



WHITE PAPER

RISK MANAGEMENT

**OPERATIONALIZING THE LCR AND NSFR:
EMBEDDING LIQUIDITY RISK MANAGEMENT
CULTURE IN BANKING**

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Introduction

All banks, irrespective of their type or size, are financial intermediaries, who acquire funds and invest them in assets. The global financial intermediation landscape has evolved many folds over time. Whereas, the basic business model of the typical bank has remained the same. In simple terms, banks aim to turn a profit by earning more from assets than it costs to raise funds. The majority of their net earnings come from the interest differential between asset earnings and expenditure on funds liability.

The banking business model has proved to be resilient and lucrative, but it is not without various risks. Of these, liquidity risk is far from the newest; in fact it has existed from the early days of banking itself. But for a long time, it lacked the attention it deserved from risk management strategies and balance sheet management. Recent events in the financial markets have, however, brought liquidity risk to the center stage – prompting the Basel Committee on Banking Supervision (BCBS) to devise new liquidity risk monitoring standards for banks.

In 2010 the BCBS published the Basel III framework for liquidity risk regulation, which was revised in 2013. January 2015 was proposed as the date for banks to start reporting their liquidity coverage ratio (LCR) and Net Stable Funding Ratio (NSFR). However, a lot still needs to be done, both by central banks as they enforce local regulation, and banks as they adapt their infrastructure. Globally, banks have put a great deal of effort into understanding the fundamentals and regulatory perspectives of the LCR and NSFR, which may not be rocket science but definitely meticulous. Data management must be improved and new policies be put in place to measure assets according to their liquidity merits and liabilities to their stability. All of which poses a mammoth task for banking operations.

In the sections to follow, we aim to establish the role of the LCR and NSFR within the larger context of a bank's liquidity risk management function. As well as discussing the ratio concepts in detail we will identify the challenges that typical bank faces as it embeds a new liquidity risk culture into its day-to-day business. How, ultimately, can organizations best prepare for these measures to serve the right purpose?

What is liquidity risk management?

A bank sources funds and invests them in economic activities. It is then obliged to return these funds either contractually

or on demand. They need to be invested in earning assets, which in turn introduce various risks in terms of repayment, repricing and the investment horizon. This business activity is continuous and doesn't involve sequential raising and usage of earmarked funds. So, banks are continuously churning money through their system, and inflows and outflows constitutes of different principal flows, interest rates and their timings. This is where a bank employs leverage on its funds, which is where risk seeps in. A bank needs to ensure that the risks related to financial intermediation and the usage of funds are well managed – and that the leverage is controlled. The task of balancing both assets and liabilities in terms of their investment returns, timing mismatch and ultimately ensuring solvency lead banks into a multi-dimensional maze.

Liquidity risk should be banks' central concern, due to the way they are structured – and the purpose they serve in financial intermediation.

The primary role of liquidity risk management within a banking organization is to:

1. Prospectively assess the need for funds to meet obligations
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 under normal and stressed conditions

The exhibit 1 below represents a bird's-eye view of the treasury function of a typical bank.

Exhibit 1



The treasury needs to fund the business units that creates assets, according to certain return targets and business strategies. The funding requirement for a particular asset mix in the balance sheet has three dimensions.

- **Time to redeem:** Each asset has its own effective term or maturity schedule, until which the asset needs to be funded
- **Market valuation and volume:** The second important aspect is the amount of funds required depending on the market valuation of the asset and corresponding loss reserves which need to be funded. This is at a plan level, where a particular asset volume is targeted, and corresponding funding volume is estimated.
- **Utilization of funds:** Besides the tenure and investment value, investing in assets requires funding the risk capital as well. This is to ensure that the volatile asset value can be continually funded under uncertain market conditions. Such risk capital needs to be budgeted for while planning required funds.

At the same time, the following considerations should be made when building the appropriate liability side of funds.

- **Matching the funding term:** It is not just the cheapest fund that a bank needs access to, but also the stability of the funding source in terms of contractual obligations and the ability to roll over the liability term. These factors determine the ability to continuously fund the asset for the desired term
- **Borrowing rate and volume:** Clearly, the net return objectives need to keep the cost of borrowing at a level favorably below the asset return.
- **Respecting obligation to repay:** The last but possibly the most direct impact on solvency is the ability to repay the funds borrowed. There can be either contractual or behavioral withdrawal demands, or existing funding contracts may not be renewed.

To manage liquidity risk and remain solvent, banks first need to control the direct risks that arise from market factors, the creditworthiness of counterparties, and the changing confidence of depositors and funding agents. Liquidity risk on the other hand may not be directly observable but arises when some or all of these factors are skewed – making it a second order risk. For instance, the liquidity crisis which is still reverberating on the global economy was triggered mainly by the credit crisis in US subprime mortgage market, which peaked during 2007 and 2008. So it follows that liquidity risk cannot be measured by one number or metric. Instead, liquidity risk measurement has various dimensions, of which the LCR and NSFR are just two. While the LCR looks at short-term solvency (30 days), the NSFR assesses the long-term funding structure for long-term assets. Liquidity needs to be managed for intermediate horizons as well; and hence cash flow liquidity gap analysis has become a key metric to monitor the maturity mismatch of assets and liabilities for the entire balance sheet horizon. While this paper focuses on the LCR and NSFR, there are other factors such as funding concentration, credit concentration, availability of liquidity buffer, current asset mix, market volatility, among others, to consider.

Liquidity risk management is a very familiar concept for banks, traditionally involving the enforcement of reserve requirements. These requirements, however, were mostly non-risk based and were gradually phased out in most developed economies, with the rationale that the burden they put on banks may lead to market inefficiency, or to a prolonged recession following a short-term crisis. But ultimately the inability of banks to draw down reserves in the times of stress has only worsened the situation. The Basel III liquidity standards represent efforts to bring back reserve and buffer requirements in a much evolved and risk-sensitive manner.

To these ends, the BCBS introduced the LCR, NSFR and dynamic buffer requirements like countercyclical buffers, capital conservation buffers and so on. The LCR does not call for any minimum quantity of cash reserves, as was the case with traditional reserve requirements. Instead, it calls for a minimum quality of various high quality liquid assets (HQLAs). By weighting bank assets according to their maturity, marketability, and riskiness, the LCR and NSFR frameworks have been designed to reduce maturity mismatches for large financial institutions and protect against the kind of panics in the repo and asset-backed commercial paper markets that occurred during the global financial crisis.

The LCR and NSFR: What brought them about and how are they measured?

The financial crisis and the failure of large financial institutions exposed the havoc liquidity risk can wreak. The widely used practice of funding long-term investments with short-term funding sounded profitable in normal to good market circumstances. But overreliance on short-term funding also requires continuous efforts to refine investments and the quality of collateral posted against raised funding. Under stressed market circumstances, short-term funding opportunities become especially volatile. For a financial institution faced with sudden depreciation in asset quality and market confidence, two challenges will typically emerge.

1. The cost of short-term funding will spike due to increasing requirement for collateral to be posted under stressed market conditions
2. Long-term assets which are still otherwise profitable becomes non-viable due to sharp increases in short-term funding costs. It goes without saying that under such stressed circumstances, the chances of new long-term funding become remote.

Hitting the financial world in both depth and breadth, the crisis also revealed the dangers of mixing terms for funding and investments. The higher margin earned by funding short term and investing long term is not really a risk-free arbitrage. During even moderate market shocks it can expose a lack of solvency and resilience in financial institutions.

Two hard lessons were learned in 2008 in terms of liquidity risk.

1. The assets held should be of good quality and liquid. Assets with deep market liquidity are more likely to be sold at any time without much discounting or value depreciation, as and when funding starts drying up.
2. Higher earning long-term assets should have stable long-term funding sources, as opposed to leveraging only short term and unsecured funding sources.

The objective of the Basel III liquidity regulation framework is to reduce the shortcomings of liquidity risk management, and the likelihood of another systemic liquidity crisis, by ensuring that banks can rely more on their own liquidity resources. The LCR aims to limit the risks of severe cash outflows owing to an overreliance on volatile funding sources and certain lending commitments. Under the LCR, banks are required to hold a minimum level of unencumbered HQLAs to withstand an acute stress scenario lasting 30 days. The LCR is specifically designed to improve the short-term resilience of banks against liquidity shocks. The NSFR, on the other hand, is designed to limit the risks emanating from excessive maturity mismatches over medium- to long-term financial positions. More specifically, the NSFR requires banks to fund illiquid assets with a minimum amount of stable liabilities over a horizon of one year.

The following paragraphs provide the Basel III definition of the LCR and NSFR ratios, and the timelines they have prescribed banks globally to comply.

Liquidity Coverage Ratio¹: The objective of the LCR is to increase the short-term resilience of a bank's liquidity profile by ensuring that it has sufficient high-quality liquid resources to withstand an acute stress scenario lasting for 30 days. Given the balance sheet and the firm's activities, this stress scenario defines the potential net cash drain. To determine the cash flow drain, every source of liquidity risk has to be carefully analyzed. The LCR standard is defined as:

$$\frac{\text{Stock of high quality liquid assets}}{\text{Total net cash outflows over the next 30 days}} \geq 100\%$$

In January 2013, the Basel Committee issued the revised liquidity coverage ratio (LCR). The LCR underpins the short-term resilience of a bank's liquidity risk profile. The LCR came into effect on 1 January 2015 and is subject to a transitional arrangement before reaching full implementation on 1 January 2019

Net Stable Funding Ratio²: The objective of the NSFR is to promote resilience over a longer-term horizon and to incentivize banks to more closely match the maturity of their funding with the maturity of assets. In contrast to the LCR, the NSFR is designed as a medium to long-term measure intended to provide a sustainable maturity structure of assets and liabilities, aiming to limit over-reliance on short-term wholesale funding. The NSFR standard is defined as:

$$\frac{\text{Available amount of stable funding}}{\text{Required amount of stable funding}} > 100\%$$

Net stable funding ratio: In October 2014, the Basel Committee issued the final standard for the net stable funding ratio (NSFR). In line with the timeline specified in the 2010 publication of the liquidity risk framework, the NSFR will become a minimum standard by 1 January 2018. The monitoring of the status of adoption of the NSFR is planned to start with the next progress report in October 2015.

Embedding the LCR and NSFR into financial balance sheet management: challenges to overcome

While central banks across the world are increasingly adopting the Basel III standards, putting such standards into operational practice remains a challenge. Data infrastructure and calculation methods are one part of that challenge – and the incorporation of liquidity risk considerations into day-to-

day decision making the second. As well as putting in place the right technology infrastructure, banks need to educate their stakeholders. And appropriate governance must ensure that incentives are both balanced and compatible with creating an organization-wide liquidity risk culture.

To all these ends, banks must consider and prepare for the following in order to setup a self-enforcing liquidity risk culture within the organization.

- **Data:** The data required for LCR and NSFR computation is both large in volume and detailed. First, financial positions across on and off balance sheet must be classified in terms of their liquidity perspective, which will change over time. Second, arriving at that liquidity perspective requires detailed assessment of contractual, behavioral, counterparty aspects of each position. Well defined and well organized balance sheet position data and high quality market information are therefore prerequisite.
- **Classification:** The LCR and NSFR ratios are governed by various classification criteria for slotting assets and liabilities in terms of their liquidation timing, behavioral balance volatility, lock-in terms, embedded protection and guarantees, encumbrance, and so forth. For such classifications the data elements needed are to some extent subjective and might not be available in the traditional data columns of a bank's data store. For example, to classify non-wholesale deposits as either "stable" or "less stable", it is necessary to first classify them as "insured" and "uninsured" – then further bifurcate them into transactional, established relationship accounts, and residual category. Banks trying to optimize deposit bifurcation for a better NSFR number will have to tie up the following loose ends in terms of insured and uninsured classification.
 - Such information does not exist in the source system of data stores of the bank and so far this information at a deposit level has never been felt necessary
 - Deposit insurance typically works based on the terms and conditions of the local deposit insurer which differs from country to country
 - The deposit insurance cover is typically capped to so many dollars per depositor. This means that the deposit insurance is not at deposit level but at depositor level
 - Typically in the case of joint depositors, the deposit balance needs to be equally allocated to each joint account holder
 - Some type of deposits e.g. foreign deposits or structured deposits, may be excluded from deposit insurance depending on the terms and conditions of the deposit insurance provider
- **Assumption interpretation:** The BCBS has provided an example framework for liquidity assessment and term assessment of financial positions. But there remains enough scope to localize the framework and assessment of

¹ THE BASEL III LCR DIRECTIVE, [HTTP://WWW.BIS.ORG/PUBL/BCBS238.PDF](http://www.bis.org/publ/bcbs238.pdf)

² THE BASEL III NSFR DIRECTIVE, [HTTP://WWW.BIS.ORG/BCBS/PUBL/D295.PDF](http://www.bis.org/bcbs/publ/d295.pdf)

market benchmarks. For example, the marketable and easily liquefiable securities of Levels 1, 2A and 2B have varying degree of asset value haircuts. These definitions and haircuts vary widely as market conditions change and are primarily defined as minimum regulatory levels. Using these minimum levels may provide a false sense of security for some jurisdictions or under imminent market stresses. So, adopting the Basel III liquidity ratio requires preparation for central banks to bridge the gap in classification conventions and localize the parameters

- **Multi entity consolidation:** Banks with multinational operations will have to report for individual entities as well as consolidate reporting across entities. The Basel III has laid down restrictive conditions for transferability of liquidity across jurisdictions. This transferability is not permanent, and qualification of such may be superseded by jurisdiction-specific capital transfer laws under stressed market conditions.
- **The cost of the LCR and NSFR:** It is clear that due to continuous regulatory monitoring of quality of assets and term structure of funding, liquidity is currently a primary consideration when managing balance sheet risk. The business units responsible for creating and maintaining liquidity need to be appropriately incentivized. At the same time business units which consume this liquidity to support long-term high-yielding assets should pay to use the cushion of liquid asset stocks and long-term funding commitments. Here, liquidity needs to be transfer priced for the originating units, which in turn need to be paid by units enjoying the safety net of continuous funding for the desired term and through unexpected market turmoil. In absence of appropriate incentive structures, enforcing the LCR and NSFR in day-to-day business dealings is practically impossible – and arriving at the right price for liquidity a challenge.

Recommendations on preparing for the LCR and NSFR

An appropriate LCR and NSFR framework needs to be consistent with the actual liquidity situation that an organization is managing. That means taking a structured approach to establishing and embedding liquidity risk monitoring tools. Below are some recommendations on preparations that investment banks can make to benefit from operationalizing the Basel III liquidity ratios.

Build a robust data framework

It is very important that a bank can access extensive data on the counterparty, intent of holding for each balance sheet and off- balance sheet position, the cash flow and valuation characteristics of its financial positions, and available financial covenants.

Get the right perspective on regulation

What Basel III has provided is an indicative minimum standard. It is necessary that the intent of all classifications and parameters are understood and seen in the relevant context. There are specific classification and parameters where intervention is required to localize in terms of jurisdiction or current market state. Localizing to jurisdiction may be carried out at central bank level, but constantly changing market conditions will require calculation parameters to be adapted so that the ratios can alert to an imminent crisis. It would make sense for the LCR and NSFR to be monitored under forward- looking market scenarios. This enables the bank to make appropriate contingency plans proactively rather than trying to take corrective measures while already in a liquidity crisis, which could be prohibitively expensive.

Establish the right incentive structure

We have already established that the LCR and NSFR are not just numbers or passive report measures, but form a very important building block from a liquidity risk management perspective.

In order for these ratios to play the desired role, the right incentive structure needs to be in place. Funds transfer pricing (FTP) can provide a very important policy instrument for asset liability management and liquidity risk management – and liquidity needs to be an integral component of the bank's FTP framework. Just as interests and risks are transfer priced, so liquidity needs to be transfer priced. The transfer pricing of liquidity is fairly a new topic which we will discuss in more detail in subsequent papers. But it is important to establish here that liquidity has a business value which needs to be priced. So, business units responsible for generating liquidity need to be judiciously incentivised, in keeping with the economics of liquidity as a commodity.

Summary and next steps

The LCR and NSFR are now key metrics for liquidity risk monitoring and management. Current banking practices, which increasingly use leverage to sourced funds, need to manage liquidity well to maintain market confidence, keep sourcing funds at a favorable price and most importantly remain solvent. Challenges are definitely in store and significant investment needs to be made, but taking the right approach to that investment will reap healthy results.

In this paper we have established the context and necessity for banks to build and start using the LCR and NSFR as key performance indicators for liquidity risk management. We have also highlighted key challenges and suggested some bare minimum prerequisites for banks to embed the LCR and NSFR in day-to-day decision making. In subsequent papers we will present proposals for the best-of-breed methodologies and structured measures that banks can use to guide, and ultimately complete, their journey to embed the Basel III ratios.

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