TC NOTES

PRACTICAL **LEADERSHIP**
AND **GUIDANCE** FROM
TORONTO CENTRE

THE RISK-BASED SUPERVISION OF LIQUIDITY

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THE RISK-BASED SUPERVISION OF LIQUIDITY

Introduction[1]

This Toronto Centre Note examines the issues faced by banks, insurers, fund managers and securities firms in the management of liquidity and the effective supervision of this within a risk-based supervision (RBS) framework. As explained in Toronto Centre (2018 and 2019), a key stage in RBS is the assessment of the adequacy of a supervised firm's financial resources (liquidity, capital and earnings) in the light of the level and nature of the net risk the firm poses and the requirement for any necessary remedial action.

This Note focuses on good practices in liquidity management in firms in a range of sectors and offers detailed guidance on how supervisors should assess liquidity management as part of their risk-based supervision. Recent high-profile bank failures such as those of Silicon Valley Bank and Credit Suisse have not only highlighted liquidity issues but have called into question a number of assumptions that supervisors have traditionally made about the stability of some sources of funding or liquidity.

The importance of liquidity

All financial institutions that have obligations to other parties (customers or other financial firms) need to ensure that they have adequate liquidity to enable them to meet these obligations in full and in a timely way in normal and stressed conditions.[2] Individual products, business lines and significant activities carry particular embedded liquidity risks which can be viewed as inherent risks. However, liquidity also has an important enterprise-wide dimension which goes beyond the risks associated with specific activities, and firms need to hold liquidity buffers against the risk of unexpected drains.

There are four broad sources of liquidity:

- Current and prospective 'core business' inflows such as bank deposits, insurance premiums, inflows to managed funds, and maturing loans, facilities and bonds;
- Holdings of financial assets which can be liquidated/monetized in response to liquidity needs;
- Market facilities such as borrowing, stock lending, repo and off-balance sheet facilities or transactions such as swaps and derivatives; and
- (In the case of some banks) central bank facilities that can be accessed on a routine basis, for example as part of a central bank's open market operations.[3]

Facilities from other financial institutions which may be formally committed in advance or uncommitted are used by some financial institutions as part of their liquidity management and are treated as sources of liquidity. However great caution is needed by both managements and supervisors in evaluating these. They may prove unreliable, particularly

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[1] This Toronto Centre Note was prepared by Paul Wright, with input from Clive Briault and Phang Hong Lim. Please address any questions about this Note to publications@torontocentre.org

[2] A distinction is sometimes drawn between a 'narrow' definition of liquidity – which is the ability of a firm to meet its current obligations – and a wider one which refers to its ability to do this on a continuous basis in the future. As will become clear from this Note, these two dimensions are inextricably linked, and supervisors need to be mindful of both in their supervision of liquidity.

[3] As discussed below, central banks may also make liquidity available on an exceptional or emergency basis, either to individual banks or the banking system as a whole, at times of market-wide stress. This exceptional support should not be seen as a routine source of liquidity.

in periods of market-wide stress and even where facilities are provided under legal contracts. For these reasons some supervisors exclude such facilities altogether from the calculation of minimum regulatory requirements while others place limited reliance on them.

Calls on liquidity are generally of three types:

- Contractual payments resulting from the firm's core business such as maturing deposits, insurance claims and redemptions of managed funds. There is a potentially important distinction between payments that are made at maturity (for example of fixed term savings contracts or term deposits) and less predictable payments which are made ahead of the maturity of the product where the contract permits this. Both of these represent calls on liquidity that need to be managed.

- Payments associated with the use of market facilities such as the repayment of market borrowing, placement of collateral, payment of margin for hedging or trading positions, and repo or stock lending transactions.

- Calls on firms' liquidity as part of their participation in payment and settlement systems which create intra-day obligations.

Liquidity problems arise when the resources readily available to a firm fail to match the calls on it. Unreliability of committed or uncommitted resources, particularly in periods of stress, may contribute to this. In such circumstances firms will seek to raise liquidity to allow timely payments to be made, but this may be possible only at a high cost (if at all) to the detriment of the firm's profitability and potentially to its consumers and reputation. The firm may also suffer legal or regulatory penalties.

Many financial firms in both mature and emerging economies have extensive foreign currency denominated assets and liabilities. In such cases obligations have not only to be met in a full and timely way, but in the appropriate currency. The additional complication arises here of ensuring that liquidity is available, or can be reliably secured, in the appropriate foreign currency.

Liquidity, which refers specifically to the availability of resources to enable payments to be made as they fall due, is conceptually separate from solvency, which refers to the net worth of an entity and its fundamental ability to meet its obligations. Solvent firms may become illiquid because of the nature and illiquidity of their (otherwise sound) asset holdings. Lenders, including central banks, may be willing to provide liquidity in such circumstances but only if they are satisfied about the borrower's fundamental soundness, the quality of the collateral it can offer, and the prospect for restoring its capacity to meet its obligations.[4] Insolvent firms can remain liquid for a while, but eventually the insolvency will result in them being unable to meet at least some of their obligations in full. In practice, market liquidity will cease to become available ahead of that point being reached as counterparties recognize that the entity is insolvent.

A distinction is sometimes drawn between *idiosyncratic* liquidity strains which result from factors specific to a particular firm (such as an unexpected outflow of deposits or an exceptional volume of insurance claims at an individual bank or insurer), and *market- or economy-wide* stresses which are the result of macroprudential or macroeconomic factors. The latter could include disruptions to capital markets, a loss of confidence in industry sectors or sub-sectors as was witnessed in the banking crisis of 2008, or a rapid and

[4] These judgements will usually be made by the supervisor and the central bank. These may be separate bodies or, where the supervisor is part of the central bank, the decision will involve separate departments.

unexpected change in monetary policy. In managing their liquidity, supervised firms need to consider both types of liquidity pressure.

While all financial firms are potentially subject to liquidity shortfalls, particular attention has traditionally been paid to liquidity management in banks. There are three reasons for this:

- The business model of banking involves the transformation of liquid liabilities (the part of their deposit base comprising short-term or demand deposits) into much less liquid assets (loans). This maturity transformation makes banks vulnerable to liquidity pressures and, in extreme circumstances, to runs in which depositors collectively withdraw funds because of concerns about a bank's soundness. Such concerns may become self-fulfilling.[5]

- The ability of banks to meet their obligations in full and on time is critical to the confidence on which the stability of the banking system depends. In other sectors, such as fund management, limitations or delays in contractual payments, whilst serious, may be seen as acceptable in times of exceptional stress.[6] This is emphatically not the case with banks, not least because of their central role in payments systems.

- The interconnectedness of banks and their role in providing the connective tissue of the payments system means that illiquidity in one significant bank or in a group of banks may become a primary source of wider systemic risk.

Because of the critical importance of liquidity in the banking system, central banks stand ready to provide liquidity to banks in various forms, against appropriate collateral and sometimes on relatively penal terms.[7] The existence of central bank facilities other than routine open market operations and the potential use of these should not be regarded as having any role in individual banks' liquidity planning. This should take place on the assumption that exceptional support will be neither sought nor provided.

One of the main challenges in all sectors is that liquidity conditions may be highly unpredictable at times of stress. Liquidity pressures – such as unexpected withdrawals of deposits by bank customers, early redemptions of managed funds, or increases in margin or collateral requirements associated with market facilities – often occur suddenly. Sentiment may shift very rapidly so that funding conditions go from relatively normal to significantly stressed in a short time frame. This non-linearity or 'cliff effect' and the associated difficulty in forecasting liquidity conditions means that stress testing – which examines the implications of a range of severe but plausible scenarios – assumes a particular importance in liquidity management by financial institutions and the supervision of them.

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[5] From the point of view of an individual depositor, it may be rational to run from a bank when concerns arise about its soundness because of uncertainty about how problems will develop and about how other depositors will react. For a discussion of this see Diamond and Dybvig (1983).

[6] Insurance companies may also delay contractual payments to policy holders as a means of managing liquidity. If carried to excess such policies may raise issues of conduct or fair treatment of consumers.

[7] Some central bank facilities are routine, such as those provided to allow end-of-day settlement in RTGS (real time gross settlement) systems and open market operations designed either to relieve liquidity imbalances which are 'exogenous' to banks (such as those arising out of seasonal tax payments by banks' customers) or as part of monetary policy (where a system-wide liquidity shortage may be 'engineered' and then relieved on terms designed to raise market interest rates). In other circumstances, exceptional liquidity assistance may be provided to individual institutions (to relieve idiosyncratic stresses) or to the system as a whole in the form of emergency liquidity arrangements. The terms, eligibility criteria and acceptable collateral will differ widely according to the context.

Conventional assumptions about the stability of some types of bank deposits – particularly retail – have increasingly been challenged as a result of the growing number of information channels available to convey concerns about individual banks' soundness and of internet and mobile banking. Silicon Valley Bank in the US lost 85% of its (mostly corporate) deposits in two days for example. Signature Bank of New York lost 20% in one day and as long ago as 2007 Northern Rock in the UK lost 20% of its deposit base in four days.[8] Assumptions about the stability of any category of bank deposits therefore need to be extremely conservative.

Sector-specific liquidity management issues

Specific issues in liquidity management arise in banks, insurers, investment management and securities firms. These sector-specific issues are briefly outlined in this section. The following section deals with high level liquidity management issues that are important for all firms of significant size regardless of the sector in which they operate. The material presented here is quite high level and mostly illustrative. More detailed information on sector-specific requirements can be found in the relevant references.

Banking

The Basel Committee on Banking Supervision has established two minimum standards that are applicable to all banks subject to the Basel III framework.[9]

The Liquidity Coverage Ratio (LCR)

Promotes short term resilience of bank liquidity by requiring banks to have an unencumbered stock of high-quality liquid assets (HQLA) that can be converted easily and quickly to cash in private markets to meet liquidity needs in a 30-day stress scenario. The requirement is:

$$\text{Stock of HQLA/total net cash outflows over 30 days} \geq 100\%$$

The Net Stable Funding Ratio (NSFR)

Aims for more stable longer-term funding in relation to a bank's business by reducing funding risk (such as an over-reliance on short term wholesale funding) and promoting a better assessment of funding needs and how these can be mitigated in periods of stress. The requirement is:

$$\text{Available stable funding/Required stable funding} \geq 100\%$$

The LCR and NSFR are intended as minimum standards only, which individual supervisory authorities should take as a starting point in their dialogue with firms recognizing that:

- The requirements should be reviewed and may be adjusted by national supervisors in the light of jurisdiction- or market-specific factors and observations regarding the stability and reliability of funding sources. Supervisors may conclude, for example, that some types of deposits are less stable than the factors embedded in the formulae imply and

[8] Basel Committee for Banking Supervision (2023).
[9] See Basel Committee on Banking Supervision (2008, 2013 and 2014).

consequently require add-ons on this basis. Adjustments to the ratios should only be in the direction of making the requirements more, not less, stringent.

- Many firms will make use of additional monitoring ratios or other metrics for internal management purposes. These include the ratio of loans to deposits, metrics on cash flow and maturity mismatches, and funding concentration measures. These may supplement (but not supplant) the LCR and NSFR minimum ratios.[10]

While compliance with the (possibly adjusted) LCR and NSFR ratios is an important requirement, this can form only part of a broader, forward looking liquidity management framework. Supervisors need to engage in a searching dialogue with supervised firms on these broader frameworks, a number of suggestions for which are set out in the next section.

Silicon Valley Bank and Credit Suisse

Liquidity pressures played an important role in the failures of these two institutions in 2023. More detailed accounts of the failures are contained in two Toronto Centre Insight notes.[11] The salient features for a discussion of liquidity were as follows.

Silicon Valley Bank (SVB) had experienced rapid growth and had a considerable concentration of funding sources (predominantly non-interest-bearing demand deposits), loans (mostly to technology start-up companies), and investments (mostly fixed income securities).

Most deposits were from technology companies, start-ups and venture capital companies. These were mostly above the coverage limit of the US deposit insurance system and accessible and movable immediately using mobile phone and internet applications. As bad news stories about SVB emerged, including a failed attempt to raise new capital, customers sought to withdraw their funds culminating in withdrawals of over three quarters of the deposit base in two days.

Lessons: One of the most important lessons from this case was that many deposits, contrary to earlier supervisory wisdom, proved highly volatile. When the volume of withdrawals became unsustainable, the bank had to close whether it was solvent or not. The bank was also hit with multiple shocks in that the withdrawal of deposits triggered the realization of losses on its 'held to maturity' bond portfolio which were the result of rising interest rates. This underlines the need for stress testing to consider the simultaneous occurrence of multiple adverse shocks.

Credit Suisse was designated as a global systemically important bank (GSIB) and as such was subject to additional capital requirements and intensified supervisory scrutiny. Scandals, controversy and claims of mismanagement had surrounded the bank for several years and this was reflected in poor profitability and losses of business. The announcement of a large financial loss in 2022, together with the failure of SVB and the public announcement by a major shareholder that they would not contribute to any additional capital for the bank, precipitated a major loss of confidence notwithstanding the existence of a substantial liquidity facility from the Swiss National Bank. Credit Suisse effectively failed and was sold to UBS.

Lesson: Even globally important banks that are subject to enhanced supervision and which are declared to be solvent can suffer major losses of liquidity. Basel minimum

[10] For further discussion of alternative metrics see Basel Committee on Banking Supervision (2019).
[11] Toronto Centre (2023a and 2023b).

standards provide an important buffer but in themselves are no guarantee of sound liquidity, which must be managed to permit a credible response in circumstances of extreme pressure.

There are two broad dimensions to liquidity policies specific to banks – prudent funding and the management of liquid assets.

Prudent funding
Banks need to have access to an appropriate diversity of funding sources that are reliable and available at reasonable cost – including at times of stress. The broad risk issues that need to be managed are:

- The **stability of existing deposits**. Projected run-off rates need to be realistic and based on evidence from the wider industry as well as the experience of the entity concerned. The cases outlined above, for example, suggest that retail and corporate deposits are less 'sticky' than is implied in the LCR formula. This should be taken account of in liquidity management (and may be reflected in adjustments to regulatory minimum ratios).

- The continued willingness of depositors to **renew (roll-over) deposits** as they become contractually due and the ability to **attract new deposits**. Assumptions here also need to be stringent and evidence-based, including those made about behaviour in periods of stress.

- The availability of **unsecured versus secured market funding** – in normal times and stress. The mix between such funding sources is a key risk-based decision for the liquidity plan.

- The sources, maturities, markets, products, and currencies involved.

- **Collateral** and other requirements for funding, including **haircuts and margin**. Such requirements may become more stringent during periods of stress and liquidity projections need to take account of this.

- **Concentration** of funding sources.

- Any technical or other market factors which may inhibit the timely use of funding sources. Periodic market testing should be used to identify any such barriers well in advance.

All of the above risk factors should be evaluated in stressed and normal conditions and across multiple time horizons to provide assurance that sources of liquidity will remain resilient.

Management of liquid assets
Holding an adequate stock of high-quality liquid assets (HQLA) is a fundamental element of banks' liquidity policies. HQLA must be reliably convertible into cash at reasonable cost and within a short and predictable timeframe. Determining the appropriate level of HQLA requires careful consideration of:

- The **quality** of the assets – the scope for them to be readily converted to cash.

- Broader characteristics such as **credit risk and volatility**, both of which should remain low, especially in times of stress. Assets should be capable of **straightforward**

valuation – for example because they are traded on deep and (usually) liquid markets. In some countries liquid markets, even for government bonds, may not exist or may be unreliable, limiting the value of these as HQLA. Even where reliable markets do exist the assets may suffer significant loss of value during periods of monetary tightening, creating potential losses and limiting the scope for realizing liquidity from their sale.

- Prices of assets should not be **correlated with those of others** which could become high risk at times of stress. Particular care needs to be taken with assets issued by other financial institutions which may lose value/liquidity or become volatile in circumstances of financial sector-wide risk ('wrong way risk').

- **Encumbrance**. Assets can only be monetized to the extent that they are not pledged (as collateral) or subject to legal, regulatory or other constraints restricting their prompt sale or transfer. Levels of encumbrance may change over time, especially during periods of stress. The acceptable degree of (current and prospective) encumbrance is a risk-based decision for firms' managements.

- **Concentration risk**. The extent to which assets are concentrated by counterparty or sector will have potential implications for their liquidity or value.

- Technical or other features of markets which may prevent the **timely monetization of assets**. Periodic market testing is required to identify any such barriers well in advance.

All of the above risk factors need to be evaluated in stressed as well as normal conditions, and across multiple time horizons, to provide assurance that holdings of liquid assets can be reliably converted into cash at any time and in a range of market conditions.

Where banks are parts of wider groups spanning multiple sectors or jurisdictions, particular attention needs to be paid to **group liquidity**. There are two aspects to this: the sound management of liquidity within individual group entities and the scope for transferring liquidity across group entities. Both of these require a consolidated group-wide view of liquidity, including an assessment of the likelihood and scale of potential parental support for subsidiaries.

Supervisors need to understand the extent to which a bank may be seen (formally or informally) as a potential internal lender of last resort to other group entities and the risk that liquidity may become trapped in entities or jurisdictions as a result of regulatory or legislative restrictions. In the case of cross-border groups, the currency mix of assets and the extent to which those in different currencies are transferable or can readily be converted needs to be considered, bearing in mind that foreign exchange or swap markets may become limited at times of stress.

Insurance

While there are no international liquidity requirements for insurers comparable to the LCR and NSFR, the International Association of Insurance Supervisors emphasizes the need for sound risk management, including of liquidity.

Insurance companies' specific sources of liquidity are typically premiums and income from investments. In the case of general insurance, the premiums are for insured events. For life insurers, premiums may also include contributions to long term savings. The asset backing for insurance contracts consists of holdings of marketable assets with maturities broadly aligned with those of the insurance contracts involved. Some of these will qualify as HQLA which can be mobilized – albeit at some potential cost – in the event of liquidity pressures.

General insurers' liquidity needs are mostly contingent on the occurrence of insurable events, while life insurers will also face demands arising from maturing policies or savings products.[12]

The main drivers of insurers' liquidity are:

- The occurrence of **insurable events**. Insurers devote extensive resources to forecasting these accurately. Such events may nevertheless turn out to be larger than expected (for example as a result of catastrophes) or more frequent (as a result of climate change), in which case liquidity needs will be higher than planned.

- The portion of insurable events that are covered by **reinsurance**. In such cases, and depending on the extent of reinsurance cover, the timeliness with which the reinsurer makes eligible payments may be a significant factor in the ceding company's liquidity.

- The timing of **other payments** such as staff remuneration and commissions. There have been some instances, albeit uncommon, where the front-loading of commission payments to employees or agents (outflows) has not been matched by sufficient premium payments (inflows) which have been spread over extended periods.

- The behaviour of **policy holders**. Holders of general insurance policies may choose to withdraw from products, decline to renew them, or fall into arrears for a variety of reasons, including changes in the levels of premiums and economic conditions. The willingness of life insurance customers to take out or retain policies with a savings element may be influenced by changes in interest rates. The extent of this will depend partly on the design of the products concerned – whether for example they have penalties for early withdrawal or termination. Products which involve significant maturity transformation and have low or no penalties for early termination may be potent drivers of illiquidity.

- Insurers' other principal source of liquidity are their **asset holdings**. Maturities should be broadly aligned with those of their liabilities, and assets need to be capable of providing the necessary level of liquidity in both normal and stressed conditions. A portion will be treated as high quality liquid assets (HQLA), meaning that they can be readily mobilized to provide liquidity at reasonable cost. Other assets may also be used to mobilize liquidity but with less certainty regarding timing or valuations. Assumptions about liquidity and valuation, particularly at times of stress, need to be constantly evaluated and tested.

- Some portion of HQLA holdings may be **encumbered** in various ways and the level of encumbrance will tend to increase in periods of stress. This needs to be fully factored in to estimates of insurers' available liquid resources.

- The behaviour of **market counterparties** (which may, in turn, reflect contractual obligations). Providers of secured funding may increase collateral requirements at times of stress, while unsecured funders may shorten the maturity of their funding or fail to roll over facilities. Counterparties to derivatives or other off-balance sheet facilities may require additional margin or collateral at times of stress or exercise options to effect early repayment, and conditions for repo or securities lending may become tighter.

- Products offering **guaranteed returns** are a particular source of liquidity risk, particularly when interest rates on variable rate assets are falling (this will pose risks to earnings and

[12] For an extensive discussion of insurers' liquidity see International Association of Insurance Supervisors (2020).

even to solvency, as well as to liquidity). Insurers may be vulnerable to successful legal challenges by policy holders or savers claiming that ambiguous terms and conditions amount to guarantees.

All of the above need to be evaluated and tested fully as part of the insurer's liquidity management plan, which sets out cash flow profiles based on projected sources and uses of funding in a range of conditions. Where an insurer is part of group – with cross sector and/or cross border operations – liquidity vulnerabilities need to be evaluated in that wider context. Group-wide liquidity needs should be assessed along with the location, currency and reliability of sources of liquidity, including HQLA, and the likelihood and potential scale of liquidity support from parents. The reliability with which liquidity in one part of the group can be made available to meet needs elsewhere needs to be assessed - in normal and stressed scenarios.

Fund management

Fund management companies face three broad types of liquidity risk which need to be incorporated into their risk management frameworks:

- For open ended schemes, mismatches between the liquidity of investments and the scope for frequent or early redemptions by investors in funds.
- Liquidity requirements arising from the use of leverage which can amplify losses but also require unexpected margin or collateral payments.[13]
- Requirements from securities lending, repo and other capital market-based activities.[14]

While there are no formal international standards for liquidity, standard setting bodies have set out a range of sound practices for investment management firms.[15] Many regulators also impose **specific liquidity requirements** on fund management companies or individual funds. These may take the form of percentages of funds' net asset values that must be backed by high quality liquid assets, or prescribed holdings of specific types of liquid assets. As in other sectors, regulatory requirements should be seen as a starting point only.

Firms need to develop their own comprehensive risk and liquidity management plans, setting liquidity thresholds based on the nature of the funds involved and the customer base. For example, a fund invested in illiquid assets such as real estate but offering frequent dealing or redemption to investors will need to hold higher levels of liquid assets than one with liquid investments and allowing only infrequent redemptions. Judgements about optimum liquidity levels (over and above regulatory requirements) are a risk-based decision for managements.

There needs to be a careful assessment of the liquidity requirements associated with funds at the **product design and introduction** stage. This will involve assessment of the liquidity characteristics of the investments, the expected redemption behaviour of investors and the potential behaviour of market counterparties. This should be subjected to scrutiny by senior management at the time of product approval and subsequently.

[13] The use of leverage by fund managers offering products to retail customers is restricted by regulation in many countries.
[14] There may also be regulatory restrictions on these.
[15] See IOSCO (2018) for a fuller discussion of liquidity requirements for fund managers. This sets out sound practices which have been endorsed by the Financial Stability Board. Practices in most jurisdictions have been found to be broadly consistent with these (see IOSCO 2022). FSB (2023) sets out proposals for strengthening liquidity management in open-ended funds.

Firms need to have explicit and coherent policies regarding **holdings and valuations of assets and investments, concentrations, counterparty risks and trading limits**. These policies need to be developed with regard to normal and stressed conditions and approved by the board. There needs to be regular reporting on compliance with the policies and on breaches and remedial action taken.

Supervisors of fund managers may permit or even encourage the use of **additional liquidity tools** such as more restrictive redemption arrangements at times of severe stress (in contrast, measures restricting access to products would not be sanctioned for banks or insurers other than in resolution). These may involve limits on the scale or timing of redemptions or place penal conditions (such as charges) on these.[16] They may be helpful in allowing fund managers to weather periods of stress and have a role in maintaining or promoting wider market stability. For example, a reduction in liquidity pressures from redemptions may make it easier for fund managers to meet increased margin or collateral payments or calls for early repayments from other creditors.

Such exceptional measures can only be taken when permitted under relevant national regulation and even then, they should be introduced with circumspection. Fund managers need to be certain about the contractual scope for introducing such measures and even where this is permitted, to be able to demonstrate that they are being taken in the best interests of investors and that investors are being treated fairly. There should be clear and transparent criteria for their introduction (such as redemption requests exceeding a specified level of the net asset value of the fund). In general, exceptional liquidity measures should be avoided, if at all possible, certainly in funds with a substantial retail investor base and liquidity management conducted on the expectation that the firm will not need to have recourse to such measures.

Securities firms/broker-dealers

Securities firms' activities include buying and selling securities on behalf of customers, acting as market makers, managing securities issues (including IPOs), trading on their own account, and providing securities services to institutional investors.

Securities firms' revenues and hence sources of liquidity are **commissions and fees** from customers, trading revenues from securities activities and fees from investment banking. Extensive use is also made of **market-based financing** in the form of repo, stock lending and derivatives trading, as well as unsecured funding from banks. They also tend to hold substantial inventories of securities which are potential sources of liquidity but whose value may become impaired at times of stress.

Liquidity requirements arise from the need to meet obligations arising out of market making, trading and investment management activities, including margin and collateral payments, repayment of secured borrowing, and payment obligations arising out of repo and stock borrowing. Some securities firms are highly leveraged, making them vulnerable to volatile market conditions when collateral and margin requirements may increase sharply, or borrowing from banks may become less available.

The main risks to broker-dealers' liquidity therefore include:

- Unexpected **payments to market counterparties and corporate investment clients** and customer withdrawals of funds where these are held directly with the securities firm (though most customer funds should be held in segregated client money accounts).

[16] A full list of additional liquidity measures can be found in IOSCO (2018).

- A **loss of value or market liquidity** of inventories of securities, reducing the scope to use these to raise liquidity (or achieve a wider de-leveraging) at times of stress.

- The **loss of secured or unsecured funding**. This may include the withdrawal of facilities or market counterparties. In less extreme circumstances funding may still be available but only on the basis of much increased margin or collateral requirements, or higher interest rates.

- An increase in required **clearing deposits** (funds held with banks to facilitate trading) by counterparty banks, possibly accompanied by a more cautious approach to the release of funds by such banks which may delay such payments at times of stress.

The issues in liquidity management in broker-dealers/investment banks are not fundamentally different from those in other institutions. Inflows and outflows need to be assessed over a range of time horizons and conditions, together with access to market borrowing and holdings of assets that can reliably be used to raise liquidity.

Supervisors traditionally focused on the segregation of client money by securities firms to limit the risks to consumers of securities firms being unable to meet payment obligations. It became increasingly apparent during the 2008 crisis however that large broker-dealers were sources of systemic risk because of their central role in the functioning of financial markets and because some were undertaking significant maturity transformation. Consequently, there is now an increased emphasis on the broader prudential supervision of such firms.[17]

The task of risk-based supervision is made complicated by the fact that many securities firms operate **business models which are relatively complex and varied**, and which may change markedly from year to year, increasing the challenge of 'knowing the business'. Such firms often undertake significant own account trading, sometimes in quite volatile assets and often involving leverage. This makes them susceptible to market risk and sudden liquidity demands, particularly in periods of stress. Supervisors need to satisfy themselves that the strength of controls and holdings of financial resources including liquidity are equal to these elevated levels of risk. This underlines the need for close supervisory scrutiny, including of the extent to which controls and liquidity are effectively overseen by senior managements and boards.

The need for a **group-wide perspective on liquidity** assumes particular importance in the case of securities firms. In some jurisdictions there are regulatory restrictions on investments in such firms by bank holding companies because of the potential volatility of their business models and the risks they are seen to pose to the banks involved.[18] Where securities firms are permitted to be part of wider financial groups that include banks it is essential that supervisors understand the exact nature of actual and potential financial linkages, including any formal or informal arrangements for the bank to act as provider of liquidity to the securities firm – including on a cross-border basis – and the ability of group entities to meet foreign currency obligations, particularly at times of stress.

Pension plans

Liquidity requirements for pension plans are broadly similar to those for firms in other sectors but there are a number of specific issues that need to be managed. One key issue is the **maturity of the fund** and the **demographic mix of its members**. Mature schemes with a large proportion of members around retirement age will face liquidity pressures resulting

[17] Federal Reserve Bank of New York (2021).
[18] There may be a prohibition on the inclusion of securities firms in financial groups that include banks, or this may only be permitted subject to strict 'ring fencing' of the entities involved.

from limited contributions and may experience a shortfall of investment returns in relation to benefits. In contrast, plans with a diversified membership and steady inflows of new members will face fewer liquidity pressures and can prudently invest in assets with longer maturities in order to boost returns.

Behaviour in response to financial market conditions may also affect investment activity and hence liquidity. For example, the search for yield during periods of low market interest rates may drive plan managers to invest in riskier, less liquid asset classes including infrastructure projects and private equity. Managers may also make use (if permitted) of derivatives or leveraged instruments creating the risk of liquidity pressures arising as a result of margin calls.

Pension fund managers and trustees therefore need to pay close attention to all aspects of liquidity risk, including that arising from their investment choices. Liquidity risk in pension funds was traditionally seen as focused mostly on funding risk and cash flow adequacy. However, the scope for funds to invest in more volatile and potentially less liquid asset classes underlines the need for a broader perspective on the full range of liquidity drivers and on the need for scenario and stress testing.

Enterprise-wide governance and controls

While the specific liquidity characteristics and requirements for firms in different sectors vary, there are a number of **general principles** which need to govern liquidity management in all supervised firms of significant size and impact regardless of sector. These stem from established principles of corporate governance set out for example in Toronto Centre (2016).

- The firm's strategy, business model and risk appetite need to be established by the board in consultation with the senior management. A relevant board committee may undertake the detailed work but the board is the ultimate decision maker.

- It is the responsibility of senior management to give operational effect to these high-level decisions on strategy and risk appetite, and to report to the board (or relevant board committee) on compliance and progress with these.

The liquidity management framework needs to stem directly from these wider governance structures. Liquidity management is not an isolated, technical activity which can be left in the hands of specialist staff. It needs to be embedded firmly in the enterprise-wide risk and control framework, to be widely understood, and to permeate day to day decision making.

- The management of liquidity is itself a risk-based activity. Boards need to specify how much liquidity risk they are willing to take (in terms, for example of the size and duration of permitted mismatches, sources of funding and holdings of HQLA). This needs to be consistent with the wider risk appetite.

- These decisions need to be taken on the basis of stressed as well as normal scenarios, recognizing that liquidity needs to remain adequate in the face of severe but plausible stresses which may be firm-specific or sector-wide.

- All of these considerations need to be encapsulated in a **liquidity risk policy** which is consistent with the firm's wider strategic goals, risk appetite and recovery plan. There needs to be clear ownership, responsibility and accountability for liquidity management within the senior management. This is likely to require the creation of a dedicated **liquidity management function** which, like other key control functions, should interact

closely with general risk management.[19] Liquidity management may be the responsibility of an asset and liability (ALM) function, which is a key part of the management of many financial institutions. This encompasses liquidity risk management but tends to be broader, also involving the management of risks such as interest rate and currency mismatches and internal funds transfer and pricing.

Responsibilities of the liquidity management function

- Continuously monitor and assess liquidity conditions (on a firm-specific and market wide basis), using a variety of indicators and reporting on these.
- Identify, assess and manage current and future liquidity needs in normal and stressed conditions. Assessments should be at the level of individual entities and the wider group. Coherent management of group-wide liquidity is essential.
- Identify specific risks to future liquidity. Develop and evaluate a strategy for addressing and mitigating these.
- Develop and implement scenario analysis and stress testing using a range of scenarios and stresses. Keep the board fully informed of the nature of the tests, the results and suggested actions to be taken in the light of these.
- Manage liquidity over a range of time horizons from intra-day to twelve months and beyond (as appropriate given the term structure of assets and liabilities) within established risk and liquidity frameworks, allowing for normal and stressed conditions.
- Test market liquidity, for example by using non-standard funding sources even when not strictly needed to test their availability in practice.
- Report regularly on liquidity conditions and compliance with the established framework to the board and senior management. This may be to an asset and liability and/or relevant board committee but the board is responsible for sign-off.
- Propose remedial measures in the event of current or prospective shortfalls in liquidity – the latter in normal and stressed conditions – and to advise immediately on any breaches of limits or policy.
- Ensure that there are clear lines of reporting and escalation so that required remedial or other liquidity measures can be taken expeditiously, especially in circumstances of stress.
- Monitor and advise on the liquidity implications of commercial matters such as new product development and product pricing.

[19] Some supervisors place a formal requirement on supervised firms to produce detailed liquidity (and capital) management plans which are then subject to their review. Banks in Europe are required to undertake an Internal Liquidity Adequacy Assessment Process (ILAAP) alongside an Internal Capital Adequacy Assessment Process (ICAAP). See European Banking Authority (2012) and Toronto Centre (2020a).

- Develop a liquidity contingency plan which should be approved by the board and is closely linked to, or (preferably) an integral part of, the wider recovery plan.

Liquidity contingency plan

A liquidity contingency plan is needed when liquidity comes under significant pressure as a result of firm-specific or market-wide circumstances. It should ideally form an integral part of the firm's wider recovery plan which is agreed by the board and reviewed by supervisors.[20] The plan should set out actions that the firm can realistically take to maintain or secure sources of liquidity that will allow normal operations to continue and obligations to be met at reasonable cost in times of stress. The plan should contain the following broad elements:

- A list of assets and funding sources that can be relied upon to be available at reasonable cost in times of stress. Stringent assumptions need to be made about the likely behaviour of contractual inflows, the valuations and haircuts applied to assets (especially those categorized as HQLA) and the terms on which external sources of funding will be available.

- Clear triggers for invoking the plan, based on firm-specific and/or market/economy wide indicators of stress.

- Clarity regarding the management 'apparatus' surrounding the plan. This involves important but frequently overlooked details such as: who would trigger the plan; delegation and escalation mechanisms, including who (up to board level) would need to approve contingency measures; and additional management information that would be provided while the plan is in operation (for example detailed daily and intra-day reporting).

Plans need to be tested regularly to check their relevance and credibility. This should include assessments of the realistic availability of funding sources, taking account of timing, legal or structural impediments to their rapid mobilization. Testing will also be required whenever significant changes are made to strategies, business plans, or funding plans.

Stress testing

Stress testing assumes a particular importance in the assessment and management of liquidity because of its potentially volatile and unpredictable nature. While aspects of the tests may be undertaken by specialists, it should not be seen as a niche or specialist activity but one which is owned and driven by the board and senior management, who should be kept fully informed of the nature of the tests, the results, and their implications for liquidity management.

- Stresses and scenarios need to be severe but plausible. Exactly what constitutes 'severe but plausible' should be agreed with the board and senior management in the context of the firm's strategy, business model, and sources of risk.

- Consideration needs to be given to the potential impact of stress on the availability and cost of all external sources of funding, calls on funding, and the terms on which holdings of assets can be monetized. Here too, the assumptions need to be severe but plausible.

[20] See Toronto Centre (2020b) for a fuller discussion of recovery planning.

- Stress testing should cover the very short term (intra-day) as well as more protracted periods. The effects of stresses should be assessed over a range of time horizons.

- Chosen stresses should not be based exclusively on past events but be forward looking and appropriately hypothetical ('black swan' scenarios). Envisaging unprecedented but plausible scenarios requires considerable imagination.

- In the case of cross-sector or cross-border groups, careful consideration needs to be given to the appropriate level of granularity – whether the stress is confined to a single entity or jurisdiction or is group-wide. The paramount requirement is that the full group-wide impacts of liquidity stresses are understood and that there is an assessment of group-wide resilience including the availability and mobility of liquidity sources within the group.

- In the case of firms or groups with substantial cross-border or foreign currency business, there will be a need to consider the effects of limitations on the ability to exchange or swap currencies in order to meet currency-specific obligations in periods of stress.

- Above all, stress testing should provide insights into risk and should lead to definite and quantifiable actions and outcomes which are agreed by boards and senior managements and consistent with their risk appetite framework.

Acting on stress testing outcomes: an example

- The senior management of Bank X ran a series of liquidity stress tests.
- One set of these involved scenarios for withdrawals of retail deposits over a 30-day period ranging from 10% (broadly equivalent to the level of stress in the Basel Liquidity Coverage Ratio) in 10% increments through to 50% withdrawal.
- The results also included an analysis of the amount of HQLA that would be required to maintain a sound liquidity position in each of the incremental scenarios and the associated costs of holding these. (There was discussion of the possible use of other, lower cost, sources of liquidity but it was decided that these would be more volatile, less reliable, and ultimately more costly).
- The results were presented in a way which allowed the board and senior management to take a view on the balance between: (a) the maximum likely level of stress; and (b) the acceptable cost of additional holdings of HQLA
- On the basis of this the board was able to take the risk-based view that it would aim to be able to survive a withdrawal of 25% of its retail deposits over a 30-day period by having sufficient HQLA in place. This was judged to represent an appropriate and prudent balance between risk and cost.
- This target was incorporated into the liquidity risk appetite.
- Similar exercises were undertaken for other forms of stress over additional time horizons. These included 'multi factor' and second round stresses – for example where withdrawal of retail deposits was accompanied by a withdrawal of market financing facilities.
- The results of the stress tests formed a key input to a comprehensive and measurable liquidity risk strategy agreed by the board.

Liquidity in risk-based supervision

Firms' management of their liquidity is a risk-based activity. Senior management need to take a view about current and future liquidity needs in normal and stressed conditions, and

on how the institution will meet these through a combination of contractual inflows, holdings of reliably liquid assets, committed facilities from other institutions and market transactions. All of these entail risks, costs and benefits which need to be evaluated and balanced carefully.

Supervisors then need to review past and current liquidity performance (based on ratios and other available metrics[21]) as well as the adequacy and effectiveness of wider, forward looking risk and liquidity management in the light of the level of identified risk in the supervised entity.

Toronto Centre (2018 and 2019) set out a framework for risk-based supervision involving the following steps:

i. Determination of the supervised entity's impact (which will govern the detailed supervisory approach);
ii. Determination of its significant activities;
iii. Assessment of the external and inherent risks embedded in these activities;
iv. Assessment of the effectiveness of controls, management and governance in mitigating these risks; leading to
v. A determination of net risk – for each activity and the supervised firm as a whole;
vi. An assessment of whether the firm's financial resources (its liquidity, capital and earnings) are sufficient given the level of net risk; and
vii. Supervisory intervention (as appropriate) to reduce inherent risks, improve governance, controls and risk management, and/or increase financial resources.

Steps 2 to 6 are encapsulated on the supervisory matrix. The one illustrated below contains a small 'sample' number of headings.

Illustrative risk matrix

		Inherent risks					Management and controls					Net risk
Significant Activity (SA)	External	Credit	Insurance	Operational	Strategic	Legal/reputation	Local controls	Risk management	Senior management	Internal Audit	Board	
SA 1												
SA 2												
Etc.												

Assessment of financial resources	
Liquidity	
Capital	
Earnings	

The detailed risk assessment, including the adequacy of the firm's financial resources, forms the basis of supervisory intervention (the remedial program) aimed at reducing net risk or strengthening financial resources. Remediation is the focus of RBS and the risk assessment,

[21] For banks see Basel Committee (2019) and for insurance companies see International Association of Insurance Supervisors (2022).

while a key step, is a means to this end. The RBS process can be seen as the development of a detailed picture of risk (centred on significant activities, inherent risks, controls and management/governance), which is then distilled into a single rating for overall net risk. This distillation is of considerable value – for example in communicating the overall level of supervisory concern to the firm. But the purpose of the risk assessment is to identify the areas where remediation is needed, which will be based on the detailed scrutiny of risks.

Earlier Toronto Centre Notes have provided broad guidance to supervisors on assessing the strength of financial resources, including liquidity. This Note aims to provide more detailed guidance on key issues in liquidity management in firms in different sectors and to provide a more secure basis for supervisory assessments. It does not propose any change to the existing Toronto Centre RBS framework.

Some supervisors place particular emphasis on liquidity as an inherent risk. In terms of the RBS framework, this may involve the inclusion of a 'liquidity risk' column in the matrix alongside other inherent risks such as credit, operational, and insurance risk. The liquidity risks associated with each identified significant activity would then be assessed.

It is possible to identify the liquidity risks associated with individual activities or business lines.[22] Firms and supervisors need to be aware of these risks and the effectiveness with which they are managed. It is also possible to aggregate these inherent risks for all significant activities to arrive at a more aggregated view of liquidity risk. However, such an approach has limitations. As is clear from the above discussion, liquidity needs to be managed on an enterprise-wide basis. Contractual inflows and outflows, market access, and the availability of liquid assets (and the interactions among these) are all factors potentially contributing to illiquidity problems which, when they occur, are whole-firm issues.

Focusing on the liquidity risks in individual significant activities may not capture adequately the full range of these factors and give only a partial view. Liquidity risk is likely to be more than the sum of the liquidity risks embedded in individual activities. Effective management of liquidity needs to recognize this and will involve the holding of an adequate enterprise-wide buffer against unexpected liquidity drains. The assessment of liquidity on an enterprise-wide level involves several components - current and future compliance with minimum ratios and other metrics, recognition and management of specific liquidity risks, the existence of a coherent liquidity management plan, and stress testing - which go beyond the liquidity characteristics of any individual activity or product.[23]

Where supervisory frameworks place particular emphasis on liquidity as an inherent risk the key requirement, as with all aspects of RBS, is that liquidity risk is properly assessed somewhere within an RBS framework and that this assessment includes coverage of all relevant risk, control, management and governance factors, possibly within an ALM framework, alongside consideration of activity-specific liquidity risks.

Supervisory assessment

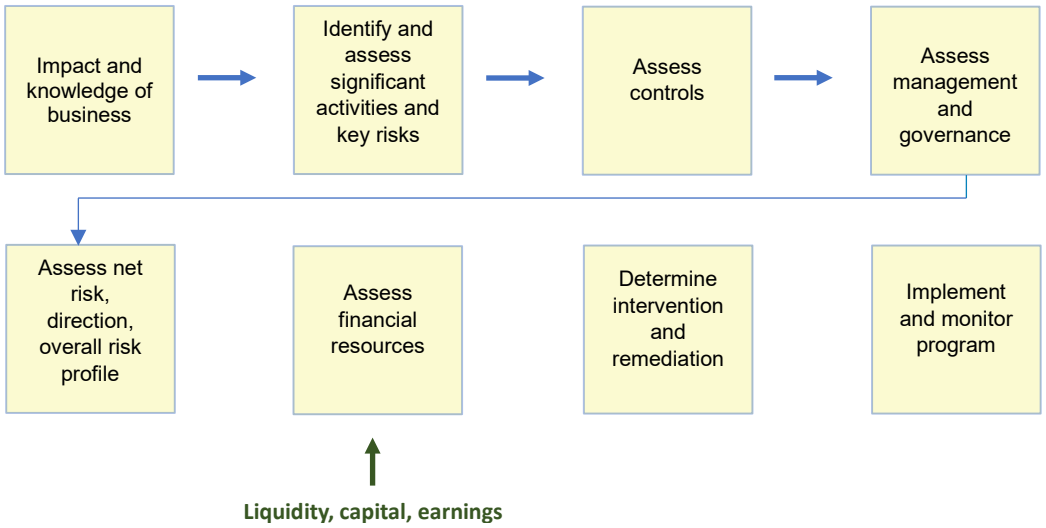
Effective liquidity management is the responsibility of the supervised firm itself. Boards have overall responsibility for specifying the liquidity risk appetite and for ensuring that senior

[22] Indeed, a well-functioning liquidity management framework should provide exactly this information to enable liquidity costs to be reflected in product pricing for example.
[23] Assessing risks on the basis of significant activities always creates the possibility of gaps. The credit risks identified in significant activities for example may not capture the totality of enterprise-wide credit risk. But this gap is likely to be more pronounced in the case of liquidity because of its enterprise-wide nature.

management have in place the necessary structures and procedures to ensure that this is adhered to, and that liquidity is prudently managed within the established framework.

Supervisors then need to review risk and liquidity management processes. Risk-based supervision involves the steps shown in the following diagram:

Steps in risk-based supervision



The initial steps in risk-based supervision lead to an assessment of the overall net risk posed by the supervised entity. This is derived from identification of its significant activities, assessment of the risks (including those to liquidity) embedded in these activities, and judgements about the effectiveness of controls, management and governance at the levels of both individual significant activities and the enterprise as a whole. The risk-based supervision of liquidity recognizes that liquidity is both a form of inherent risk embedded in significant activities and (through the holdings of a liquidity buffer) a mitigant to liquidity risk in the enterprise as a whole. Having assessed the detailed liquidity risks supervisors then need to take three additional steps:

- An assessment of the adequacy of the entity's financial resources - its liquidity, capital and earnings. Other things being equal, the higher the level of assessed net risk the higher will be the expected level of financial resources, which in turn may lead supervisors to impose Pillar 2 add-ons to capital and/or liquidity requirements.

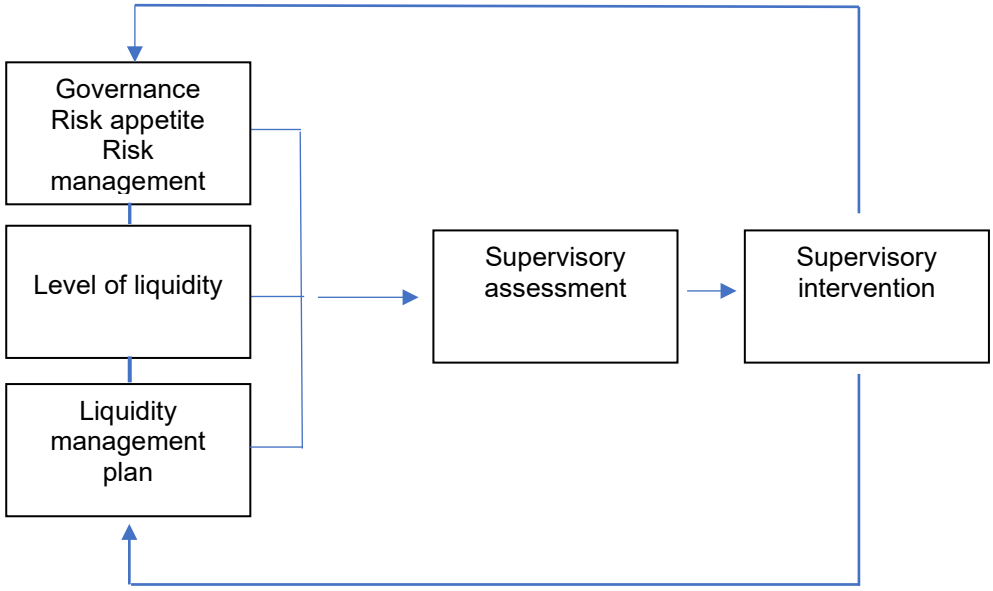
- The development of a program of supervisory intervention aimed at reducing net risk. The following points need to be emphasized in this context:

    - Intervention to reduce net risk is the primary goal of risk-based supervision. The risk assessment is a step (albeit an important one) towards this goal.
    - The reduction of net risk may involve the reduction of inherent risks and/or the strengthening of management and controls.
    - Additional financial resources may be required as a risk mitigant while the fundamental issues creating excessive net risk are addressed, but neither additional liquidity nor capital should be seen as a long-term substitute for strengthened controls.

- The implementation and monitoring of the remedial program.

A full assessment of the adequacy of liquidity involves a searching dialogue with the firm's board and management to establish that liquidity policies (as well as current levels of liquidity) are adequate. In practice this will be closely linked to discussions about the firm's high level risk management processes. The process is summarized in the diagram below. The process for assessing the capital element of financial resources within RBS is very similar.

Liquidity assessment and supervisory intervention



The broad areas for supervisory scrutiny of liquidity are:

- Measures of liquidity, which will include supervisory requirements (such as the LCR) and any internally generated metrics and ratios. Supervisors need to understand how these have been complied with, the frequency of breaches, and how these have been dealt with.

- Detailed information about how firms identify and measure liquidity vulnerabilities in both normal and stressed conditions. Such vulnerabilities will arise out of the liquidity risks inherent in significant activities as well as broader, enterprise-wide risks.

- Information about sources of additional funding/liquidity should these prove necessary, and the results of market testing concerning their reliability and likely cost.

- Holdings and valuation of HQLA and the results of forecasts and stress tests on how reliably and on what basis assets can be monetized in normal and stressed conditions.

- Scenario analysis and stress testing – how tests are designed and implemented, how the results are interpreted and acted upon, and what information is provided to the board.

- How the above are incorporated into a coherent and forward-looking liquidity plan which is owned and approved by senior management and the board, and is regularly reviewed and updated.

- How this in turn is incorporated into the firm's wider recovery plan, which needs to be similarly forward looking and comprehensive.

Supervisors may find it helpful to assess these using a checklist. They would provide a rating for each item and these would then be aggregated on the basis of judgement into an overall rating for 'financial resources – liquidity'. The ratings categories would be Strong (S), Acceptable (A), Needs Improvement (NI) and Weak (W). This would involve a table like the one below which has been populated with hypothetical ratings for the purposes of illustration.[24]

Liquidity measure	**Rating**
Quantitative measures of liquidity	**A**
Identification of inherent liquidity risks and vulnerabilities	**A**
Sources of additional funding/liquidity	**NI**
Holdings of HQLA	**A**
Scenario analysis and stress testing	**NI**
Liquidity plan	**NI**
Liquidity aspects of wider recovery plan	**NI**
Overall rating: Financial Resources – Liquidity	**NI**

Supervisors should receive extensive documentation from firms concerning enterprise-wide governance and risk management, as well as liquidity management and contingency planning as part of their off-site or general reporting requirements. Where there is a formal supervisory requirement for firms to undertake an internal liquidity assessment process (such as an ILAAP as referred to above) the documentation supporting this should also be provided.

In the case of supervised firms of any significant size this documented information will need to be supplemented with (on site) discussions with key personnel. As discussed in Toronto Centre (2022), such discussions will involve two types of questions:

- 'Closed-ended', largely factual questions designed to elicit objective information about processes and practices. These will supplement written information received about processes and structures and will mostly uncover information about the 'characteristics' of liquidity management.

- More 'open-ended' questions designed to allow supervisors to form an assessment of the role of the board and senior management in overseeing the development and use of controls and how these operate in practice. The responses to these questions need to be

[24] A similar methodology – using the appropriate measures - can be used for the assessment of capital as a financial resource.

carefully evaluated and will form an important part of the evidence base for the overall assessment of risk and any required supervisory actions.

Supervisors need to develop skills in identifying which type of questioning is appropriate in the context of a particular discussion, in framing the questions and discussions and, crucially, in interpreting the answers. The questions must not be formulaic or predictable but should be tailored to provide insights and information about the effectiveness of management and controls in practice. Examples of the type of questions that might be helpful are provided below. This is not intended as a checklist but as a suggested framework for questioning, divided between those intended to elicit factual information and those that may help in assessing the effectiveness of liquidity management. The table is colour coded to provide a very general idea of who the questions should be directed to.

Questioning a financial institution about liquidity

Senior management	Board	Senior management and Board

Area of questioning	Factual questions	Assessment questions
General governance and risk management (not specific to liquidity)[25]	Senior Management • How is the risk appetite statement made operational? • Give examples of how it has been translated into procedures (e.g. limits) • Give examples of where the risk appetite (or wider risk strategy) has had a demonstrable effect on operations in the past twelve months Board • What management information does the board receive on risk and in what form? • How often does the board discuss risk issues?	Board • How would you characterize the board's attitude to risk and the risk appetite? • How does the board assure itself that the risk appetite is being complied with? • How does the board satisfy itself about the adequacy of the MI it receives on risk? • Describe the discussions you have had about risk in the past twelve months and some of the key issues that have arisen • How would you characterize your relationship with the Risk Management function/CRO? • Describe an episode in which changes were made to the strategy or business model (actual or proposed) in response to a discussion about risk
Inherent risk and vulnerability	Senior management • What are the inherent liquidity risks in the identified significant activities? • Explain/demonstrate how effectively these are managed • What other liquidity risks have been identified that arise out of the business but are not specific to significant activities? • Explain/demonstrate how effectively these are managed	Board • What do you see as the main risks to liquidity from the firm's principal activities?
Measures of liquidity Internal ratios and metrics	Senior management • What measures of liquidity do you use (other than those that are regulatory requirements)? • Explain the rationale for these • How forward looking are they?	Board and senior management • How do you view your performance against liquidity metrics? • Exceeded – was this intentional?

[25] These are issues that may already have been discussed in the context of governance and risk management generally. In that case they should be seen here as a recap/*aide memoire* and a prelude to the more specific liquidity questions that follow.

Area of questioning	Factual questions	Assessment questions
	• Have you met/complied with all formal requirements over the past 12 months? • What have the measured levels of these ratios been? • How have any breaches been dealt with?	• Met – were the ratios met comfortably or were any special measures (e.g. unexpected asset sales) required? • Shortfalls – what were the circumstances? What action was taken? • What were the wider implications for your liquidity management policy?
Liquidity management policy	Senior management • What is the liquidity risk appetite? • How does it get translated into liquidity risk management? • Who is responsible for liquidity management? • To whom does the responsible head of this function report? • What are its functions and terms of reference? • What does it do in practice? Board • How often does the board receive MI on liquidity/liquidity risk and what form does this take?	Board • How would you characterize the board's attitude to liquidity risk? • How is your overall stance made operational – in terms of policies on funding and liquid assets? • How does the board satisfy itself about the adequacy of the MI it receives on liquidity? • What is your general view of the structure and operations of liquidity risk management?
Intra-day liquidity	Senior management • What is the process for ensuring that intra-day liquidity is adequate? • How often have you experienced pressures on intra-day liquidity in the past 12 months? What was the response? • What stress testing do you undertake regarding intra-day liquidity? • What measures have you taken in response to stress tests? Board • What information does the board receive on intra-day liquidity?	Board • How does the board satisfy itself that the MI on intra-day liquidity is adequate? • When was the last time there was an issue with intra-day liquidity? • Was this reported to the board? How quickly? • What was the nature of the discussion and the follow up action? • How was the board engaged: a) on the day; and b) in any subsequent lessons learned?

Liquid assets	Senior management
	• What is the overall policy in relation to holdings of HQLA?
	• Over the past 12 months have your holdings of HQLA been in line with this?
	• Have there been any instances of problems in liquidating assets at reasonable prices and in a timely way?
	• How do you monitor HQLAs in terms of their location in the group and their currency?
	• What are your detailed policies regarding
	  ○ Encumbrance
	  ○ Collateral
	  ○ Concentration risk
	  ○ Market testing
	• Describe your stress testing of HQLA needs and availability
	• Who: a) designs the stress and scenario tests; b) undertakes them; and c) to whom are the results reported?
		Board
		• What is the general board stance on holdings and adequacy of HQLA?
		• How does this fit within
		  ○ The wider risk appetite?
		  ○ The liquidity risk appetite?
		• What opportunities does the board have to assess and comment on policies concerning the optimum holdings of HQLA, encumbrance, collateral, concentration and market testing?
		• When did the board last become aware of a problem/issue with the amount or availability of HQLA? What did you do about it?
		• What role does the board play in the design and interpretation of scenario analysis and stress testing?
		• Describe any board actions or directions regarding HQLA which were the result of scenario analysis or stress testing

Area of questioning	Factual questions	Assessment questions
	• Do you do market testing of the reliability of HQLA?	

Funding	Senior management
	• What is the overall funding policy?
	• Show me the schedule of funding needs/projections by time bands
	• Has your funding been in line with the policy over the past 12 months?
	• What are your assumptions regarding run off rates/policy surrenders/redemptions?
	• What are your policies with respect to secured and unsecured funding, sources, maturities, products and currencies?
	• What are your policies with respect to collateral, margins and haircuts?
	• Describe your stress testing of funding needs and availability
	• Who: a) designs the stress and scenario tests; b) undertakes them; and c) to whom are the results reported?
		Board
		• What is the general board stance on funding policy?
		• How does this fit within
		  ○ The wider risk appetite?
		  ○ The liquidity risk appetite?
		• What opportunities does the board have to assess and comment on technical issues such as run off rates/ policy, surrenders and redemptions, secured vs unsecured funding, sources, concentration etc?
		• When did the board last become aware of a problem/issue with the availability or cost of funding? What did you do about it?
		• What role does the board play in the design and interpretation of liquidity scenario analysis and stress testing?
		• Describe any board actions or directions which have been the result of stress or scenario testing

Liquidity contingency plan	Senior management • Provide details of the liquidity contingency plan • How does this relate to a) stress and scenario testing you have undertaken; and b) the wider recovery plan? • Describe the process by which the plan would be invoked and implemented. What are the chains of responsibility? • To what extent is the plan tested? • How often is the plan revised? • (Groups) what are the expectations regarding parental liquidity support for subsidiaries or other group entities?	Board • What are the main features of the liquidity contingency plan? • How does it relate to the wider recovery plan? • What role did the board play in developing/approving it? • What would be the board's involvement in the triggering and subsequent implementation of the plan? • What additional information would you need/receive under the plan? • How often is the plan discussed? • How often is the plan revised? • What do you think of the plan? • How confident are you that the plan would work in practice?

While the specific focus of this Note is on liquidity, the supervisory processes described in this section also apply to the supervisory assessment of capital as a financial resource. Supervisors need to undertake their risk assessment and to evaluate the adequacy of current levels of capital and the process for its management and broader governance arrangements to arrive at an evaluation of the adequacy of a financial institution's capital.

Supervisory guidance

The following guidance is intended to assist supervisors in rating liquidity as part of their overall assessment of financial resources. It is intended as a guide only; supervisory authorities need to consider whether adjustments need to be made in the light of conditions in their jurisdictions. The criteria are inevitably high level, but they encapsulate the effectiveness of liquidity management based on the detailed material contained in this Note.

Supervisory rating of liquidity as a financial resource

Strong	• Has consistently demonstrated strong and reliable liquidity performance in terms of:
	  ○ Meeting/exceeding regulatory and internal requirements and metrics
	  ○ Effective liquidity planning
	• Detailed and clear liquidity risk and liquidity management framework and policies which exceed accepted sound practice as set out by standard-setting bodies
	• Clear and detailed liquidity contingency planning which exceeds accepted sound practice
	• Full engagement by board and senior management in liquidity management

Acceptable	• Acceptable and reliable liquidity performance in terms of:
	  ○ Meeting regulatory and internal requirements and metrics
	  ○ Effective liquidity planning
	• Detailed and clear liquidity risk and liquidity management policies which are in line with accepted sound practice as set out by standard-setting bodies
	• Acceptable liquidity contingency planning in line with accepted sound practice
	• Acceptable level of engagement by board and senior management in liquidity management

Needs improvement	• Fragile/less than fully reliable liquidity
	  ○ Failure to meet regulatory and internal requirements and metrics
	  ○ Ineffective liquidity planning
	• Shortcomings in liquidity risk and liquidity management framework and policies which fall short of accepted sound practice as set out by standard-setting bodies and operated by peers
	• Shortcomings in liquidity contingency planning which falls short of accepted sound practice
	• Limited engagement by board and senior management in liquidity management

Weak	• Multiple instances of shortfalls in liquidity/failure to meet regulatory or internal targets
	  ○ Failure to meet regulatory and internal requirements and metrics
	  ○ Ineffective liquidity planning
	• No clear evidence of coherent liquidity risk and liquidity management framework or policies. Falls far short of accepted sound practice as set out by standard-setting bodies and operated by peers
	• No clear evidence of liquidity contingency planning. Falls far short of accepted sound practice
	• No evidence of significant engagement by board and senior management in liquidity management

Supervisory Intervention

It is necessary to consider two levels of supervisory intervention in the context of liquidity:

- Intervention which is necessary to strengthen liquidity, liquidity management and contingency planning in relatively normal 'business as usual' circumstances; and
- Intervention to address an emerging liquidity crisis.

Intervention in 'normal' circumstances

Most supervisory intervention will take place in circumstances in which liquidity, its management or contingency planning are seen as having some deficiencies but the firm is not facing an immediate liquidity threat or emergency.

The above section gives an indication of the type of open-ended questioning that may be needed to elicit information about the effectiveness of risk management in general and the

management of liquidity in particular. The suggested assessment criteria provide an indication of how this information might be used to arrive at an overall assessment of liquidity and its management. Firms need to develop liquidity contingency plans (and wider recovery plans) in 'normal' times - well ahead of any emergency developing.

The assessment is not an end in itself. It is of value only to the extent to which it leads to effective supervisory intervention aimed at improving liquidity and its management. The nature of this intervention will depend on the nature and severity of the shortcomings observed. The table below provides examples based on the important principle that in addition to addressing immediate issues identified in the course of assessments it is also important to consider possible deeper root causes. In several cases the immediate intervention involves increasing liquidity holdings. This is a response to high levels of perceived levels of liquidity risk and is analogous to the imposition of a Pillar 2 capital add-ons.

Examples of supervisory intervention

Issue	**Measures for potential inclusion in supervisory program**	
	Immediate intervention	**Broader issues**
Repeated failures to meet internal ratios	• Increase liquidity holdings (pending reviews below) • Review ('lessons learned') of reasons for failure to meet • Review of appropriateness and relevance of ratios (with a presumption against loosening them)	• Deeper reasons for repeated failures • Review of actions taken following failures • Review of broader liquidity management issues
Repeated pressure on HQLA (e.g. episodes of mobilization and unexpected loss)	• Review of policies/holdings of HQLA • Review of reasons ('lessons learned') for HQLA failures (need for liquidation and terms on which this was done)	• High level (senior management and board) discussion of HQLA policy • Review of lessons learned • Embedding lessons into risk management policies and better monitoring •
Unclear ownership and coordination of liquidity management	• Additional liquidity requirements (pending wider improvements) • Clarification of formal responsibility for liquidity management and planning • Clear terms of reference for individuals (e.g. Head of Liquidity Management) and structures (e.g. liquidity committee)	• Review of how these structures is embedded into wider risk framework • Review of MI and board reporting arrangements on liquidity
Insufficient board engagement on liquidity	• Additional liquidity requirements (pending wider improvements) • Review/revision of MI on liquidity • Review of reporting lines to senior management and board	• Review of board understanding of and engagement in liquidity issues • Possible need for training or education of board members
Insufficiently rigorous or frequent stress/scenario testing	• Additional liquidity requirements (pending wider improvements) • Stronger processes for developing, operating and interpreting tests. • Senior management responsibility for technical aspects of testing and interface with senior management and board	• Review of board understanding of modalities and significance of stress testing • Possible need for training or education of board members
Absence of evidence of actions taken after stress testing	• Review of stress testing process – design/implementation/follow up. • Review of responsibilities for process including follow up	• Part of review of board understanding of stress testing • Allocation of responsibility for stress testing and follow up to board member or committee

Issue	Measures for potential inclusion in supervisory program	
	Immediate intervention	**Broader issues**
Absence of a clear liquidity contingency plan	• Development of a coherent and tested contingency plan to be agreed with supervisors. • Actions that will be taken to strengthen liquidity. • Clear chains of responsibility in implementing the plan • Market testing • Performance indicators to monitor the effectiveness of the plan. • Communications strategy (internal and external)	• Mechanism to identify and address the factors leading to a liquidity crisis. • Longer term measures (cost reductions, restructuring, changes to business models) that may be required. • Willingness/ability of the board to engage with forward planning for major unforeseen events

Liquidity crises

In the event that a supervised firm is facing an immediate (and presumably unforeseen) liquidity crisis it will be necessary to implement its liquidity contingency plan, which should form part of its wider recovery plan. The exact steps will vary from case to case but are likely to include:

- Immediate steps to strengthen liquidity (the use of market facilities, mobilization of HQLA and other measures to the extent that these are available).
- Putting in place measures and metrics to allow frequent assessment of progress.
- Immediate and full communication with the supervisory authority regarding the immediate crisis, the triggering of the plan, and progress in restoring liquidity.
- Agreement with the supervisor on reporting - on a frequent (at least daily) basis.
- Immediate and full communication with the central bank. In many jurisdictions the supervisory authority is located within the central bank. Whether or not this is the case, dialogue needs to take place with those responsible for market liquidity including any emergency facilities that are available.
- Full engagement of the board in all aspects of plan implementation – this may involve daily meetings (in some form) with the board as a whole or the relevant board committee.
- Internal stakeholder management including staff communications.
- External stakeholder management including press, public, market counterparties, group companies, overseas entities and other supervisors.

Conclusion

Liquidity is fundamental to the operation of all types of financial firms. Liquidity problems can arise suddenly and unpredictably and can escalate to become life-threatening.

Effective liquidity management is not simply a matter of adhering to fixed ratios or metrics, important though this is. It requires an enterprise-wide perspective on risks to liquidity and how these would be addressed. Board and senior management need to be fully aware of actual and potential liquidity issues in both normal and stressed circumstances.

Supervisors have the task of reviewing firms' internal liquidity management and planning, including their use of scenario analysis and stress testing. This Note has set out guidance on how they might go about this.

References

Bank of England Prudential Regulatory Authority (July 2021). *The PRA's Approach to Supervising Liquidity and Funding Risks*.

Basel Committee on Banking Supervision (September 2008). *Principles for Sound Liquidity Risk Management and Supervision*.

Basel Committee on Banking Supervision (January 2013). *Basel III The Liquidity Coverage Ratio and Liquidity Risk Monitoring Tools*.

Basel Committee on Banking Supervision (October 2014). *The Net Stable Funding Ratio*.

Basel Committee on Banking Supervision (December 2019). *SRP 50 Liquidity Monitoring Metrics*.

Basel Committee on Banking Supervision (October 2023). *Report on the 2023 Banking Turmoil*.

Diamond, D. and Dybvig, P. (June 1983). *Bank Runs, Deposit Insurance and Liquidity*. Journal of Political Economy.

European Banking Association (November 2016). *Guidelines on ICAAP and ILAAP Information Collected for SREP purposes*.

Federal Reserve Bank of New York (May 2021). *The Value of Internal Sources of Funding Liquidity: US Broker Dealers and the Financial Crisis*.

Financial Stability Board (December 2023). *Revised Policy Recommendations to Address Structural Vulnerabilities from Liquidity Mismatch in Open Ended Funds.*

FINRA (September 2015). *Liquidity Risk: Guidance on Liquidity Risk Management Practices*.

FINRA (January 2023). *Report on FINRA's Examination and Risk Monitoring Program*.

International Association of Insurance Supervisors (June 2020). *Application Paper on Liquidity Risk Management*.

International Organization of Securities Supervisors (February 2018). *Recommendations for Liquidity Risk Management for Collective Investment Schemes*.

International Organization of Securities Supervisors (November 2022). *Thematic Review of Liquidity Risk Management Recommendations*.

Toronto Centre (March 2018). *Risk Based Supervision*.

Toronto Centre (January 2019). *The Development and Use of Risk-based Supervision Frameworks*.

Toronto Centre (June 2020a). *Pillar 2 and Beyond: Issues for Supervisors in Implementing Basel II and Basel III*.

Toronto Centre (August 2020b). *Recovery Planning*.

Toronto Centre (April 2022). *Supervising Corporate Governance: Pushing the Boundaries*.

Toronto Centre (March 2023a). *Supervisory Lessons from the Failure of Silicon Valley Bank*.

Toronto Centre (March 2023b). *Supervisory Lessons from the Collapse of Credit Suisse*.