

Liquidity risk management in financial institutions

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While there were many diverse problems that led to the recent financial crisis, one of the key tipping points was the implosion of Lehman Brothers due to liquidity issues. Liquidity risk is a fluid, dynamic area of risk with great impact on financial institutions. It has just as much potential to bring down a bank as credit risk or market risk, and deserves a measurement and management regime that is just as rigorous.

Industry regulators have distributed a preliminary notice of how they expect large global institutions to manage liquidity risk. From our experience with financial institutions, we have seen that regional and community banks should also increase their focus on liquidity risk management. This is especially true of banks under regulatory orders because of the limitations typically placed on the bank's flexibility to raise funds.

Liquidity is, first, the bank's ability to meet its cash-flow obligations and, second, its ability to fund asset growth. This definition means managing liquidity risk requires analysis of forwarding-looking projections of both cash in-flows and cash out-flows. This is not static, point-in-time analysis; rather it is dynamic and subject to the affects of actions (or inactions) by and among other parties spread across the economy. Complicating the dynamics, changes in liquidity are primarily driven by events associated with other types of risk, particularly interest rate, market, and credit risk.

Risk management framework

The framework Baker Tilly has developed (see Figure one) for managing risks, including liquidity risk, encompasses all aspects of identifying risk, assessing/measuring risk, monitoring risk, and controlling/mitigating risk. The framework helps guide the way the bank should implement its risk management functions, including:

- > Oversight and strategy
- > Policies, standards, and guidelines
- > Processes and procedures
- > Controls, monitoring, and reporting

Liquidity risk arises due to future variability of cash supplies and cash demands, including future funding of asset growth. Management of this form of risk requires a significant effort in forecasting cash flows.

Figure one

	Policies, Guidelines, and Standards	Process and Procedures	Controls, Monitoring, and Reports
Oversight and Strategy Corporate risk system oversight > Policy compliance > Effectiveness of rating systems and processes > Internal control review Strategy > Customer, product, and channel strategy and objectives > Regulatory interpretation and risk framework > Risk appetite and capital planning	Portfolio monitoring, economic and regulatory capital adequacy, and reporting > Capital adequacy definitions > Risk concentration and testing framework > Exposure monitoring and migration standards > Equity and securitization frameworks		
	Risk modeling and validation > Strategic capital planning > Capital adequacy calculation > Customer and product risk segmentation analysis > Interest rate risk testing > Risk concentration analysis and testing > Special loan and receivable management > Disclosures		
	Data maintenance > Modeling design, methods, and standards > Validation, vetting, and use test criteria > Rating/parameter system design > Annual review methodology		
	Credit and collateral management (loans, leases, securitization, trading, equities) > Data management and control framework > Data quality and integrity > Data collection > Data processing > Data retrieval and storage > Data delivery		
	Operational, reputational, and strategic risk > Collateral definition, controls, and valuation > Loan covenant definition and monitoring > Risk system operation and application > Origination > Credit and collateral monitoring > Approval > Risk rating revision process > Fulfillment, funding, and booking > Bookkeeping and investor services > Servicing and default management		
	Market, interest rate, and liquidity risk > Risk systems and standards > Risk control points > Market and interest risk tolerance > Liquidity tolerance > Trading book frameworks > Market risk scenarios > Liquidity scenarios > Trading book valuation and verification > Liquidity monitoring		

Skill Sets / Roles and Responsibilities / Division of Duties
Enabling Technology

Board of Directors

Perhaps the most important consideration for managing risk appropriately, liquidity or any other, is active participation by the Board of Directors in overseeing and approving the actions of management. The Board should establish the bank's appetite, or tolerance, for liquidity risk and receive regular reports of the bank's position relative to that level of tolerance.

Senior management must develop the strategies, policies, and business practices to measure and manage liquidity risk, and obtain Board approval of the policies and strategies. Among the policies that should be put in place and approved by the Board are:

- > Composition of assets and liabilities
- > Maturities of assets and liabilities
- > Diversity and stability of funding sources
- > Approach to managing liquidity across lines of business
- > Approach to managing liquidity across legal entities (especially taking into account any legal or regulatory restrictions on the transfer of funds among legal entities, regardless of the operational management structure of the institution)
- > Approach to managing liquidity on an intraday basis
- > Specifications of the assumptions that apply to estimating the marketability of assets
- > High level targets – qualitative and quantitative as applicable
- > Establishing appropriate internal controls

Once policies are in place, the costs and benefits of liquidity risk should be embedded into pricing, performance measurement, and new product introduction processes. This applies to both on- and off-balance sheet products. The bank should take special note of any situations where contingent exposures are created that may not have direct on- or off-balance sheet impact.

Liquidity risks

Liquidity risk arises due to future variability of cash supplies (e.g., prices of financial assets and willingness to fund) and cash demands, including future funding of asset growth. Management of this form of risk requires a significant effort in forecasting cash flows.

Typically, the models used to measure and manage interest rate risk, market risk, and credit risk evaluate the impact on profits or capital of various shock scenarios. However, it is also important to understand the implications these risks have on the bank's liquidity. For example, a dramatic change in interest rates may not only be adverse from a profit perspective, it may also result in depositors removing balances from the bank. Similarly, credit problems can result in lower collections of anticipated loan and lease payments. Both of these events could have significant negative implications for liquidity.

The forecasting of future cash flows for liquidity risk modeling needs to account for the cash flow implications of the results of the models used for measuring the other major risk types. Since the forecasting is subject to errors of many types, it is imperative the bank conduct stress testing of various scenarios associated with other risk types and their implications for liquidity.

Reporting requirements

Understanding the movement of cash requires reporting that should include:

- > Concentrations (broken into "time-bands") of both assets and liabilities by:
 - Product
 - Industry
 - Counterparty
 - Geography
 - Currency (if cross-border activity is significant)
- > The same concentrations reported for credit risk monitoring should also be used for considering the liquidity implications of asset products. Higher concentrations of low credit grades, or more immediately, deteriorating credit grades, should be considered a leading indicator of a potential shortage of cash inflow.
- > Contractual maturity mismatches should be reported by time band (e.g., overnight, two-day, three-day, five-day, ten-day, one-month, two-months, three-months, six-months, one-year, three-years, five-years, etc.).
- > Available, unencumbered assets that can be used as collateral against either borrowing in the market or from the Federal Reserve should also be reported.

The global consortium of regulators has published two specific measures against which the big banks must report: the liquidity coverage ratio and the net stable funding ratio. While the regulatory definitions of each are fairly complex, a simplified approach to these can also be useful for regional and large community banks.

Liquidity coverage ratio

Liquidity coverage ratio, which should be greater than one, is an expansion of traditional "coverage ratio" measures many banks use. It is defined as:

$$\frac{\text{Stock of high quality liquid assets}}{\text{Net cash outflows over a thirty day time period}}$$

- > High quality liquid assets can be converted to cash with little or no loss of value quickly and easily. These include:
 - Cash
 - Reserves at the Federal Reserve
 - Marketable securities with a risk weighting of zero
 - Treasury securities
 - Very high quality corporate bonds (A- or better, for a 40% or less risk weight)
- > Net cash outflows are defined as the difference between projected cash outflows less projected cash inflows over a thirty day period.
 - Outflows include deposit run-off, and both secured and unsecured wholesale funding run-off. Additionally, consideration should be given to possible liquidity needs from derivative transactions such as: downgrade triggers, valuation changes and effects on posted collateral, etc. Further, consideration should be given to committed credit facilities and other contingent liabilities.
 - Inflows should be conservatively estimated – that is, only fully performing exposures.

Net stable funding ratio

Net stable funding ratio, which also should be greater than one, expands the concept of “net liquid assets” that many banks use today. It is defined as:

$$\frac{\text{Available amount of stable funding}}{\text{Required amount of stable funding}}$$

- > Available stable funding is the total amount of the bank’s capital, plus liabilities with maturities of a year or more, plus the “stable portion” of deposits without stated maturity, plus preferred stock with maturity of a year or more.
- > The required amount of stable funding is the sum of the value of assets plus off-balance sheet activity, multiplied by various factors ranging from 0% to 100% to take into account the degree to which the item could be converted to cash.

Note that beyond its own assets and liabilities, the bank may also be subject to liquidity exposures due to correspondent activities, its custody business, or settlement activity.

Marketplace risks

In addition to monitoring its own condition, the bank should also continuously monitor its local marketplace as well as the national economy for any early warnings of possible negative changes in liquidity risk factors such as:

- > Increasing retail deposit outflows
- > Increasing redemptions of CDs before maturity
- > Rising retail or wholesale funding costs
- > Negative trends in asset quality
- > Rising delinquencies
- > Decrease in the weighted average maturity of liabilities
- > Growing concentrations in particular assets or liabilities

Liquidity risk mitigation

As with other types of risk, mitigation of liquidity risk should begin with the bank diversifying its funding sources in the short-term, intermediate-term, and long-term, and managing each distinctly. Loan sale clauses should be standard in all loan documentation, to enable sale of assets in a stress situation. Regular use of some asset-sales markets may help a bank enhance its ability to execute asset sales in times of stress. In addition, that bank should have in place a formal contingency funding plan, and test it regularly. Among the options that a bank may explore in the event of a liquidity shock are:

- > Deposit growth
- > Longer maturity liabilities
- > New issues of debt
- > Draw-down committed facilities with other institutions
- > Asset securitization
- > Sale or repossession of unencumbered, highly liquid assets



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While at first blush, intraday liquidity management is probably less of an issue for regional or community banks than for larger institutions, particularly global banks, management of intraday cash flows is still an important aspect of good liquidity risk management.

Liquidity risk is clearly a focus of regulators and investors and is subject to increasing scrutiny by both. A bank will be well served by enhancing its ability to measure and manage liquidity risk.

How we can help

Baker Tilly can help your bank assess and refine liquidity risk management capabilities by reviewing existing liquidity monitoring tools and ratios, assessing the liquidity risk management knowledge of executive management and the board of directors, evaluating currently liquidity plans and models, and developing an action plan for upgrading your liquidity risk management capabilities.

Connect with us:

For more information or any questions you might have on improving your risk management, please contact:

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