

# Strengthening regimes for controlling liquidity risk: some lessons from the recent turmoil

In this speech,<sup>(1)</sup> Nigel Jenkinson,<sup>(2)</sup> Executive Director for financial stability, emphasises that the management of liquidity risk is a key counterpart to banks' maturity transformation role. Over the decade prior to 2007 he explains how banks' vulnerability to liquidity risk increased as the rapid growth of structured products dispersed risk throughout the financial system but increased the system's interconnectedness and banks' reliance on wholesale markets as source of funding. He explains that common defences to a decline in the availability of liquidity (securitising illiquid assets, bidding for retail deposits, reducing assets) do not work well when all banks face funding pressures simultaneously as happened when financial market conditions deteriorated rapidly in August 2007 and wholesale term markets dried up. The last line of defence is to hold a buffer of high-quality liquid assets: the banking system has, however, reduced this buffer steadily over the past century. Jenkinson concludes with four recommendations: (1) banks and authorities develop better understanding regarding the vulnerability to liquidity risk particularly under stressed conditions; (2) banks develop more effective contingency funding plans; (3) banks support improved market functioning through better disclosure; and (4) supervision of liquidity risk is strengthened to ensure that banks' liquidity risk management is undertaken to a more robust standard that internalises some of the costs of a bank failure on the wider financial system.

## Introduction

Commercial banks play a pivotal role in the economy. They facilitate payments and the smooth transfer of goods and services, and they match savers who may lack detailed knowledge of borrowers and who (generally) want to be able to withdraw their money at short notice, with borrowers who often wish to repay their loans over a longer-term horizon. This 'maturity transformation' performed by banks is essential to allow capital to be invested in a productive way to support economic growth. But by offering such maturity transformation, banks are inherently exposed to liquidity risk — the risk that a bank is unable to meet its commitments should depositors attempt to withdraw their funds ahead of the bank's capacity to repay them.

As many bankers through the ages have found to their cost, the key objective for the management of liquidity risk is the retention of confidence. A bank may be well capitalised and profitable with a sound loan book, but if depositors lose confidence in the bank's ability to provide their funds as and when they request them, the crystallisation of liquidity risk can

bring down an otherwise viable institution in short order. Once under way, a liquidity crisis can be very hard to stop. Adverse dynamics may feed back on themselves as the limited offer of immediate, full repayment awaits those first to the exit. Moreover, liquidity risk can be triggered through the realisation of other risks, such as the disclosure of large and unexpected trading losses, or the discovery of fraudulent activity within the bank. But it is just as likely to develop independently through the simple combination of an inherently vulnerable funding position and a sudden (and not necessarily rational) turn in market sentiment.

These considerations illustrate why it is of crucial importance to build strong defences against this risk, particularly as the macroeconomic and financial market developments of the past few years have in my view led to an increase in many banks' overall vulnerability to liquidity risk. And while this

(1) Given at the Euromoney Conference on Liquidity and Funding Risk Management on 24 April 2008. This speech can be found on the Bank's website at [www.bankofengland.co.uk/publications/speeches/2008/speech345.pdf](http://www.bankofengland.co.uk/publications/speeches/2008/speech345.pdf).

(2) I am very grateful to Emily Beau for her collaboration on this speech, and to Andrew Bailey, Adrian Chiu, John Gieve, Laurie Roberts and Forrest Capie for help and comments.

changing environment has led to distinct improvements in banks' efficiency and management of other risks, liquidity risk management and supervision have not always kept pace. Recent events have clearly demonstrated that the current defences have proved wanting, with banks insufficiently prepared for a period of severe liquidity strain. The experience of the past few months already suggests a number of key lessons for liquidity risk management and supervision which I will cover later. But I would first like to review the impact of market developments in recent years for liquidity risk management.

## Changing environment and business models

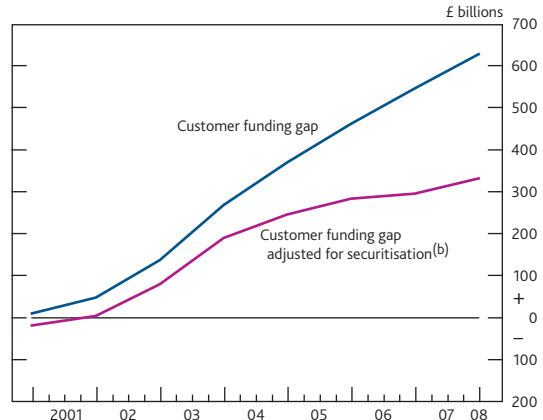
How then has the financial environment changed in the past few years, and why has this led to a greater vulnerability to liquidity risk? The decade leading up to July 2007 has been described as a period of great stability: around the world, economic conditions were dominated by low inflation, low nominal yields, and lower volatility of the economic cycle. The benign macro background was associated with a fall in financial market volatility. And advances in technology spurred a wave of financial innovation and the development of new products offering improvements in the tailoring and matching of risks to investors' risk appetite. This combination of factors encouraged investors to seek out riskier investments in search of higher returns — the 'search for yield'.

One feature of this 'search for yield' was the rapid expansion of structured financial instruments; for example, where individual loans are packaged into tradable securities, such as residential or commercial mortgage-backed securities, or where the risk of a pool of loans is packaged into complex securities offering different levels of exposure to the potential losses in the pool (a collateralised debt obligation). Moreover, new products emerged which also supported the transfer, hedging and dispersion of risks, such as credit derivatives. And the use of these instruments strengthened the interrelationships between financial market participants across the globe: greater integration of markets went hand in hand with the acceleration of financial innovation and rapid growth of market activity.

These developments helped stimulate important changes in banks' business models. Constraints on growth were eased as funding sources widened. Many banks took advantage of new sources of wholesale funding available from securitisation — the packaging of loans into instruments which could be sold on in financial markets. In many cases, assets were routinely transferred into off balance sheet vehicles which funded themselves through asset-backed commercial paper, with the sponsoring bank providing a back-up liquidity line. By applying this 'originate and distribute' model, banks tapped a new source of funding on a large scale. More traditional and stable sources of funding, such as retail deposits, declined in

importance (**Chart 1**). In addition, many banks saw opportunities to generate new sources of revenue and fee income by developing and deepening their activities in international capital markets.

**Chart 1** Major UK banks' customer funding gap<sup>(a)</sup>



Sources: Dealogic, published accounts and Bank calculations.

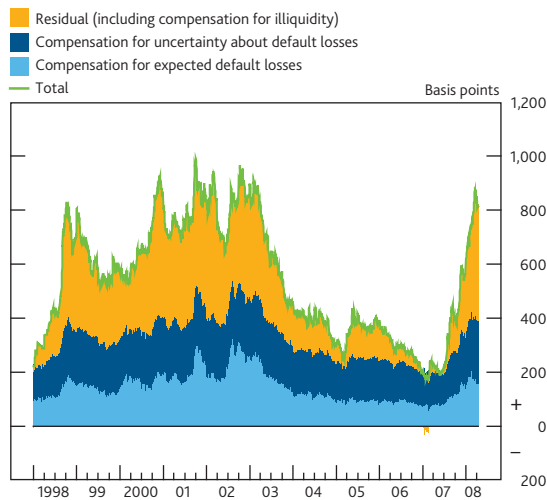
(a) Data exclude Nationwide.

(b) Customer funding gap less securitised debt. Where not available, stocks of securitisations are estimated from issuance data.

Innovation has provided banks with greater opportunities to hedge and diversify risks. For example, a regionally based bank in country A can easily lower its geographical concentration, for example by selling credit risk to other investors who had not previously been able to access such exposures, and/or by purchasing exposure to credit risk elsewhere. The resulting dispersal of risk allows banks to diversify their risk profile as well as their sources of revenue. Providing that the gain from diversification outweighs the increased cost of credit assessment, as banks take on exposure to entities where they have no banking relationship, and that risks are priced fully and appropriately, such innovation should improve market efficiency and lower the cost of intermediation and of capital.

These changes in the financial environment, however, resulted in banks increasing their exposure to liquidity risk. Banks originated large volumes of long-term loans in the expectation that they could be quickly and readily sold on, but leaving them with additional funding risks if they could not. Contingent liquidity lines to securitisation conduits and special purpose vehicles rose rapidly with little expectation that they would be drawn. Exposures to higher-yielding complex structured products rose, with market participants failing to recognise sufficiently that the high yields offered by such products were in part compensation for higher liquidity and market risk and that prospective risk-adjusted returns were much lower than might first appear from their short historic track record. Moreover, in buoyant market conditions, the compensation for liquidity risk itself was bid down to negligible levels by early 2007 (**Chart 2**). By that stage, many market participants recognised that compensation for risk-taking was too low, but judged that the business risks of

**Chart 2** Decomposition of sterling high-yield corporate bond spreads<sup>(a)</sup>



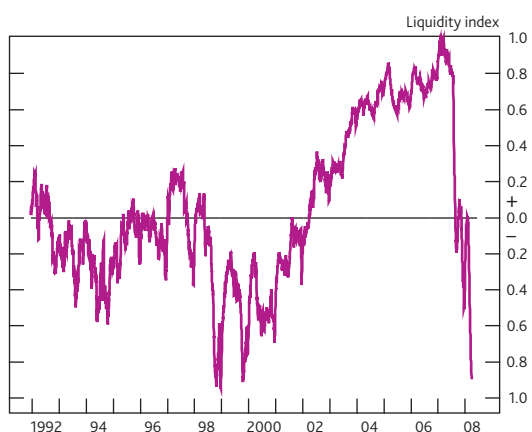
Sources: Bloomberg, Merrill Lynch, Thomson Datastream and Bank calculations.

(a) Webber, L and Churm, R (2007), 'Decomposing corporate bond spreads', *Bank of England Quarterly Bulletin*, Vol. 47, No. 4, pages 533–41.

exiting lines outweighed the financial risks of continuing to write new business.<sup>(1)</sup> Firms became overconfident in their ability to hedge or exit positions if conditions changed, failing to recognise that many participants would be attempting to do the same and that market liquidity would then evaporate. Indeed, given a change in sentiment, the increased integration of financial markets transmits risks just as much as it disperses them.

Banks' funding thus became increasingly vulnerable to a sudden shift in financial market conditions. As covered extensively elsewhere,<sup>(2)</sup> the crystallisation of this risk in August 2007 led to a sharp decline in liquidity across a wide range of markets (as shown in **Chart 3**). Funding pressures intensified as asset managers lowered demand for

**Chart 3** Financial market liquidity<sup>(a)</sup>



Sources: Bank of England, Bloomberg, Chicago Board Options Exchange, Debt Management Office, London Stock Exchange, Merrill Lynch, Thomson Datastream and Bank calculations.

(a) The liquidity index shows the number of standard deviations from the mean. It is a simple unweighted average of nine liquidity measures, normalised on the period 1999–2004. Data shown are an exponentially weighted moving average. The indicator is more reliable after 1997 as it is based on a greater number of underlying measures.

asset-backed securities and complex products more broadly, to lower risks and to guard against pressures from their investors for early redemption. And as banks attempted to fund contingent claims, liquidity in wholesale term markets dried up — adding to the strain. A number of institutions across the globe, such as Northern Rock, IKB and Bear Stearns have succumbed to the pressure, necessitating public sector intervention to support financial stability.

## Defences against liquidity risks

Banks have a range of defences to a sudden decline in the availability of wholesale funds. Recent developments have highlighted a number of limitations in these defences in addressing the recent system-wide liquidity shock.

One potential counter-measure to liquidity pressures is to transform illiquid assets into cash. So in the event of increased funding pressures, a number of banks had planned to use securitisation techniques more intensively to liquefy assets such as mortgages. Such a counter-measure may well succeed if a single firm faces a liquidity problem on its own. But of course this approach fails completely when the source of the change in market conditions is a lowering of global demand for securitised products and a widespread closure of term lending markets.

Another approach is to bid for higher retail deposits. That is likely to take time as many individual retail savers react only slowly to changes in relative interest rates and as banks offer higher rates on term deposits to limit their movement. More importantly, this approach can only succeed by offering rates above those of competitors, thereby eroding margins. And in an environment of general liquidity strain, competitors are likely to follow suit to protect their market share. So the impact on each bank in the medium term is likely to be limited to a share in any rise in aggregate retail savings.

Faced with restrictions on raising liquidity, a bank must respond to a funding shortfall by acting on the asset side of its balance sheet to lower its financing need: in other words, by slowing or even reducing its lending to households and corporate customers. This policy will ease funding pressures and boost liquidity, but it has two major drawbacks. The first is that it takes time to take effect. Many lending decisions are agreed weeks or months in advance and cannot be readily reversed. So the approach will not stem a very fast drainage of liquidity. Moreover, as one bank tightens lending conditions to restrict balance sheet growth, other banks facing similar pressure will react to limit any additional diversion of funding pressure onto their own balance sheets. The second is that a retrenchment in lending can have significant implications for

(1) See Bank of England *Financial Stability Reports* July 2006 and April 2007.

(2) See, for example, Bank of England *Financial Stability Report*, October 2007.

the wider economy, as fewer funds are available to companies and households to support long-term investment and consumption. We are seeing some signs of that beginning to occur as highlighted in the most recent Bank of England *Credit Conditions Survey*.

These defences suffer from a common shortcoming. While they may work well when one bank is facing funding pressure on its own, when liquidity pressures are widespread every bank will attempt to use them at the same time. The actions of one bank will work to negate those of a competitor in these circumstances as gains and losses of market share will net out. That implies an increase in the economy-wide costs of adjustment, posing increased risks to financial stability during the adjustment process.

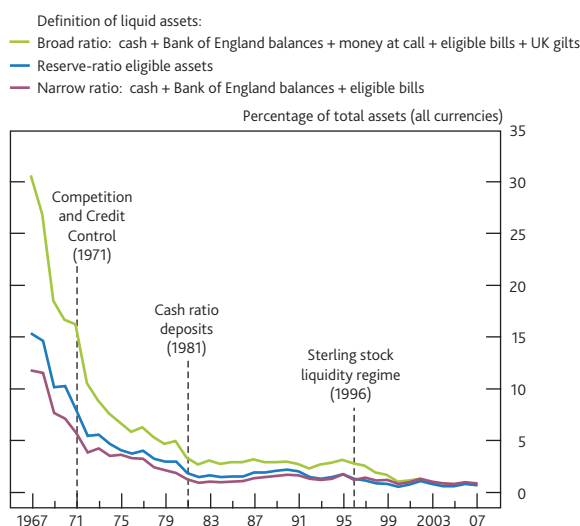
There is, however, one last line of defence left. A bank holding a buffer of reliable high-quality liquid assets, such as Treasury bills or other government securities, can draw on them immediately and directly in the event of a sudden withdrawal of market liquidity or an unexpected increase in its funding requirement. Of course, safe, liquid assets offer lower returns than other types of assets, so there is an opportunity cost in maintaining such a liquidity cushion on the balance sheet. But such assets nevertheless provide the most readily available and reliable provision against a crystallisation of liquidity risk.

Unfortunately, banks' reserves of reliable liquid assets have proved insufficient to meet the recent funding shock. With hindsight, incentives to raise the efficiency of maturity transformation have lowered this safety valve in the system too far.

I would like to examine in a little more detail the UK experience in this respect. In the mid-19th century, UK banks held on average 60% of liquid assets as a proportion of total deposits, an extremely high ratio explained by the frequency of liquidity crises around that time. Shortly after the 1866 Overend and Gurney crisis, the Bank of England accepted a role as lender of last resort, leading banks to relax their extremely conservative (and inefficient) approach to liquidity. The average liquidity ratio dropped to around 30% of total deposits. The first agreement on liquidity between the Bank of England and private banks occurred in 1947, and involved a requirement to hold a minimum liquid assets ratio of 32% (lowered to 28% 16 years later). The regime prevailed until 1971, when the Competition and Credit Controls Act (CCC) introduced a minimum reserve ratio of 12½%. The CCC had two objectives: first, it was intended to strengthen control over monetary policy, by creating a solid money base to underpin it; second, it aimed to unify restrictions on banks to strengthen competition in the industry. The minimum reserve ratio was designed with this aim in mind, and this perhaps took priority over any desire to impose prudential liquidity reserves.

While CCC undoubtedly liberalised the UK banking sector and thus supported improvements in competition and efficiency, it led to a fall in very high-quality sterling liquid asset holdings of UK banks, as shown in **Chart 4**. After twice lowering the minimum requirement, the Bank of England finally replaced the reserve ratio regime with the cash ratio deposit regime in 1981, which did not directly require a minimum level of liquid assets. The sterling stock liquidity regime in 1996 focused on holding sufficient liquidity to meet a particular severe cash-flow funding stress. It is calibrated to ensure that a bank has enough highly liquid assets to meet its outflows for the first week of a liquidity crisis without recourse to the market for renewed wholesale funding, in order to allow the authorities time to explore options for an orderly resolution. It was designed as one component of a wider crisis management regime, and not as a means for a bank to manage its precautionary buffer for addressing liquidity strain on a going concern basis.<sup>(1)</sup>

**Chart 4** Sterling liquid assets relative to total asset holdings of UK banking sector



Sources: Bank of England data and calculations.

**Chart 4** shows how actual liquid reserves fell in line with minimum requirement levels until 1981, and continued to decline afterwards, albeit more slowly. Clearly, over this same period, banks also diversified their liquid asset holdings to include other currencies, and started using repo markets extensively. So the chart may exaggerate the decline somewhat. Nonetheless, the overall historical pattern has clearly been one of a marked secular decline in cushions of high-quality liquid assets. Similar trends also prevailed in countries other than the United Kingdom, such as the United States, Canada and Sweden.<sup>(2)</sup> And focusing on the

(1) See Financial Services Authority (2007), 'Review of the liquidity requirements for banks and building societies', *Discussion Paper 07/7*, December. The UK regime is under review.

(2) See Goodhart, C A E (2008), *Liquidity and money market operations: a proposal*, London School of Economics, mimeo.

past decade, while holdings of very high-quality liquid assets have remained relatively stable, they have not increased to match banks' rising vulnerability to liquidity risk described above.

## Lessons

The recent turmoil has highlighted clear deficiencies in banks' liquidity risk management. And it has also demonstrated that these deficiencies pose serious risks to financial stability and thus to the economy more broadly.

To address this risk in the near term, central banks globally have provided additional liquidity to the banking system and emergency operations have been conducted to support Northern Rock and Bear Stearns. Additional liquidity has been provided at longer-term maturities to address the problem of funding an unexpected overhang of illiquid assets. The Bank's recently launched Special Liquidity Scheme is enabling UK banks to liquefy a proportion of their outstanding stock of illiquid assets by swapping them for high-quality liquid government securities, while ensuring that credit risks remain very clearly with the banks. That should ease current funding pressures.

But in the medium term, it is clear that action is needed to strengthen the financial system's defences to liquidity risk to limit the likelihood of any recurrence of the recent problems. Central banks globally are reviewing the lessons of the episode for their market operations, for example, to ensure that the usefulness of facilities is not undermined by perceptions of stigma that may be attached to a bank that uses them. But it is clear that primary responsibility for bolstering the defences lies with the banks themselves and that supervisory regimes for liquidity risk need reinforcing to support that process.

I would like to highlight four emerging lessons from the current crisis that should help prevent future problems. First, we need to understand better the various sources of liquidity risk, particularly under stressed conditions. Second, banks need to develop more effective contingency funding plans. Third, banks should support improved market functioning and stricter market discipline through better disclosure. And finally, supervision should ensure that banks' liquidity risk management is undertaken to a more robust standard, in order to internalise some of the costs of a bank failure on the wider financial system. I shall cover these briefly in turn.

Banks and public authorities alike need to develop a more in-depth and more complete understanding of the various forms in which liquidity risk can arise. That requires both a careful analysis of the various potential sources of liquidity risk, and of how such risks may crystallise under stressed market conditions. As outlined earlier, in today's financial environment, it is not just the simple maturity transformation

between deposits and loans that generates liquidity risk for banks. To this must be added contingent risks, such as the potential activation of liquidity lines to off balance sheet vehicles, or the drawing of committed facilities extended to corporate customers. Contingent risks may also arise, in a variety of forms, from complex trading instruments, as detailed well by the Institute for International Finance last year.<sup>(1)</sup> Yet more sources of potential funding pressure have emerged from greater activity in capital markets, such as the pipeline risk that arises from being unable to offload leveraged loans and warehouses of loans awaiting securitisation when unfavourable market conditions prevail. And banks are also subject to the risk of exposures previously passed on to third parties flowing back to them, for example when sub-prime residential mortgage-backed securities are 'put back' to the originator should they be found to breach certain credit criteria. Finally, banks are also exposed to the risks of a decline in asset market liquidity and falls in market prices through the potential for higher collateral or margin requirements. These may substantially raise the level of funding a bank requires on a day-to-day basis.

As emphasised in a recent report by the Senior Supervisors Group,<sup>(2)</sup> banks need to develop a comprehensive approach to the management of liquidity risk to ensure that it is in line with the bank's overall risk appetite. One strong recommendation in the report is that financial organisations develop and apply a systematic policy of internal charging for liquidity risk. In particular, banks need to ensure that risk decisions made by front-office traders price appropriately the liquidity risk generated by new products and business lines, rather than treating it as a 'free good' or overhead to be managed centrally by the treasury function. Furthermore, banks and supervisors should analyse in far greater depth how the wide range of liquidity risks may crystallise, separately or conjointly, in a stressed market environment. Rigorous stress testing should span individual, group-wide and market-wide scenarios. There is considerable scope for much better consideration of likely system-wide interactions, including the potential impact of 'crowded trades' being unwound, the dynamics of liquidity hoarding, and the risks of signalling weakness and thus losing market confidence and funding lines. Stress scenarios should test properly for the outright closure of funding markets, and explore the possibility of several markets being shut concurrently. Finally, testing should consider longer horizons, to cater for the possibility that a liquidity crisis could persist for some time. These are just some of the areas which could be considered in more detail — clearly banks, supervisors and central banks all have much to learn with regards to the design of appropriately demanding and comprehensive stress scenarios.

(1) Institute for International Finance (2007), *Principles of liquidity risk management*, March.

(2) Senior Supervisors Group (2008), *Observations on risk management practices during the recent market turbulence*, March.

Recent events have also highlighted the need to devise considerably tougher contingency plans. Closer integration with stress tests will help firms develop more reliable and robust responses to future episodes of strain. Experience has highlighted the need to improve resilience to a sharp decline in market liquidity and to demonstrate that firms can survive the closure of one or more funding markets by ensuring that finance can be readily raised from a variety of sources. Consideration should clearly be given to boosting holdings of very high-quality liquid assets that can provide reliable reserves under all conditions. And it is important that plans are legally robust and that they are regularly tested.

Another lesson from the recent episode is that disclosure practices in relation to liquidity risk management objectives, controls and metrics vary significantly. In some cases, banks go as far as providing information on stress tests and contingency funding plans; in others there is a relative paucity of information. That hampers market functioning: in times of heightened uncertainty, a lack of information can lead to defensive reactions by market counterparties that provision of additional information could prevent. There are some risks from greater disclosure. For example, a bank revealing a weak funding position could precipitate an adverse reaction, although that should of course lead to stronger risk management as a precaution against that risk. There are also measurement challenges. It is difficult to present a simple, representative summary measure of liquidity risks run by a given bank — any single definition of such a complex array of risks will necessarily be approximate. But that does not seem a sufficient reason not to disclose any measure — indeed there may be some parallels with market risk where a single metric such as a firm's overall Value-at-Risk is not viewed as encapsulating all dimensions of such risk. Nonetheless, the degree of disclosure on market risks which banks are now providing under Pillar 3 of the Basel II Accord marks a definite improvement in this area. While liquidity risk metrics remain complex and challenging, I believe that there is scope over time to achieve some degree of enhanced, consistent disclosure across institutions.

The final lesson is the need for stronger oversight of banks' liquidity risk management practices. The authorities' role is to preserve financial stability by lowering the probability and impact of bank failures that could threaten the functioning of the financial system more broadly through contagion, spillover and damage to financial networks. There is no incentive for private banks to bear this cost spontaneously, as their

responsibility is to their shareholders rather than to users of the financial system more broadly. The objective of prudential supervision is to correct this misalignment between private incentives and public policy goals, by forcing banks to deliver higher standards of liquidity risk management and to build stronger defences than they would naturally provide of their own volition.

That leaves open the formidably difficult question of the level of resilience to liquidity stress that the authorities should seek from individual banks. An answer to this question requires a balance to be struck between the risks to financial stability if resilience is set too low, and the risks of inefficiency of financial intermediation if buffers are set too high. Moreover, in addressing this question the authorities also need to take into account that some actions taken today to limit the likelihood and costs of financial instability if risks do crystallise may lead agents to underinsure against future risks. They may thus raise the probability and amplitude of future problems.

Resolving these issues raises major challenges for the global regulatory community given the strong increase in financial market integration and the substantial growth in internationally active banks. Action is under way internationally<sup>(1)</sup> as well as domestically<sup>(2)</sup> to improve and strengthen the management and supervision of liquidity risk and to promote greater consistency of approach. The Basel Committee on Banking Supervision is working on producing revised Sound Practices for the management and supervision of liquidity risk. These will be released for consultation in the early summer. The Committee of European Bank Supervisors is undertaking work in parallel. The aim is to strengthen the platform for the management and oversight of liquidity risk. Among other areas for improvement, supervisors are driving higher standards for stress testing and subjecting contingency funding plans to more rigorous cross-examination before they are validated.

## Conclusion

To conclude, developments in financial markets have increased the importance and complexity of liquidity risk management over the past decade. That, in turn, increased the vulnerability of banks to a system-wide liquidity shock. Preparations for such a shock proved inadequate and insufficient. But the recent experience already provides us with important lessons both for banks and for public authorities and points to a clear need for action by both.

(1) Basel Committee on Banking Supervision (2008), *Liquidity risk: management and supervisory challenges*, February.

(2) Financial Services Authority (2007), 'Review of the liquidity requirements for banks and building societies', *Discussion Paper 07/7*, December.