

# Liquidity Standards in a Macroprudential Context

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## INTRODUCTION

The turmoil that started with the collapse of the U.S. subprime-mortgage market in mid-2007 erupted into a full-scale financial crisis in September 2008, following the bankruptcy of Lehman Brothers. Concerns about the quality of assets on bank balance sheets and uncertainty about future funding requirements associated with off-balance-sheet vehicles brought bank funding markets to a standstill. As major financial institutions (FIs) became concerned about their ability to access financial markets to meet their obligations, they significantly reduced the maturities of funds to each other in core funding markets. While perfectly rational for each individual FI, this undermined the functioning of funding markets, setting off a vicious circle. In retrospect, the practices used by FIs to manage liquidity risk prior to the crisis left them particularly vulnerable to a shock in core funding markets.

Improving the management of liquidity risk at FIs would strengthen their ability to absorb liquidity shocks. But, given the importance of markets to a bank's overall liquidity, fortifying each FI does not guarantee the stability of the financial system. Efforts must also be made to strengthen the resilience of core funding markets in times of stress, meaning that a more system-wide approach to the issue is also essential. In other words, improving the management of liquidity risk has both microprudential elements (improving liquidity-risk management at individual FIs) and macroprudential elements (the impact on markets and/or the extension of credit) that need to be carefully balanced.

Extensive public sector liquidity support for banking systems around the world led to calls by G-20 finance ministers and central bank governors in September 2009 for

the introduction of new liquidity standards for internationally active banks.<sup>1</sup> This was accompanied by an announcement from the Basel Committee on Banking Supervision (BCBS) that it would introduce a global standard for funding liquidity that includes a “stressed liquidity coverage ratio” requirement, underpinned by a “longer-term structural liquidity ratio” (BCBS 2008). Work is continuing at the BCBS to define what these requirements will mean in practice. In this report, we outline some of the macroprudential challenges associated with such liquidity requirements and offer suggestions on how they could be addressed in the design of new liquidity requirements and through the promotion of more resilient capital markets. Taking these issues into account would help to ensure that the new requirements will promote more effective liquidity-management practices in the banking system without undermining the functioning of financial markets or the financial intermediation process more generally.

## IMPROVING THE MANAGEMENT OF LIQUIDITY RISK

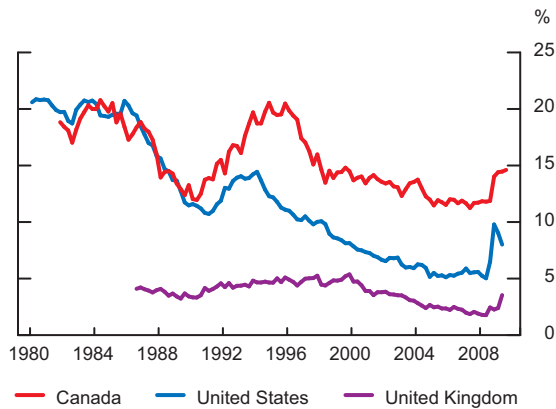
In retrospect, the management of liquidity risk by the banking sector does not appear to have been given the attention it deserved. Around the world, two trends in liquidity-risk management rendered banks particularly vulnerable to a shock: (i) their holdings of liquid assets as a share of total assets had been on a downward trend for many years; while (ii) their reliance on capital markets for funding had been on the rise, notably their reliance on wholesale deposits and securitization. In the aftermath of the Lehman failure, attention has focused on improving the management of liquidity risk at individual FIs. The argument

\* Many thanks to Chris Graham for helpful comments.

<sup>1</sup> “Declaration on Further Steps to Strengthen the Financial System,” G-20 Meeting of Finance Ministers and Central Bank Governors (London, 4–5 September 2009). Available at <[http://www.g20.org/Documents/FM\\_\\_CBG\\_Declaration\\_-\\_Final.pdf](http://www.g20.org/Documents/FM__CBG_Declaration_-_Final.pdf)>.

**Chart 1: Canadian banks hold higher levels of liquid assets**

Liquid assets as a share of total assets

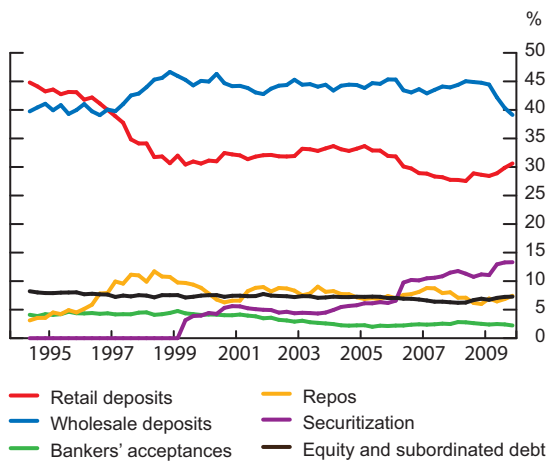


Note: Liquid assets are defined as cash and cash equivalents, government issued-/guaranteed securities, and secured loans to brokers.

Sources: Canada, OSFI; United States, Flow of Funds Accounts; United Kingdom, Bank of England

Last observation: 2009Q3

**Chart 2: The major Canadian banks have a mix of funding sources**



Note: Wholesale deposits include business deposits and some market debt.

Source: OSFI

Last observation: 2009Q3

here is that larger holdings of liquid assets and less reliance on shorter-term wholesale funding markets should better position FIs to withstand shocks to key funding markets and result in a more resilient system as a whole. There is some validity to this argument, which can be seen by comparing the performance of major Canadian banks with that of their international counterparts.

Canadian banks were not immune to the liquidity crisis—they faced serious funding pressures, especially in foreign capital markets. Nevertheless, they fared relatively well compared with their international peers. With the support of liquidity facilities provided by the Bank of Canada and the federal government's Insured Mortgage Purchase Program (IMPP), they were able to significantly increase their

holdings of liquid assets and obtain needed funding without having to engage in large sales of less-liquid assets into illiquid markets.<sup>2</sup>

Several factors help to explain this relative resilience of Canadian banks. First, they did not hold the same quantity of “toxic” assets as their international peers and had strong capital ratios and high-quality capital that enabled them to absorb the losses that did occur. For example, Canadian banks were not involved in the U.S. subprime-mortgage market to the same extent as many of their major foreign counterparts, and thus were (generally) seen as less-risky counterparties in funding markets. Second, and perhaps even more important, were their liquidity and funding profiles. While Canadian banks have, over time, reduced their holdings of liquid assets as a share of total assets, the relative decline was more modest than in some other countries (**Chart 1**). Third, while Canadian banks have increasingly relied on funding from capital markets, this has been balanced to some extent by continued reliance on retail deposits for a significant share of their funding (**Chart 2**). Moreover, their reliance on securitization markets has been markedly less than was the case internationally.<sup>3</sup> As noted by the International Monetary Fund (IMF), with relatively larger holdings of liquid assets and more stable sources of funding, Canadian banks were better positioned to handle liquidity shocks than many foreign banks.<sup>4</sup>

## LIQUIDITY METRICS PROPOSED BY THE BCBS

Given the need to enhance liquidity-management practices, in early 2008, the Financial Stability Forum (now the Financial Stability Board) set an agenda to address a range of issues, including the identification and measurement of liquidity risk and the use of stress tests to improve the funding plans of FIs (FSF 2008). The BCBS has since published several papers, including updated principles for sound liquidity-risk management (summarized in the box on p. 37) and is working on new regulatory standards for liquidity at internationally active banks (BCBS 2008).

**Liquidity-coverage ratio** The first proposed standard is a minimum liquidity-coverage ratio that can be applied in a cross-border setting. This standard, as specified by supervisors, would help to ensure that internationally active banks have sufficient high-quality liquid assets to withstand a stressed funding scenario. The objective is to ensure that a bank maintains an adequate amount of unencumbered,

<sup>2</sup> See Zorn, Wilkins, and Engert (2009) for more on the actions taken by the federal government and the Bank of Canada during the turmoil to improve liquidity and funding conditions.

<sup>3</sup> Securitization has recently become more important, owing to government programs to improve liquidity (e.g., the IMPP). Indeed, throughout the crisis, Canadian FIs were able to generate funds by insuring their mortgages and securitizing them through the Canada Mortgage Bond program operated by CMHC.

<sup>4</sup> See Ratnovski and Huang (2009) for a recent study on the resilience of Canadian banks.

high-quality assets that can be converted into cash to meet its liquidity needs over a specified horizon under a specific stressed liquidity scenario. In connection with this proposed standard, the BCBS is also developing a definition of “highly liquid assets.”

**Structural liquidity ratio** Second, there is an additional standard that underpins the liquidity-coverage ratio to address structural mismatches in liquidity and core funding over longer-term horizons.

From a microprudential perspective, these standards have the potential to elevate the importance of liquidity-risk management within FIs and to improve practices. However, if they are poorly designed, they could have undesirable macroprudential consequences. To achieve a balance between the micro- and macroprudential elements, one should carefully consider the objectives of the standards and how they would function in normal times and in times of systemic stress.

## THE DESIGN AND OPERATION OF LIQUIDITY STANDARDS: SOME ISSUES

The role of liquid assets is to allow FIs to continue to meet their obligations when a funding shock occurs without their having to excessively deleverage, reduce productive credit extension, or come prematurely to the central bank. The question is, of course, how much is enough? The more liquid assets that are held, the larger (or longer) the shock that can be absorbed. However, the more liquidity an FI holds, the less it can lend out. Therefore, a balance must be struck between appropriate liquidity management and the extension of credit to the broader macro economy.

To promote good management of liquidity risk and to mitigate moral hazard, banks should be required to hold enough liquid assets to self-insure against institution-specific and most adverse market shocks. But how far should an FI go in insuring against the latter? Clearly, it would be prohibitively inefficient, if not impossible, for an FI to fully protect

### Principles for Sound Liquidity-Risk Management

In September 2008, the Basel Committee on Banking Supervision (BCBS) published updated principles for sound liquidity-risk management and supervision. The fundamental principle is as follows:

A bank is responsible for the sound management of liquidity risk. A bank should establish a robust liquidity risk management framework that ensures it maintains sufficient liquidity, including a cushion of unencumbered, high quality liquid assets, to withstand a range of stress events, including those involving the loss or impairment of both unsecured and secured funding sources. Supervisors should assess the adequacy of both a bank’s liquidity risk management framework and its liquidity position and should take prompt action if a bank is deficient in either area in order to protect depositors and to limit potential damage to the financial system.

Sixteen other BCBS principles support the fundamental principle in greater depth, covering the following key areas:

1. Governance of liquidity-risk management  
e.g., liquidity-risk tolerance; development of strategies, policies, and practices; internal pricing.

2. Measurement and management of liquidity risk  
e.g., a process for identifying, measuring, monitoring, and controlling liquidity risk; diversification in the sources and tenor of funding; management of collateral and intraday liquidity; stress testing; contingency funding plans; maintenance of a cushion of unencumbered high-quality liquid assets.
3. Public disclosure  
e.g., regular disclosure of information so that market participants can make informed judgments about each FI’s liquidity risk.
4. The role of supervisors  
e.g., regular assessment of each FI’s liquidity-management practices; intervention; communication with other authorities.

Further details on each of these principles can be found in the report by the Basel Committee on Banking Supervision, “Principles for Sound Liquidity Risk Management and Supervision,” published September 2008 and available on the BIS website at <http://www.bis.org/publ/bcbs144.htm>.

itself against systemic shocks.<sup>5</sup> Thus, to balance the costs and benefits of liquid assets, we believe that, consistent with the BCBS principles for liquidity management, the objective of a microprudential tool, such as a liquidity standard, should be for FIs to protect themselves against their own institution-specific liquidity and funding shocks, as well as most adverse market shocks, including the risk of loss or impairment of both secured and unsecured funding sources. Implementing such standards should also leave FIs in a better position to manage systemic shocks when they occur.

In light of the lessons learned from the crisis, the standards should encourage holdings of high-quality liquid assets and a stable mix of funding in good times. Further, they should support the efficient functioning of funding markets in times of systemic stress. In other words, FIs should not find themselves having to boost their liquid assets and curtail their activities in core funding markets during periods of systemic stress, since these actions could undermine the functioning of those markets.

### Defining highly liquid assets

Financial institutions need to hold a stock of high-quality liquid assets and have confidence that those assets can be readily sold to raise the necessary cash to deal with funding shocks. Holding these assets helps to mitigate moral hazard, since the FIs own resources are the first to be used to combat a funding shock.

Defining “liquid assets” for the liquidity standards is an important issue currently under discussion at the international level. One option under consideration is to apply a narrow definition comprising only government debt securities, since those assets are the most likely to be liquid in times of systemic market stress. Another is to broaden the definition to include high-quality assets that are liquid in a range of normal (including adverse) market conditions. An example of this type of asset would be actively traded investment-grade public and private sector debt securities with finite maturity dates.

Choosing between these two options raises some interesting macroprudential issues. Would a narrower definition distort relative prices between assets that are eligible for meeting the standard versus assets that are not? Would a narrow list undermine the functioning of the market for eligible assets? This could occur if FIs are required to effectively immobilize eligible assets to meet the requirements,

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<sup>5</sup> True systemic funding/liquidity shocks are rare events, beyond those outlined in the BCBS liquidity-management principles. While there are various definitions, for simplicity, we assume that a systemic shock is characterized by a sudden and indiscriminate aversion to credit risk, a dramatic decline in the liquidity of all but the highest-quality assets (e.g., sovereign debt), and a sudden, significant increase in system-wide bank funding costs relative to government yields.

thus reducing market liquidity for them.<sup>6</sup> In addition, a broader list may help to sustain liquidity in the markets for the additional assets when markets are unsettled, since FIs may be more willing to trade them, knowing that they meet the liquidity standards. And, finally, would a narrow set of eligible assets increase the risk seen in many developing and emerging-market economies in the past, where liquidity standards degenerated to the point of being used as instruments to compel FIs to purchase government debt?

### Drawing down liquidity in times of stress

The purpose of holding a supply of high-quality liquid assets is to permit the FI to use them to meet obligations when a shock occurs. That is, liquid assets are useful only if they can be used. While standards will outline how much liquidity is appropriate for the prudent management of liquidity risk, supervisors in each jurisdiction will determine the actions banks should take to address any shortfalls.

Institution-specific shocks occur much more frequently than systemic ones. In the case of the former, there must be consequences for not adhering to the standards if supervisors are to encourage the prudent management of liquidity risk and mitigate moral hazard. For example, failure to meet the standards could result in more intense supervision or require actions to move the FI back into line with the standards. If markets notice that an FI is falling below the minimum, they may see this as a signal of poor quality and act accordingly. Standards can thus play an important role in influencing the behaviour of FIs by clearly indicating what is considered to be prudent behaviour.

The challenge comes when the event is a systemic shock, as occurred in the autumn of 2008. In this period of heightened aversion to credit risk, FIs saw their access to funding markets evaporate, since, at the height of the crisis, counterparties would only place funds with them for very short maturities. Uncertainty regarding future access to funding boosted FIs' demand for liquid assets, which, at a systemic level, could only be met by either increased issuance of government debt or by liquidity supplied by central banks.<sup>7</sup> In such circumstances, the liquidity positions of FIs relative to a regulatory liquidity standard that is defined in terms of funding needs over a specified horizon may deteriorate, but that deterioration is an indication of systemic stress.

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<sup>6</sup> This may have been the case in the past when Canada had minimum liquidity requirements (called “secondary reserve requirements”) that required banks to hold prescribed minimum amounts of treasury bills on their balance sheets. As noted in Bank of Canada (1987), one unintended consequence was that they inhibited the development of the treasury bill market in the late 1960s and early 1970s until the stock of treasury bills grew well beyond the needs of the banking system.

<sup>7</sup> A key difference between non-systemic and systemic events is that, in the former, just one FI is taking action to meet the liquidity standard (selling lower-quality assets to buy high-quality assets from other market participants). In normal times, the market will absorb this behaviour. In a systemic event, a large number of FIs are attempting to take the same mitigating actions, which has negative effects on the markets. Increased demand for high-quality assets against a limited supply increases their price (reduces yields in a flight-to-quality situation).



Moreover, it may not be possible for FIs to collectively generate liquidity by reducing the amount of credit they supply to customers. Attempts by FIs to collectively reduce credit supply could result in customers withdrawing funds from the system to service their own obligations. This, in turn, would aggravate the funding pressures on the financial system as a whole, thereby negating, at least in part, the benefits gained from restricting growth in less-liquid assets.

Therefore, while there must be consequences for FIs that fall below the standards in most periods, from a macroprudential perspective, it is extremely unhelpful if, in an exceptional period of systemic stress, the liquidity standards give FIs an incentive to disengage (more than they otherwise would) from funding markets and decrease their market-making activities.

### Limiting procyclicality in liquidity requirements

Ideally, one would like FIs to increase their holdings of liquid assets and fund with longer maturities in good times so that they can use the stock of liquid assets and have fewer funding pressures in bad times (however defined). This would allow them to better deal with funding shocks without excessive deleveraging by selling assets or by dramatically cutting new lending.

As noted previously, however, the funding liabilities of FIs tend to shorten in term to maturity when markets are under stress. This results in an increase in rollover risk and could cause liquidity requirements under a regulatory standard tied to funding requirements over a specified horizon to increase in a systemic event. These pressures can be addressed by central banks outside of the new liquidity standards. For example, central banks can broaden the range of assets they accept in their market operations and standing liquidity facilities in times of extraordinary systemic stress, as was done by the Bank of Canada and other central banks during the recent crisis. Nothing is more liquid than central bank money, and central banks can satisfy the financial system's demand for liquidity at all times. Thus, FIs could continue to meet the standards without having to deleverage by pledging a wide range of illiquid assets to the central bank in periods of systemic stress to obtain the liquidity they need to meet their obligations as they come due.<sup>8</sup>

### Local versus global minimum liquidity requirements

An interesting intersection between markets and liquidity standards is the issue of whether internationally active FIs should be required to hold and manage liquidity on a local,

<sup>8</sup> One way central banks can mitigate the moral hazard of providing liquidity support in this regard is by limiting the number of FIs with which they deal and making them compete with each other for the liquidity being supplied. This argument is outlined in more detail in Chapman and Martin (2007).

or a global, basis and also on a currency-by-currency basis. Many internationally active FIs currently manage liquidity on a global basis and assume that funding in the major currencies is freely convertible and, hence, does not necessarily need to be matched, currency by currency. This enables them to allocate liquidity efficiently across the enterprise, thus minimizing their cost of holding liquid assets while ensuring that their obligations can be met on a timely basis. However, some regulatory authorities, most notably the U.K. Financial Services Authority, have argued that liquidity requirements should be applied on both an enterprise-wide basis and on a local jurisdiction basis. This would ensure that local branches and subsidiaries of foreign banks maintain appropriate funding structures and have enough liquid assets on hand locally to manage domestic liquidity shocks on their own before having to call on the resources of foreign parents and affiliates.

Local liquidity requirements benefit individual jurisdictions that have concerns about the ability and willingness of foreign parents to provide liquidity support to their affiliates. However, if applied too stringently, such practices could raise some interesting macroprudential questions. For example, the requirements would reduce the ability of a subsidiary or branch to draw upon the liquidity resources of the parent in times of stress.<sup>9</sup> They could also increase global liquidity requirements and raise the cost of financial intermediation, resulting in a reduction of the supply of credit globally. To what extent might this be a concern? The BIS Committee on the Global Financial System is currently investigating the various trade-offs.

There may be other ways to tackle the concerns of authorities in this area. For example, steps could be taken to improve the efficiency of foreign exchange swap markets to facilitate the movement of funds across borders and across currencies.<sup>10</sup>

## IMPROVING THE RESILIENCE OF CORE FUNDING MARKETS

From a microprudential perspective, liquidity standards should help FIs to cope with funding shocks when they arise. However, it is also useful to consider the steps that could be taken to reduce the risk of funding shocks occurring in the first place. An important lesson from the crisis is the need to improve the resilience of core funding markets, since those markets will continue to be an important source of funding for FIs in the future.

<sup>9</sup> Pooling liquidity has long been recognized as a useful way for FIs to manage their exposures to idiosyncratic funding shocks, since the risk of all FIs (or all entities within an FI group) being exposed to the same shock at the same time is fairly low. However, the benefits of pooling are reduced in cases of systemic shocks, since most FIs (or all entities within the same FI) would be exposed to the same shock at the same time.

<sup>10</sup> Central bank swap facilities proved helpful in this regard. Alternatively, the use of a central counterparty to clear foreign exchange swaps might also facilitate fund movements across borders.

Several initiatives are under way in various international forums to improve the transparency of financial instruments and enhance infrastructure arrangements (e.g., by establishing central counterparties) and to look at margin requirements and haircuts. Central banks are uniquely positioned to contribute to these issues, given their role as lender of last resort and their ability to provide (virtually) unlimited liquidity. Indeed, a major initiative is under way at the Bank of Canada to improve the resilience of the repo market and other core markets that are important from a system-wide perspective. For more on these initiatives, see “Improving the Resilience of Core Funding Markets” on p. 41 in this issue.

## CONCLUSION

The recent liquidity crisis has highlighted the need for the improved management of liquidity risk by individual institutions, and for improved resilience in core funding markets. In the wake of the extensive public sector liquidity support for banking systems around the world, the BCBS has begun work on introducing liquidity standards based on commonly agreed metrics. This is important work, since such standards, if appropriately designed and applied, have the potential to greatly improve the management of liquidity risk within FIs and to improve their ability to deal with a wide range of liquidity and funding shocks.

We argue here that the objective of a liquidity standard should be to encourage FIs to self-insure against institution-specific and most market shocks. This objective will provide a balance between prudent liquidity-risk management and mitigation of moral hazard and the efficient use of liquidity. To provide these benefits, the standards should require FIs to hold a prudent stock of high-quality liquid assets and a stable mix of funding in normal times.

The standards should also support the functioning of core funding markets in times of systemic stress. The latter must be designed so that they do not worsen the situation for funding markets already under systemic stress by motivating FIs to conserve liquid assets and disengage from funding markets, further decreasing their market-making activities. However, it is important to bear in mind that central banks can help FIs cope with the demands of the standards in periods of systemic stress by expanding the range of assets they accept in their market operations and standing liquidity facilities in exceptional circumstances.

Finally, the introduction of liquidity standards begs the question of whether they should be applied on a consolidated enterprise-wide level, on a currency-by-currency basis, or at the local entity level. As noted previously, this raises some interesting macroprudential issues, since applying them too stringently could undermine global capital flows and impede the supply of credit to the global economy.

In the end, it is important to bear in mind that the introduction of liquidity standards is only one piece of the puzzle. It is also important to consider what can be done to reduce the risk of funding shocks occurring in the first place. This is why the Bank of Canada and other central banks are working together and with major market participants on various initiatives to improve the resilience of core funding markets here in Canada and abroad.

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