clear lines of responsibility and accountability delineated over liquidity-risk management and management decision making?
  - c. Is there a designated asset/liability committee (ALCO) or other management decision-making body in which liquidity risk is appropriately discussed? Does the institution have a separate liquidity-risk management function?
  - d. Is the frequency of ALCO meetings appropriate, and are the reports presented at meetings adequate?
  - e. Does management regularly and formally discuss risk reports, and are meeting minutes and decisions adequately documented?
  - f. Is the technical and managerial expertise
- of management and personnel involved in liquidity management appropriate for the institution?
- g. Are senior management's centralized and decentralized liquidity-management responsibilities clearly delineated?
3. Are the institution's policies, procedures, and limits for liquidity risk appropriate and sufficiently comprehensive to adequately control the range of liquidity risk for the level of the institution's activity?
  - a. Do the policies and procedures identify the objectives and strategies of the institution's liquidity management, and do they include the institution's expected and preferred reliance on various sources of funds to meet liquidity needs under alternative scenarios?
  - b. Are policies and procedures consistent with institution practices?
  - c. Are the limits comprehensive and appropriately defined for the institution's level of activity? Are limit exceptions communicated to management in a timely manner?
  - d. Is there a formal process for setting, reassessing, and communicating the rationale for the limit structure?
  - e. Do quantitative limits and guidelines define the acceptable level of risk for the institution (i.e., maximum and targeted amounts of cash-flow mismatches, liquidity reserves, volatile liabilities, funding concentrations, etc.)?
  - f. Are the frequency and methods used to measure, monitor, and control liquidity risk specified?
4. Are liquidity-risk measurement methodologies, models, assumptions, and reports, as well as other liquidity-risk management documentation, sufficiently adequate, comprehensive, and appropriate?
  - a. Is liquidity-risk management involved in the financial institution's new-product discussions?
  - b. Has the institution developed future growth plans and ongoing funding needs, and the sources of funding to meet those needs?
  - c. Has the institution developed alternative sources of funds to be used if its future plans are not met?
  - d. Does management adequately utilize com-

- prehensive cash-flow projections and supporting analysis in order to manage the institution's liquidity?
- e. Does the institution utilize appropriate summary measures and ratios that adequately reflect its liquidity-risk profile?
  - f. Do the above reports provide relevant information, including comments on major changes in risk profiles?
  - g. Does the planning and budgeting function consider liquidity requirements?
  - h. Are internal management reports concerning liquidity needs and sources of funds to meet those needs prepared regularly and reviewed, as appropriate, by senior management and the board of directors?
5. Does an independent party regularly review and evaluate the components of the liquidity-risk management function?
- a. Is the liquidity-risk management function audited internally, or is it evaluated by the risk-management function? Are the audit and/or evaluation of the liquidity-risk management process and controls independent and of sufficient scope?
  - b. Are audit findings and management responses to those findings fully documented and tracked for adequate follow-up?
- c. Do the internal controls and internal audit reviews ensure compliance with internal liquidity-management policies and procedures?
  - d. Is line management held accountable for unsatisfactory or ineffective follow-up?
  - e. Do risk managers give identified material weaknesses appropriate and timely attention? Are their actions verified and reviewed for objectivity and adequacy by senior management or the board?
6. Are internal controls and information systems adequately tested and reviewed?
- a. Are risk-measurement tools accurate, independent, and reliable?
  - b. Is the frequency for the testing of controls adequate, given the level of risk and sophistication of risk-management decisions?
7. On the basis of a composite evaluation, as evidenced by answers to the foregoing questions, are the internal controls and internal audit procedures considered adequate?

APPENDIX 1—FUNDAMENTALS  
OF LIQUIDITY-RISK  
MEASUREMENT

Measuring a financial institution's liquidity-risk profile and identifying alternative sources of funds to meet cash-flow needs are critical elements of sound liquidity-risk management. The liquidity-measurement techniques and the liquidity measures employed by depository institutions vary across a continuum of granularity, specificity, and complexity, depending on the specific characteristics of the institution and the intended users of the information. At one extreme, highly granular cash-flow projections under alternative scenarios are used by both complex and noncomplex firms to manage their day-to-day funding mismatches in the normal course of business and for assessing their contingent liquidity-risk exposures. At the other end of the measurement spectrum, aggregate measures and various types of liquidity ratios are often employed to convey summary views of an institution's liquidity-risk profile to various levels of management, the board of directors, and other stakeholders. As a result of this broad continuum, effective managers generally use a combination of cash-flow analysis and summary liquidity-risk measures in managing their liquidity-risk exposures, since no one measure or measurement technique can adequately capture the full dynamics of a financial institution's liquidity-risk exposure.

This appendix provides background material on the basic elements of liquidity-risk measurement and is intended to enhance examiners' understanding of the key elements of liquidity-risk management. First, the fundamental structure of cash-flow-projection worksheets and their use in assessing cash-flow mismatches under both normal business conditions and contingent liquidity events are discussed. The appendix then discusses the key liquidity characteristics of common depository institution assets, liabilities, off-balance-sheet (OBS) items, and other activities. These discussions also present key management considerations surrounding various sources and uses of liquidity in constructing cash-flow worksheets and addressing funding gaps under both normal and adverse conditions. Finally, commonly used summary liquidity measures and ratios are discussed,

along with special considerations that should enter into the construction and use of these summary measures.<sup>1</sup>

I. Basic Cash-Flow Projections

In measuring an institution's liquidity-risk profile, effective liquidity managers estimate cash inflows and cash outflows over future periods. For day-to-day operational purposes, cash-flow projections for the next day and subsequent days out over the coming week are used in order to ensure that contractual obligations are met on time. Such daily projections can be extended out beyond a one-week horizon, although it should be recognized that the further out such projections are made, the more susceptible they become to error arising from unexpected changes.

For planning purposes, effective liquidity managers project cash flows out for longer time horizons, employing various incremental time periods, or "buckets," over a chosen horizon. Such buckets may encompass forward weeks, months, quarters, and, in some cases, years. For example, an institution may plan its cash inflows and outflows on a daily basis for the next 5–10 business days, on a weekly basis over the coming month or quarter, on a monthly basis over the coming quarter or quarters, and on a quarterly basis over the next half year or year. Such cash-flow bucketing is usually compiled into a single cash-flow-projection worksheet or report that represents cash flows under a specific future scenario. The goal of this bucketing approach is a measurement system with sufficient granularity to (1) reveal the time dimension of the needs and sources of liquidity and (2) identify potential liquidity-risk exposure to contingent events.

In its most basic form, a cash-flow-projection worksheet is a table with columns denoting the selected time periods or buckets for which cash flows are to be projected. The rows of this table consist of various types of assets, liabilities, and OBS items, often grouped by their cash-flow

1. Material presented in this appendix draws from the OCC *Liquidity Handbook*, FDIC guidance, Federal Reserve guidance, findings from Federal Reserve supervision reviews, and other material developed for the Federal Reserve by consultants and other outside parties.

characteristics. Different groupings may be used to achieve different objectives of the cash-flow projection. For each row, net cash flows arising from the particular asset, liability, or OBS activity are projected across the time buckets.

The detail and granularity of the rows, and thus the projections, depend on the sophistication and complexity of the institution. Complex banks generally favor more detail, while less complex banks may use higher levels of aggregation. Static projections based only on the contractual cash flows of assets, liabilities, and OBS items as of a point in time are helpful for identifying gaps between needs and sources of liquidity. However, static projections may inadequately quantify important aspects of potential liquidity risk because they ignore new business, funding renewals, customer options, and other potential events that may have a significant impact on the institution's liquidity profile. Since liquidity managers are generally interested in evaluating how available liquidity sources may cover both expected and potential unexpected liquidity needs, a dynamic analysis that includes management's projected changes in cash flows is normally far more useful than a static projection based only on contractual cash flows as of a given projection date.

In developing a cash-flow-projection worksheet, cash inflows occurring within a given time horizon or time bucket are represented as positive numbers, while outflows are represented as negative numbers. Cash inflows include increases in liabilities as well as decreases in assets, and cash outflows include decreases in liabilities as well as increases in assets. For each type of asset, liability, or OBS item, and in each time bucket, the values shown in the cells of the projected worksheet are net cash-flow numbers. One format for a cash-flow-projection worksheet arrays sources of net cash inflows (such as loans and securities) in one group and sources of net cash outflows (such as deposit runoffs) in another. For example, the entries across time buckets for a loan or loan category would net the positives (cash inflows) of projected interest, scheduled principal payments, and prepayments with the negatives (cash outflows) of customer draws on existing commitments and new loan growth in each appropriate time bucket. Summing the net cash flows within a given column or time bucket identifies the extent of maturity mismatches that may exist. Funding shortfalls caused by mismatches in particular time frames are revealed

as a "negative gap," while excess funds within a time bucket denote a "positive gap." Identifying such gaps early can help managers take the appropriate action to either fill a negative gap or reduce a positive gap. The subtotals of the net inflows and net outflows may also be used to construct net cash-flow coverage ratios or the ratio of net cash inflows to net cash outflows.

The specific worksheet formats used to array sources and uses of cash can be customized to achieve multiple objectives. Exhibit 1 provides an example of one possible form of a cash-flow-projection worksheet. The time buckets (columns) and sources and uses (rows) are selected for illustrative purposes, as the specific selection will depend on the purpose of the particular cash-flow projection. In this example, assets and liabilities are grouped into two broad categories: those labeled "customer-driven cash flows" and those labeled "management-controlled cash flows." This grouping arrays projected cash flows on the basis of the relative extent to which funding managers may have control over changes in the cash flows of various assets, liabilities, OBS items, and other activities that have an impact on cash flow. For example, managers generally have less control over loan and deposit cash flows (e.g., changes arising from either growth or attrition) and more control over such items as fed funds sold, investment securities, and borrowings.

The net cash-flow gap illustrated in the next-to-the-last row of exhibit 1 is the sum of the net cash flows in each time-bucket column and reflects the funding gap that will have to be financed in that time period. For the daily time buckets, this gap represents the net overnight position that needs to be funded in the unsecured short-term (e.g., fed funds) market. The final row of the exhibit identifies a cumulative net cash-flow gap, which is constructed as the sum of the net cash flows in that particular time bucket and all previous time buckets. It provides a running picture across time of the cumulative funding sources and needs of the institution. The worksheet presented in exhibit 1 is only one of many alternative formats that can be used in measuring liquidity gaps.

## Exhibit 1—Example Cash-Flow-Projection Worksheet

	<i>Day 1</i>	<i>Week 1</i>	<i>Week 2</i>	<i>Week 3</i>	<i>Month 1</i>	<i>Month 3</i>	<i>Months 4–6</i>	<i>Months 7–12</i>
<i>Customer-driven cash flows</i>								
Consumer loans								
Business loans								
Residential mortgage loans								
Fixed assets								
Other assets								
Noninterest-bearing deposits								
NOW accounts								
MMDAs								
Passbook savings								
Statement savings								
CDs under \$100,000								
Jumbo CDs								
Net noninterest income								
Miscellaneous and other liabilities								
Other								
Subtotal								
<i>Management-controlled cash flows</i>								
Investment securities								
Repos, FFP, & other short-term borrowings								
FHLB & other borrowings								
Committed lines								
Uncommitted lines								
Other								
Subtotal								
Net cash-flow gap								
Cumulative position								

## II. Scenario Dependency of Cash-Flow Projections

Cash-flow-projection worksheets describe an institution's liquidity profile under an established set of assumptions about the future.

The set of assumptions used in the cash-flow projection constitutes a specific scenario customized to meet the liquidity manager's objective for the forecast. Effective liquidity managers generally use multiple forecasts and scenarios to achieve an array of objectives over planning time horizons. For example, they may use three broad types of scenarios every time they make cash-flow projections: normal-course-of-business scenarios; short-term, institution-specific stress scenarios; and more-severe, intermediate-term,

institution-specific stress scenarios. Larger, more complex institutions that engage in significant capital-markets and derivatives activities also routinely project cash flows for various systemic scenarios that may have an impact on the firm. Each scenario requires the liquidity manager to assess and plan for potential funding shortfalls. Importantly, no single cash-flow projection reflects the range of liquidity sources and needs required for advance planning.

Normal-course-of-business scenarios establish benchmarks for the "normal" behavior of cash flows of the institution. The cash flows projected for such scenarios are those the institution expects under benign conditions and should reflect seasonal fluctuations in loans or deposit flows. In addition, expected growth in

assets and liabilities is generally incorporated to provide a dynamic view of the institution's liquidity needs under normal conditions.

Adverse, institution-specific scenarios are those that subject the institution to constrained liquidity conditions. Such scenarios are generally defined by first specifying the type of liquidity event to be considered and then identifying various levels or stages of severity for that type of event. For example, institutions that do not have publicly rated debt generally employ scenarios that entail a significant deterioration in the credit quality of their loan and security holdings. Institutions that have publicly rated debt generally include a debt-rating downgrade scenario in their contingency funding plans. The downgrade of an institution's public debt rating might be specified as one type of event, with successively lower ratings grades, including below-investment-grade ratings, to identify increasing levels of severity. Each level of severity can be viewed as an individual scenario for planning purposes. Effective liquidity managers ensure that they choose potential adverse liquidity scenarios that entail appropriate degrees of severity and model cash flows consistent with each level of stress. Events that limit access to important sources of funding are the most common institution-specific scenarios used.

The same type of cash-flow-projection worksheet format shown in exhibit 1 can be used for adverse, institution-specific scenarios. However, in making such cash-flow projections, some institutions find it useful to organize the accounts differently to accommodate a set of very different assumptions from those used in the normal-course-of-business scenarios. Exhibit 2 presents a format in which accounts are organized by those involving potential cash outflows and cash inflows. This format focuses the analysis first on liability erosion and potential off-balance-sheet draws, followed by an evaluation of the bank's ability to cover potential runoff, primarily from assets that can be sold or pledged. Funding sources are arranged by their sensitivity to the chosen scenario. For example, deposits may be segregated into insured and uninsured portions. The time buckets used are generally of a shorter term than those used under business-as-usual scenarios, reflecting the speed at which deteriorating conditions can affect cash flows.

A key goal of creating adverse-situation cash-flow projections is to alert management as

to whether incremental funding resources available under the constraints of each scenario are sufficient to meet the incremental funding needs that result from that scenario. To the extent that projected funding deficits are larger than (or projected funding surpluses are smaller than) desired levels, management has the opportunity to make adjustments to its liquidity position or develop strategies to bring the institution back within an acceptable level of risk.

Adverse systemic scenarios entail macroeconomic, financial market, or organizational events that can have an adverse impact on the institution and its funding needs and sources. Such scenarios are generally customized to the individual institution's funding characteristics and business activities. For example, an institution involved in clearing and settlement activities may choose to model a payments-system disruption, while a bank heavily involved in capital-markets transactions may choose to model a capital-markets disruption.

The number of cash-flow projections necessary to fully assess potential adverse liquidity scenarios can result in a wealth of information that often requires summarization in order to appropriately communicate contingent liquidity-risk exposure to various levels of management. Exhibit 3 presents an example of a report format that assesses available sources of liquidity under alternative scenarios. The worksheet shows the amount of anticipated funds erosion and potential sources of funds under a number of stress scenarios, for a given time bucket (e.g., overnight, one week, one month, etc.). In this example, two rating-downgrade scenarios of different severity are used, along with a scenario built on low-earnings projections and a potential reputational-risk scenario.

Exhibit 4 shows an alternative format for summarizing the results of multiple scenarios. In this case, summary funding gaps are presented across various time horizons (columns) for each scenario (rows). Actual reports used should be tailored to the specific liquidity-risk profile and other institution-specific characteristics.

### Exhibit 2—Example Cash-Flow-Projection Worksheet—Liquidity Under an Adverse Scenario

<i>Potential outflows/funding erosion</i>	<i>Day 1</i>	<i>Day 2</i>	<i>Days 3–7</i>	<i>Week 2</i>	<i>Week 3</i>	<i>Week 4</i>	<i>Month 2</i>	<i>Months 2+</i>
Federal funds purchased								
Uncollateralized borrowings (sub-debt, MTNs, etc.)								
Nonmaturity deposits:								
insured								
— Noninterest-bearing deposits								
— NOW accounts								
— MMDAs								
— Savings								
Nonmaturity deposits: uninsured								
— Retail CDs under \$100,000								
— Jumbo CDs								
— Brokered CDs								
— Miscellaneous and other liabilities								
Subtotal								
<i>Off-balance-sheet funding requirements</i>								
Loan commitments								
Amortizing securitizations								
Out-of-the-money derivatives								
Backup lines								
Total potential outflows								
<i>Potential sources to cover outflows</i>								
Overnight funds sold								
Unencumbered investment securities (with appropriate haircut)								
Residential mortgage loans								
Consumer loans								
Business loans								
Fixed/other assets								
Unsecured borrowing capacity								
Brokered-funds capacity								
Total potential inflows								
Net cash flows								
Coverage ratio (inflows/outflows)								
Cumulative coverage ratio								

### Exhibit 3—Example Summary Contingent-Liquidity-Exposure Report (for an Assumed Time Horizon)

Events:	Current	Ratings downgrade	Earnings	Reputation	Other (?)
Scenarios:		<i>I</i> cate- gory	BBB to BB	RoA = ?	
<i>Potential funding erosion</i>					
Large fund providers	—	—	—	—	—
Fed funds	—	—	—	—	—
CDs	—	—	—	—	—
Eurotakings/foreign deposits	—	—	—	—	—
Commercial paper	—	—	—	—	—
Subtotal	—	—	—	—	—
Other funds providers	—	—	—	—	—
Fed funds	—	—	—	—	—
CDs	—	—	—	—	—
Eurotakings/foreign deposits	—	—	—	—	—
Commercial paper	—	—	—	—	—
DDAs	—	—	—	—	—
Consumer MMDAs	—	—	—	—	—
Savings	—	—	—	—	—
Other	—	—	—	—	—
Total uninsured funds	—	—	—	—	—
Total insured funds	—	—	—	—	—
Total funding	—	—	—	—	—
<i>Off-balance-sheet needs</i>					
Letters of credit	—	—	—	—	—
Loan commitments	—	—	—	—	—
Securitized assets	—	—	—	—	—
Derivatives	—	—	—	—	—
Total OBS items	—	—	—	—	—
Total funding erosion	—	—	—	—	—
<i>Sources of funds</i>					
Surplus money market	—	—	—	—	—
Unpledged securities	—	—	—	—	—
Securitized assets	—	—	—	—	—
Credit cards	—	—	—	—	—
Autos	—	—	—	—	—
Mortgages	—	—	—	—	—
Loan sales	—	—	—	—	—
Other	—	—	—	—	—
Total internal sources	—	—	—	—	—
Borrowing capacity	—	—	—	—	—
Brokered-funds capacity	—	—	—	—	—
Fed discount borrowings	—	—	—	—	—
Other	—	—	—	—	—

### Exhibit 4—Example Summary Contingent-Liquidity-Exposure Report (Across Various Time Horizons)

	<i>Projected liquidity cushion</i>				
	1 week	2–4 weeks	2 months	3 months	4+ months
<i>Normal course of business</i>					
Total cash inflows	—	—	—	—	—
Total cash outflows	—	—	—	—	—
Liquidity cushion (shortfall)	—	—	—	—	—
Liquidity coverage ratio	—	—	—	—	—
<i>Mild institution-specific</i>					
Total cash inflows	—	—	—	—	—
Total cash outflows	—	—	—	—	—
Liquidity cushion (shortfall)	—	—	—	—	—
Liquidity coverage ratio	—	—	—	—	—
<i>Severe institution-specific</i>					
Total cash inflows	—	—	—	—	—
Total cash outflows	—	—	—	—	—
Liquidity cushion (shortfall)	—	—	—	—	—
Liquidity coverage ratio	—	—	—	—	—
<i>Severe credit crunch</i>					
Total cash inflows	—	—	—	—	—
Total cash outflows	—	—	—	—	—
Liquidity cushion (shortfall)	—	—	—	—	—
Liquidity coverage ratio	—	—	—	—	—
<i>Capital-markets disruption</i>					
Total cash inflows	—	—	—	—	—
Total cash outflows	—	—	—	—	—
Liquidity cushion (shortfall)	—	—	—	—	—
Liquidity coverage ratio	—	—	—	—	—
<i>Custom scenario</i>					
Total cash inflows	—	—	—	—	—
Total cash outflows	—	—	—	—	—
Liquidity cushion (shortfall)	—	—	—	—	—
Liquidity coverage ratio	—	—	—	—	—

### III. Liquidity Characteristics of Assets, Liabilities, Off-Balance-Sheet Positions, and Various Types of Banking Activities

A full understanding of the liquidity and cash-flow characteristics of the institution's assets, liabilities, OBS items, and banking activities is critical to the identification and management of mismatch risk, contingent liquidity risk, and market liquidity risk. This understanding is required for constructing meaningful cash-flow-projection worksheets under alterna-

tive scenarios, for developing and executing strategies used in managing mismatches, and for customizing summary liquidity measures or ratios.

#### A. Assets

The generation of assets is one of the primary uses of funds at banking organizations. Once acquired, assets provide cash inflows through principal and interest payments. Moreover, the liquidation of assets or their use as collateral for

borrowing purposes makes them an important source of funds and, therefore, an integral tool in managing liquidity risk. As a result, the objectives underlying an institution's holdings of various types of assets range along a continuum that balances the tradeoffs between maximizing risk-adjusted returns and ensuring the fulfillment of an institution's contractual obligations to deliver funds (ultimately in the form of cash). Assets vary by structure, maturity, credit quality, marketability, and other characteristics that generally reflect their relative ability to be convertible into cash.

Cash operating accounts that include vault cash, cash items in process, correspondent accounts, accounts with the Federal Reserve, and other cash or "near-cash" instruments are the primary tools institutions use to execute their immediate cash-transaction obligations. They are generally not regarded as sources of additional or incremental liquidity but act as the operating levels of cash necessary for executing day-to-day transactions. Accordingly, well-managed institutions maintain ongoing balances in such accounts to meet daily business transactions. Because they generate no or very low interest earnings, such holdings are generally maintained at the minimum levels necessary to meet day-to-day transaction needs.

Beyond cash and near-cash instruments, the extent to which assets contribute to an institution's liquidity profile and the management of liquidity risk depends heavily on the contractual and structural features that determine an asset's cash-flow profile, its marketability, and its ability to be pledged to secure borrowings. The following sections discuss important aspects of these asset characteristics that effective managers factor into their management of liquidity risk on an ongoing basis and during adverse liquidity events.

*Structural cash-flow attributes of assets.* Knowledge and understanding of the contractual and structural features of assets, such as their maturity, interest and amortization payment schedules, and any options (either explicit or embedded) that might affect contractual cash flows under alternative scenarios, is critical for the adequate measurement and management of liquidity risk. Clearly, the maturity of assets is a key input in cash-flow analysis. Indeed, the management of asset maturities is a critical tool used in matching expected cash outflows and inflows. This matching is generally accom-

plished by "laddering" asset maturities in order to meet scheduled cash needs out through short and intermediate time horizons.

Short-term money market assets (MMAs) are the primary "laddering" tools used to meet funding gaps over short-term time horizons. They provide vehicles for institutions to ensure future cash availability while earning a return. Given the relatively low return on such assets, managers face important tradeoffs between earnings and the provision of liquidity in deploying such assets. In general, larger institutions employ a variety of MMAs in making such tradeoffs, while smaller community organizations face fewer potential sources of short-term investments.

The contractual and structural features, such as the maturity and payment streams of all financial assets, should be factored into both cash-flow projections and the strategies developed for filling negative funding gaps. This practice includes the assessment of embedded options in assets that can materially affect an asset's cash flow. Effective liquidity managers incorporate the expected exercise of options in projecting cash flows for the various scenarios they use in measuring liquidity risk. For example, normal "business as usual" projections may include an estimate of the expected amount of loan and security principal prepayments under prevailing market interest rates, while alternative-scenario projections may employ estimates of expected increases in prepayments (and cash flows) arising from declining interest rates and expected declines in prepayments or "maturity extensions" resulting from rising market interest rates.

*Market liquidity, or the "marketability" of assets.* Marketability is the ability to convert an asset into cash through a quick "sale" and at a fair price. This ability is determined by the market in which the sale transaction is conducted. In general, investment-grade securities are more marketable than loans or other assets. Institutions generally view holdings of investment securities as a first line of defense for contingency purposes, but banks need to fully assess the marketability of these holdings. The availability and size of a bid-asked spread for an asset provides a general indication of the market liquidity of that asset. The narrower the spread, and the deeper and more liquid the market, the more likely a seller will find a willing buyer at or near the asked price.

Importantly, however, the market liquidity of an asset is not a static attribute but is a function of conditions prevailing in the secondary markets for the particular asset. Bid-asked spreads, when they exist, generally vary with the volume and frequency of transactions in the particular type of assets. Larger volumes and greater frequency of transactions are generally associated with narrower bid-asked spreads. However, disruptions in the marketplace, contractions in the number of market makers, the execution of large block transactions in the asset, and other market factors may result in the widening of the bid-asked spread—and thus reduce the market liquidity of an instrument. Large transactions, in particular, can constrain the market liquidity of an asset, especially if the market for the asset is not deep.

The marketability of assets may also be constrained by the volatility of overall market prices and the underlying rates, which may cause widening bid-asked spreads on marketable assets. Some assets may be more subject to this type of market volatility than others. For example, securities that have inherent credit or interest-rate risk can become more difficult to trade during times when market participants have a low tolerance for these risks. This may be the case when market uncertainties prompt investors to shun risky securities in favor of more-stable investments, resulting in a so-called flight to quality. In a flight to quality, investors become much more willing to sacrifice yield in exchange for safety and liquidity.

In addition to reacting to prevailing market conditions, the market liquidity of an asset can be affected by other factors specific to individual investment positions. Small pieces of security issues, security issues from nonrated and obscure issuers, and other inactively traded securities may not be as liquid as other investments. While brokers and dealers buy and sell inactive securities, price quotations may not be readily available, or when they are, bid-asked spreads may be relatively wide. Bids for such securities are unlikely to be as high as the bids for similar but actively traded securities. Therefore, even though sparsely traded securities can almost always be sold, an unattractive price can make the seller unenthusiastic about selling or result in potential losses in order to raise cash through the sale of an asset.

Accounting conventions can also affect the market liquidity of assets. For example, State-

ment of Financial Accounting Standards No. 115 (FAS 115), which requires investment securities to be categorized as held-to-maturity (HTM), available-for-sale (AFS), or trading, significantly affects the liquidity characteristics of investment holdings. Of the three categories, securities categorized as HTM provide the least liquidity, as they cannot be sold to meet liquidity needs without potentially onerous repercussions.<sup>2</sup>

Securities categorized as AFS can be sold at any time to meet liquidity needs, but care must be taken to avoid large swings in earnings or triggering impairment recognition of securities with unrealized losses.

Trading account securities are generally considered the most marketable from an accounting standpoint, since selling a trading account investment has little or no income effect.

While securities are generally considered to have greater market liquidity than loans and other assets, liquidity-risk managers increasingly consider the ability to obtain cash from the sale of loans as a potential source of liquidity. Many types of bank loans can be sold, securitized, or pledged as collateral for borrowings. For example, the portions of loans that are insured or guaranteed by the U.S. government or by U.S. government-sponsored enterprises are readily saleable under most market conditions. From a market liquidity perspective, the primary difference between loans and securities is that the process of turning loans into cash can be less efficient and more time-consuming. While securitizations of loan portfolios (discussed below) are more common in practice, commercial loans and portfolios of mortgages or retail loans can be, and often are, bought and sold by banking organizations. However, the due diligence and other requirements of these transactions generally take weeks or even months to complete, depending on the size and complexity of the loans being sold. Liquidity-risk managers may include selling marketable loans as a potential source of cash in their liquidity analyses, but they must be careful to realistically time the expected receipt of cash and should carefully consider past experience and market conditions at the expected time of sale. Institutions that do not have prior experience selling a loan or a mortgage portfolio often need more time to

2. HTM securities can be pledged, however, so they do still provide a potential source of liquidity. Furthermore, since the HTM-sale restriction is only an accounting standard (FAS 115)—not a market limitation—HTM securities can be sold in cases of extreme need.

close a loan sale than does an institution that makes such transactions regularly. Additionally, in systemic liquidity or institution-specific credit-quality stress scenarios, the ability to sell loans outright may not be a realistic assumption.

Securitization can be a valuable method for converting otherwise illiquid assets into cash. Advances in the capital markets have made residential mortgage, credit card, student, home equity, automobile, and other loan types increasingly amenable to securitization. As a result, the securitization of loans has become an important funds-management tool at many depository institutions. Many institutions have business lines that originate assets specifically for securitization in the capital markets. However, while securitization can play an important role in managing liquidity, it can also increase liquidity risk—especially when excessive reliance is placed on securitization as a single source of funding.

Securitization can be regarded as an ongoing, reliable source of liquidity only for institutions that have experience in securitizing the specific type of loans under consideration. The time and effort involved in structuring loan securitizations make them difficult to use as a source of asset liquidity for institutions that have limited experience with this activity. Moreover, peculiarities involved in the structures used to securitize certain types of assets may introduce added complexity in managing an institution's cash flows. For example, the securitization of certain retail-credit receivables requires planning for the possible return of receivable balances arising from scheduled or early amortization, which may entail the funding of sizable balances at unexpected or inopportune times. Institutions using securitization as a source of funding should have adequate monitoring systems and ensure that such activities are fully incorporated into all aspects of their liquidity-risk management processes—which includes assessing the liquidity impact of securitizations under adverse scenarios. This assessment is especially important for institutions that originate assets specifically for securitization since market disruptions have the potential to impose the need for significant contingent liquidity if securitizations cannot be executed. As a result, effective liquidity managers ensure that the implications of securitization activities are fully considered in both their day-to-day liquidity management and their liquidity contingency planning.

*Pledging of assets to secure borrowings.* The potential to pledge securities, loans, or other assets to obtain funds is another important tool for converting assets into cash to meet funding needs. Since the market liquidity of assets is a significant concern to the lender of secured funds, assets with greater market liquidity are more easily pledged than less marketable assets. An institution that has a largely unpledged investment-securities portfolio has access to liquidity either through selling the investments outright or through pledging the investments as collateral for borrowings or public deposits. However, once pledged, assets are generally unavailable for supplying contingent liquidity through their sale. When preparing cash-flow projections, liquidity-risk managers do not classify pledged assets as “liquid assets” that can be sold to generate cash since the liquidity available from these assets has already been “consumed” by the institution. Accordingly, when computing liquidity measures, effective liquidity managers avoid double-counting unpledged securities as both a source of cash from the potential sale of the asset and as a source of new liabilities from the potential collateralization of the the same security. In more-sophisticated cash-flow projections, the tying of the pledged asset to the funding is made explicit.

Similar to the pledging of securities, many investments can be sold under an agreement to repurchase. This agreement provides the institution with temporary cash without having to sell the investment outright and avoids the potential earnings volatility and transaction costs that buying and selling securities would entail.

*Use of haircuts in measuring the funds that can be raised through asset sales, securitizations, or repurchase agreements.* The planned use of asset sales, asset securitizations, or collateralized borrowings to meet liquidity needs necessarily involves some estimation of the value of the asset at the future point in time when the asset is anticipated to be converted into cash. Based on changes in market factors, future asset values may be more or less than current values. As a result, liquidity managers generally apply discounts, or *haircuts*, to the current value of assets to represent a conservative estimate of the anticipated proceeds available from asset sales or securitization in the capital markets. Similarly, lenders in secured borrowings also apply haircuts to determine the

amount to lend against pledged collateral as protection if the value of that collateral declines. In this case, the haircut represents, in addition to other factors, the portion of asset value that cannot be converted to cash because secured lenders wish to have a collateral-protection margin.

When computing cash-flow projections under alternative scenarios and developing plans to meet cash shortfalls, liquidity managers ensure that they incorporate haircuts in order to reflect the market liquidity of their assets. Such haircuts are applied consistent with both the relative market liquidity of the assets and the specific scenario utilized. In general, longer-term, riskier assets, as well as assets with less liquid markets, are assigned larger haircuts than are shorter-term, less risky assets. For example, within the securities portfolio, different haircuts might be assigned to short-term and long-term Treasuries, rated and unrated municipal bonds, and different types of mortgage securities (e.g., pass-throughs versus CMOs). When available and appropriate, historical price changes over specified time horizons equal to the time until anticipated liquidation or the term of a borrowing are used by liquidity-risk managers to establish such haircuts. Haircuts used by nationally recognized statistical ratings organizations (NRSROs) are a starting point for such calculations but should not be unduly relied on since institution- and scenario-specific considerations may have important implications.

Haircuts should be customized to the particular projected or planned scenario. For example, adverse scenarios that hypothesize a capital-markets disruption would be expected to use larger haircuts than those used in projections assuming normal markets. Under institution-specific, adverse scenarios, certain assets, such as loans anticipated for sale, securitization, or pledging, may merit higher haircuts than those used under normal business scenarios. Institutions should fully document the haircuts they use to estimate the marketability of their assets.

Bank-owned life insurance (BOLI) is a popular instrument offering tax benefits as well as life insurance on bank employees. Some BOLI policies are structured to provide liquidity; however, most BOLI policies only generate cash in the event of a covered person's death and impose substantial fees if redeemed. In general, BOLI should not be considered a liquid asset. If it is included as a potential source of

funds in a cash-flow analysis, a severe haircut reflecting the terms of the BOLI contract and current market conditions should be applied.

*Liquid assets and liquidity reserves.* Sound practices for managing liquidity risk call for institutions to maintain an adequate reserve of liquid assets to meet both normal and adverse liquidity situations. Such reserves should be structured consistent with the considerations discussed above regarding the marketability of different types of assets. Many institutions identify a specific portion of their investment account to serve as a liquidity reserve, or *liquidity warehouse*. The size of liquidity reserves should be based on the institution's assessments of its liquidity-risk profile and potential liquidity needs under alternative scenarios, giving full consideration to the costs of maintaining those assets. In general, the amount of liquid assets held will be a function of the stability of the institution's funding structures and the potential for rapid loan growth. If the sources of funds are stable, if adverse-scenario cash-flow projections indicate adequate sources of contingent liquidity (including sufficient sources of unused borrowing capacity), and if asset growth is predictable, then a relatively low asset liquidity reserve may be required. The availability of the liquidity reserves should be tested from time to time. Of course, liquidity reserves should be actively managed to reflect the liquidity-risk profile of the institution and current trends that might have a negative impact on the institution's liquidity, such as—

- trading market, national, or financial market trends that might lead rate-sensitive customers to pursue investment alternatives away from the institution;
- significant actual or planned growth in assets;
- trends evidencing a reduction in large liability accounts;
- a substantial portion of liabilities from rate-sensitive and credit-quality-sensitive customers;
- significant liability concentrations by product type or by large deposit account holders;
- a loan portfolio consisting of illiquid, nonmarketable, or unpledgeable loans;
- expectations for substantial draws on loan commitments by customers;
- significant loan concentrations by product, industry, customer, and location;
- significant portions of assets pledged against

- wholesale borrowings; and
- impaired access to the capital markets.

## B. Liabilities

Similar to its assets, a depository institution's liabilities present a complicated array of liquidity characteristics. Banking organizations obtain funds from a wide variety of sources using an array of financial instruments. The primary characteristics that determine a liability's liquidity-risk profile include its term, optionality, and counterparty risk tolerance (which includes the counterparty's need for insurance or collateral). These features help to determine if an individual liability can be considered as stable or volatile. A stable liability is a reliable source of funds that is likely to remain available in adverse circumstances. A volatile liability is a less stable source of funds that may disappear or be unavailable to the institution under heavy price competition, deteriorating credit or market-risk conditions, and other possible adverse events. Developing assumptions on the relative stability or volatility of liabilities is a crucial step in forecasting a bank's future cash flows under various scenarios and in constructing various summary liquidity measures. As a result, effective liquidity managers segment their liabilities into volatile and stable components on the basis of the characteristics of the liability and on the risk tolerance of the counterparty. These funds may be characterized as credit-sensitive, rate-sensitive, or both.

*Characteristics of stability and risk tolerance.* The stability of an individual bank liability is closely related to the customer's or counterparty's risk tolerance, or its willingness and ability to lend or deposit money for a given risk and reward. Several factors affect the stability and risk tolerance of funds providers, including the fiduciary responsibilities and obligations of funds providers to their customers, the availability of insurance on the funds advanced by customers to banking organizations, the reliance of customers on public debt ratings, and the relationships funds providers have with the institution.

Institutional providers of funds to banking organizations, such as money market funds, mutual funds, trust funds, public entities, and other types of investment managers, have

fiduciary obligations and responsibilities to adequately assess and monitor the relative risk-and-reward tradeoffs of the investments they make for their customers, participants, or constituencies. These fund providers are especially sensitive to receiving higher returns for higher risk, and they are more apt to withdraw funds if they sense that an institution has a deteriorating financial condition. In general, funds from sources that lend or deposit money on behalf of others are less stable than funds from sources that lend their own funds. For example, a mutual fund purchaser of an institution's negotiable CD may be expected to be less stable than a local customer buying the same CD.

Institutionally placed funds and other funds providers often depend on the published evaluations or ratings of NRSROs. Indeed, many such funds providers may have bylaws or internal guidelines that prohibit placing funds with institutions that have low ratings or, in the absence of actual guidelines, may simply be averse to retaining funds at an institution whose rating is poor or whose financial condition shows deterioration. As a result, funds provided by such investors can be highly unstable in adverse liquidity environments.

The availability of insurance on deposits or collateral on borrowed funds are also important considerations in gauging the stability of funds provided. Insured or collateralized funds are usually more stable than uninsured or unsecured funds since the funds provider ultimately relies on a third party or the value of collateral to protect its investment.

Clearly, the nature of a customer's relationship with an institution has significant implications for the potential stability or volatility of various sources of funds. Customers who have a long-standing relationship with an institution and a variety of accounts, or who otherwise use multiple banking services at the institution, are usually more stable than other types of customers.

Finally, the sensitivity of a funds provider to the rates paid on the specific instrument or transaction used by the banking organization to access funds is also critical for the appropriate assessment of the stability or volatility of funds. Customers that are very rate-driven are more likely not to advance funds or remove existing funds from an institution if more competitive rates are available elsewhere.

All of these factors should be analyzed for the

## Exhibit 5—General Characteristics of Stable and Volatile Liabilities

<i>Types of funds providers</i>	<i>Characteristics of funds providers that affect the stability/volatility of the funds provided</i>				
	<i>Fiduciary agent or own funds</i>	<i>Insured or secured</i>	<i>Reliance on public information</i>	<i>Relationship</i>	<i>Stability assessment</i>
Consumers	owner	yes	low	high	high
Small business	owner	in part	low	high	medium
Large corporate	owner	no	medium	medium	low
Banks	agent	no	high	medium	medium
Municipalities	agent	in part	high	medium	medium
Money market mutual funds	quasi-fiduciary	no	high	low	low
Other	—	—	—	—	—

more common types of depositors and funds providers and for the instruments they use to place funds with the institution. Such assessments lead to general conclusions regarding each type of customer's or counterparty's risk sensitivity and the stability of the funds provided by the instruments they use to place funds with the institution. Exhibit 5 provides a heuristic schematic of how effective liquidity-risk managers conduct such an assessment regarding the array of their different funds providers. It uses a continuum to indicate the general level of risk sensitivity (and thus the expected stability of funds) expected for each type of depositor, customer, or investor in an institution's debt obligations. Of course, individual customers and counterparties may have various degrees of such concerns, and greater granularity is generally required in practice. An additional instrument assessment of the stability or volatility of funds raised using that instrument from each type of fund provider is a logical next step in the process of evaluating the relative stability of various sources of funds to an institution.

There are a variety of methods used to assess the relative stability of funds providers. Effective liquidity managers generally review deposit accounts by counterparty type, e.g., consumer, small business, or municipality. For each type, an effective liquidity manager evaluates the applicability of risk or stability factors, such as whether the depositor has other relationships with the institution, whether the depositor owns the funds on deposit or is acting as an agent or manager, or whether the depositor is likely to be more aware of and concerned by adverse news

reports. The depositors and counterparties considered to have a significant relationship with the institution and who are less sensitive to market interest rates can be viewed as providing *stable* funding. Statistical analysis of funds volatility is often used to separate total volumes into stable and nonstable segments. While such analysis can be very helpful, it is important to be mindful that historical volatility is unlikely to include a period of acute liquidity stress.

The following discussions identify important considerations that should be factored into the assessment of the relative stability of various sources of funds utilized by banking organizations.

*Maturity of liabilities used to gather funds.* An important factor in assessing the stability of funds sources is the remaining contractual life of the liability. Longer-maturity liabilities obviously provide more-stable funding than do shorter maturities. Extending liability maturities to reduce liquidity risk is a common management technique and an important sound practice used by most depository institutions. It is also a major part of the cost of liquidity management, since longer-term liabilities generally require higher interest rates than are required for similar short-term liabilities.

*Indeterminate maturity deposits.* Evaluations of the stability of deposits with indeterminate maturities, such as various types of transaction accounts (e.g., demand deposits, negotiable order of withdrawal accounts (NOWs) or money market demand accounts (MMDAs), and savings accounts) can be made using criteria similar

to those shown in exhibit 5. In doing so, effective liquidity managers recognize that the relative stability or volatility of these accounts derives from the underlying characteristics of the customers that use them and not on the account type itself. As a result, most institutions delineate the relative volatility or stability of various subgroups of these account types on the basis of customer characteristics. For example, MMDA deposits of customers who have fiduciary obligations may be less stable than those of individual retail customers. Additionally, funds acquired through a higher pricing strategy for these types of deposit accounts are generally less stable than are deposits from customers who have long-standing relationships with the institution. Increasingly, liquidity managers recognize that traditional measures of “core” deposits may be inappropriate, and thus these deposits require more in-depth analysis to determine their relative stability.

Assessment of the relative stability or volatility of deposits that have indeterminate maturities can be qualitative as well as quantitative, consistent with the size, complexity, and sophistication of the institution. For example, at larger institutions, models based on statistical analysis can be used to estimate the stability of various subsets of such funds under alternative liquidity environments. Such models can be used to formulate expected behaviors in reaction to rate changes and other more-typical financial events. As they do when using models to manage any type of risk, institutions should fully document and understand the assumptions and methodologies used. This is especially the case when external parties conduct such analysis. Effective liquidity managers aggressively avoid “black-box” estimates of funding behaviors.

In most cases, insured deposits from consumers may be less likely to leave the institution under many liquidity circumstances than are funds supplied by more-institutional funds providers. Absent extenuating circumstances (e.g., the deposit contract prohibits early withdrawal), funds provided by agents and fiduciaries are generally treated by banking organizations as volatile liabilities.

*Certificates of deposit and time deposits.* At maturity, certificates of deposit (CDs) and time deposits are subject to the general factors regarding stability and volatility discussed above, including rate sensitivity and relationship factors. Nonrelationship and highly-rate-sensitive

deposits tend to be less stable than deposits placed by less-rate-sensitive customers who have close relationships with the institution. Insured CDs are generally considered more stable than uninsured “jumbo” CDs in denominations of more than \$100,000. In general, jumbo CDs and negotiable CDs are more volatile sources of funds—especially during times of stress—since they may be less relationship-driven and have a higher sensitivity to potential credit problems.

*Brokered deposits and other rate-sensitive deposits.* Brokered deposits are funds a bank obtains, directly or indirectly, by or through any deposit broker, for deposit into one or more accounts. Thus, brokered deposits include both those in which the entire beneficial interest in a given bank deposit account or instrument is held by a single depositor and those in which the deposit broker pools funds from more than one investor for deposit in a given bank deposit account. Rates paid on brokered deposits are often higher than those paid for local-market-area retail deposits since brokered-deposit customers are generally focused on obtaining the highest FDIC-insured rate available. These rate-sensitive customers have easy access to, and are frequently well informed about, alternative markets and investments, and they may have no other relationship with or loyalty to the bank. If market conditions change or more-attractive returns become available, these customers may rapidly transfer their funds to new institutions or investments. Accordingly, these rate-sensitive depositors may exhibit characteristics more typical of wholesale investors, and liquidity-risk managers should model brokered deposits accordingly.

The use of brokered deposits is governed by law and covered by the 2001 Joint Agency Advisory on Brokered and Rate-Sensitive Deposits.<sup>3</sup> (See appendix 4.) Under 12 USC 1831f and 12 CFR 337.6, determination of “brokered” status is based initially on whether a bank actually obtains a deposit directly or indirectly through a deposit broker. Banks that are considered only “adequately capitalized” under the “prompt corrective action” (PCA) standard must receive a waiver from the FDIC before

3. Office of the Comptroller of the Currency, Board of Governors of the Federal Reserve System, Federal Deposit Insurance Corporation, and Office of Thrift Supervision. May 11, 2001. Federal Reserve SR-letter 01-14.

they can accept, renew, or roll over any brokered deposit. They are also restricted in the rates they may offer on such deposits. Banks falling below the adequately capitalized range may not accept, renew, or roll over any brokered deposit, nor solicit deposits with an effective yield more than 75 basis points above the prevailing market rate. These restrictions will reduce the availability of funding alternatives as a bank's condition deteriorates. The FDIC is not authorized to grant waivers for banks that are less than adequately capitalized. Bank managers who use brokered deposits should be familiar with the regulations governing brokered deposits and understand the requirements for requesting a waiver. Exhibit 6 shows the capital designations required for banks that use brokered deposits and the rate restrictions for banks that are less than well capitalized under PCA standards.

Deposits attracted over the Internet, through CD listing services, or through special advertising programs that offer premium rates to customers who do not have another banking relationship with the institution also require special monitoring. Although these deposits may not fall within the technical definition of "brokered" in 12 USC 1831f and 12 CFR 337.6, their inherent risk characteristics may be similar to those of brokered deposits. That is, such deposits are typically attractive to rate-sensitive customers who may not have significant loyalty to the bank. Extensive reliance on funding products of this type, especially those obtained from outside a bank's geographic market area, has the potential to weaken a bank's funding position in times of stress.

Under the 2001 joint agency advisory, banks are expected to perform adequate due diligence before entering any business relationship with a deposit broker; assess the potential risks to earnings and capital associated with brokered deposits; and fully incorporate the assessment and control of brokered deposits into all elements of their liquidity-risk management processes, including contingency funding plans.

*Public or government deposits.* Public funds generally represent deposits of the U.S. government, state governments, and local political subdivisions; they typically require collateral to be pledged against them in the form of securities. In most banks, deposits from the U.S. government represent a much smaller portion of

total public funds than that of funds obtained from states and local political subdivisions. Liquidity-risk managers generally consider the secured nature of these deposits as being a double-edged sword. On the one hand, they reduce contingent liquidity risk because secured funds providers are less credit-sensitive, and therefore their deposits may be more stable than those of unsecured funds providers. On the other hand, such deposits reduce standby liquidity by "consuming" the potential liquidity in the pledged collateral.

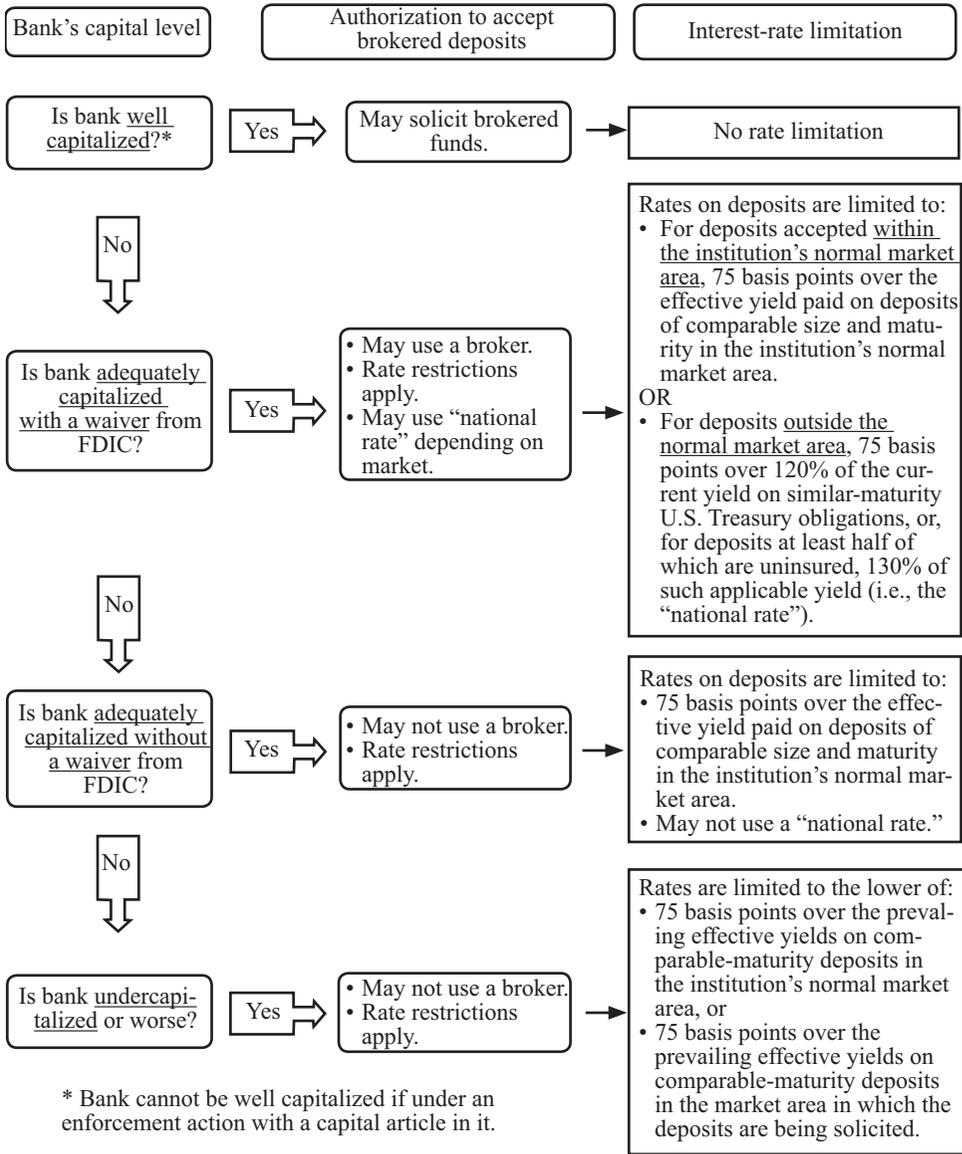
Rather than pledge assets as collateral for public deposits, banks may also purchase an insurance company's surety bond as coverage for public funds in excess of FDIC insurance limits. Here, the bank would not pledge assets to secure deposits, and the purchase of surety bonds would not affect the availability of funds to all depositors in the event of insolvency. The costs associated with the purchase of a surety bond must be taken into consideration when using this alternative.

Deposits from taxing authorities (most school districts and municipalities) also tend to be highly seasonal. The volume of public funds rises around tax due dates and falls near the end of the period before the next tax due date. This fluctuation is clearly a consideration for liquidity managers projecting cash flows for normal operations. State and local governments tend to be very rate-sensitive. Effective liquidity managers fully consider the contingent liquidity risk these deposits entail, that is, the risk that the deposits will not be maintained, renewed, or replaced unless the bank is willing to offer very competitive rates.

*Eurodollar deposits.* Eurodollar time deposits are certificates of deposit issued by banks outside of the United States. Large, internationally active U.S. banks may obtain Eurodollar funding through their foreign branches—including offshore branches in the Cayman Islands or other similar locales. Eurodollar deposits are usually negotiable CDs issued in amounts of \$100,000 or more, with rates tied to LIBOR. Because they are negotiable, the considerations applicable to negotiable CDs set forth above also apply to Eurodollar deposits.

*Federal funds purchased.* Federal funds (fed funds) are excess reserves held at Federal Reserve Banks. The most common type of federal funds transaction is an overnight, unse-

Exhibit 6—Brokered-Deposit Use and the Law  
(12 USC 1831f and 12 CFR 337.6)



Source: Office of the Comptroller of the Currency (OCC)

cured loan. Transactions that are for a period longer than one day are called *term fed funds*. The day-to-day use of fed funds is a common

occurrence, and fed funds are considered an important money market instrument used in managing daily liquidity needs and sources.

Many regional and money-center banks, acting in the capacity of correspondents to smaller community banks, function as both providers and purchasers of federal funds. Overnight fed funds purchased can pose a contingent liquidity risk, particularly if a bank is unable to roll over or replace the maturing borrowing under stress conditions. Term fed funds pose almost the same risk since the term is usually just a week or two. Fed funds purchased should generally be treated as a volatile source of funds.

*Loans from correspondent banks.* Small and medium-sized banks often negotiate loans from their principal correspondent banks. The loans are usually for short periods and may be secured or unsecured. Correspondent banks are usually moderately credit-sensitive. Accordingly, cash-flow projections for normal business conditions and mild adverse scenarios may often treat these funds as stable. However, given the credit sensitivity of such funds, projections computed for severe adverse liquidity scenarios should treat these funds as volatile.

*FHLB borrowings.* The Federal Home Loan Banks (FHLBs) provide loans, referred to as *advances*, to members. Advances may be unsecured but are generally secured by collateral acceptable to the FHLB, such as residential mortgage loans and mortgage-backed securities. Both short-term and long-term FHLB borrowings, with maturities ranging from overnight to 10 years, are available to member institutions at generally competitive interest rates. For some small and medium-sized banks, long-term FHLB advances may be a significant or the only source of long-term funding.

Some FHLB advances contain embedded options or other features that may increase funding risk. For example, some types of advances, such as putable and convertible advances, provide the FHLB with the option to either recall the advance or change the interest rate on an advance from a fixed rate to a floating rate under specified conditions. When such optionality exists, institutions should fully assess the implications of this optionality on the liquidity-risk profile of the institution.

In general, an FHLB establishes a line of credit for each of its members. Members are required to purchase FHLB stock before a line of credit is established, and the FHLB has the ability to restrict the redemption of its stock. An FHLB may also limit or deny a member's

request for an advance if the member engages in any unsafe or unsound practice, is inadequately capitalized, sustains operating losses, is deficient with respect to financial or managerial resources, or is otherwise deficient.

Because most FHLB advances are secured by collateral, the unused FHLB borrowing capacity of a bank is a function of both its eligible, unpledged collateral and its unused line of credit with its FHLB.

FHLBs have access to bank regulatory information not available to other lenders. The composite rating of an institution is a factor in the approval for obtaining an FHLB advance, as well as the level of collateral required and the continuance of line availability. Because of this access to regulatory data, an FHLB can react quickly to reduce its exposure to a troubled institution by exercising options or not rolling over unsecured lines of credit. Depending on the severity of a troubled institution's condition, an FHLB has the right to discontinue or withdraw (at maturity) its collateralized funding program because of concerns about the quality or reliability of the collateral or other credit-related concerns. On the one hand, this right may create liquidity problems for an institution, especially if it has large amounts of short-term FHLB funding. At the same time, because FHLB advances are fully collateralized, the various FHLBs have historically shown restraint in exercising their option to withdraw funding from members. To this extent, FHLB borrowings are viewed by many liquidity managers as a relatively stable source of funding, barring the most severe of adverse funding situations.

Sound liquidity-risk management practices call for institutions to fully document the purpose of any FHLB-borrowing transaction. Each transaction should be analyzed on an ongoing basis to determine whether the arrangement achieves the stated purpose or whether the borrowings are a sign of liquidity deficiencies. Some banks may use their FHLB line of credit to secure public funds; however, doing so will reduce their available funds and may present problems if the FHLB reduces the institution's credit line. Additionally, the institution should periodically review its borrowing agreement with the FHLB to determine the assets collateralizing the borrowings and the potential risks presented by the agreement. In some instances, the borrowing agreement may provide for collateralization by all assets not already pledged for other purposes.

*Repurchase agreements and dollar rolls.* The terms *repurchase agreement*<sup>4</sup> (repo) and *reverse repurchase agreement* refer to transactions in which a bank acquires funds by selling securities and simultaneously agreeing to repurchase the securities after a specified time at a given price, which typically includes interest at an agreed-on rate. A transaction is considered a repo when viewed from the perspective of the supplier of the securities (the borrower) and a reverse repo or matched sale–purchase agreement when described from the point of view of the supplier of funds (the lender).

A repo commonly has a near-term maturity (overnight or a few days) with tenors rarely exceeding three months. Repos are also usually arranged in large dollar amounts. Repos may be used to temporarily finance the purchase of securities and dealer securities inventories. Banking organizations also use repos as a substitute for direct borrowings. Bank securities holdings as well as loans are often sold under repurchase agreements to generate temporary working funds. These types of agreements are often used because the rate on this type of borrowing is less than the rate on unsecured borrowings, such as federal funds purchased.

U.S. government and agency securities are the most common type of instruments sold under repurchase agreements, since they are exempt from reserve requirements. However, market participants sometimes alter various contract provisions to accommodate specific investment needs or to provide flexibility in the designation of collateral. For example, some repo contracts allow substitutions of the securities subject to the repurchase commitment. These transactions are often referred to as *dollar repurchase agreements* (dollar rolls), and the initial seller's obligation is to repurchase securities that are substantially similar, but not identical, to the securities originally sold. To qualify as a financing, these agreements require the return of "substantially similar securities" and cannot exceed 12 months from the initiation of the transaction. The dollar-roll market primarily consists of agreements that involve mortgage-backed securities.

Another common repo arrangement is called a *flex repo*, which provides a flexible term to maturity. A flex repo is a term agreement

between a dealer and a major customer in which the customer buys securities from the dealer and may sell some of them back before the final maturity date.

Effective liquidity-risk managers ensure that they are aware of special considerations and potential risks of repurchase agreements, especially when the bank enters into large-dollar-volume transactions with institutional investors or brokers. It is a fairly common practice to adjust the collateral value of the underlying securities daily to reflect changes in market prices and to maintain the agreed-on margin. Accordingly, if the market value of the repo-ed securities declines appreciably, the borrower may be asked to provide additional collateral. Conversely, if the market value of the securities rises substantially, the lender may be required to return the excess collateral to the borrower. If the value of the underlying securities exceeds the price at which the repurchase agreement was sold, the bank could be exposed to the risk of loss if the buyer is unable to perform and return the securities. This risk would increase if the securities were physically transferred to the institution or broker with which the bank has entered into the repurchase agreement.

Because these instruments are usually very short-term transactions, institutions using them incur contingent liquidity risk. Accordingly, cash-flow projections for normal and mild scenarios usually treat these funds as stable. However, projections computed for severe scenarios generally treat these funds as volatile.

*International borrowings.* International borrowings may be direct or indirect. Common forms of direct international borrowings include loans and short-term call money from foreign banks, borrowings from the Export-Import Bank of the United States, and overdrawn nostro accounts (due from foreign bank demand accounts). Indirect forms of borrowing include notes and trade bills rediscounted with the central banks of various countries; notes, acceptances, import drafts, or trade bills sold with the bank's endorsement or guarantee; notes and other obligations sold subject to repurchase agreements; and acceptance pool participations. In general, these borrowings are often considered to be highly volatile, non-stable sources of funds.

*Federal Reserve Bank borrowings.* In 2003, the Federal Reserve Board revised Regulation A to

4. See section 3010.1 of the *Commercial Bank Examination Manual*.

provide for primary and secondary credit programs at the discount window.<sup>5</sup> (See Appendix 5.) Reserve Banks will extend primary credit at a rate above the target fed funds rate on a short-term basis (typically, overnight) to eligible depository institutions, and acceptable collateral is required to secure all obligations. Discount window borrowings can be secured with an array of collateral, including consumer and commercial loans. Eligibility for primary credit is based largely on an institution's examination rating and capital status. In general, institutions with composite CAMELS ratings of 1, 2, or 3 that are at least adequately capitalized are eligible for primary credit unless supplementary information indicates their condition is not generally sound. Other conditions exist to determine eligibility for 4- and 5-rated institutions.

An institution eligible for primary credit need not exhaust other sources of funds before coming to the discount window. However, because of the above-market price of primary credit, the Reserve Banks expect institutions to mainly use the discount window as a backup source of liquidity rather than as a routine source. Generally, Reserve Banks extend primary credit on an overnight basis with minimal administrative requirements to eligible institutions. Reserve Banks may also extend primary credit to eligible institutions for periods of up to several weeks if funding is not available from other sources. These longer extensions of credit are subject to greater administrative oversight. Reserve Banks also offer secondary credit to institutions that do not qualify for primary credit. Secondary credit is another short-term backup source of liquidity, although its availability is more limited and is generally used for emergency backup purposes. Reserve Banks extend secondary credit to assist in an institution's timely return to a reliance on traditional funding sources or in the resolution of severe financial difficulties. This program entails a higher level of Reserve Bank administration and oversight than primary credit.

#### *Treasury Tax and Loan deposits.* Treasury Tax

5. "Interagency Advisory on the Use of the Federal Reserve's Primary Credit Program in Effective Liquidity Management," Office of the Comptroller of the Currency, Board of Governors of the Federal Reserve System, Federal Deposit Insurance Corporation, and Office of Thrift Supervision. July 25, 2003. Federal Reserve SR-letter 03-15. See also section 3010.1 of the *Commercial Bank Examination Manual*.

and Loan accounts (TT&L accounts) are maintained at banks by the U.S. Treasury to facilitate payments of federal withholding taxes. Banks may select either the "remittance-option" or the "note-option" method of forwarding deposited funds to the U.S. Treasury. In the remittance option, the bank remits the TT&L account deposits to the Federal Reserve Bank the next business day after deposit, and the remittance portion is not interest-bearing. The note option permits the bank to retain the TT&L deposits. In the note option, the bank debits the TT&L remittance account for the amount of the previous day's deposit and simultaneously credits the note-option account. Note-option accounts are interest-bearing and can grow to a substantial size.

TT&L funds are considered purchased funds, evidenced by an interest-bearing, variable-rate, open-ended, secured note callable on demand by Treasury. As per 31 CFR 203.24, the TT&L balance requires pledged collateral, usually from the bank's investment portfolio. Because they are secured, TT&L balances reduce standby liquidity from investments, and because they are callable, TT&L balances are considered to be volatile and they must be carefully monitored. However, in most banks, TT&L deposits constitute only a minor portion of total liabilities.

#### *C. Off-Balance-Sheet Obligations*

Off-balance-sheet transactions have been one of the fastest-growing areas of banking activity. While these activities may not be reflected on the balance sheet, they must be thoroughly reviewed in assessing an institution's liquidity-risk profile, as they can expose the institution to significant contingent liquidity risk. Effective liquidity-risk managers pay particular attention to potential liquidity risks in loan commitments, lines of credit, performance guarantees, and financial guarantees. Banks should estimate both the amount and the timing of potential cash flows from off-balance-sheet claims.

Effective liquidity managers ensure that they consider the correlation of draws on various types of commitments that can trend with macroeconomic conditions. For example, standby letters of credit issued in lieu of construction completion bonds are often drawn when builders cannot fulfill their contracts. Some types of credit lines, such as those used to provide working capital to businesses, are most

heavily used when either the borrower's accounts receivable or inventory is accumulating faster than its collections of accounts payable or sales. Liquidity-risk managers should work with the appropriate lending managers to track such trends.

In addition, funding requirements arising from some types of commitments can be highly correlated with the counterparty's credit quality. Financial standby letters of credit (SBLOCs) are often used to back the counterparty's direct financial obligations, such as commercial paper, tax-exempt securities, or the margin requirements of securities and derivatives exchanges. At some institutions, a major portion of off-balance-sheet claims consists of SBLOCs supporting commercial paper. If the institution's customer issues commercial paper supported by an SBLOC and if the customer is unable to repay the commercial paper at maturity, the holder of the commercial paper will request that the institution perform under the SBLOC. Liquidity-risk managers should work with the appropriate lending manager to (1) monitor the credit grade or default probability of such counterparties and (2) manage the industry diversification of these commitments in order to reduce the probability that multiple counterparties will be forced to draw against the bank's commitments at the same time.

Funding under some types of commitments can also be highly correlated with changes in the institution's own financial condition or perceived credit quality. Commitments supporting various types of asset-backed securities, asset-backed commercial paper, and derivatives can be subject to such contingent liquidity risk. The securitization of assets generally requires some form of credit enhancement, which can take many forms, including SBLOCs or other types of guarantees issued by a bank. Similarly, many structures employ *special-purpose entities* (SPEs) that own the collateral securing the asset-backed paper. Bank SBLOCs or guarantees often support those SPEs. As long as the institution's credit quality remains above defined minimums, which are usually based on ratings from NRSROs, few or none of the SBLOCs will fund. However, if the institution's credit rating falls below the minimum, a significant amount or all of such commitments may fund at the same time.

Financial derivatives can also give rise to contingent liquidity risk arising from financial market disruptions and deteriorating credit

quality of the banking organization. Derivatives contracts should be reviewed, and their potential for early termination should be assessed and quantified, to determine the adequacy of the institution's available liquidity. Many forms of standardized derivatives contracts allow counterparties to request collateral or to terminate contracts early if the institution experiences an adverse credit event or deterioration in its financial condition. In addition, under situations of market stress, a customer may ask for early termination of some contracts. In such circumstances, an institution that owes money on derivatives transactions may be required to deliver collateral or settle a contract early, when the institution is encountering additional funding and liquidity pressures. Early terminations may also create additional, unintended market exposures. Management and directors should be aware of these potential liquidity risks and address them in the institution's CFP. All off-balance-sheet commitments and obligations should receive the focused attention of liquidity-risk managers throughout the liquidity-risk management process.

#### *D. Specialized Business Activities*

Institutions that engage in specialized banking activities ensure that all elements of these activities are fully incorporated into their assessment of liquidity-risk exposure and their ongoing management of the firm's liquidity. Such activities may include mortgage servicing, trading and dealer activities, and various types of fee-income-generating businesses.

Institutions engaged in significant payment, clearing, and settlement activities face particular challenges. Institutions that are active in payment, settlement, or clearing activities should ensure that they have mechanisms for measuring, monitoring, and identifying the amount of liquidity they may need to settle obligations in normal as well as stressed environments. These institutions should fully consider the unique risks that may result from their participation in different payment-system activities and factor these risks into their liquidity contingency planning. Factors that banks should consider when developing liquidity plans related to payment activities include—

- the impact of pay-in rules of individual payment systems, which may result in short-notice payment adjustments and the

need to assess peak pay-in requirements that could result from the failure of another participant;

- the potential impact of operational disruptions at a payment utility and the potential need to move activity to another venue in which settlement is gross rather than net, thereby increasing liquidity requirements to settle;
- the impact that the deteriorating credit quality of the institution may have on collateral requirements, changes in intraday lending limits, and the institution's intraday funding needs; and
- for clearing and nostro service providers, the impact of potential funding needs that could be generated by their clearing customers in addition to the bank's own needs.

#### IV. Summary Measures of Liquidity-Risk Exposure

Cash-flow projections constructed assuming normal and adverse conditions provide a wealth of information about the liquidity profile of an institution. However, liquidity managers, bank supervisors, rating agencies, and other interested parties use a myriad of summary measures of liquidity to identify potential liquidity risk. These measures include various types of financial ratios. Many of these measures attempt to achieve some of the same insights provided by comprehensive cash-flow scenario analyses but use significantly less data. When calculated using standard definitions and comparable data, such measures provide the ability to track trends over time and facilitate comparisons across peers. At the same time, however, many summary measures necessarily entail simplifying assumptions regarding the liquidity of assets, the relative stability or volatility of liabilities, and the ability of the institution to meet potential funding needs. Supervisors, management, and other stakeholders that use these summary measures should fully understand the effect of these assumptions and the limitations associated with summary measures.

Although general industry conventions may be used to compute various summary measures, liquidity managers should ensure that the specific measures they use for internal purposes are suitably customized for their particular institution. Importantly, effective liquidity man-

agers recognize that no single summary measure or ratio captures all of the available sources and uses of liquidity for all situations and for all time periods. Different ratios capture different facets of liquidity and liquidity risk. Moreover, the same summary measure or ratio calculated using different assumptions can also capture different facets of liquidity. This is an especially important point since, by definition, many liquidity ratios are scenario-specific. Measures constructed using normal-course-of-business assumptions can portray liquidity profiles that are significantly different than those constructed assuming stress contingency events. Indeed, many liquidity managers use the same summary measures and financial ratios computed under alternative scenarios and assumptions to evaluate and communicate to senior management and the board of directors the institution's liquidity-risk profile and the adequacy of its contingency funding plans.

##### A. Cash-Flow Ratios

Cash-flow ratios are especially valuable summary liquidity measures. These measures summarize the information contained in detailed cash-flow projections and forecasts. They are generally constructed as the ratio of total projected cash inflows divided by total projected cash outflows for a particular time period or cash-flow-projection time bucket. The ratio for a given time bucket indicates the relative amount by which the projected sources of liquidity cover projected needs. For example, a ratio of 1.20 indicates a liquidity "surplus" equal to 20 percent of projected outflows. In general, such coverage ratios are compiled for each time bucket in the cash-flow projections used to assess both normal and adverse liquidity circumstances.

Some institutions also employ cumulative cash-flow ratios that are computed as the ratio of the cumulative sum of cash inflows to the cumulative sum of cash outflows for all time buckets up to a given time bucket. However, care should be taken to recognize that cumulative cash-flow ratios used alone and without the benefit of assessing the individual time-period exposures for each of their component time buckets may mask liquidity-risk exposures that can exist at intervals up to the cumulative time horizons chosen.

## B. Other Summary Liquidity Measures

Other common summary liquidity measures employ assumptions about, and depend heavily on, the assessment and characterization of the relative marketability and liquidity of assets and the relative stability or volatility of funding needs and sources, consistent with the considerations discussed in the prior section. Liquidity managers use these other measures to review historical trends, summarize their projections of potential liquidity-risk exposures under adverse liquidity conditions, and develop strategies to address contingent liquidity events. In selecting from the myriad of available measures, effective liquidity managers focus primarily on those measures that are most related to the liquidity-management strategies pursued by the institution. For example, institutions that focus on managing asset liquidity place greater emphasis on measures that gauge such conditions, while institutions placing greater emphasis on managing liability liquidity emphasize measures that address those aspects of their liquidity-risk profile.

The following discussions briefly describe some of the more common summary measures of liquidity and liquidity risk. Some of these measures are employed by liquidity managers, rating agencies, and supervisors using definitions and calculation methods amenable to publicly available Call Report or BHC Performance Report data. Because such data require the use of assumptions on the liquidity of broad classes of assets and on the stability of various types of aggregated liabilities, liquidity managers and supervisors should take full advantage of the available granularity of internal data to customize the summary measures they are using. Incorporating internal data ensures that summary measures fit the specific liquidity profile of the institution. Such customization permits a more robust assessment of the institution's liquidity-risk profile.

In general, most common summary measures of liquidity and liquidity risk can be grouped into the following three broad categories:

1. those that portray the array of assets along a continuum of liquidity and cash-flow characteristics for normal and potentially adverse circumstances
2. those that portray the array of liabilities along a continuum of potential volatility and stability characteristics under normal and

potentially adverse circumstances

3. those that assess the balance between funding needs and sources based on assumptions about both the relative liquidity of assets and the relative stability of liabilities

*Relative liquidity of assets.* Summary measures that address the liquidity of assets usually start with assessments of the maturity or type of assets in an effort to gauge their contributions to actual cash inflows over various time horizons. In general, they represent an attempt to summarize and characterize the expected cash inflows from assets that are estimated in more-detailed cash-flow-projection worksheets assuming normal business conditions. Summary measures assessing the liquidity of assets include such measures as—

- short-term investments (defined as maturing within a specified time period, such as 3 months, 6 months, or 1 year) as a percent of total investments, and
- short-term assets (defined as maturing within a specified time period) as a percent of total assets.

Other measures within this category attempt to assess the expected time period over which longer-term, illiquid assets may need to be funded. These measures, which use broad asset categories and employ strong assumptions on the liquidity of these assets, include—

- loans and leases as a percent of total assets, and
- long-term assets (defined as maturing beyond a specified time period) as a percent of total assets.

To better gauge the potential for assets to be used as sources of liquidity to meet uncertain future cash needs, effective liquidity managers use additional “liquid asset” summary measures that are customized to take into account the ability (or inability) to convert assets into cash or borrowed funds. Such measures attempt to summarize the potential for sale, securitization, or use as collateral of different types of assets, subject to appropriate scenario-specific haircuts. Such measures also attempt to recognize the constraints on potential securitization and on those assets that have already been pledged as collateral for existing borrowings. Examples of these measures include—

- marketable securities (as determined by the assessment of cash-flow, accounting, and haircut considerations discussed in the previous section) to total securities;
  - marketable securities as a percent of total assets;
  - marketable assets (as determined by the assessment of cash-flow, accounting, and haircut considerations discussed in the previous section) to total assets;
  - pledgable assets (e.g., unpledged securities and loans) as a percent of total assets;
  - pledged securities (or pledged assets) to total pledgable securities (or pledgable assets);
  - securitizable assets to total assets (sometimes computed to include some assessment of the time frame that may be involved); and
  - liquid assets to total assets with the measure of liquid assets being some combination of short-term assets, marketable securities, and securitizable and pledgable assets (ensuring that any pledged assets are not double-counted).
- total deposits as a percent of total liabilities or total assets;
  - insured deposits as a percent of total deposits;
  - deposits with indeterminate maturities as a percent of total deposits; and
  - long-term liabilities (defined as maturing beyond a specified time period) to total liabilities.

These measures necessarily employ assumptions about the stability of an institution's deposit base in an attempt to define a set of relatively stable or core funding sources. Liquidity managers and examiners should take care in constructing their estimates of stable or core liabilities for use in such measures. This caution has become especially important as changes in customer sophistication and interest-rate sensitivity have altered behavioral patterns and, therefore, the stability characteristics traditionally assumed for retail and other types of deposits traditionally termed "core." As a result, examiners, liquidity managers, and other parties should use more-granular breakouts of funding sources to assess the relative stability of deposits and should not place undue reliance on standardized traditional measures of core deposits. Breakouts that use such a greater granularity include—

- various breakouts of retail deposits to total deposits based on product type (MMDA, demand deposit, savings account, etc.) and customer segmentation to total deposits or liabilities;
- breakouts of various types of institutional deposits (e.g., collateralized deposits of municipal and government entities) as a percent of deposits; and
- various breakouts of brokered deposits (by size, types of fund providers, and maturity).

At the other end of the stability/volatility continuum, some summary measures focus on identifying those sources of funding that need to be rolled over in the short term under normal business conditions and those whose rollover or usage in the future may be especially sensitive to institution-specific contingent liquidity events. These measures include—

- short-term liabilities (defined as fund sources maturing within a specified time period, such as 3 months, 6 months, or 1 year) as a percent of total liabilities;

*Relative stability or volatility of liabilities as a source of funding.* Summary measures used to assess the relative stability or volatility of liabilities as sources of funding often start with assessments of the maturity of liabilities and their ability to be "rolled-over" or renewed under both normal business and potentially adverse circumstances. These measures also represent an attempt to summarize and characterize the use of actual and potential sources of funds, which are estimated in more-detailed cash-flow-projection worksheets. In fact, proper construction of many of these summary measures requires the same analytical assessments required for cash-flow projections. Such measures attempt to gauge and array the relative sensitivity and availability of different sources of funds on the basis of the anticipated behavior of various types of transactions, business activities, funds providers, or other attributes.

Given the difficulties involved in portraying funding sources across the entire continuum of stability and volatility characteristics, along with the complexity of overlaying alternative contingent scenarios on such portrayals, some common summary measures attempt to group funding sources as falling on one side or the other of this continuum. Financial ratios that attempt to portray the extent to which an institution's funding sources are stable include—

- short-term brokered deposits as a percent of total deposits;
- insured short-term brokered deposits as a percent of total deposits;
- purchased funds (including short-term liabilities such as fed funds purchased, repos, FHLB borrowings, and other funds raised in secondary markets) as a percent of total liabilities;
- uncollateralized purchased funds as a percent of total liabilities; and
- short-term purchased funds to total purchased funds.

When computing measures to assess the availability of potential sources of funds under contingent liquidity scenarios, institutions may adjust the carrying values of their liabilities in order to develop best estimates of available funding sources. Similar to the haircuts applied when assessing marketable securities and liquid assets, such adjustments endeavor to identify more-realistic rollover rates on current and potential funding sources.

*Balance between funding needs and sources.* Measures used to assess the relationship between actual or potential funding needs and funding sources are constructed across a continuum that arrays both the tenor or relative liquidity of assets and the potential volatility or stability of liabilities. Many of these measures use concepts discussed earlier regarding the liquidity of assets and the relative stability or volatility of liabilities as funding sources. Some measures express various definitions of short-term liquid assets to total liabilities or alternative definitions of volatile or stable liabilities to total assets. Such measures may include—

- net short-term liabilities (short-term liabilities minus short-term assets) as a percent of total assets;
- stable deposits as a percent of total assets;
- total purchased funds as a percent of total assets;
- uncollateralized borrowings as a percent of total assets; and
- liquid assets as a percent of total liabilities.

Other measures attempt to identify the relationships between different classifications of liquid or illiquid assets and stable or volatile liabilities. Exhibit 7 provides a conceptual

schematic of the range of relationships that are often addressed in such assessments.

Some commonly used summary liquidity measures and ratios focus on the amount of different types of liquid assets that are funded by various types of short-term and potentially volatile liabilities (upper-left quadrant of exhibit 7). One of the most common measures of this type is the “net short-term position” (used by some NRSROs).<sup>6</sup> Liquidity managers, bank supervisors, and rating agencies use this measure to assess an institution’s ability to meet its potential cash obligations over a specified period of time. It is computed as an institution’s liquid assets (incorporating appropriate haircuts on marketable assets) minus the potential cash obligations expected over the specified time period (e.g., 3 months, 6 months, or 1 year). Other measures used to assess the relationship or coverage of potentially volatile liabilities by liquid assets include—

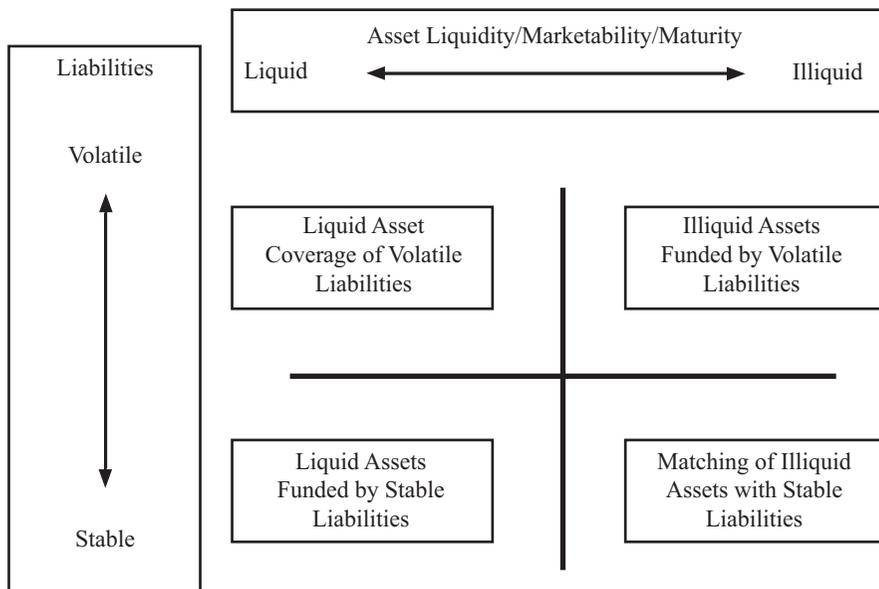
- short-term investments (defined as investments maturing within a specified time period, such as 3 months, 6 months, or 1 year) as a percent of short-term and potentially volatile liabilities; and
- short-term investments (defined as investments maturing within a specified time period, such as 3 months, 6 months, or 1 year) as a percent of short-term liabilities (defined as liabilities maturing within a specified time period, such as 3 months, 6 months, or 1 year).

Other summary liquidity measures take a more expansive approach to assessing the continuum of liquid assets and volatile liabilities by including more items or expanding the breadth of analysis. Such measures include—

- liquid assets (defined as a combination of short-term assets, marketable securities, and securitizable and pledgable assets—ensuring that any pledged assets are not double-counted—over a certain specified time frame) as a percent of liabilities judged to be volatile (over the same time period);
- liquidity-surplus measures, such as liquid assets minus short-dated or volatile liabilities; and
- liquid assets as a percent of purchased funds.

6. See Moody’s, “Liquidity Update: US Bank Holding Companies and US Banks,” November 2004.

## Exhibit 7—Relationships Between Liquid or Illiquid Assets and Stable or Volatile Liabilities



Other common summary measures of liquidity focus on the potential mismatch of using short-term or potentially volatile liabilities to fund illiquid assets (upper-right-hand quadrant of exhibit 7). Often these measures factor only those volatile liabilities in excess of short-term and highly liquid assets or marketable investment securities into this assessment. Such volatile-liability-dependence measures provide insights as to the extent to which alternative funding sources might be needed to fund long-term liquidity needs under adverse liquidity conditions. These measures include—

- net short-term noncore-funding-dependence measures, such as short-term volatile funding minus short-term investments as a percent of illiquid assets; and
- net volatile-funding-dependence measures, such as volatile funding minus liquid assets as a percent of illiquid assets.

Another set of summary liquidity ratios can be constructed to focus on the extent to which illiquid assets are match-funded by stable liabilities (lower-right quadrant of exhibit 7). Common examples of such measures include traditional loan-to-deposit ratios (which incor-

rectly assume all deposits are stable) and loan-to-core-deposit ratios (which often take a product-specific approach to defining the stability of certain types of deposits). However, since such traditional measures necessarily require the use of broad assumptions on the stability of deposits, they should not be relied on to provide meaningful insights regarding potential funding mismatches between stable funding sources and illiquid assets.

One meaningful measure used to gauge such relationships is the concept of “net cash capital” (which is also used by some NRSROs). This measure is the dollar amount by which stable sources of funds exceed illiquid assets; it can be computed as a percent of total assets to facilitate comparisons across institutions. In addition, it can be computed using customized assessments of the relative stability of different types of liabilities and the ability to convert assets into cash through sale, securitization, or collateralization. For example, firms may choose to exclude portions of loans sold regularly (e.g., loans conforming to secondary-market standards) as illiquid assets, or they may choose to include long-term debt as stable liabilities.

A final set of summary measures are used by liquidity managers to optimize the liquidity

profiles of their institutions. These measures assess the extent to which relatively stable funding sources are used to fund short-term and liquid assets (lower-left quadrant of exhibit 7). Since short-term liquid assets generally entail relatively lower returns than longer-term less-liquid assets, measures assessing such potential mismatches focus liquidity managers on the cost of carrying liquid assets.

## V. Liquidity-Measurement Considerations for Bank Holding Companies

Because of their unique liquidity-risk profile, bank holding companies (BHCs) confront some different liquidity-risk management issues than do banks. BHCs cannot accept deposits, purchase fed funds, or borrow from the discount window; as a result, they are more reliant than banks on more-credit-sensitive wholesale funding sources. Accordingly, BHCs depend on different sources of funds and have a higher liquidity-risk profile than that of banks. The nature of this risk profile depends greatly on the size and complexity of the firm. Small one-bank shell holding companies face significantly simpler liquidity-risk profiles than do multibank holding companies and those with nonbank subsidiaries.

The flow of funds between a BHC and its subsidiaries introduces challenges for liquidity managers at both the bank and the BHC. For example, BHCs may place cash with their bank subsidiaries. These cash deposits may represent the temporary placement of idle funds, or they may constitute a more permanent source of bank funding. In the latter case, the cash deposits may not be a ready source of liquidity for the BHC. As a result, liquidity managers at both the bank and the BHC level should fully assess the ability of the subsidiary bank to replace the funds in the marketplace through other sources if such deposits are required by the BHC.

A BHC may also have loans or debt outstanding to its subsidiaries, which may have an impact on the parent company's liquidity profile. A large, negative net short-term position may result if these loans cannot be repaid readily by the subsidiaries in the event of liquidity needs at the holding company. A subsidiary may be unable to readily repay loans or debt from its parent if it does not have

adequate sources of alternative liquidity or if the repayment of the loan would breach regulatory requirements or covenants between the subsidiary and other lenders.

BHCs may enter into sweep agreements with the customers of a nonbank subsidiary to invest those customers' excess funds on an overnight basis, and those funds are usually placed with an insured depository institution subsidiary. In view of the extremely short-term maturity of this funding source, care should be taken to invest the proceeds in short-term, highly liquid, readily marketable assets. Use of sweep-account proceeds to finance longer-term assets may lead to serious liquidity mismatches that compromise safety and soundness.

Liquidity support for the BHC may be available from nonbank subsidiaries of the BHC. Nonbank subsidiaries may have fewer regulatory restrictions on "upstreaming" dividends to their parent companies. Nonetheless, they may also have significant creditor restrictions or limited liquidity available to upstream.

Commercial paper issuances are often important sources of funding liquidity for BHCs. Commercial paper (CP) is a short-term, fixed-maturity, unsecured promissory note issued in the public markets as an obligation of the issuer. The rate of interest paid on CP generally tracks the rates paid on other money market instruments. Most CP is issued with maturities of less than 270 days, the threshold under which SEC registration is not required. Most investors limit purchases of CP to rated or high-quality paper. A superior CP rating depends in part on the adequacy of the issuer's short-term liquidity. To obtain a superior rating, an issuer may need to obtain credit support to guarantee payment. Credit support generally takes the form of a letter of credit or the collateralization of the CP issuance with high-quality assets. The costs of providing this credit support, including the opportunity costs of pledging high-quality assets, should be considered in determining the cost-effectiveness of this source of funding liquidity.

CP proceeds are used by BHCs to fund a variety of activities. However, care must be taken to ensure CP and other short-term debt are not used to fund long-term assets, corporate dividends, or current expenses. Maintaining a high CP rating is important, as CP investors are credit-sensitive. Losing access to the CP market can seriously compromise the funding of the operations of the BHC, given its

limited sources of alternative liquidity. BHCs should endeavor to ensure that the distribution of their CP is as broad as possible so that the failure of one holder to continue to participate in the CP program does not place the company in a liquidity squeeze, thus forcing the BHC to resort to more-drastic and expensive funding sources.

Liquidity managers and supervisors should monitor the extent to which a BHC's CP program is supported by backup lines of credit from unaffiliated banks to cover any unexpected CP runoff. Commitments for lines of credit should be in writing, and the impact of any "material adverse change clauses" or restrictive covenants should be considered carefully. Lines of credit should be structured to be immediately available in the event that access to the CP markets is interrupted. Owing to the potential for contagion effects between the BHC and bank subsidiaries, BHCs' frequent or extended use of backup lines of credit for liquidity purposes may unintentionally compromise perceptions of the safety and soundness of the subsidiary bank(s)—a particular concern if the bank does not have a significant source of stable liabilities. Holding companies may look to backup lines of credit as an ultimate source of liquidity. In such cases, market perception is critical for accessing backup lines. The drawdown of a liquidity facility may be a signal to the market that the company is facing funding difficulties throughout the consolidated organization and could raise questions about the funding stability of its banks. These concerns can be ameliorated to the extent that the subsidiary banks are largely core-funded. Conversely, if the subsidiary banks do not have ample sources of stable funds, the parent company's reliance on backup lines may be misplaced.

### *A. Liquidity Measurement for BHCs*

Cash-flow projections under alternative scenarios are critical liquidity measures at all levels within a complex BHC structure, such as a multibank holding company or a firm with nonbank subsidiaries. In addition, several types of liquidity measures discussed in the previous sections can be adapted for use at the BHC level—particularly measures of the concentration of funding sources and needs based on the marketability of assets or the relative stability of liabilities. However, as a result of the unique

funding structure and liquidity-risk profile of BHCs, liquidity-risk managers, supervisors, rating agencies, and other parties often use summary measures customized for BHCs. The importance of debt ratings to institutions that have publicly rated debt issuances means liquidity managers at such institutions should be fully knowledgeable of the measures rating agencies use to assess the liquidity of the holding company and its subsidiaries.

One common type of summary measure used in analyzing holding company liquidity is the evaluation of the company's ability to self-fund its cash obligations for a minimum period of one year. The excess of liquid assets over potential cash demands (net short-term position) expressed as a percentage of consolidated earnings is one such measure. It provides insights as to the extent to which a deficiency could be addressed by upstreamed dividends from subsidiaries to the parent. In such analyses, regulatory and creditor limitations on dividend payments from subsidiaries must be taken fully into consideration. The liquid-assets component of this measure includes cash and deposits in banks, securities (net of haircuts), and interest income and fees generated at the holding company. Liquid assets may be adjusted to include dividends from nonbank subsidiaries that are not subject to regulatory or creditor limitations and are reasonably expected to be paid within the year. Cash demands include all short-term debt, the portion of long-term debt maturing within one year, and all operating expenses at the holding company. Cash demands are netted against the holding company's unpledged liquid assets to arrive at a net short-term position. This net short-term position is then compared with the net income generated on a consolidated basis, in order to provide a rough indication of the scope of any potential liquidity shortfall. If the ratio is positive, it indicates that a sale of the holding company's liquid assets would be sufficient to meet its cash demands over the next year. If the ratio is negative, potential cash demands outstrip liquid assets, and the holding company may have to develop a strategic plan to address the potential liquidity shortfall.

Other common types of measures used to assess the liquidity of BHCs are fixed-charge-coverage ratios. The fixed-charge-coverage ratio measures the parent holding company's ability to pay its fixed contractual obligations to creditors (including the payment of taxes) and

preferred stockholders. The ratio is calculated as after-tax income, plus an add-back of interest and lease expense (already deducted from after-tax income), as a percentage of fixed contractual obligations to creditors and preferred stockholders. The common-stock cash-dividend-coverage ratio measures the ability of the parent to continue to pay cash dividends. It is calculated as after-tax income minus fixed contractual obligations as a percentage of the common-stock-dividend payout. Coverage ratios in excess of 1:1 are critical for both of these ratios.

Declining trends in these and other liquidity ratios may signal a need for the company to curtail common-stock dividends or take other action to bolster liquidity. Supervisors should be aware that BHCs may bolster these ratios through increasing the dividends paid by subsidiaries. While subsidiary dividends are an important component of earnings for many BHCs, dividends upstreamed from an insured institution's subsidiary should be reasonable and prudent in light of the subsidiary's financial condition and capital position. If dividends from an insured institution's subsidiary are deemed excessive in light of the subsidiary's resources, a written program of corrective action may be required.

## APPENDIX 2—FOURTEEN PRINCIPLES FOR THE ASSESSMENT OF LIQUIDITY MANAGEMENT IN BANKING ORGANIZATIONS

*The following principles were advanced by the Basel Committee on Banking Supervision in the paper "Sound Practices for Managing Liquidity in Banking Organisations," publication 69, February 2000.*

### Developing a Structure for Managing Liquidity

*Principle 1:* Each bank should have an agreed strategy for the day-to-day management of liquidity. This strategy should be communicated throughout the organisation.

*Principle 2:* A bank's board of directors should approve the strategy and significant policies

related to the management of liquidity. The board should also ensure that senior management takes the steps necessary to monitor and control liquidity risk. The board should be informed regularly of the liquidity situation of the bank and immediately if there are any material changes in the bank's current or prospective liquidity position.

*Principle 3:* Each bank should have a management structure in place to execute effectively the liquidity strategy. This structure should include the ongoing involvement of members of senior management. Senior management must ensure that liquidity is effectively managed, and that appropriate policies and procedures are established to control and limit liquidity risk. Banks should set and regularly review limits on the size of their liquidity positions over particular time horizons.

*Principle 4:* A bank must have adequate information systems for measuring, monitoring, controlling and reporting liquidity risk. Reports should be provided on a timely basis to the bank's board of directors, senior management and other appropriate personnel.

### Measuring and Monitoring Net Funding Requirements

*Principle 5:* Each bank should establish a process for the ongoing measurement and monitoring of net funding requirements.

*Principle 6:* A bank should analyse liquidity utilising a variety of "what if" scenarios.

*Principle 7:* A bank should review frequently the assumptions utilised in managing liquidity to determine that they continue to be valid.

### Managing Market Access

*Principle 8:* Each bank should periodically review its efforts to establish and maintain relationships with liability holders, to maintain the diversification of liabilities, and aim to ensure its capacity to sell assets.

## Contingency Planning

*Principle 9:* A bank should have contingency plans in place that address the strategy for handling liquidity crises and include procedures for making up cash flow shortfalls in emergency situations.

## Foreign Currency Liquidity Management

*Principle 10:* Each bank should have a measurement, monitoring and control system for its liquidity positions in the major currencies in which it is active. In addition to assessing its aggregate foreign currency liquidity needs and the acceptable mismatch in combination with its domestic currency commitments, a bank should also undertake separate analysis of its strategy for each currency individually.

*Principle 11:* Subject to the analysis undertaken according to Principle 10, a bank should, where appropriate, set and regularly review limits on the size of its cash flow mismatches over particular time horizons for foreign currencies in aggregate and for each significant individual currency in which the bank operates.

## Internal Controls for Liquidity Risk Management

*Principle 12:* Each bank must have an adequate system of internal controls over its liquidity risk management process. A fundamental component of the internal control system involves regular independent reviews and evaluations of the effectiveness of the system and, where necessary, ensuring that appropriate revisions or enhancements to internal controls are made. The results of such reviews should be available to supervisory authorities.

## Role of Public Disclosure in Improving Liquidity

*Principle 13:* Each bank should have in place a mechanism for ensuring that there is an adequate level of disclosure of information about the bank in order to manage public perception of the organisation and its soundness.

## Role of Supervisors

*Principle 14:* Supervisors should conduct an independent evaluation of a bank's strategies, policies, procedures and practices related to the management of liquidity. Supervisors should require that a bank has an effective system in place to measure, monitor and control liquidity risk. Supervisors should obtain from each bank, sufficient and timely information with which to evaluate its level of liquidity risk and should ensure that the bank has adequate liquidity contingency plans.

## APPENDIX 3—SUMMARY OF MAJOR LEGAL AND REGULATORY CONSIDERATIONS

The following discussions summarize some of the major legal and regulatory considerations that should be taken into account in managing the liquidity risk of banking organizations. The discussions are presented only to highlight potential issues and to direct bankers and supervisors to source documents on those issues.

### A. Federal Reserve Regulation A

Federal Reserve Regulation A addresses borrowing from the discount window. Rules defining eligible collateral can be found in this regulation.

### B. Federal Reserve Regulation D

Federal Reserve Regulation D addresses required reserves for deposits. One portion of the regulation, however, restricts the type of eligible collateral that can be pledged for repurchase-agreement borrowings.

### C. Federal Reserve Regulation F

Federal Reserve Regulation F imposes limits on interbank liabilities. This regulation implements section 308 of the Federal Deposit Insurance Corporation Improvement Act (FDICIA). Banks that sell funds to other banks must have written

policies to limit excessive exposure, must review the financial condition or credit rating of the debtor, must have internal limits on the size of exposures that are consistent with the credit risk, may not lend more than 25 percent of their capital to a single borrowing bank, and must undertake other steps.

Banks that borrow federal funds or other borrowings from correspondent banks may find, as a result of the seller's compliance with Regulation F, that the amount they may borrow has suddenly declined as a result of a reduction in their credit rating or credit quality. Regulation F may make it harder for a bank to use borrowings as a liquidity source for a bank-specific liquidity crisis.

## D. Federal Reserve Regulation W

Federal Reserve Regulation W governs transactions between an insured bank or thrift and its affiliates. The regulation establishes a consistent and comprehensive compilation of requirements found in section 23A of the Federal Reserve Act, 70 years of Board interpretations of section 23A, section 23B of the Federal Reserve Act, and portions of the Gramm-Leach-Bliley Act of 1999. Covered transactions include purchases of assets from an affiliate, extensions of credit to an affiliate, investments in securities issued by an affiliate, guarantees on behalf of an affiliate, and certain other transactions that expose the member bank to an affiliate's credit or investment risk. Derivatives transactions and intraday extensions of credit are also covered.

The intentions of the regulation are (1) to protect the depository institution, (2) to ensure that all transactions between the bank and its affiliates are on terms and conditions that are consistent with safe and sound banking practices, and (3) to limit the ability of a depository institution to transfer to its affiliates the subsidy arising from the institution's access to the federal safety net. The regulation achieves these goals in four major ways:

1. It limits a member bank's covered transactions with any single affiliate to no more than 10 percent of the bank's capital stock and surplus, and limits transactions with all affiliates combined to no more than 20 percent of the bank's capital stock and surplus.
2. It requires all transactions between a member

bank and its affiliates to be on terms and conditions that are consistent with safe and sound banking practices.

3. It prohibits a member bank from purchasing low-quality assets from its affiliates.
4. It requires that a member bank's extensions of credit to affiliates and guarantees on behalf of affiliates be appropriately secured by a statutorily defined amount of collateral.

Section 23B protects member banks by requiring that certain transactions between the bank and its affiliates occur on market terms, that is, on terms and under circumstances that are substantially the same, or at least as favorable to the bank, as those prevailing at the time for comparable transactions with unaffiliated companies. Section 23B applies the market-terms restriction to any covered transaction (as defined in section 23A) with an affiliate as well as certain other transactions, such as (1) any sale of assets by the member bank to an affiliate, (2) any payment of money or furnishing of services by the member bank to an affiliate, and (3) any transaction by the member bank with a third party if an affiliate has a financial interest in the third party or if an affiliate is a participant in the transaction.

Liquidity-risk managers working in banks that have affiliates must give careful attention to Regulation W, which addresses transactions between banks and their affiliates. In the normal course of business, the prohibition on unsecured funding can tie up collateral, complicate collateral management, and restrict the availability of funding from affiliates. In stressed conditions, all of those problems—plus the size limit and the prohibition on sales of low-quality assets to affiliates—effectively close down many transactions with affiliates.

## E. Statutory Restriction of FHLB Advances

The Federal Home Loan Banks (FHLBs) provide a number of different advance programs with very attractive terms to member banks. Many banks now use the FHLBs for term funding. The FHLBs are very credit-sensitive lenders.

A federal regulation (12 CFR 935, Federal Housing Finance Board—Advances) requires the FHLBs to be credit-sensitive. In addition to

monitoring the general financial condition of commercial banks and using rating information provided by bank rating agencies, the FHLBs have access to nonpublic regulatory information and supervisory actions taken against banks. The FHLBs often react quickly, sometimes before other funds providers, to reduce exposure to a troubled bank by not rolling over unsecured borrowing lines. Depending on the severity of a troubled bank's condition, even the collateralized funding program may be discontinued or withdrawn at maturity because of concerns about the quality or reliability of the collateral or other credit-related concerns. Contractual provisions requiring increases in collateral may also be invoked. Any of these changes in FHLB-loan availability or terms can create significant liquidity problems, especially in banks that use large amounts of short-term FHLB funding.

### F. Statutory Restriction on the Use of Brokered Deposits

The use of brokered deposits is restricted by 12 CFR 337.6. Well-capitalized banks may accept brokered deposits without restriction. Adequately capitalized banks must obtain a waiver from the FDIC to solicit, renew, or roll over brokered deposits. Adequately capitalized banks must also comply with restrictions on the rates that they pay for these deposits. Banks that have capital levels below adequately capitalized are prohibited from using brokered deposits. In addition to these restrictions, banking regulators have also issued detailed guidance, discussed in section H below, on the use of brokered deposits.

### G. Legal Restrictions on Dividends

A number of statutory restrictions limit the amount of dividends that a bank may pay to its stockholders. As a result, a bank holding company that depends on cash from its bank subsidiaries can find this source of funds limited or closed. This risk is particularly significant for bank holding companies with nonbank subsidiaries that require funding or debt service.

### H. Restrictions on Investments That Affect Liquidity-Risk Management

Interagency guidance issued in 1998 by the FFIEC, "Supervisory Policy Statement on Investment Securities and End-User Activities," contains provisions that may affect liquidity and liquidity management. (See SR-98-12.) The following points summarize some of these potential impacts, although readers should review the entire rule for more-complete information.

1. When banks specify permissible instruments for accomplishing established objectives, they must take into account the liquidity of the market for those investments and the effect that liquidity may have on achieving their objective.
2. Banks are required to consider the effects that market risk can have on the liquidity of different types of instruments under various scenarios.
3. Banks are required to clearly articulate the liquidity characteristics of the instruments they use to accomplish institutional objectives.

In addition, the policy statement specifically highlights the greater liquidity risk inherent in complex and less actively traded instruments.

### APPENDIX 4—JOINT AGENCY ADVISORY ON BROKERED AND RATE-SENSITIVE DEPOSITS

*This advisory (SR-01-14) was issued on May 11, 2001.*

#### Purpose

The Office of the Comptroller of the Currency, the Federal Reserve Board, the Federal Deposit Insurance Corporation (FDIC), and the Office of Thrift Supervision (the agencies) are reminding bankers and examiners of the potential risks associated with excessive reliance on brokered and other highly rate-sensitive deposits, such as those obtained through the Internet, certificate of deposit listing services, and similar advertising programs. When prudently managed, these deposits can be and often are beneficial to banks. However, without proper monitoring and man-

agement, they may be an unstable source of funding for an institution. This issuance outlines prudent risk identification and management for rate-sensitive deposits. It applies to all FDIC-insured commercial and savings institutions (“banks”).<sup>1</sup>

## Background

Deposit brokers have traditionally provided intermediary services for banks and investors. Recent developments in technology provide bankers increased access to a broad range of potential investors who have no relationship with the bank and who actively seek the highest returns offered within the financial industry. In particular, the Internet and other automated service providers are effectively and efficiently matching yield-focused investors with potentially high-yielding deposits. Typically, banks offer certificates of deposit (CDs) tailored to the \$100,000 FDIC deposit insurance limit to eliminate credit risk to the investor, but amounts may exceed insurance coverage. Rates paid on these deposits are often higher than those paid for local-market-area retail CDs, but due to the FDIC insurance coverage, these rates may be lower than for unsecured wholesale market funding.

Customers who focus exclusively on rates are highly rate-sensitive and provide less stable funding than do those with local retail deposit relationships. These rate-sensitive customers have easy access to, and are frequently well informed about, alternative markets and investments, and may have no other relationship with or loyalty to the bank. If market conditions change or more-attractive returns become available, these customers may rapidly transfer their funds to new institutions or investments. Rate-sensitive customers with deposits in excess of the insurance limits also may be alert to and sensitive to changes in a bank’s financial condition. Accordingly, these rate-sensitive depositors, both under and over the \$100,000 FDIC insurance limit, may exhibit characteristics more typical of wholesale investors.

Under 12 USC 1831f and 12 CFR 337.6, determination of “brokered” status is based initially on whether a bank actually obtains a

deposit directly or indirectly through a deposit broker. Banks that are considered only “adequately capitalized” under the “prompt corrective action” (PCA) standard<sup>2</sup> must receive a waiver from the FDIC before they can accept, renew, or roll over any brokered deposit. They also are restricted in the rates they may offer on such deposits. Banks falling below the adequately capitalized range may not accept, renew, or roll over any brokered deposit nor solicit deposits with an effective yield more than 75 basis points above the prevailing market rate. These restrictions will reduce the availability of funding alternatives as a bank’s condition deteriorates. Bank managers who use brokered deposits should be familiar with the regulation governing brokered deposits and understand the requirements for requesting a waiver.

Deposits attracted over the Internet, through CD listing services, or through special advertising programs offering premium rates to customers without another banking relationship also require special monitoring. Although these deposits may not fall within the technical definition of “brokered” in 12 USC 1831f and 12 CFR 337.6, their inherent risk characteristics are similar to brokered deposits.<sup>3</sup> That is, such deposits are typically attractive to rate-sensitive customers who may not have significant loyalty to the bank. Extensive reliance on funding products of this type, especially those obtained from outside a bank’s geographic market area, has the potential to weaken a bank’s funding position.

Some banks have used brokered and Internet-based funding to support rapid growth in loans and other assets. Bankers are reminded that under the agencies’ safety-and-soundness standards,<sup>4</sup> a bank’s asset growth should be prudent and its management must consider the source, volatility, and use of the funds generated to support asset growth.

2. See 12 CFR 325, subpart B for FDIC-insured institutions, 12 CFR 6.4 for national banks, 12 CFR 208.40 for state member banks, or 12 CFR 565 for thrift institutions.

3. Moreover, under 12 CFR 337.6(a)(5)(iii), the restrictions on brokered deposits do apply to solicitations by a depository institution that is less than well capitalized where the solicitation offers rates of interest “significantly higher” than the prevailing rates of interest in the institution’s “normal market area.” This can be particularly problematic for Internet solicitations since determination of the bank’s “normal market area” for such deposits is difficult.

4. See 12 CFR 364 for FDIC-insured institutions; 12 CFR 30, appendix A, for national banks; 12 CFR 208, appendix D-1, for state member banks; or 12 CFR 570 for thrift institutions.

1. This guidance supplements each agency’s existing supervisory and examination guidance on funding and liquidity issues.

## Risk-Management Guidelines

The agencies expect bank management to implement risk-management systems commensurate in complexity with the liquidity and funding risks undertaken. Such systems should incorporate the following principles:

- *Proper funds-management policies.* A good policy should generally provide for forward planning, establish an appropriate cost structure, and set realistic limitations and business strategies. It should clearly convey the board's risk tolerance and should not be ambiguous about who holds responsibility for funds-management decisions.
- *Adequate due diligence when assessing deposit brokers.* Bank management should implement adequate due-diligence procedures before entering any business relationship with a deposit broker. Deposit brokers are not regulated by the agencies.
- *Due diligence in assessing the potential risk to earnings and capital associated with brokered or other rate-sensitive deposits, and prudent strategies for their use.* Bankers should manage highly sensitive funding sources carefully, avoiding excessive reliance on funds that may be only temporarily available or which may require premium rates to retain.
- *Reasonable control structures to limit funding concentrations.* Limit structures should consider typical behavioral patterns for depositors or investors and be designed to control excessive reliance on any significant source(s) or type of funding. This includes brokered funds, and other rate-sensitive or credit-sensitive deposits obtained through Internet or other types of advertising.
- *Management information systems (MIS) that clearly identify non-relationship or higher-cost funding programs and allow management to track performance, manage funding gaps, and monitor compliance with concentration and other risk limits.* At a minimum, MIS should include a listing of funds obtained through each significant program, rates paid on each instrument and an average per program, information on maturity of the instruments, and concentration or other limit

monitoring and reporting. Management should also ensure that brokered deposits are properly reported in Consolidated Reports of Condition and Income.<sup>5</sup>

- *Contingency funding plans that address the risk that these deposits may not "roll over" and provide a reasonable alternative funding strategy.* Contingency funding plans should factor in the potential for changes in market acceptance if reduced rates are offered on rate-sensitive deposits. The potential for triggering legal limitations that restrict the bank's access to brokered deposits under prompt-corrective-action standards, and the effect that this would have on the bank's liability structure, should also be factored into the plan.

## Examination Guidelines

Examiners should carefully assess the liquidity-risk management framework at all banks. Banks with meaningful reliance on brokered or other rate-sensitive deposits should receive the appropriate level of supervisory attention. Examiners should not wait for PCA provisions to be triggered, or the viability of the institution to be in question, before raising relevant safety-and-soundness issues with regard to the use of these funding sources. If a determination is made that a bank's use of these funding sources is not safe and sound, or that these risks are excessive or that they adversely affect the condition of the institution, then appropriate supervisory action should be immediately taken. The following represent potential red flags that may indicate the need to take action to ensure the risks associated with brokered or other rate-sensitive funding sources are managed appropriately:

- ineffective management or the absence of appropriate expertise
- newly chartered institution with few relationship deposits and an aggressive growth strategy
- inadequate internal audit coverage
- inadequate information systems or controls
- identified or suspected fraud
- high on- or off-balance-sheet growth rates

5. See Instructions for Consolidated Reports of Condition and Income, schedule RC-E—Deposits.

- use of rate-sensitive funds not in keeping with the bank's strategy
- inadequate consideration of risk, with management focus exclusively on rates
- significant funding shifts from traditional funding sources
- the absence of adequate policy limitations on these kinds of funding sources
- high loan-delinquency rate or deterioration in other asset-quality indicators
- deterioration in the general financial condition of the institution
- other conditions or circumstances warranting the need for administrative action

## APPENDIX 5—INTERAGENCY ADVISORY ON THE USE OF THE FEDERAL RESERVE'S PRIMARY CREDIT PROGRAM IN EFFECTIVE LIQUIDITY MANAGEMENT

*This advisory (SR-03-15) was issued on July 23, 2003.*

Most depository institutions have liquidity contingency funding plans that identify use of the Federal Reserve's discount window advances in certain situations. The revisions to the Federal Reserve's Regulation A established new Federal Reserve discount window programs that can alter the manner in which some depository institutions use discount window borrowings in their liquidity management and contingency planning. This interagency advisory presents information on the new discount window programs and provides to the directors, management, examiners, and supervisors of depository institutions guidance on the appropriate use of primary credit in effective liquidity management.

### Background on New Federal Reserve Discount Window Programs

On January 9, 2003, the Federal Reserve replaced two of its discount window programs—adjustment credit and extended credit—with new primary and secondary credit programs.<sup>1</sup>

Under the new primary credit program, Reserve Banks may extend short-term credit to eligible depository institutions at a rate above the target federal funds rate. An important goal of the primary credit program is to reduce institutions' reluctance to use the window as a source of backup, short-term liquidity. Accordingly, Reserve Banks normally extend primary credit with significantly less administration than under the former adjustment and extended credit programs. Reserve Banks may extend secondary credit to depository institutions that do not qualify for primary credit when the loan would be consistent with the institution's prompt return to market sources of funds or would facilitate the resolution of significant financial difficulties. Information on the new discount window programs, including the revised Regulation A, is available on the Federal Reserve's discount window web site located at [www.frbdiscountwindow.org](http://www.frbdiscountwindow.org).

The primary credit program is the Federal Reserve's principal safety valve for ensuring adequate liquidity in the banking system and is intended to serve as a backup source of short-term funds for eligible institutions. The interest rate for primary credit was set initially at a level 100 basis points above the Federal Open Market Committee's target for the federal funds rate. This spread may change in light of experience with the new program. Generally, primary credit is extended on a very short-term basis, usually overnight. In some cases, primary credit may be extended for up to a few weeks to small institutions that meet eligibility requirements.

In general, there are no restrictions on the use of primary credit. The primary credit program does not require institutions to seek alternative sources of funds before requesting occasional short-term advances. Except in unusual circumstances, Reserve Banks will not question depository institutions about their reason for borrowing primary credit. The institution must have the necessary collateral arrangements and documentation in place with the appropriate Reserve Bank in order to utilize the primary credit program. Collateral arrangements and documentation remain the same as those required for adjustment credit.

An institution's supervisory examination rating and capital status largely determine its eligibility for primary credit. Therefore, given the confidential nature of CAMELS and SOSA ratings, regulators do not permit depository

1. Seasonal credit is unaffected by these changes.

institutions to disclose publicly their primary credit eligibility.

In general, depository institutions with composite CAMELS<sup>2</sup> ratings of 1, 2, or 3 that are at least adequately capitalized are eligible for primary credit unless supplementary information indicates their condition is not generally sound. Foreign banking organizations with SOSA rankings of 1 or 2 and a ROCA, Combined ROCA, and/or Combined U.S. Operations rating of 1, 2, or 3 will also be considered eligible for primary credit unless supplementary information indicates their condition is not generally sound. Supplementary information for both domestic institutions and foreign banking organizations may include public debt ratings and information provided by examiners and market sources.

Federal Reserve Banks may extend secondary credit to depository institutions that do not qualify for primary credit. Reserve Banks extend secondary credit to assist in an institution's timely return to a reliance on traditional funding sources or in the resolution of severe financial difficulties. This program entails a higher level of Reserve Bank administration and oversight than primary credit. The secondary credit rate is above the primary credit rate. The spread was set at 50 basis points at the program's inception; it may vary.

## Sound Liquidity-Risk Management and Liquidity Contingency Planning

The agencies have long advised depository institutions that sound liquidity-risk management requires the following four elements.<sup>3</sup>

2. Credit unions are rated under the CAMEL Rating System (see Letter to Credit Unions No. 03-CU-04, CAMEL Rating System, March 2003).

3. This interagency advisory supplements and does not replace existing agency guidance or policy. See "Sound Practices for Managing Liquidity Risk in Banking Organizations," Basel Committee on Banking Supervision (February 2000). For national banks, see the *Comptroller's Handbook on Liquidity*. For state member banks and bank holding companies, see the Federal Reserve's *Commercial Bank Examination Manual* (section 4020) and *Bank Holding Company Supervision Manual* (section 4010). For state nonmember banks, see the FDIC's Revised Examination Guidance for Liquidity and Funds Management (Trans. No. 2002-01) (Nov. 19, 2001). For savings associations, see the Office of Thrift Supervision's Thrift Bulletin (TB) No. 77, Sound Practices for Liquidity Management at Savings

- Well-established strategies, policies, and procedures for managing both the sources and uses of an institution's funds across various tenors or time frames. This includes assessing and planning for short-term, intermediate-term, and long-term liquidity needs.
- Liquidity-risk measurement systems that are appropriate for the size and complexity of the institution. Depending upon the institution, such measurement systems can range from simple gap-derived cash-flow measures to very sophisticated cash-flow simulation models.
- Adequate internal controls and internal audit processes. Internal controls and internal audit reviews are needed to ensure compliance with internal liquidity management policies and procedures.
- Comprehensive liquidity contingency planning. Contingency plans need to be well designed and should span a broad range of potential liquidity events that are tailored to an institution's specific business lines and liquidity-risk profile.

Adequate liquidity contingency planning is critical to the ongoing maintenance of the safety and soundness of any depository institution. Contingency planning starts with an assessment of the possible liquidity events that an institution might encounter. The types of potential liquidity events considered should range from high-probability/low-impact events that can occur in day-to-day operations to low-probability/high-impact events that can arise through institution-specific and/or systemic market or operational circumstances. Responses to these events should be assessed in the context of their implications for an institution's short-term, intermediate-term, and long-term liquidity profile. A fundamental principle in designing contingency plans for each of these liquidity tenors is to ensure adequate diversification in the potential sources of funds to be utilized. Such diversification should not only focus on the number of potential funds providers but on the underlying stability, availability, and flexibility of funds sources in the context of the type of liquidity event they are expected to address.

Associations (June 19, 2001). For credit unions, see Letter to Credit Unions No. 02-CU-05, Examination Program Liquidity Questionnaire (March 2002).

## Federal Reserve Primary Credit and Liquidity Contingency Planning

By enhancing the availability of discount window credit, the new primary credit program offers depository institutions an additional tool for managing short-term liquidity risks. Management should assess fully the potential role that primary credit might play in managing their institution's liquidity and consider the appropriateness of incorporating it in their liquidity management policies, procedures, and contingency plans. In light of the new primary and secondary credit programs, institutions should update existing policies, procedures, and contingency plans and remove any reference to the Federal Reserve's former adjustment and extended credit facilities.

The new primary credit program has the following attributes that make the discount window a viable source of backup or contingency funding for short-term purposes:

- A less burdensome administrative process than applied under the previous adjustment credit program makes primary credit a simpler and more accessible source of backup, short-term funding.
- Primary credit can enhance diversification in short-term funding contingency plans.
- Discount window borrowings can be secured with an array of collateral, including consumer and commercial loans.
- Requests for primary credit advances can be made anytime during the day.<sup>4</sup>
- There are no restrictions on the use of short-term primary credit.

If an institution incorporates primary credit into its contingency plans, the institution should ensure that it has in place with the appropriate Reserve Bank the necessary collateral arrangements and documentation. This is particularly important when the intended collateral consists of loans or other assets that may involve significant processing or lead-time for pledging to the Reserve Bank.

It is a long-established sound practice for institutions to periodically test all sources of contingency funding. Accordingly, if an institu-

tion incorporates primary credit in its contingency plans, management should occasionally test the institution's ability to borrow at the discount window. The goal of such testing is to ensure that there are no unexpected impediments or complications in the case that such contingency lines need to be utilized.

Institutions should ensure that any planned utilization of primary credit is consistent with the stated purposes and objectives of the program. Under the primary credit program, the Federal Reserve generally expects to extend funds on a very short-term basis, usually overnight. Therefore, as with any other type of short-term contingency funding, institutions should ensure that any use of primary credit facilities for short-term liquidity contingencies is accompanied by viable take-out or exit strategies to replace this funding expeditiously with other sources of funding. Institutions should factor into their contingency plans an analysis of their eligibility for primary credit under various scenarios, recognizing that if their financial condition were to deteriorate, primary credit may not be available. Under those scenarios, secondary credit may be available.

Another critical element of liquidity management is an appropriate assessment of the costs and benefits of various sources of potential liquidity. This assessment is particularly important in managing short-term and day-to-day sources and uses of funds. Given the above-market rates charged on primary credit, institutions should ensure that they adequately assess the higher costs of this form of credit relative to other available sources. Extended use of any type of relatively expensive source of funds can give rise to significant earnings implications which, in turn, may lead to supervisory concerns.

It is also important to note that the Federal Reserve's primary credit facility is only one of many tools institutions may utilize in managing their liquidity-risk profiles. An institution's management should ensure that the institution maintains adequate access to a diversified array of funding sources. That array has traditionally included, and should continue to include, liquid assets such as high-grade investment securities and a diversified mix of wholesale and retail borrowings.

4. Advances generally are booked at the end of the business day.

## Supervisory and Examiner Considerations

Since primary credit can serve as a viable source of backup, short-term funds, supervisors and examiners should view the occasional use of primary credit as appropriate and unexceptional. At the same time, however, supervisors and examiners should be cognizant of the implications that too-frequent use of this source of relatively expensive funds may have for the

earnings, financial condition, and overall safety and soundness of the institution. Overreliance on primary credit borrowings, or any one source of short-term contingency funds, regardless of the relative costs, may be symptomatic of deeper operational and/or financial difficulties. Importantly, the use of primary credit, as the use of any potential sources of contingency funding, is a management decision that must be made in the context of safe and sound banking practices.