The Basel III Liquidity Standards: An Update

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Introduction

Banks play a crucial role in financing economic activity by acting as intermediaries between savers and borrowers; the maturity transformation performed by banks is an integral part of financial intermediation that contributes to the efficient allocation of resources in the economy. These activities expose banks to a number of risks, however, including funding-liquidity risk. As became evident during the financial crisis that began in 2007, inadequate management of liquidity risk can create severe problems for individual banks, contribute to contagion across the broader financial system and lead to a breakdown in financial intermediation.

This report considers the motivation for the Basel III liquidity framework, which is rooted in the failures in liquidity-risk management that were exposed by the financial crisis. It reviews the evolution of the Liquidity Coverage Ratio (LCR) over the observation period established to evaluate the standard, including the subsequent revisions, as well as outstanding issues to be addressed. Finally, the report provides an update on work to complete the Net Stable Funding Ratio (NSFR), focusing on objectives and key considerations that should factor into its final design and calibration.

The deficiencies in liquidity-risk management revealed by the financial crisis spurred several countries, including Canada, to strengthen prudential guidance and monitoring of liquidity-risk management. The Basel Committee on Banking Supervision (BCBS) was also motivated to reinforce global principles and standards for the measurement and management of liquidity risk. "Basel III: International Framework for Liquidity Risk Measurement, Standards and Monitoring," published in December 2010 (BCBS 2010b), provides a fundamental review of the risk-management practices of banks related to funding liquidity.[1] The Basel III framework is centred on two standards: the LCR and the NSFR, which were developed to meet two separate, but complementary, objectives. The aim of the LCR is to promote short-term resilience to adverse liquidity shocks by ensuring that a bank has enough high-quality liquid assets (HQLA) to survive an acute stress scenario that lasts for one month. The goal of the NSFR is to promote structural resilience over a longer time horizon by encouraging banks to finance their activities with more-stable (including longer-term) sources of funding. This framework is complemented by a set of monitoring indicators for supervisors.

The BCBS also established an observation period, which began in 2011, to allow authorities time to review the liquidity standards, with particular emphasis on mitigating potential unintended consequences for market functioning and economic activity. Based on analysis that was completed over the 2011–12 period, the BCBS made some substantive changes to the LCR, which were published in January 2013 after being endorsed by the Governors and Heads of Supervision of the BCBS (BIS 2013). Work is currently under way to address some outstanding issues related to the LCR by the end of 2013, including developing a public disclosure framework and assessing interactions between the LCR and central bank liquidity. With the LCR largely finalized, the focus has turned to further developing and finalizing the NSFR by the end of 2014.[2]

1 There is a long history of BCBS discussion on the management of liquidity risk by banks. For example, the BCBS first published a framework for managing and measuring liquidity risk in 1992. More recently, the Working Group on Liquidity, a BCBS subgroup established in 2006, has issued reports that updated and strengthened these documents (BCBS 2000, 2008).

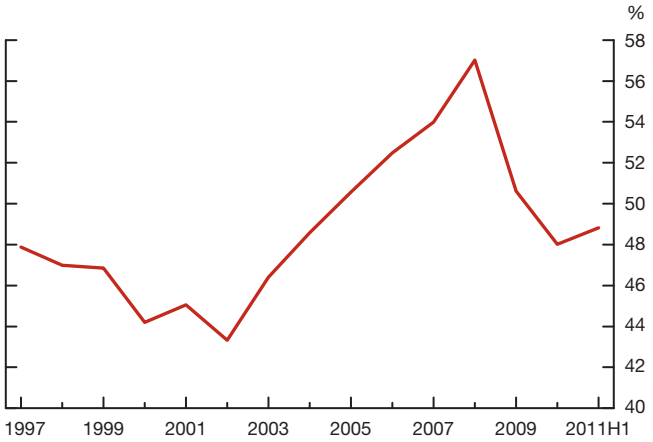
2 See BIS (2013). Banks will be required to implement the LCR during the 2015–18 phase-in period. The NSFR will be implemented as of 1 January 2018.

Experience of the Financial Crisis

Interactions between funding liquidity and market liquidity created highly procyclical dynamics during the financial crisis. Adverse feedback effects between the need for banks to generate cash to meet obligations (funding liquidity) and their ability to transact in financial markets without causing a significant price impact (market liquidity) led to debilitating liquidity spirals that imperilled global financial stability.[3] These dynamics were particularly severe in major jurisdictions such as the United States and Europe; Canada was also affected, but to a significantly lesser extent (Gomes and Khan 2011).

Over the period leading up to the financial crisis, two significant trends underpinned the fragile funding structures at some banks. First, there was an increasing reliance on short-term wholesale funding, rather than stable retail deposits or longer-term debt. In just six years (2002–08), the reliance by global banks on short-term/wholesale funding grew from around 44 per cent of total funding to almost 60 per cent (**Chart 1**). This growth was partly fuelled by easy access to relatively inexpensive short-term funding, including securitizations (e.g., asset-backed securities (ABS) and asset-backed commercial paper (ABCP)). Much of this funding was also transacted with liquidity-fragile counterparties, thereby increasing interconnectedness, common exposures and channels of contagion.

Chart 1: Global banks' reliance on short-term funding increased dramatically between 2002 and 2008



Note: Short-term wholesale funding is proxied by the difference between total liabilities and customer deposits. The ratio is calculated for the 40 largest commercial banks in the world.

Source: Bankscope Last observation: 2011H1

Second, banks amassed large holdings of assets that ultimately proved less liquid than expected, particularly securitized debt instruments such as ABS, collateralized debt obligations and residential mortgage-backed securities (RMBS).[4] In stressed market conditions, banks could not easily monetize (liquidate or borrow against) these assets in private markets. Both the longer maturity and the complexity of the assets contributed to their relative illiquidity.

The increased funding of less-liquid assets with short-term, and ultimately unstable, funding sources provided the rationale for the Basel Committee's development of the LCR and the NSFR. The Bank of Canada and the Office of the Superintendent of Financial Institutions have been actively involved in the development of these standards, which will serve to reinforce the overall Basel III framework and enhance the resilience of both individual banks and the global financial system.

Liquidity Coverage Ratio

Objectives and development

The objective of the LCR is to promote the resilience of bank liquidity and limit the need for public support. At a minimum, the stock of unencumbered HQLA should enable a bank to survive until day 30 of the one-month stress scenario assumed by the LCR. By then, it is assumed that appropriate corrective action can be taken by management and supervisors, or that the bank can be resolved in an orderly way. The LCR is defined as follows:

> Stock of HQLA/Total net cash outflows over the next 30 calendar days ≥ 100 per cent.

The degree to which the LCR achieves its stated objective depends in large part on: (i) the definition of HQLA, and (ii) the calibration of the parameters related to the inflows and outflows of funds (**Box 1**).

Since the observation period established to review the standards began in 2011, the BCBS has conducted extensive analysis of both the overall design and calibration of the LCR. To inform its decisions, the BCBS based its empirical analysis on experience during the 2007–09 financial crisis whenever possible.

Many of the potential consequences of the LCR for bank funding models are *intended*, since the LCR is calibrated to create incentives for more-prudent management of liquidity risk. While the higher capital and liquidity

3 See, among others, Brunnermeier (2009) and Brunnermeier and Pedersen (2009).

4 For example, Acharya, Afonso and Kovner (2013) show that outstanding ABCP rose from US$900 billion in 2006 to almost US$1,200 billion in mid-2007. This market had declined to US$700 billion by the beginning of 2009.

Box 1

Definition of the Liquidity Coverage Ratio

Three broad groups of assets qualify as high-quality liquid assets (HQLA) in the numerator of the ratio:

- Level 1 assets—Include cash, central bank reserves and cash substitutes such as top-rated sovereign debt. These assets can make up an unlimited amount of total liquid assets and are measured at full value (i.e., no haircuts).
- Level 2A assets—Include lower-rated public debt and high-rated covered bonds and non-financial corporate bonds. These assets are restricted to a maximum of 40 per cent of the total pool of liquid assets and are given a minimum haircut of 15 per cent.
- Level 2B assets—Supervisors may also choose to include lower-rated non-financial corporate debt, high-quality non-financial equities (each at a minimum 50 per cent haircut) and high-quality residential mortgage-backed securities (RMBS, at a minimum 25 per cent haircut). All Level 2B assets are restricted to a maximum of 15 per cent of the total pool of liquid assets.

The denominator of the LCR is defined as the total expected cash outflows minus the total expected cash inflows under the specified stress scenario for the subsequent 30 calendar days. These figures are calculated by multiplying outstanding balances by the assumed stress outflow and inflow rates; total expected cash inflows are calculated up to an aggregate cap of 75 per cent of total expected cash outflows. For more details on the categories of outflows and inflows, as well as the rates at which they are calibrated, see BCBS (2013).

standards may impose additional costs on banks, several studies (e.g., BCBS 2010a; FSB-BCBS 2010) anticipate significant benefits from the standards in terms of mitigating procyclicality and reducing the probability and severity of banking crises.

The goal over the observation period is to limit *unintended* consequences for the sound functioning of financial markets, the extension of credit and real economic activity. This analysis has led to several key changes to the LCR, many of them to address previously identified shortcomings, including those noted in Northcott and Zelmer (2009) and Gomes and Khan (2011). The changes are intended to accomplish several objectives: (i) help to ensure that the LCR functions as intended during both normal times and periods of stress, (ii) reduce perverse impacts on asset and funding markets, (iii) mitigate potential impediments to the smooth functioning of central bank operations and (iv) limit unintended consequences for economic activity.

Broadly speaking, there were four major changes to the original formulation of the LCR published in 2010. First, the BCBS reinforced the principle that the pool of HQLA is intended to be used if required. The LCR rules now explicitly state that, while prudent liquidity-risk management requires the accumulation of HQLA in normal periods, banks may draw down this pool as needed, and that supervisors will assess the situation and adjust their response flexibly, according to the circumstances, if a bank reports an LCR below the minimum requirement. This will help to mitigate the risk that supervisory and market pressures will induce unwarranted hoarding of liquidity during periods of stress to meet prudential requirements.

Second, the pool of eligible HQLA was expanded to incorporate a broader range of assets, including those that have demonstrated resilient market liquidity, even during periods of stress. Among these additional assets are lower-rated non-financial corporate debt, high-quality non-financial equities and high-quality RMBS. Given that these assets are less liquid and bear more credit risk than other HQLA, they are subject to higher haircuts and are limited to a maximum of 15 per cent of the HQLA pool. This change allows banks to harness gains from diversification: a broader pool of assets reduces concentration on banks' balance sheets and could decrease the possibility of asset fire sales and a severe deterioration of market liquidity during periods of stress.

Third, the BCBS calibrated inflow and outflow rates for the LCR based on the experience of the financial crisis. Careful attention was also applied to potential knock-on effects, since calibration rates will influence relative costs and therefore the incentive to undertake certain activities. As mentioned earlier, some increased costs are intended. For example, unsecured funding sourced from other financial institutions is assigned a 100 per cent outflow rate.[5] During a systemic crisis, unsecured funding from other financial institutions is very fragile; hence, the rules aim to reduce undue reliance on this source of funding. This calibration is symmetric for both inflows and outflows. The inflow rate is also 100 per cent for the lending bank, consistent with banks' internal risk-management assumptions.

5 This means that regulated banks must hold an amount of HQLA that is equal to these transactions and that matures in 30 days or less.

However, other calibrations could have unduly increased the cost of core financial services, with unintended adverse implications for credit creation in the broader economy. For example, the outflow rate previously assumed for backup liquidity lines was 100 per cent, which was much higher than measured historical experience. This could have had negative implications for non-financial corporate firms (Gomes and Khan 2011). Since many firms require these backstops to issue commercial paper, this requirement could have prohibitively raised the costs of market funding for firms' liquidity-management practices. As a result, the assumed outflow rate on these facilities was reduced from 100 per cent to 30 per cent, which is more in line with observed experience over periods of stress.[6] These considerations, together with historical experience, motivated changes to the assumed outflow rates in other areas, including certain deposits, committed liquidity lines and obligations related to trade finance. Other preliminary calibrations were inconsistent with central bank operations and could have inappropriately influenced policy implementation, providing the motivation to reduce to zero the assumed outflow rates associated with all transactions secured by central banks.

Finally, the BCBS decided to institute a phase-in period for the implementation of the LCR, beginning in January 2015 (when the minimum requirement is 60 per cent), with full implementation to be completed by January 2019. This phase-in period is aligned with that for the requirements of the Basel III capital framework. The rules also allow individual countries that are receiving financial support for macroeconomic and structural reforms to choose a different implementation schedule (BCBS 2013).[7] This should ensure that banks will strengthen their liquidity-risk management and meet the LCR standard, while still being able to provide credit to the real economy. Canadian banks, which have been subject to prudential liquidity monitoring and reporting for some time, are well placed to meet these requirements.

Outstanding issues

Although the overall design and calibration of the LCR were finalized in January 2013, the BCBS is examining three outstanding issues (BIS 2013):

(i) The BCBS is developing requirements to reinforce consistency and transparency in the disclosure practices of the funding and liquidity practices of banks. Consistent with the Pillar 3 framework of the Basel Capital Accord, enhanced disclosure will support market discipline to reinforce regulatory and supervisory actions, and will reduce the risks associated with the lack of transparency that contributed to uncertainty during the crisis. This work will need to balance these benefits with the potential for negative market signals during a period of financial stress.

(ii) The BCBS is exploring the use of market-based indicators of liquidity to supplement existing measures based on asset classes and credit ratings. Keeping in mind that supervisors may choose to apply stricter requirements than those stipulated by the LCR, this work will improve the ability of supervisors to evaluate the liquidity properties of assets that are currently eligible as HQLA.[8]

(iii) Finally, the BCBS is assessing the interactions between the LCR and the provision of central bank liquidity.

This work is expected to be completed by the end of 2013.

Net Stable Funding Ratio

Objectives and development

The NSFR is designed to reduce the ex ante exposure of banks to funding-liquidity risk by promoting a more-stable funding profile relative to the maturity profile of assets and off-balance-sheet exposures. It is intended to complement the LCR by creating incentives for structural changes to bank funding profiles over a time horizon that is longer than 30 days, thereby promoting a *structurally* sound banking system. Specifically, the NSFR aims to reduce undue reliance on wholesale short-term funding and to encourage better management of liquidity risk from off-balance-sheet exposures.

Extending the term and otherwise improving the stability of a bank's funding profile reduces its exposure to the risk of maturity mismatches. Funding long-term assets (e.g., mortgage loans) with short-term wholesale liabilities exposes banks to "rollover" risk, where banks are unable to refinance previously loaned funds without significantly increased costs, or to "run" risk, where creditors flee. If either of these risks materializes, a bank may be unable to fund its operations and redeem commitments to its clients without fire sales of potentially illiquid assets.

6 The outflow rate determines how much HQLA banks need to hold against potential outflows assumed under the specified stress scenario. In this case, for example, under the original rules, banks would have needed to hold HQLA equal to the amount of potential outflows, owing to calls on backup liquidity lines. With the change to the rules, banks now need to hold HQLA equal to 30 per cent of potential outflows.

7 For example, this may include countries undertaking multilateral aid programs.

8 Note that the Basel Pillar 1 standards are minimum requirements, and supervisors may choose to apply higher standards under Pillar 2.

Several forms of structural funding ratios are used to monitor and manage this risk. For example, banks and supervisors often use maturity "gap" or "ladder" analysis to identify gaps in contractual inflows and outflows that could give rise to liquidity risk. An example is the metric for contractual maturity mismatches that is included in the Basel III liquidity-monitoring metrics (BCBS 2013). Simpler metrics include: (i) the core funding ratio, which is a simple ratio of (unweighted) assets to stable funding;[9] and (ii) short-term funding as a share of total funding, which limits the overall proportion of less-stable funding in a bank's funding profile.

In the 2010 proposal for the NSFR, the BCBS chose a measure that takes into account the defined risk characteristics of both assets and liabilities and captures a broad range of on- and off-balance-sheet activities.[10] The NSFR is defined so that the amount of "available stable funding" is greater than the amount of "required stable funding":

> Available stable funding/Required stable funding > 100 per cent.

Available stable funding includes capital, preferred stock and liabilities with remaining maturities equal to one year or more, and the share of deposits and wholesale funding "with maturities of less than one year that would be expected to stay with the institution for an extended period in an idiosyncratic stress event" (BCBS 2010b). These categories were assigned weights in the 2010 version based on their recognized stability.

Required stable funding is calculated as the sum of unencumbered assets plus off-balance-sheet exposures and other activities. Items pertaining to required stable funding are assigned a factor that is inversely related to their assessed market liquidity; in other words, the more liquid the asset, the less stable funding is needed. For example, immediately available cash is assigned a factor of zero per cent, since it is assumed to be directly on hand, whereas retail loans with a remaining maturity of less than one year are assigned a factor of 85 per cent, since they will not be fully repaid until a later date.

The NSFR must be met continuously and reported to supervisors at least quarterly (see BCBS 2010b for more details). The NSFR is calibrated using a one-year time horizon for the demarcation of long-term/stable funding; this is consistent with current market structures, where most money market funding has a maximum tenor of 12 months.

9 A practical example is the core funding ratio used in New Zealand's prudential regime (RBNZ 2011).

10 The proposed metric was also designed to discourage overreliance on borrowing from other banks, which can increase interlinkages and spread contagion during periods of stress.

The academic literature suggests that meeting this new requirement will impose costs on banks, impinging on profitability and potentially raising the cost of lending (Härle et al. 2010; King 2012). At the same time, research indicates that increasing the NSFR would reduce the probability of bank failures, with the weakest banks feeling the largest effects (Vazquez and Federico 2012; BCBS 2010a). By reinforcing stable ex ante funding structures, the NSFR should bolster confidence in individual banks and reduce the probability of financial crises.

Important considerations in the development of a structural funding requirement

A number of key factors should be considered in the development of a structural funding requirement over the remainder of the observation period to reinforce its benefits and to avoid unintended consequences.

First, while the NSFR should curb *excessive* maturity mismatches in banks, it should not unduly hinder the ability of banks to perform maturity transformation and provide credit and liquidity to the broader financial system, including households, firms and markets. Some level of maturity mismatch is inherent in the role that banks play as financial intermediaries, and there may be benefits to the use of short-term borrowing. For example, short-term retail deposits that are the backbone of traditional retail banking can be a stable source of liquidity, unlike short-term wholesale funding. Short-term debt-like contracts can also act as a device that enforces discipline for managers of financial institutions and could be an optimal private response to governance concerns (Calomiris and Kahn 1991; Diamond and Rajan 2000, 2001). Short-term funding can also provide incentives for creditors to monitor bank managers and thus mitigates agency and moral hazard problems (Diamond 1984).

Nonetheless, as the proportion of unstable funding of a bank increases, its structural funding profile weakens. For example, a bank that funds long-term mortgages with very short-term wholesale unsecured funding is more exposed to rollover risk and run risk than a bank that funds mortgages with stable deposits and long-term debt. Reliance on short-term funding may also be excessive if the bank deals with many creditors and it is difficult to commit to an aggregate maturity structure (Brunnermeier and Oehmke 2013). Separately, unstable funding profiles are closely related to the interventions by central banks to facilitate access to financial institutions to refinancing during periods of stress (Farhi and Tirole 2012).

From a systemic point of view, banks can contribute to the weakening of their funding profile if they adopt risky balance-sheet strategies because they do not

distinguish between the individual riskiness of their assets and the importance of the assets to the financial system as a whole (Morris and Shin 2008). As well, the monitoring by creditors may not be fully effective (Kashyap, Rajan and Stein 2008), owing to negative externalities such as fire sales or if creditors have less incentive to monitor, since they have a higher priority than equity holders to residual claims if the firm enters bankruptcy. In the case of systemically important banks in particular, creditors expect to incur few, or no, losses in the event of insolvency. Thus, there may be social gains from introducing a standard that places a cap on the mismatch between required and available stable funding. The difficult task for policy-makers is to find the right balance when determining this limit.

Second, the NSFR must be defined to support financial stability by reducing funding risk at the bank level and, equally, by promoting stabilizing system-wide dynamics in times of financial stress. During the crisis, the tenor of bank funding shortened dramatically, with long-term funding markets accessible only to a handful of banks, and at punitive costs. This occurred in Canada as well, despite the relative health of Canadian banks, albeit to a lesser extent than in other jurisdictions, such as the United States and Europe.[11] Structural funding requirements should not only account for banks' own responses in these stress situations, but must also ensure that banks' individual responses do not exacerbate procyclicality or hinder efforts by authorities to address market dislocations.

Finally, the NSFR should be designed to complement the other prudential requirements, such as the LCR, capital requirements and the leverage ratio. There is evidence that this is the case. For example, King (2010) finds that increasing liquid assets to reach higher liquidity requirements will help banks to meet strengthened capital requirements by reducing risk-weighted assets. The NSFR may also interact with other regulatory initiatives; for example, because the NSFR will encourage the issuance of longer-term debt, it can reinforce the availability of a bank's liabilities that can be bailed-in in the event of failure. However, since interactions and incentives depend on detailed calibrations of the standard, as well as its overall design, further assessment of the NSFR with respect to other key elements of the Basel framework would be beneficial.[12]

Conclusion

The Basel III liquidity framework incorporates a number of important measures that will increase the resilience of banks to short-term liquidity shocks, as well as promoting a more structurally sound funding profile for them and enhancing their incentives to better assess and manage liquidity risk. The resulting improved measurement and management of liquidity risk, together with the other important elements of Basel III, will contribute to reducing the probability and impact of financial stress. Canadian banks are well placed to meet these new requirements.

11 In fact, the Bank of Canada did introduce extraordinary liquidity facilities to ease funding pressures, lending for periods up to 12 months. For details, see Zorn, Wilkins and Engert (2009).

12 For example, some industry participants think that the design of the NSFR needs to take into account interactions with the leverage ratio, as well as potential cliff effects (AFME 2012).

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