Financial Services Authority

Review of the liquidity requirements for banks and building societies

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Annex 1: Summary list of questions
The Financial Services Authority invites comments on this Discussion Paper. Please send us your comments to reach us by 31 March 2008.

Comments may be sent by electronic submission using the form on the FSA's website at (www.fsa.gov.uk/Pages/Library/Policy/DP/2007/dp07_07_response.shtml).

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1 Overview

Introduction

1.1 The market turbulence which began in early August 2007 and continues to affect many financial markets around the world has sharply focused attention on the crucial role which liquidity plays in assuring the effective functioning of the banking sector and related markets. The significant reduction of liquidity in short-term money markets, the virtual drying-up of liquidity in the securitisation and covered bond markets and problems in accessing funding in the secured financing markets, even for highly-rated assets, have caused severe difficulties for many firms in funding their on and off balance sheet activities. In the UK, the case of Northern Rock, a medium-sized bank with a prime residential mortgage book, has graphically illustrated many of these problems. A significant lack of market liquidity caused an intractable bank-specific funding liquidity problem and led to a call on the Bank of England for emergency liquidity assistance.

1.2 The purpose of this Discussion Paper (DP) is to set the scene for a constructive dialogue with banks¹, other relevant firms, and other stakeholders about the shape and content of our future liquidity policy. This DP sets out some of the key questions which we think regulators and firms need to consider as they reflect on the recent turmoil in financial markets. It also reaffirms our view that our liquidity policy and regulation should be more principles-based. This DP was foreshadowed in the statement by the Chancellor of the Exchequer on 11 October, and forms part of the work of the Tripartite Authorities (the Treasury, the Bank of England, and the FSA) to improve financial stability and depositor protection in response to the recent market turbulence.

1.3 We had started, at the beginning of 2007², to review our existing liquidity policies for banks and building societies. This was in parallel with an international review of banking liquidity by the Basel Committee of Banking Supervisors and a further review at EU level which is being run by the Committee of European Banking Supervisors (CEBS). (Although minimum quantitative capital rules are established through the Basel Accord, and in the EU by the Capital Requirements Directive, there is no analogous international – or EU – agreed standard on liquidity.) The Financial

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¹ Throughout this paper, except in chapter 5, we will refer – for brevity – to ‘banks’ meaning banks and building societies.
² We say more about our previous work on liquidity risk in the next chapter.
Stability Forum\(^3\) has asked the Basel Committee to take responsibility for delivering an international response to the liquidity problems which developed in the world’s money markets since August. We would still prefer to develop our policy in line with any emerging international consensus.

**Context**

1.4 There are several kinds of market failure related to banking liquidity, which we cover in more detail in a later chapter. The overall danger, against which our requirements have to guard, is that individual banks hold less liquidity than they need to meet their obligations, particularly in stressed circumstances, and so put financial stability and depositor protection at risk. We understand the dilemma banks face in managing their balance sheets: highly liquid assets carry a lower yield, and represent a diversion of resource away from the bank’s main business of lending to its customers. So, imposing liquidity requirements that are too high unjustifiably raises all banks’ costs, and reduces the maturity transformation\(^4\) carried out by banks. This, in turn, reduces the supply and increases the cost of secured and unsecured lending to business and consumers. Our starting point is to re-affirm the importance of Principle 4 – adequate financial resources – in the context of liquidity management. We explain later in the paper that ‘adequate’ has both firm-specific and systemic dimensions.

1.5 The role of the central bank as provider of liquidity to the money markets, and as the source of the ultimate local currency settlement asset, is a key part of the framework within which individual banks have to manage their own funding and liquidity. The Bank of England has recently clarified and reaffirmed its published approach, both in the Bank’s paper of 12 September to the Treasury Committee\(^5\) and in the Governor’s speech in Belfast on 9 October\(^6\). The Bank was careful to point out in those communications the danger that ill-advised central bank intervention could promote undesirable risk-taking behaviour, i.e. the ‘moral hazard’ of intervention. We take the Bank’s present arrangements for providing liquidity as a given in our analysis, but should its approach change we would of course review the implications for our liquidity regime.

1.6 The joint Discussion Paper published by the Tripartite Authorities in October\(^7\) raises questions about how depositor compensation arrangements might be further improved and whether bank failures can be resolved in a way that preserves critical banking functions. Any changes resulting from this consultation process could shift more of the burden of detriment resulting from banking failures away from individual depositors at failed banks and towards the banks themselves and their owners. We take account of this work in our analysis too.

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3. The Financial Stability Forum brings together senior representatives of national financial authorities (e.g. central banks, supervisory authorities and treasury departments), international financial institutions, international regulatory and supervisory groupings, committees of central bank experts and the European Central Bank.

4. Maturity transformation occurs where banks take short-term deposits from savers but lend longer-term to borrowers.

5. See www.bankofengland.co.uk/publications/other/monetary/treasurycommittee/paper070912.pdf


More principles-based regulation

1.7 We have explained elsewhere – in particular, in our April 2007 paper⁸ ‘Principles-based regulation: focusing on the outcomes that matter’ – our thinking on more principles-based regulation. In the context of liquidity, this means that we start – not from a set of complex rules setting out quantitative requirements – but from the existing high-level principles that are relevant. Our Principle 4 states:

A firm must maintain adequate financial resources

This applies Threshold Condition 4:

The resources of the person concerned [the bank] must, in the opinion of the authority be adequate in relation to the regulated activities that he seeks to carry on, or carries on⁹.

to specifically financial resources such as liquidity or capital. Principle 2:

A firm must conduct its business with due skill, care and diligence.

and Principle 3:

A firm must take reasonable care to organise and control its affairs responsibly, and effectively, with effective risk management systems.

are also relevant. Taken together, these Principles establish that it is banks themselves – and not in the first instance the regulator, the central bank or the Government – which are responsible for their effective management of liquidity risk, and their maintenance of adequate liquidity. The more detailed, or quantitative, requirements that we propose support these Principles – not the other way round – and are based on the lessons learned from recent events as set out in Chapter 4.

Purpose

1.8 The main purpose of this paper is to review some of the lessons to be learned for managing and regulating banks’ liquidity from the recent market turbulence and set out preliminary ideas for reform. In doing that, we also aim to:

• understand how the market turbulence impacted banks’ liquidity;

• find out how they coped with the market turbulence;

• take note of the differing role of liquidity in banks with different types of business; and

• seek confirmation that a more principles-based approach is the right one.

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⁸ www.fsa.gov.uk/pubs/other/principles.pdf
⁹ Financial Services and Markets Act Schedule 6, paragraph 4 (1)
1.9 We are continuing to review and challenge how banks and major investment firms manage liquidity, using the various tools within our existing policies and supervisory model. Our experience of doing this will in turn feed back into our thinking on future policy. We are also clear that our review cannot be one-sided. We should also challenge both our own existing liquidity policies, and the effectiveness of our supervision of banks’ liquidity, including how well our principles and high level standards were implemented in practice. The former is covered later in the paper, where we review critically the existing requirements for banks and building societies. The latter is being addressed in our ongoing supervisory work, and we have recently strengthened our capability in this area by establishing a specialist risk review team dedicated to liquidity, funding and balance sheet management risks. Furthermore, as we have already announced, we will publish in March 2008 the findings of our review of our supervisory engagement with Northern Rock itself which will provide further input into our approach to liquidity supervision in general.

1.10 Liquidity risk is also a significant issue, in particular, for major non-bank securities firms, and these firms are also typically also active in the same money and debt securities markets as banks. While these firms do not perform the maturity transformation characteristic of banking, many of the issues and findings covered in this DP will be relevant to them too. At present, such firms must meet the same high-level standards – based on Principle 4 – as banks, though no quantitative requirements apply. We will want to consider how far, and with what modifications, some of the ideas for a reformed liquidity regime for banks developed in this paper might in due course be applied to major securities firms.

**Who should read this paper?**

1.11 This paper directly affects all UK-regulated deposit-takers (banks and building societies), including branches of both EEA and other overseas banks operating in the UK. Major non-bank securities firms should also read it, for the reasons given above. It will also be of interest to other participants in the money markets, to various trade associations and to organisations representing banking consumers. The paper does not directly affect credit unions or electronic money institutions.

**Consumers**

This paper relates to liquidity policy, which is a regulatory tool we use to reduce (but not eliminate) the risk of banks failing. It also reduces the impact of bank failures if they occur. This helps us meet our statutory objectives of maintaining market confidence and securing the appropriate degree of protection for consumers. Any change to liquidity policy resulting from the ideas and analysis in this paper may affect consumers indirectly. This is because such a change may reduce further the low probability that a bank cannot meet its liabilities, and fails, but may at the same time increase the costs that all banks face in maintaining liquidity against that contingency. Those costs, in turn, may be passed on to consumers in the pricing of products and services. Although we do not think this paper will be of direct interest to individual consumers, we think it will be of interest to organisations that represent, or comment upon, the interests of banking consumers.
Summary of issues

1.12 In Chapter 2 we look at what we mean by liquidity risk, and what the objectives of our liquidity policy should be. We describe the dependencies on the work flowing from the joint October DP, and what is happening on the international front. Chapter 3 sets out our market failure analysis and comments on cost benefit issues.

1.13 In Chapter 4, we examine what lessons can be learned from the experience of market turbulence during the second half of 2007. Chapter 5 then reviews our existing liquidity requirements for banks and building societies, and considers the strengths and weaknesses of those policies.

1.14 In Chapter 6 we set out, at a more detailed level, preliminary ideas for the reform of liquidity regulation including, in particular:
   - what outcomes are desired;
   - why quantitative requirements are necessary;
   - why, and how, we should differentiate between banks; and
   - how access to central bank facilities should be factored in.

1.15 Finally, in Chapter 7 we review how information on liquidity is reported to us, how this is already being improved and what further changes we envisage.

Conclusions

We set out preliminary ideas for reforming our regulation of liquidity, within the context of our more principles-based approach, and based on our existing high-level standards for adequacy of financial resources:

- The responsibility of banks’ boards and management needs to be re-emphasised;
- The application of our qualitative requirements e.g. for stress testing, needs to be toughened;
- We think quantitative liquidity requirements – within a mismatch-type framework – are necessary, in view of some of the market failures we identify;
- Within such a framework, we think there also remains a need – at the short end – for a buffer of highly-liquid assets to ensure immediate survival in stressed conditions. And this need should be extended to a wider range of banks.

Next steps

1.16 We welcome comments on the analysis and issues raised in this Discussion Paper: these need not be limited to responding to the specific questions in each chapter. We will continue, in the meantime, our useful dialogue with the trade associations covering the whole banking sector. After considering the responses to this paper, and taking stock of other relevant work by the Tripartite Authorities, and regulatory developments on liquidity in Basel and the EU, we expect to publish more definite proposals for taking forward our liquidity policy during the summer of 2008.
2 Liquidity risk

What is liquidity risk?

2.1 A bank’s role in financial intermediation – transforming the maturity of short-term deposits into longer-term loans – makes it inherently susceptible to the risk that creditors’ demands for repayment may outstrip the bank’s ability to liquidate its assets. So banks rely on ready access to the money and asset markets, where liquidity is reallocated from bank and non-bank participants with surplus liquidity to those with liquidity needs. In an orderly, functioning market, an adequately capitalised bank should always be able to obtain additional liquidity. However, this may be hampered or obstructed by market failures, such as asymmetric information, leading to uncertainty about a participant’s true net worth and creditworthiness. This can occur when the market is uncertain about the primary risks faced by a particular firm or class of firms – such as credit risk, market risk and operational risk – but also because more widespread uncertainty leads a wide range of market participants, including those who would normally be the providers of liquidity, to hoard liquidity due to uncertainty about their own needs. This may severely limit the market’s willingness to reallocate liquidity, at prices which properly reflect the true risks, or even at all.

2.2 We define liquidity risk as the risk that a firm, although balance-sheet solvent, cannot maintain or generate sufficient cash resources to meet its payment obligations in full as they fall due, or can only do so at materially disadvantageous terms. The corollary is that liquidity risk management means mitigating the risk that a bank is not able to do this. This in turn requires reliable access to enough cash resources, at unpredictable times and to unpredictable extents, to meet uncertain cash flow obligations. Such access – and indeed the cash flow obligations themselves – depends on market and other external events and on other agents’ behaviour. Even during normal conditions this can be far from straightforward; stressed conditions, which are themselves often unpredictable, make it even more challenging and add extra layers of uncertainty to a task already surrounded by uncertainty.

10. Other firms (such as broker-dealers) do not typically carry out significant maturity transformation but may still face mismatches between the liquidity of assets and liabilities.
2.3 Our objective for liquidity regulation is to increase banks’ resilience to liquidity stress given the market failures described in paragraph 2.1 above, but balancing benefits against costs in the extent to which we pursue that objective. The main benefit is reducing the risk of a bank becoming unable to meet liabilities during periods of firm-specific or market-wide liquidity stress. This is relevant to our consumer protection objective but also – as a loss of confidence in one bank may spread to the banking sector more widely\textsuperscript{11} – to our market confidence objective. Other benefits include:

- Firstly, reducing the risk of asset sales at fire-sale prices that might prejudice balance sheet solvency and, if sufficiently widespread, disrupt the asset markets more widely; and
- Secondly, reducing the need for intervention by the authorities, with potential costs to the public purse.

Costs include the direct costs to banks’ profitability of holding increased liquidity but also the indirect consequences to the wider economy of any reduction in maturity transformation by the banking sector.

2.4 The previous paragraphs provide only a brief introduction to liquidity risk. More is said in Chapter 3 on market failure analysis, with references to the literature. Specific points (e.g. diversification of funding and access to the central bank) are explored further in Chapter 4 on ‘lessons learned’.

**Our current requirements – an overview**

2.5 We have three sets of quantitative requirements for three types of deposit-takers. The Sterling Stock regime applies to some UK retail banks and requires banks to hold Bank of England eligible assets to cover their five-day wholesale net outflow and 5% of retail deposits withdrawable over the same period. The Mismatch regime applies to all other banks and aims to assess whether a bank has enough assets to meet its liabilities in different time-bands on a maturity ladder. The Building Society regime requires societies to hold 3.5% of liabilities in high quality marketable assets, which extend beyond the Bank of England’s eligible collateral list. We discuss our current requirements in more detail in Chapter 5.

**Recent initiatives on liquidity**

2.6 We introduced our current approach to stress requirements for liquidity risk on 31 December 2004, which applies to non-bank investment firms, as well as banks, and can now be found in SYSC 11\textsuperscript{12} of our Handbook. It requires firms to undertake stress testing and scenario analysis of their liquidity needs, develop contingency funding plans for dealing with possible liquidity crises and document their liquidity-risk-management policy. SYSC 11 is applied on a bespoke basis, according to the size, nature and complexity of the firm.

\textsuperscript{11} This is often referred to as contagion risk.
\textsuperscript{12} Our sourcebook on Senior Management Arrangements, Systems and Controls, see http://fsahandbook.info/FSA/html/handbook/SYSC/11
Previously, in October 2003, we had proposed a different approach with the publication of DP 24. We planned to introduce a common qualitative regime for all banks, applied mainly on a legal entity basis, but which in some cases allowed recognition of groups. The approach was mismatch based, with prescribed stress factors, based on stress behaviour, with limits set in the one week and one month time-bands. However, this was not taken forward as the proposed stress factors were insufficiently adaptable to the individual circumstances of each firm. So we decided not to follow through with DP 24 and instead to place emphasis on the stress-testing requirements described in paragraph 2.6 above, while also retaining – pending international / EU consensus – the existing quantitative regimes.

Objectives of FSA policy

We want to ensure that our liquidity policy helps achieve our broad statutory objectives of market confidence and consumer protection, by seeking to avert bank failures and other consequences (as described in paragraph 2.3 above) caused by illiquidity.

We can identify the following more specific outcomes – that every bank takes reasonable steps:

- to prevent or avoid firm-specific liquidity stresses – we pursue this objective mostly through managing and regulating primary risks faced by a particular firm or class of firms, such as credit risk, market risk and operational risk (including especially reputational risk and IT resilience risk). This is not discussed further here as it is outside the scope of this discussion paper; and

- to withstand a firm-specific or market-wide liquidity stress of significant severity in order to remain able to meet liabilities as they fall due and to do so without needing to take actions – such as large-scale asset sales at fire-sale prices or access to emergency central bank lending – that might disrupt market confidence.

These are clearly preventative, concerned with reducing the ‘probability of default’: they contribute towards an overall outcome that consumers are confident to hold their cash savings with banks, and face a very low risk of loss of savings or interruption to banking facilities. And they complement the objectives of the banking reform project outlined in the joint October Dp13, which are remedial, concerned with reducing the ‘loss given default’ – that is, primarily addressing the situation where a bank is already about to fail.

Within this frame of reference, our detailed policy should lead banks to manage their own liquidity in such a way that these objectives are achieved. This must involve banks assessing their own exposure to liquidity risk, and holding enough liquidity to withstand the impact of the risk when it crystallises. Banks also need to understand what tools and options are available to them in the event of a significant market-wide shock, including their access to central bank liquidity.

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13. Paragraph 2.10 of Banking reform – protecting depositors: a discussion paper

10 DP07/7: Review of liquidity requirements (December 2007)
Q1: Have we established the right objectives for liquidity policy? If not, what alternatives would you suggest?

2.11 Beyond that, we work with the Bank of England and the Treasury to ensure that severe shocks can be properly managed by firms and the authorities so that spill-over effects to the financial system can be contained.

The central bank's role in providing liquidity

2.12 A fundamental part of the context within which any prudential liquidity requirements for banks operate is the basis on which the central bank supplies domestic currency, either to the market as a whole (as part of its monetary operations, or to relieve market stress) or to individual banks unable to satisfy their urgent liquidity needs in the market.

2.13 The Bank of England's framework for its normal operations in the sterling money market is set out in the 'Red Book' and associated documentation. The most relevant part for this discussion is Objective 2:

An efficient, safe and flexible framework for liquidity management – both in competitive money markets and, where appropriate, using central bank money – in routine and stressed, or otherwise extraordinary, conditions.

2.14 The Red Book also provides a helpful summary of how its published facilities can help banks manage liquidity in both normal and stressed conditions:

The Bank provides three main channels through which liquidity can pass between it and the banking system – variation in reserves balances, OMOs17 to provide financing to the market as a whole, and use of standing facilities. UK banks and building societies can build these arrangements into their sterling liquidity planning, both routine and emergency, alongside raising funds in the money markets or, where available, by drawing on committed lines. In the case of major operational or financial disruption to the wider market or its supporting infrastructure, the Bank can operate within its framework to meet demand for additional liquidity and to increase its intermediation of the interbank flow of funds while maintaining market interest rates in line with the official Bank Rate.

All UK banks and building societies that are required to hold Cash Ratio Deposits at the Bank are eligible to join the reserves averaging scheme and to have access to the standing facilities. The Cash Ratio Deposit regime finances the Bank’s monetary and financial stability functions. One of its rationales – as set out by HM Treasury – is that UK banks and building societies benefit from the Bank’s provision of liquidity services, which lies at the heart of its monetary and financial stability mission. The Bank’s framework delivers this by giving such institutions right of access to remunerated reserves and standing facilities as liquidity management tools, as well as by providing liquidity to the system as a whole via OMOs.

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17. The Bank uses open market operations (OMOs) to provide sufficient central bank money to the market to enable reserves scheme members in aggregate to meet their targets. OMOs comprise short-term repos, long-term repos, and outright purchases of bonds.
Individual institutions also need to have plans to manage liquidity in times of stress. Smaller banks can obtain liquidity ‘insurance’ from larger banks by paying for committed lines of credit. But larger banks cannot buy insurance from each other, without incurring an unacceptable level of (contingent) counterparty credit risk. They have to self-insure, which they do in sterling by holding either balances on their reserves account at the Bank or high quality assets that can be exchanged for central bank money in the Bank’s OMOs or through the standing lending facility\(^{18}\). The Bank’s framework is designed to provide flexible access to central bank money, including in unlimited size against eligible collateral at a penalty rate through the standing lending facility. Banks can therefore make their contingency liquidity plans in the knowledge of the terms on which the Bank’s facilities are available. In the United Kingdom, the Financial Services Authority treats reserves balances with the Bank (which are the final settlement asset in sterling) and assets that are eligible collateral in the Bank’s operations as high-quality liquid assets for the purposes of liquidity regulation.

2.15 Moreover, the Bank positively encourages access to the standing facilities for all eligible banks and building societies\(^{19}\):

All other banks and building societies that are required to place CRDs at the Bank are also eligible to have access to the standing facilities. Provided that the Bank is satisfied that the legal documentation underpinning its operations is, and remains at all times, fully valid and robust in all relevant jurisdictions, the Bank believes that all such eligible banks and building societies should sign up to have access to them. That is because wide participation in the Bank’s standing facilities makes the UK banking system more robust in stressed conditions.

2.16 Behind this framework lies the recognition that central bank money underpins the working of the short-term money market; and that individual banks may from time to time need to use the Red Book facilities to meet their day-to-day liquidity needs and reserves targets. If, due to the pattern of its payment flows, an individual bank finds that it needs additional liquidity, it can use the standing facility on demand. Provided it has made the necessary arrangements, it can access it on publicly known terms and against a transparent list of eligible collateral comprising the highest quality debt securities.

2.17 The central bank also has the power to go beyond these facilities and to provide support as ‘lender of last resort’ (– known in other centres as ‘emergency liquidity assistance’ – (ELA). Such assistance is discretionary, and can in principle be provided in many different ways, at terms and against collateral determined in the individual case. Because it goes beyond the Bank of England’s published framework for operations in the money market, it constitutes a ‘support operation’ within the terms of the Tripartite Memorandum of Understanding. It would therefore normally only be undertaken in the case of a genuine threat to the stability of the financial system to avoid a serious disturbance in the UK economy; and ultimate responsibility for authorisation of such operations rests with the Chancellor of the Exchequer. For these reasons, ELA cannot be relied upon in banks’ liquidity planning. But it does provide an additional safeguard, beyond banks’ own prudent planning for severe liquidity shocks, against the risks that those shocks may occasionally pose to the financial system as a whole.

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18. Where they have significant activities in currencies other than sterling, they may also need to make plans to raise liquidity from the relevant overseas central banks, taking into account the relevant operational frameworks.

2.18 Banks active in more than one currency need to manage their liquidity risk accordingly. Internationally active banks may also have access to liquidity, in currencies other than sterling, from the central banks of other countries or monetary zones in which they operate. But for a bank to use liquidity denominated in one currency to meet a liquidity need in another currency it has to have access to the foreign exchange swap market – to a counterparty willing to exchange currencies in the opposite direction. This is not guaranteed, for example because of lower liquidity in either of the two relevant money markets or because of counterparty credit risk concerns. Nevertheless, diversification is generally a positive feature in risk management, so access to a range of central bank facilities – other things being equal – should enhance a bank’s resilience to liquidity shocks and, where available, is a desirable component of robust multi-currency liquidity management.

Q2: How well is the role of central bank standing facilities in banks’ liquidity risk management understood? Should all UK banks be required to sign up to these facilities, or (if they do not have access) have an agreed alternative in place?

Dependencies on other banking reform work

2.19 Our work on developing liquidity policy also needs to be informed by the other work described in the Tripartite Authorities’ October Discussion Paper on banking reform. This DP covers work on the maintenance of critical banking functions, and the possibility of further enhancement to the compensation coverage of bank deposits, both of which should contribute to the overall desired outcomes for consumers. We should also take account of the extension of 100% deposit protection to the consumer’s first £35,000 of deposits (which was introduced as a matter of urgency on 1 October 2007 in the interests of consumer protection). We do not think this other work needs to change the fundamental approach to bank liquidity, but the results will need to be taken into account in the re-design of the detail of our liquidity requirements, and can be expected to influence the cost-benefit analysis of any specific measures.

Q3: How should the wider banking reform work influence the reform of liquidity policy?

International developments

2.20 There are two authoritative international statements on liquidity. The Basel Committee produced its Sound Practices for Managing Liquidity in Banking Organisations in February 200020 and the Joint Forum’s Working Group on Risk Assessment and Capital21 produced a report on the Management of Liquidity Risk in Financial Groups in May 200622. These statements, especially the more recent study by the Working Group,

21. The Joint Forum was established in 1996 under the aegis of the Basel Committee on Banking Supervision (BCBS), the International Organization of Securities Commissions (IOSCO) and the International Association of Insurance Supervisors (IAIS) to deal with issues common to the banking, securities and insurance sectors, including the regulation of financial conglomerates.
provide valuable insights into the key issues in the management and regulation of liquidity risk especially in cross-border, multi-currency or cross-sectoral contexts. However, fundamental differences in national liquidity regimes remain. These are due in part to the different national regulatory traditions, but also to different contextual factors, such as deposit protection schemes and national rules on emergency liquidity assistance and bank resolution. For this reason it has not yet proved possible to agree a harmonised international approach to managing liquidity at the level of detail that would be especially relevant and desirable for internationally-operating banking groups. The result has been that international policy work on liquidity has made much slower progress.

2.21 In a renewed attempt to determine a consistent international approach to liquidity, the Basel Committee began at the start of this year a stock-take of existing national practices. The intention was to understand:

- the differences as well as the similarities between national approaches;
- the different contextual factors, such as deposit protection schemes and national rules on emergency liquidity assistance and bank resolution, which determine the individual nature of the national regimes;
- the consequences of current diversity of approach for supervisors and for banks; and
- views on crisis management techniques and objectives.

Following the onset of market turbulence in August, it was agreed that work on this ‘intelligent stock-take’ would be expanded to include a first assessment of lessons learned from these events and recommendations for the future direction of work on a new international agreement on liquidity, to be discussed by the Committee. The Committee will report on progress to the Financial Stability Forum ahead of its report to G7 Ministers in March 2008.

The Committee of European Banking Supervisors (CEBS)

2.22 In February 2007, the European Commission issued a call for advice to CEBS, which was divided into two parts. The first requested an update of the original Group de Contact stock-take in 2000 of member states’ liquidity regulations, taking account of the new accession countries and market developments impacting liquidity risk, and was finalised by CEBS in July 2007.

2.23 The second part of the call for advice asked for an in-depth analysis of other factors with implications for liquidity risk, which, to date, had not received enough attention. These include:

- collateral management, the impact of covenants on net liquidity positions, netting agreements, the distinction between banking and trading books and the analysis of concentration of liquidity sources;
- the increasingly complex interaction between market liquidity risk and funding liquidity risk;

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14 DP07/7: Review of liquidity requirements (December 2007)
• the increased use of internal approaches to managing liquidity; and
• the impact of payment and settlements system design, such as real time gross settlement.

The second part of the call for advice was originally due a response by January 2008. However, due to the ongoing turmoil in financial markets, the European Commission has provided CEBS with an extension to July 2008, so that CEBS can draw relevant lessons to learn and incorporate them into the final report.

2.24 The Banking Supervision Committee of the European Central Bank has its own workstream on liquidity. The mandate for this group, which was set up in the summer, focuses its work on practical issues arising from stress-testing and contingency funding plans. Its work will involve engagement with industry across the EU and it is expected that its findings will complement both the Basel and CEBS work.

Work by International Banks

2.25 International banks have worked together very effectively on liquidity risk management issues. In March this year, the International Institute of Finance (IIF) produced a detailed report24 containing a long list of recommendations for firms to address on a ‘comply or explain’ basis, as well as proposals for supervisors and central banks. There is a wealth of valuable material in this report, which we have sought to take into account in writing this discussion paper.

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3 Market failure and cost-benefit analysis

Market failure

3.1 We normally conduct a market failure analysis before considering making new rules in any market. If this analysis finds there is no market failure, there will usually be no case for regulatory intervention. In current debates over bank liquidity, we anticipate broad agreement that a risk of serious problems exists and that regulatory authorities should attempt to reduce this risk. It is still useful, however, to analyse the origins of this problem.

Liquidity risk in a well-functioning market

3.2 To define market failure, we consider how firms would behave in a ‘perfect’ market. In such markets, opportunities would exist for firms fully to insure against uncertain future events such as fluctuations in interest rates or in the supply of credit. Further, shareholders would understand firms’ exposure to various risks and push managers fully to insure against them. Also, in perfect markets, the quality of banks’ collateral would be transparent, so the market’s willingness to lend against given collateral would not shift suddenly.

3.3 We think firms can fail even in a well-functioning market, and that firm failure is a means by which markets ‘weed out’ risky or mistaken business models. However, our society is reluctant to bear the consequences of a bank failing, if it has large deposits or a key role in the payment system. So society may prefer regulators to attempt to ‘weed out’ banks’ mistakes in managing liquidity and other risks before markets do so.

3.4 Recent events have highlighted that even banks that appear otherwise solvent can suffer liquidity problems, for several reasons. Creditors may be uncertain about a bank’s solvency position, leaving them unwilling to lend even though the bank may be fundamentally solvent. Even if they do not doubt the bank’s solvency, they may doubt that it is liquid and so that if they make short-term deposits they will not be repaid in a timely fashion. This may be compounded by the fact that a ‘run’ on a bank can be self-fulfilling: even if the ‘run’ starts on the basis of unfounded rumours that it might be insolvent or illiquid, the ‘run’ itself may lead to the outcome feared. For example, in trying to generate cash to repay creditors, the bank may suffer losses (from ‘fire-sales’) and become financially weakened. A ‘run’ by some creditors may lead other creditors that previously did not doubt the bank’s liquidity to fear that the
‘run’ will deplete its liquid assets. That being the case, once a ‘run’ has started or even if one is feared it may be individually rational for creditors to ‘run’.25

*Market failures that may induce firm errors in managing liquidity risk*

3.5 Market failures may mean that banks make less provision for liquidity risk than they would in a well-functioning market. There are three main reasons for this:

- First, liquidity stresses are low-frequency, but extreme severity, events that are not well-understood. In contrast, holding a high stock of liquid or short term assets imposes an immediate and on-going cost. So there is a temptation, even if irrational from a long-term perspective, for management and shareholders to neglect this risk, especially if they have had no recent experience of liquidity stresses. In the immediate future this is perhaps less likely as recent events have focused the attention of all on liquidity risk. However, we need to build a liquidity regime that will remain effective even when recent events have ceased to be as vividly present in the perceptions of management and shareholders.

- Second, even if some banks mitigate their liquidity risk they face a competitive disadvantage if other banks do not and therefore have lower costs. As liquidity stresses are low-frequency, but extreme severity events, this disadvantage may endure for long periods of time. In a perfect market, these other banks would not be able to exploit this cost advantage, as depositors and other counterparties would be reluctant to do business with them because of their failure to mitigate liquidity risk. In practice, it is often difficult even for wholesale depositors or counterparties to assess from the outside the liquidity position of a bank, and almost impossible for a retail depositor or investor to do this – see paragraphs 3.10 to 3.11 below for further discussion. Further deposit insurance significantly reduces incentives for some retail depositors even to attempt to do this.

- Third, there is a market perception that central banks will intervene to supply liquidity during a market-wide stress and, at least for banks whose failure might have systemic consequences, for a firm-specific stress. This perception reduces the incentives for banks to mitigate their own liquidity risks, and for depositors and other creditors to avoid doing business with banks that fail to do so. This creates a moral hazard. Further, to the extent that this perception wrongly anticipates that there will be action by central banks, depositors and other counterparties may be exposed to the risk of loss. Even where the perception is accurate, risks remain as central bank lending to a specific bank may, if publicised, lead to a loss of confidence in that bank. See paragraphs 3.8 to 3.9 below for further discussion.

3.6 So, although managers and shareholders have strong incentives, arguably without regulation, to build in some resilience to liquidity stress, these incentives may be insufficient. This would not be a problem if the consequences of a bank’s insufficient resilience to a liquidity stress were confined solely to loss to shareholders and managers, but this is not the case as we may anticipate wider effects. These include depositors and other creditors losing some of their deposits or claims, and borrowers losing the

25. Well-designed deposit insurance schemes mitigate this problem.
continuity of an established bank relationship and as a result possibly encountering problems accessing new funding, particularly in the short term. Other banks may also suffer through direct financial exposures and declining asset values as a result of fire-sales of assets by a troubled bank to raise liquidity. And if the problems at one bank are interpreted as a signal of possible problems in another, they may also suffer possible reputational contagion. In these ways, losses may spread through the financial system.

3.7 Another complication, and arguably a possible source of market failure, is that a bank’s liquidity need may be bigger than the amount which counterparties are able or willing to lend. Or counterparties may refuse to lend because of uncertainty over whether they themselves will be able to borrow if a secondary liquidity shortage arises, as occurred in the recent episode (liquidity ‘hoarding’).

Public policy that may encourage firms to manage liquidity risk inadequately

3.8 Public interventions may also induce firms to manage liquidity risk poorly. If the social costs of failure are large, the central bank may provide emergency liquidity assistance (ELA), which compensates for banks’ own inadequate defences against liquidity shocks. Recent experience suggests that this is not an attractive option for a bank, because of the ‘stigma’ attached i.e. the adverse signal it sends to other market participants. But if ELA is advanced too readily, or at rates which are not sufficiently unattractive, it may further reduce managers’ and shareholders’ incentives to manage liquidity as carefully as the wider costs of failure would justify (i.e. ‘moral hazard’).

3.9 Academic work has found support for the hypothesis, mentioned in paragraph 3.5, that expectations of central bank support could discourage banks from providing for liquidity risk, as banks hold smaller ‘liquidity buffers’ in countries where the central bank is a more willing lender of last resort (LOLR)\(^{26}\) – an instance of moral hazard. But further studies suggest that it is the terms of LOLR funding, rather than its existence, which determines the extent of moral hazard.\(^{27}\)

Unique features of liquidity risk problems

3.10 Liquidity risks appear to differ from other business risks in at least two ways. First, liquidity risks can grow in severity very rapidly. Once rumours that bank X is in trouble emerge, depositors may withdraw funds from it very quickly, in part because the existence of a bank run increases each depositor’s incentive to withdraw his or her funds. Since it is hard for depositors to assess the viability of individual banks, fears about bank X could also quickly spread to other banks.

3.11 A second special feature of liquidity risk appears to be that it is hard to predict. Commentators have recently argued that banks’ internal stress tests have underestimated the risk of a liquidity shortage. Indeed, if panics and herd behaviour contribute to liquidity shortages, it might well be hard to assess their probability from historical data.


**Non-bank investment firms**

3.12 Much of the above discussion also applies to many non-bank investment firms such as broker-dealers. Especially for the large securities firms the costs of failure would extend beyond their immediate customers and counterparties as their extensive positions might cause significant disruption to asset and derivative markets. Further, as recent events show, the liquidity of retail and commercial banks now depends not solely upon the actions of their own depositors but also upon the liquidity of the money markets and key assets markets such as the securitisation, covered bond, currency swap and repo markets. The failure, due to a lack of liquidity, of a non-bank firm that is a key player in any one of these markets might lead to contagion to the banking sector with consequences for its liquidity.

**Cost-benefit analysis**

**Benefits of regulation**

3.13 In principle, liquidity regulation should make liquidity crises less frequent. The benefit of crises prevented is their probability multiplied by their cost, were there no such regulation. The probability of liquidity crises appears low – although, as recent events show, they do happen and when they do they can be very severe. Such crises could have negative effects short of the failure of a bank. These could include sharp falls in profits, large-scale asset sales at fire-sale prices that disrupt asset markets and sudden changes in the volume and terms of bank loans, which might reduce activity in the wider economy.

3.14 Liquidity crises could, in the extreme, lead to the disorderly liquidation of a bank, or a securities firm that holds significant assets and/or derivative positions. The social cost of a large bank failing would be very large. The social cost of a small bank failing would be considerable, though possibly on the same scale as past events our society has tolerated, such as the collapse of some defined-benefit pension schemes. The costs of a government or central bank acting as LOLR to prevent bank failures are not clear, but could include the taxpayer buying banks’ assets whose credit or market risks exceed the government’s normal risk appetite.

**Costs of regulation**

3.15 Forcing banks to increase their provisions against liquidity risk would be costly for them. Regulation would either force banks to hold more liquid assets than they would otherwise choose, or to establish costly tools to provide liquidity in an emergency, such as lines of credit. More liquid assets tend to have lower returns than other assets. In addition to these direct costs to banks and firms there would be indirect costs especially if regulation reduces maturity transformation carried out by banks. This could reduce the supply, and increase the cost of secured and unsecured lending to business and consumers, with potential consequences for the housing market in particular and the economy more generally.
3.16 A relevant question for future debates will be the relative costs and benefits of different types of liquidity regulation, such as qualitative and quantitative regimes. Qualitative liquidity regimes may be more flexible, but could be costly in supervisory resources. These regimes could also be more prone to errors and oversight than some types of quantitative regime. Conversely a quantitative regime even if executed as intended may prove less able actually to mitigate any particular firm’s liquidity risks as it would be less bespoke in its application.

Q4: Are there other market failures or cost benefit issues that we should consider?
4 Lessons learned from recent events

Work ahead and some provisional conclusions

4.1 As part of the ‘lessons to be learned’ exercise, we need to understand how banks’ internal liquidity measurement, management and reporting systems are coping with the challenges that have embroiled financial markets over the past months. Also, what lessons need to be learned as to how to assure effective mitigation and diversification (e.g. by counterparty, market and product) of liquidity risk, especially during times of market turbulence? Responses to the questions we pose to banks in this chapter will help us learn from their experience of liquidity stresses so we can build on this when designing a new liquidity regime.

4.2 We are aware that it may be too early to draw definitive lessons from a liquidity stress that may still not have run its course. But we feel that it is already safe to conclude that any considered analysis of recent events will expose some clear limitations in liquidity risk management. These include:

- first, the quality and robustness of individual banks’ liquidity stress testing;
- second, their use of liquidity ‘insurance’;
- third, the quality and effectiveness of the contingency plans put in place to deal with stressed circumstances; and
- fourth, the nature and frequency of the information available to us on the liquidity position of banks.

This final issue will be addressed in more detail in Chapter 7.

4.3 We believe that the description of ‘lessons to be learned’ set out below, even though only preliminary, will be of direct relevance to banks as they carry out their own ‘lessons to be learned’ reviews as well as for us as we develop the future framework for liquidity regulation. However, a degree of caution is needed here. The focus of the management and the regulation of liquidity should be on possible future stresses and not solely on the prospect of an exact repeat of the immediate past stress. There are lessons to be learned from the immediate past, but these alone are an insufficient guide for reform for the future.
Stress testing

4.4 Stress tests are a primary, fundamental tool almost universally used by banks in managing liquidity risk. The key strength of this tool is that banks may use it to quantify their exposure to possible future liquidity stresses as the basis for taking mitigating actions to reduce that exposure to fit their risk appetite. It is also the primary way in which banks comply with our high-level qualitative requirements for liquidity. However, a stress test is only as good as the methods and assumptions that are used to construct it. Recent events carry some clear lessons on ways in which these may need to be improved. These include the following.

4.5 Recent events highlight the need to carry out stress tests for both firm-specific and market-wide stresses. A firm-specific stress considers only the circumstance of a firm-specific negative event (such as a multi-notch ratings downgrade) but in the context of markets remaining benign. A market-wide stress test considers a wider disruption of one or more primary or secondary markets (e.g. wholesale deposits, corporate paper, certificates of deposit, secured finance such as repo, covered bond, securitisation etc). These different types of stress, firm-specific and market-wide, tend to identify different sources of liquidity risk. Also, mitigation actions that are effective in one type of stress (e.g. secured finance in the context of a firm-specific stress) may not be available in the other type of stress (e.g. a closure of the secured finance repo market). It is therefore important for banks to carry out both types of stress test. It is not sufficient to carry out solely a firm-specific stress and argue that this provides a sufficient proxy for the outcomes that would occur during a market-wide stress.

4.6 Stress tests should consider both ‘chronic’ and ‘shock’ plausible liquidity stresses. A ‘shock’ stress is an extreme, but short duration (e.g. a few days or weeks) stress. A ‘chronic’ stress is less severe but may continue for several months. Recent events have been a ‘chronic’ stress – the wholesale deposits, corporate paper and certificates of deposits have not closed completely for a short period of time, rather they have remained open but for the last several months we have seen decreased volumes and significant maturity shortening.

Q5: How did your liquidity planning address (i) both firm-specific and market-wide scenarios and (ii) both ‘chronic’ and ‘shock’ plausible liquidity stresses?

4.7 The market-wide stress tests need to take account of plausible disruptions and closures of not only the unsecured funding markets, but also of the secured funding markets, and also of both at the same time. Stress tests that focus solely or mainly on unsecured funding make the implicit assumption that – except perhaps for short periods of time – secured finance would always be available against the collateral of high quality assets. This in fact has proved not to be the case during recent months.

4.8 Stress tests need to contemplate prolonged lack of access to sources of long term funding, such as securitisations, medium term notes and covered bonds, which might be closed off to them for several months. Banks’ stress tests tend to do this, but (as is discussed more fully below) they tended to link this to planned mitigations such as placing greater reliance on short-term finance, especially secured short-term finance.
This implicitly assumes a low correlation between those short-term markets and the long-term markets which in fact has proved not to be the case in recent months.

4.9 Recent events have stressed the importance of diversification of funding sources – by counterparty, by market and by product- as a liquidity risk management tool. However, assumptions as to how effective diversification across sources of funding will be during a liquidity stress should be cautious. In recent months, diversification across funding product types, e.g. wholesale deposits, corporate paper, certificates of deposit, secured finance such as repo, covered bond, securitisation etc, has only proved to be of limited use. Simultaneously, there has been a complete closure of the securitisation market, a near-complete closure of the covered bond market and decreased volumes and significant shortening of duration in available wholesale deposits, corporate paper or certificates of deposit funding. And this has all occurred simultaneously in the major currency zones – Euro, US$ and sterling.

Q6: How did your market-wide stress tests take account of disruptions both in the unsecured funding markets and in the secured funding markets (and both at the same time)? What were your assumptions on the correlation between short-term funding and long-term funding markets and on the effectiveness of diversification across sources of funding during a liquidity stress? Do you plan to revise your assumptions?

4.10 Stress tests should take account of plausible stresses from off balance-sheet vehicles (such as conduits etc.) arising from legal or reputational links between the vehicle and the bank carrying out the stress test. Often such vehicles themselves engage in maturity transformation by funding longer term assets with short term commercial paper. Stress tests that ignore off balance-sheet vehicles, or that only refer to legally binding funding commitments from a bank to such vehicles, are likely to understate the full economic exposure of that bank to liquidity risk during a stress event. In recent months some bank sponsors of some off-balance sheet vehicles have voluntarily assumed funding responsibility for those vehicles when they became unable sufficiently to fund themselves.

4.11 Stress tests need to make cautious, well-researched behavioural assumptions as to when, and for how much, during a liquidity stress, a bank’s customers and counterparties would draw down on the contingent funding commitments made to them by a bank. At a prosaic level the point here is that as these commitments are off-balance sheet there is a temptation to overlook them, but the more substantive point is that simple assumptions as to how, and for how much, such funding promises will be drawn down are likely to be inadequate and unrealistic. A detailed granular analysis as between the different types of customer and counterparty is needed to understand the circumstances in which those customers and counterparties would draw down on the promise and whether, and to what extent, those circumstances are correlated to each other across customers and counterparties and as between them and the circumstances that give rise to liquidity difficulties for the bank’s on balance-sheet operations. Where the underlying business risks of the counterparty are similar to that of the bank, e.g. maturity transformation or funding credit risk etc., a high degree of correlation should be assumed.
Q7: How far were contingent exposures arising from both on-balance sheet and off-balance sheet activities incorporated into your liquidity planning? How did your behavioural and correlation assumptions compare with recent events? How will you revise your assumptions?

4.12 Stress tests should only make cautious assumptions as to a bank’s ability during time of stress to swap liquidity in one currency for liquidity in another currency, to move liquidity across time zones or to move liquidity from one legal entity to another. Diversification of sources of liquidity across more than one currency is a source of strength, and during the liquidity stress in recent months banks have in the main been able to swap liquidity in one major currency to another, but not necessarily always in a timely way, for the large amounts they have wanted to, and within normal price ranges. Practical considerations may sometimes make it difficult to move liquidity across time zones. Legal constraints may hinder the transfer of liquidity as between legal entities, especially during times of stress.

Q8: To what extent have constraints in cross-border liquidity (e.g. trapped pools of liquidity, time zone differences, freezing of FX swap markets) and regulation (e.g. large exposure limits on intra-group lending and other rules and legal restrictions) impacted on your liquidity management during the market turmoil?

4.13 The stress testing for retail deposits needs to be significantly more granular than perhaps is typically the case. Recent events suggest that some sources of retail deposits tend to be significantly less sticky during a stress than others. At a high level, we might identify the following as less sticky:

- retail deposits that have been acquired quickly through price-focused advertising, e.g. through offers that are designed to move the bank’s product temporarily to, or near, the top of the ‘best buy’ tables;
- large balance retail deposits, e.g. those that are significantly in excess of the £35,000 deposit protection ceiling;
- retail deposits from product offerings that are especially attractive to customers who actively manage their deposits or who have ‘wealth managers’ who act on their behalf; and
- retail deposits raised through on-line accounts where the technology makes switching a less burdensome process (but the evidence here is arguable).

Q9: In light of recent events, how would you improve the stress testing for retail deposits, including the behavioural assumptions used in stress scenarios?

4.14 Stress testing results should inform and challenge the ongoing liquidity management at firms and serve as triggers for senior management to consider remedial action (e.g. revisiting limits, reducing exposures, implementing risk mitigation techniques, diversifying the firm’s funding base, holding of central bank eligible assets, access to
committed credit lines). To be effective, stress testing must also translate into a detailed contingency funding plan.

**Q10**: How severe was your firm’s experience of the market turmoil? Describe how your firm was exposed to a drying up of inter-bank funding and a flight to quality.

**Q11**: In what ways do you think stress testing – including the assumptions used to build stress scenarios - could be strengthened in light of recent events? How has the output from your stress testing informed and challenged your ongoing liquidity management? Please provide some examples.

**Liquidity ‘insurance’**

4.15 Banks have typically used one or more of these three approaches to holding a reserve of liquidity for use during a liquidity stress.

- A bank may hold a stock of ‘treasury assets’ with the aim of selling or raising secured finance on those assets to meet its stress liquidity needs.
- A bank may hold liquidity promises typically, but not necessarily always, from other banks.
- A bank may hold cash or near cash, that is very short-dated assets that mature or are redeemable.

4.16 Recent event have cast some doubt on the effectiveness in all circumstances of the first two approaches. This is explained more fully below.

**Treasury Assets**

4.17 The treasury assets many banks hold appear to have two purposes: First, they are held as a source of liquidity for use especially during a liquidity stress. Second, they are a source of interest revenue and, if the aim is to achieve an interest return that exceeds the bank’s interest funding cost, they are a source of profit. Recent events illustrate that, pursued too far, the second aim may negate the first.

4.18 A treasury asset is only a good ‘insurance’ for a bank against liquidity if the asset itself is not likely to become illiquid in the same circumstances as the bank experiences difficulties raising liquidity for other reasons. Recent events illustrate three problems in this respect:

- First, it is not clear that secured finance from mortgage backed securities or other asset backed securities (where the underlying asset is a credit asset originated by the banking sector) may be relied upon as a source of liquidity by banks in circumstances in which they themselves are finding it difficult to raise unsecured funding. The same market-wide credit or valuation concerns that focus on banks’ own loan books may also focus on such securities, causing them to become illiquid.

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28. Or even an asset originated by a non-bank but of the same nature as assets typically originated by banks, e.g. mortgages originated by a non-bank lender.
Recent events give a clear example of a problematic interaction between market and funding liquidity. The creation of conduits and structured investment vehicles was fuelled by cheap credit and the presumption of liquidity in the markets used to distribute the risks. The growth of lending surpassed the growth of deposits from the public and, as a consequence, the reliance on market liquidity to secure funding increased significantly. This adversely affected funding liquidity in two ways. Investors lost their appetite for mortgage backed securities and other asset backed securities, thus removing the securitisation market as a source of funding for issuers and intermediaries. Also, this has led to a decline in value of, and a disruption in the market for, the mortgage backed securities and other asset backed securities held as treasury assets by banks.

- Second, similar problems may even affect the liquidity of other securities if there is not a two-way market with potential purchasers extending significantly more widely than the banking sector. Recent events show that during a market-wide stress, banks tend to hoard liquidity and this tends to make illiquid those securities whose liquidity depends on the presence of bank purchasers in the market. In fact this problem may extend more widely even to all securities where banks (and banks’ off-balance sheet vehicles such as SIVs) hold a significant stock of the securities in issue. During a banking liquidity stress actual sales from banks might exceed the capacity of non-banks to purchase. Or even possible future large-scale sales from banks might discourage the non-banks from buying now for fear that they will subsequently experience mark-to-market losses should the forced sales by banks occur.

- Third, if the treasury assets that are held include structured products that are complex, and so difficult to value especially during a market-wide liquidity stress the uncertainty which results as to the potential value loss to a bank which holds those assets may itself undermine confidence in the bank and so make it more difficult for it to raise liquidity. Although to some extent this may be overcome by careful and timely disclosure by the bank of its positions to the market.

4.19 None of the above means that a bank should not hold securities of the types described in the above three bullet points. It simply means that it is questionable whether a bank should rely upon them to mitigate a market-wide banking liquidity stress. The wider lesson from recent events is perhaps that banks may need to adjust their policy for selecting treasury assets so that:

- the trade off between interest yield and reliable liquidity during a banking liquidity stress is shifted more towards the latter than the former;

- the factors that drive a security’s own liquidity, and the possible correlation between them and the factors that drive the banking sector’s liquidity, are appraised more thoroughly; and

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29. Of course if the securities are eligible as collateral at a central bank, a bank may also have the option of generating liquidity from the central bank, provided that it has direct or – via a counterparty relationship with another bank – indirect reliable access to that central bank. The Bank of England has on occasions been willing to accept a wider than usual range of collateral – in its auctions in late September and early to mid October, in which certain mortgage backed securities would have been eligible, and in the concerted action with other central banks announced on 12 December.
• structured products – especially those that might be perceived as complex by the market – are only held by a bank if it has a good understanding of the potential consequences of holding such assets. This would include being able to form its own view – without over-reliance on a structured product’s ratings – of its economic substance, having a clear and robust methodology for valuing such assets even during periods of market wide stress and having a clear and effective disclosure strategy to mitigate possible negative market perceptions of the bank that might occur during a market wide stress as a result of it holding such assets.

Q12: To what extent have your ‘treasury assets’ been affected by the liquidity freeze in the asset markets? What assets, in your opinion, can be considered consistently liquid?

Liquidity promises and liquidity facilities

4.20 For the purpose of this discussion, by a ‘liquidity promise’ we mean a legally binding pre-commitment from a counterparty to a bank, or to a bank’s off-balance sheet vehicle, to provide liquidity if called upon to do so. Sometimes the promise is conditional, e.g. on an off-balance sheet vehicle not finding a market for its commercial paper, but provided the condition is met the counterparty does not within the terms of the contract have discretion to refuse payment. By ‘liquidity facility’ we mean an agreement that allows, but does not compel, the counterparty to lend to a bank under terms that have already been fully and legally pre-documented.

4.21 During the recent market-wide liquidity stress, banks that held liquidity lines proved extremely reluctant to call upon them. There appear to be two main reasons for this.

• First, there was a perception that if a bank was seen drawing down on a liquidity promise this might be seen as sign of weakness. The fear was that this would damage the bank’s reputation and so make it more difficult to raise liquidity from other sources, possibly more than negating the help to liquidity gained by the draw down.

• Second, at least for some liquidity promises, there appeared to be a strong commercial expectation between the bank and the counterparty that the promise would not be called. And this is perhaps linked to the first bullet point, as drawing down against such an expectation would heighten the risk of damage to a bank’s reputation.

4.22 The above is a generalisation. Not all liquidity promises are made with the very strong expectation they will not be called, nor is a call necessarily a sign of weakness. In fact, some banks make routine use of calls unrelated to the occurrence of a liquidity stress. However, banks that intend to rely on liquidity promises as an effective mitigation technique in a liquidity stress need to understand how to overcome the limitations described above.

4.23 Further, it may be argued that too widespread a use of liquidity promises might be counterproductive at least where the counterparty making the promise is itself also a bank.
• There is the obvious point that such inter-bank liquidity promises increase inter-dependence within the banking sector. Actual inter-dependence within the banking sector, and more importantly wholesale and retail depositors’ and investors’ perceptions of inter-dependence, is an important source of contagion of reputational risk, and so also of liquidity risk, within the sector.

• However there is, perhaps, a more important point. Inter-bank liquidity promises may actually encourage liquidity hoarding by the bank that makes the promise (because it fears the promise will be drawn upon) without improving the position of the bank to which the promise is made. That bank, for the reasons already set out above, may fear that calling upon the promise would damage its market reputation, and so actually make its liquidity position worse.

4.24 While identifying some reasons why liquidity promises may not prove an effective mitigation technique in a liquidity stress, we still consider that they potentially have a role to play provided their limitations are addressed. Moreover, there is some evidence that liquidity promises do have particular uses for some firms, such as smaller banks—which may not have the scale efficiently to access other forms of funding—as a route to obtain liquidity insurance from larger banks.

4.25 In contrast to legally-committed liquidity promises, and perhaps at first glance paradoxically, discretionary liquidity facilities appear to have made some contribution in helping banks to manage their liquidity during the recent market-wide liquidity stress. There are two reasons for this.

• As the grantor of the facility is not pre-committed to make a payment it does not need to hoard liquidity to guard against this possibility.

• However, as the facility is in place and fully legally documented, it can typically be put into operation very quickly when both parties agree. In particular, secured financing facilities with counterparties with whom the bank has a strong pre-existing relationship, and which have been tested by actual transactions before the stress, appear to have worked quite well during recent months.

Q13: In your experience, what has been the role of liquidity promises and liquidity facilities in your liquidity management during the recent market-wide liquidity stress? How well did liquidity promises perform when and if called upon and did ‘committed’ lenders invoke material adverse change or market disruption clauses to refuse lending?

Mitigation actions

4.26 The contingency plan is the follow on step from the stress tests and the means by which a bank or firm mitigates the risks identified in the stress tests so as to reduce them to fit within its risk appetite. Recent events carry some clear lessons on ways in which these may need to be improved. These include:

• The importance of establishing counterparty relationships before the liquidity stress, especially in the short-term wholesale markets.
• The need, when planning for a liquidity stress, to understand that some actions that normally succeed in raising extra liquidity might be counterproductive during a liquidity stress as they damage a bank’s reputation.

• The importance, where practicable, of putting in place in advance some way of packaging on-balance sheet assets so that they can rapidly be sold or used to raise secured finance.

• The need to articulate a clear – and clearly acceptable - risk appetite in the contingency plan so that the effectiveness of the planned stress actions may be judged in advance against that risk appetite.

**Counterparty relationships**

4.27 An important lesson that recent events have once again highlighted is the importance of establishing strong counterparty relationships in advance of any liquidity stress. Here, especially for the short-term wholesale funding markets, there appears to be a diversity of practice, with some banks maintaining regular direct and personal contact with wholesale depositors, tracking their past and present behaviour with good granular management information, and building trust between each counterparty and the bank. There are two reasons why this appears to be important:

• One of the reasons for the disruption to the funding markets during a liquidity stress is the asymmetry of information between liquidity providers and a bank seeking liquidity. An established relationship of trust in which the bank has previously explained its business strategy and risks to its counterparties is one way, at least in part, of overcoming this during a liquidity stress. However, preparation is key here as seeking to establish the relationship for the first time only during the stress itself is unlikely to be as effective.

• When during a liquidity stress important counterparties cease to place new funds with a bank, it is important to understand why. Some banks track the recent (e.g. last 3 to 12 months) behaviour of counterparties and use this information to infer the internal limit that the counterparty has for their name. They then use this on an aggregate basis to get some idea of the remaining capacity that the market has for their name. They also compare the inferred limit for each major counterparty to the actual current behaviour of the counterparty. If the counterparty appears unwilling currently to lend amounts up to the total it has done in the recent past they discuss with the counterparty to find out whether this is due to a concern it has as to the bank’s name (i.e. has cut its name limit) or other reason, e.g. the counterparty itself has insufficient excess liquidity to make the investment.

4.28 Although the evidence here is anecdotal, during the recent liquidity stress, banks with strong relationships with counterparties in the short-term wholesale funding markets appear to have achieved higher retentions of short-term funds at better maturities.
Management of reputation during a liquidity stress

4.29 One of the defining characteristics of a market-wide liquidity stress is not only that the aggregate demand for liquidity expands as the supply contracts, but that for each bank there is a limit to which raising the rate that it is willing to pay in order to secure liquidity actually achieves more liquidity for that bank. During the liquidity stress an institution that bids up the price it will pay for liquidity or seeks liquidity in amounts or from sources that are unusual for it and so costly to it, risks being seen – not necessarily correctly – as signalling that it is short of liquidity.

4.30 The lesson to be drawn is that actions (such as bidding up price) that are normally successful in gaining more liquidity do not necessarily work during a liquidity stress and therefore may not be suitable for inclusion in a contingency liquidity plan.

Using on-balance sheet assets to raise liquidity

4.31 Recent events show clearly that a bank that has already put in place the necessary legal and other arrangements to raise funding before a liquidity stress has stronger resilience to liquidity stresses. In particular, recent events suggest the following:

- A bank that has a securitisation process, or covered bond issuance programme, is sometimes able to raise funding even during a stress by private placement of its own paper especially with counterparties with whom it has strong relationships. However, the lead time for the necessary audit and rating agency reviews for on-balance sheet loans before they may be placed even into an existing securitisation process or covered bond issuance programme may be several weeks. A bank with such a process or programme should consider putting some or all of its on-balance sheet loans through the audit and rating process so that they are ready to be put into the securitisation or covered bond pools at short notice.

- A bank that holds treasury assets to provide liquidity but that, before a liquidity stress, was not an active participant in the repo markets may experience operational and other difficulties in accessing those markets during a liquidity stress. Legal documentation etc. may take some time to be put in place. Also, if liquidity in the repo markets is low counterparties may, not unnaturally, prefer to deal only with banks with whom they have already established relationships. One way of overcoming this is to put in place repo facilities before a liquidity stress and to test those facilities by using them.

4.32 As a generalisation it is probably true to say that if a bank is not used to raising liquidity from a particular asset type before a liquidity stress, it will find it very difficult to do so during a stress, even if the secured finance markets for that asset remain partially open for pre-existing regular market participants. Similarly, it is likely that during a liquidity stress firms will be less able to structure sizeable securitisation programmes. Therefore, a funding strategy based on a more continuous series of smaller deals and/or on deals structured so that they can be reopened at a later date may prove more effective during a stress scenario.
Having a clear risk appetite

4.33 A bank needs in its contingency plan to articulate a clear – and clearly acceptable – risk appetite for the stresses against which it judges the adequacy of its contingency plans. Some stresses – such as a widespread retail deposit run – might be so severe that short of ceasing to perform the economic function of a bank (maturity transformation), a bank is unable to mitigate it once it has got going. The focus here would be on actions designed to reduce the risk of such a run occurring to a suitably low level. For other stresses – such as a more limited leakage of retail deposits – the focus might be both on seeking to reduce the risk of this occurring and on mitigating its effects if it were to occur. In that example, a bank might ensure that necessary liquidity was available from other sources to fund such a leakage, and that the physical infrastructure was in place to enable the payments to be made without disruption. The contingency plan should articulate not only how a bank mitigates the effects of stresses when they occur, but also the size, scale and nature of liquidity stresses for which it is intended to cater and those that go beyond its reasonable scope.

4.34 Senior management need to understand, own and approve the contingency plan and it needs to reflect, to the fullest extent that this is knowable in advance, how they would in fact behave during the liquidity stress contemplated. In the light of recent events, banks have an opportunity to revise their contingency plans to reflect this reality. The contingency plan needs to have clear decision points as to when it will be activated and clear escalation procedures detailing when each of the actions will be taken, including the use of liquidity support from the central bank. The importance of such triggers is not that management should unthinkingly follow them during a liquidity stress, but that during a liquidity stress they draw to management’s attention the need to consider actions.

Q14: Which of the courses of action contained in your contingency funding plans have been more useful in ensuring enough liquidity to remain operational? At what point and for what reason did you activate your contingency funding plans?

Q15: In what ways do you think contingency funding plans could be strengthened in light of recent events? Do you think that a necessary component of a contingency funding plan is to have access to a central bank’s standing facilities?

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30. As referred to in Chapter 2, the Bank positively encourages that all eligible banks and building societies have access to the Bank’s standing facilities.
5 Review of existing regimes

Introduction

5.1 Our high-level policy on the management of liquidity risk is already based on Threshold Condition 4 and Principle 4. Following the replacement of most of the former interim prudential sourcebooks by GENPRU\(^3\) and BIPRU\(^2\), the high-level rules requiring firms to maintain adequate liquidity, stress test their liquidity position in plausible but demanding scenarios, and develop contingency funding plans, are now the same for all banks and building societies. These are explained in more detail in the next chapter. However, for reasons explained last year in CP06/10\(^3\), we have for the time being continued the three distinct sets of quantitative liquidity requirements, inherited from predecessor regulators, for banks\(^3\) and building societies: these are the sterling stock and mismatch approaches for banks and the separate liquidity approach for building societies. In this chapter we briefly review each of these three approaches.

Sterling Stock regime

5.2 The Sterling Stock regime was introduced in 1996 and applies to some UK retail banks on a consolidated basis. There are 17 sterling stock banks at present and we agree with the individual bank whether this regime is to apply. The objective of the regime is to ensure that a sterling stock 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, to allow the authorities time to explore options for an orderly resolution. Therefore, the sterling stock regime should be considered as one component of a wider crisis management regime, and not as a means for managing mild stresses and day-to-day liquidity. The stock is limited to central bank eligible assets and assets held at the central bank itself (reserves balances), as they consistently deliver liquidity through sale or repo, with either the market or the central bank, and help mitigate the

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31. Our General Prudential Sourcebook, see http://fsahandbook.info/FSA/html/handbook/GENPRU
32. Our Prudential Sourcebook for Banks, Building Societies and Investment firms, see http://fsahandbook.info/FSA/html/handbook/BIPRU
33. CP06/10 ‘Strengthening Capital Standards – Restructuring the Handbook’, see paras 2.3 to 2.5 and 3.5 to 3.6 http://www.fsa.gov.uk/pubs/cp/cp06_10.pdf
34. In this chapter in contrast to the rest of the paper when we refer to banks we do not also include building societies.
need to raise liquidity at fire-sale prices, with costs to the wider economy resulting from downward pressure on asset prices. The calculation is as follows:

\[
\text{Stock of sterling liquid assets} \geq 100\%
\]

\[
\frac{\text{(Wholesale sterling net outflow over next 5 working days} - \text{allowable certificates of deposits)}}{\text{+ 5% sterling retail deposits contractually withdrawable over next 5 working days)}} \geq 100\%
\]

5.3 With the Bank of England we had already begun a review of the components of the sterling stock regime. It has a number of significant limitations in scope, some of which have become more evident during the events of the late summer:

- Sterling stock has less relevance for ‘chronic’ (as opposed to ‘shock’) liquidity stresses, which are less severe than the short-duration ‘shock’ liquidity stresses (in which all counterparty activity may be assumed to cease) but are of longer duration lasting for several months;

- Non-sterling liabilities are excluded from the calculation. While this may have been appropriate in 1996, today this means that a significant proportion of maturing liabilities across US Dollar, Euro and other currencies over the 5 five-day period are not covered;

- Certificates of deposit can be used to offset wholesale sterling liabilities by up to 50% with a 15% haircut. In stress situations, there may be few, or no, willing buyers of CDs as there may be a lack of confidence in the banking system;

- Off-balance sheet contingent liabilities are also excluded from the calculation. These include variation margin calls on derivative transactions, possible shortfalls in secured funding and committed funding lines, including liquidity facilities to securitisation conduits; and

- 5% of retail deposits are included as outflows. The experience of Northern Rock indicates this may no longer be a true reflection of possible retail behaviour over a five-day period.

5.4 Despite these limitations, we think the sterling stock regime makes a valuable contribution in two important respects. First, it helps ensure that in the aggregate across the banking sector as a whole there is a minimum stock of very high-quality assets that are eligible as collateral for the Bank of England and therefore readily realisable. Second, it helps ensure that banks are able to withstand a sudden short-duration extreme liquidity ‘shock’. Therefore, despite its limitations we think that – suitably revised – its features could be used more generally in a new quantitative regime.

5.5 Banks subject to the sterling stock regime are required to set an internal limit on their wholesale sterling net outflow over the next five days. Its purpose is to limit short-term wholesale funding volatility. The wholesale sterling net outflow is calculated by subtracting wholesale sterling assets maturing over the next five days from wholesale sterling liabilities falling due over the same period. Banks are also required to agree a sterling stock floor with the FSA, which is normally set at 50% of the limit. This ensures that banks hold a sufficient stock of liquid assets at all times, including when short-term increases in wholesale assets might otherwise reduce the level of stock required.
Q16: What other comments would you like to make on the operation of the sterling stock regime? How could the regime be refined if it were to continue?

**The Mismatch regime**

5.6 The Mismatch regime applies to all non-sterling stock banks on legal entity basis, which comprises the majority of UK banks. It also applies to branches of overseas banks unless they are subject to a global liquidity concession. (This is granted essentially because the ‘wholebank’ in question manages its liquidity on an integrated basis both in and outside its home country.) In cases where a global liquidity concession doesn’t apply, there may be branches which, for example, accept retail deposits in the UK, but whose reliance on ‘in case of need’ funding from Head Office is not undoubted. In both cases we expect branches to be able to demonstrate, proportionately to their size and complexity, that the bank’s liquidity is subject to appropriate stress tests.

5.7 The regime aims to ensure that a bank has sufficient maturing and readily marketable assets to cover maturing liabilities, through limiting the mismatch between a bank’s inflows (assets) and outflows (liabilities) within different time bands on a maturity ladder (next day, one week, one month, three months etc). We require the flow assumptions to be made on a worst case basis, so that inflows arrive at the latest contractual date and outflows depart at their earliest possible date. This means that the regime assesses a bank’s liquidity when its funding sources are unwilling to lend and its depositors withdraw their money and is, therefore, regarded as a prudent way of mitigating liquidity risk. However, there may be certain cash flows material to liquidity risk that the Mismatch regime does not fully capture.

5.8 We recognise that cash flows may not behave according to their contractual maturity, so the regime allows banks to submit requests for behavioural adjustments, which are then assessed by supervisors. The review process involves statistical analysis of past data and an assessment of relevant qualitative factors such as economic conditions at the time, the nature of the cash flow and the firm’s standing within the market.

5.9 The regime also permits a proportion of inter-bank and intra-group committed lines provided to a bank to be included on a case-by-case basis as inflows, and considers 15% of committed lines granted by a bank as outflows.

5.10 Marketable assets are included in the one-week time bucket at a discount, according to their liquidity, and comprise assets that have regularly quoted prices, are regularly traded and can be readily sold in a deep and liquid market for cash, according to a prescribed settlement timetable. A firm can propose that certain assets be classified as marketable if it thinks it can demonstrate that they meet the above criteria. The proposal is then assessed by supervisors. However, recent events have shown that certain assets may no longer be as readily marketable as previously thought.

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35. There are non-deposit taking banks which are subject to the Mismatch regime, such as some EU investment firms which passported into the UK under the BCD, rather than the ISD. These banks express their mismatch as a percentage of total assets.
5.11 The resulting mismatch for the one-week and one-month time buckets is expressed as a percentage of total deposit liabilities. Our typical expectations are that banks’ mismatch is zero, but this can vary, such as with some retail-focused banks that have tighter requirements. Guidelines are not set for time periods longer than a month.

5.12 Our preliminary assessment is that the mismatch framework addresses the right liquidity risk issues for these banks, that is the structural mismatch between banks’ maturing funding obligations and their realisable assets, in defined time buckets. We may not in practice have made optimum use of the regime and its flexibility. But we think the basic features of a mismatch framework should be carried forward into any new regime.

Q17: What is your experience of applying the mismatch regime? How well does it address core liquidity risk? In what ways could it be improved?

Building societies regime

5.13 Building societies have separate semi-quantitative liquidity requirements which derive from policy work by the predecessor regulator, the Building Societies Commission, in 1997. The regime is much simpler than either of the bank regimes, and reflects the simpler business model – residential mortgage lending primarily funded out of retail savings – that results from the stipulations of the Building Societies Act 1986.

5.14 Building societies must hold appropriate amounts both of total, and of short term, liquidity. The society’s board has to set a range (expressed as a percentage of banking liabilities) within which total liquidity will be maintained – as a result, actual liquidity falls typically between 15% and 25%. The rules do not set a hard minimum for total liquidity, but the range, like other aspects of the policy, is reviewed, and may be challenged, by the supervisor. We do, however, set out – as guidance – a matrix of asset types suitable to be held as liquidity by building societies of varying size and complexity. For short-term (up to eight days) liquidity, we set a hard minimum for all societies: 3.5% of banking liabilities, and require this to be met from a much narrower list of high quality marketable assets (though not quite as narrow as eligible collateral).

5.15 In practice, building societies’ natural caution means that most target to hold liquidity - total and short-term - well above their policy or regulatory minimum. Building societies have also been encouraged to maintain higher liquidity if they increase their use of shorter-term funding from the money markets. The advantages of the regime are that it is simple, easily understood, and goes with the grain of building societies’ inclinations. One drawback is that its calibration is uncertain: the 3.5% short term requirement is not based on a defined degree of resilience. Nor is there an explicit methodology linking the holding of total liquidity to an individual society’s risk features – such as its wholesale funding gaps, or the volatility of its retail deposit base. So when the supervisor needs to challenge a society’s move to reduce its total liquidity, the regime does not necessarily provide the tools for doing this.

Q18: How successful, in your experience, is the building society regime in regulating societies’ liquidity?
6 A more principles-based way forward?

The general approach

6.1 In Chapter 2 we identified the outcome we seek through our liquidity regulatory regime as follows: that a bank should take reasonable steps to withstand a firm-specific or market-wide liquidity stress of reasonable severity so as to remain able to meet liabilities as they fall due and to do so without needing to take actions – such as large-scale asset sales at fire-sale prices or access to emergency central bank lending – that might disrupt market confidence.

6.2 This outcome contributes both to the protection of consumers at any individual bank and to the maintenance of market confidence.

Existing high-level standards

6.3 We explained in Chapter 1 that our liquidity policy will be principles-based, deriving in particular from (and supporting) Principle 4. We have also made clear in GENPRU that ‘financial resources’ covers both liquidity and capital, and we explain below that our risk tolerance for bank failure should be consistent when using either capital adequacy or liquidity tools. Our key rule is GENPRU 1.2.26R:

A firm must at all times maintain overall financial resources, including capital resources and liquidity resources, which are adequate, both as to amount and quality, to ensure that there is no significant risk that its liabilities cannot be met as they fall due.

6.4 We have already made further rules, and given guidance, on the stress testing, scenario analysis and contingency funding plans that we expect banks to undertake or put in place. Some of this is in GENPRU but most is set out in SYSC 11 – which deals with the systems and controls needed for liquidity risk. Key provisions, derived from the Banking Consolidation Directive, are SYSC 11.1.11R and 11.1.12R:

SYSC 11.1.11R: A BIPRU firm must have policies and processes for the measurement and management of its net funding position and requirements on an ongoing and forward looking basis. Alternative scenarios must be considered and the assumptions underpinning decisions concerning the net funding position must be reviewed regularly.
SYSC 11.1.12R: A BIPRU firm must have contingency plans in place to deal with liquidity crises.

and these are amplified by the evidential provisions SYSC 11.1.21E and 11.1.24E.

6.5 We think that these high-level standards remain the right foundation for our liquidity policy. They underline that it is in the first instance the responsibility of the board and senior management of a bank to maintain adequate liquidity, so enabling that bank to meet its liabilities as they fall due. Recent events have proved the necessity for rigorous stress testing and meaningful contingency plans as these high-level standards require. But they have also drawn attention to the importance of the methods and assumptions banks and firms use being most appropriate to their circumstances. This raises the questions of:

- whether, and how, we should further develop our supporting guidance to make clear what we expect banks to do; and
- how we should strengthen our supervisory review of whether they meet those expectations.

We might, for example, explore further exactly what ‘adequate’ means in the context of the high-level principles – taking account of our market failure analysis. As well as strengthening the application of our high-level standards, we also provisionally conclude that some rules-based quantitative requirements will still be necessary to achieve our regulatory objectives. But - as discussed more fully below - we anticipate reforming these quantitative requirements to make them more effective.

Q19: How effective do you think our high-level standards are? Do they make sufficiently clear that liquidity remains the responsibility of the bank and its board/senior management?

Our risk appetite

6.6 We are also clear that we do not seek to operate a zero-failure regime. Maintaining at all times the financial resources required by Threshold Condition 4/Principle 4, in terms of both capital and liquidity, has an ongoing cost. So we need to be clearer that we have correctly identified our risk tolerance. For capital adequacy, we have set our risk appetite at a minimum level of BBB. In practice this means that, depending on the historical data period used, we expect banks to hold sufficient capital so there is no more than a 1 in 200 chance of them becoming insolvent during the following year.

6.7 There is presently no such common measurement of our risk appetite for bank failures as a result of illiquidity. We want to consider now whether there should be one and how we would set it. There is no prima facie reason why the risk appetite should be different. Ultimately, it is the failure of the firm that causes the consumer detriment, loss of market confidence, or financial instability, regardless of whether that failure results from a credit event or a liquidity event. However, the planning horizon for capital adequacy and liquidity are necessarily different, so in applying
our risk appetite for the purpose of liquidity risk we need to convert the 1 in 200 chance in one year to the equivalent lower probability over a shorter time horizon, e.g. an approx. 1 in 800\(^{36}\) chance over a three-month period.

Q20: What are your views on the correct risk appetite? Should the same 1 in 200 one-year risk appetite that applies for capital also be applied to liquidity, if necessary converted to the equivalent for a shorter time horizon?

**Applying our risk appetite**

6.8 Having established the same calibration for liquidity as for capital, this risk appetite still needs to be translated into the actual stress tests banks apply. Two main issues arise here:

- Over which period or periods should the liquidity stresses be applied? One of the lessons of recent events is that chronic liquidity stresses may continue for several months, and that to understand a bank’s vulnerability to liquidity stresses, we need to consider its liquidity strategy – that is its funding plans over longer periods of say up to one year – and not solely its tactical liquidity over shorter periods. This suggests that a range of periods should be taken with short periods testing tactical liquidity and longer periods testing strategic liquidity.

- Which assumptions should be made about the behaviour of customers, counterparties and markets during a stress that is calibrated to the 1 in 200 standard (or equivalent over a shorter period)? There is a link here to the period of the stress tests. For short periods of no less than a week, little or no assumption should be made for favourable behaviour of counterparties and markets should be assumed to be illiquid, except for assets eligible in normal central bank operations. For retail deposits a prudent assumption as to the ‘shock’ loss of deposits needs to be made. For longer periods the aim is to replicate a chronic long-duration stress in which there is some activity by counterparties and some market liquidity, but at levels well below normal and there is a ‘leakage’ over time, rather than a shock loss, of retail deposits. Recent events may be used to help calibrate the types of stresses that should be applied, but with care as future stresses and tail events\(^{37}\) are rarely repeats of past events.

6.9 The difficulty in knowing which assumptions to make, and over which periods, raises the question of the extent to which we should amplify our high level principles by more detailed rules to specify stress test assumptions and periods. This is essentially the distinction we make between qualitative requirements (in which banks themselves specify the stress test periods and assumptions, but within the context of the high-level principles and subject to our supervisory review, see below) and quantitative requirements (in which the FSA rules set out the stress-test periods and assumptions).

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36. As a three-month period is one quarter of a year we apply a fourth root to the fraction \(199/200\) to give the survival ratio of approx. \(799/800\) for the three-month period. This is not necessarily the only way of converting an annual confidence level into a quarterly one and implicitly makes the assumption that the probability of default in each quarter is independent of the next. This assumption may in fact not be true.

37. Tail events typically mean low frequency, high impact stress events, for which little or no data exists and so any ex-ante estimates are unlikely to be reliable.
6.10 Our preliminary view is that we should set quantitative requirements for the short-period stress tests of a week, but apply a qualitative approach for the longer periods. The trade-off here is between the benefits of standardisation – that is, comparability between banks and reduced risk of the stress tests not being implemented properly – and the benefits of bespoke application – that is, the stress test can be based on assumptions that are realistic and periods that are relevant for the particular circumstances of a specific bank. This is most important for the longer-duration stress tests which necessitate making assumptions as to the stress behaviour of counterparties and markets over longer periods. For shorter periods it is less relevant as the assumption is little or no favourable behaviour of counterparties or liquidity in markets, and it is more important that all banks, at least, make this same assumption to ensure there is sufficient aggregate short term liquidity within the banking sector.

Q21: How should we apply our risk appetite to our stress-testing requirements? Which assumptions should be applied and over which periods? How should we develop what we mean by ‘forward looking’ in SYSC 11.1.11R?

**Qualitative requirements**

6.11 Qualitative requirements allow broad latitude to banks as to methods and assumptions applied in undertaking stress tests, mitigating risks identified by those tests and putting in place contingency funding plans. However, in making use of this latitude, banks need to abide by the high-level principles. To do this they need to ensure that their assumptions, mitigation strategies and plans are rigorously thought through, realistic, evidence based and prudent with respect to the stress circumstances they are designed to address.

6.12 Banks are subject to our supervisory review, and one purpose of this is to help ensure they apply qualitative requirements appropriately. Recent events have highlighted the importance of this review. For any particular bank the scope, depth and timing of the review is determined by our ARROW Framework\(^\text{38}\) based on the nature, scale and complexity of that bank’s business. Recent events highlight the importance of this review including, where relevant:

- scrutiny of how banks identify where they are vulnerable to the drying-up of funding, and how resilient they would be if that happens;
- review of where each bank focuses its liquidity management, including actual stress-testing;
- challenging the methods and assumptions used in the stress tests;
- benchmark stress testing assumptions and to ensure consistent levels of resilience;
- scrutinising how the bank follows up on its stress tests by producing mitigation strategies, challenging business planning assumptions and contingency funding plans; and

• ensuring that these contingency funding plans are regularly tested and that the bank understands how their plans would work in practice, and that these plans have well-articulated and clearly understood implementation triggers.

6.13 The aim is that every bank understands which scenarios would crystallise severe liquidity risk, and how it would mitigate that. We would expect banks to identify which extreme scenarios might stress their business model to the point of failure, even if they then conclude that the remote implausibility of the stress together with its extreme severity make it not cost-effective to guard fully against such circumstances on their own. And, as explained in later in this chapter, we argue that quantitative liquidity requirements are also necessary to achieve the outcomes we seek.

Internal Models

6.14 There is no single definition of what is meant by ‘internal model’, but for the purpose of this discussion we take it to mean any internal system, process or methodology that is used to quantify risk, but especially those that rely upon statistical or stochastic inference. Internal models have an important role to play in the effective management of liquidity – especially at large, complex financial institutions. And in a more principles-based qualitative approach to liquidity regulation we can envisage conducting a dialogue with the major firms about how they manage their liquidity using an internal model. We would use what we learn from this as an important input into determining whether a bank is conducting its business with due skill, care and diligence (Principle 2), and whether a bank has adequate systems and controls in place (Principle 3), to ensure that its financial resources are adequate (Principle 4).

6.15 There are inherent difficulties in modelling liquidity risk, but these are reasons to encourage banks in their efforts to create internal models for quantifying their exposure to liquidity risk. Our experience is that provided management do not over-rely on the output of internal models, the process of seeking to quantify a difficult risk helps improve awareness and understanding of that risk. The difficulties in modelling liquidity risk include:

• The inherent difficulty of quantifying the drivers of liquidity risk. Market and credit risk influence a firm’s need for liquidity, but so do the behaviour of a firm’s counterparties. This is non-linear and so cannot be extrapolated from behaviour in normal times. Nor can models be calibrated using available data.

• The considerable difficulty of validating firms’ estimates consistently across firms and over time. Arguably, objective validation is not possible.

• Banks have little incentive to take account of their systemic significance and so regulators need to impose relevant requirements on them. But this is difficult to do when firms are responsible for making estimates that supervisors then validate.

• Banks have little incentive to hold assets of sufficient quality to take account of the external costs of liquidation.
Well-designed and executed internal models, therefore, help provide rigour and discipline when the bank (in compliance with our qualitative requirements) makes its own assessment of the level of resilience it should be able to demonstrate. But – because of the inherent difficulties described above in modelling liquidity risk – internal models are not yet in our view an adequate substitute for some rules-based quantitative requirements.

Q22: Are the proposals for amplifying our qualitative requirements sufficient to improve the robustness of banks’ liquidity management to chronic long-duration stress?

Q23: What changes, if any, are you planning to make to your liquidity policies and liquidity risk management practices in response to the recent market turmoil?

Why quantitative requirements are necessary?

6.16 The key problem with relying on a purely qualitative approach led by the firm’s own assessment (leaving aside the specific difficulties with models mentioned above) is that it is hard – although not perhaps impossible – to see how such qualitative requirements alone would give us sufficient assurance that the market failures identified in Chapter 3 had been sufficiently mitigated. These market failures arise from inherent difficulties in quantifying liquidity risk, competitive pressures to hold less liquidity than desirable and moral hazards arising from externalities. Those countries which do rely solely upon qualitative requirements for liquidity risk normally do so in the context of a supervisory regime that includes extensive, detailed and sometimes burdensome on-site inspections. We are not convinced that in the context of the UK market this is the most cost-effective method of achieving our regulatory objectives.

6.17 We are aware of the various arguments against quantitative requirements. If simple, they are just broad rules of thumb – and it is difficult to demonstrate that they deliver the desired level of protection. More complex requirements can work well over a range of banks, but their complexity can become a problem in itself. And there is a risk that our prescribing quantitative requirements then discourages banks from the efforts to assess and mitigate their own liquidity risk properly – as the quantitative requirements appear to take them straight to the ‘answer’. In our view these arguments have more force when looking at liquidity over longer time horizons, and for this reason we are only proposing a quantitative regime for short-horizon liquidity.

6.18 Our current liquidity requirements for banks are a combination of the (qualitative) high-level standards described above, which apply to all banks, and separate quantitative regimes for different types of banks, and for building societies, which are legacies from our predecessor regulators. Chapter 5 described what the (different) objectives of each quantitative regime are, and offered our assessment of how well they work. We start with a presumption that we would not want to perpetuate three separate sets of quantitative requirements. But we suggest that our future policy should combine a single successor quantitative regime with the existing qualitative high-level standards.
Q24: Do you agree that quantitative requirements are a necessary component of our liquidity regime? Do you agree that we should aim for a single quantitative regime to replace the three existing ones?

6.19 From our review of our existing regimes, we see two important ways in which quantitative requirements might usefully supplement our qualitative requirements in helping us achieve our regulatory objectives for shorter term liquidity stresses:

- to constrain the funding mismatches banks would otherwise be tempted to run in normal and lightly-stressed conditions; and
- to help banks to withstand short-duration ‘shock’ liquidity stresses even if extreme.

6.20 The Mismatch regime should in principle be effective to achieve the first outcome given above, but this – as recent events illustrate – depends crucially on how well the assumptions made (e.g. as to the behaviour of customers and counterparties during a stress-event) correctly anticipate the reality of future liquidity stresses. The question arises whether, at least for the short term, say up to one month or even beyond, these assumptions are best specified by our quantitative rules or whether banks should be allowed to continue to make their own behavioural assumptions (subject only to our supervisory review and validation).

6.21 Our assessment of the Stock Regime was that despite its other shortcomings it is reasonably effective in achieving the second outcome given above (although even here could be improved in the light of lessons learnt from recent event) and to some extent also the first, as it places a limit on the first five days. So one option for consideration is that something similar to this approach, but suitably improved, should apply to all banks at the short term end of a Mismatch regime, so that both outcomes described above are achieved for all banks.

6.22 The purpose of the stock is to ensure that banks can generate liquidity for a while even if cut off from unsecured market funding. So the assets counting towards this stock need to be reliably liquid in a broad range of situations. A bank can then use these assets to raise liquidity in the market, either by repo or by outright sale. Central bank eligibility further ensures that the bank may be able to use the assets to raise liquidity from the central bank. But banks may not have access to the central bank in all the currencies in which they are active, and there may be other limitations on such use, such as the possibility of adverse signalling effects, if they access central bank facilities in a visible way. This suggests that the stock should comprise assets which are not only central-bank eligible but are also reliably liquid in the market and so can be used in either way, as circumstances dictate.

Q24: Would the mismatch approach, suitably refined, provide an effective framework for quantitative requirements for all banks? Should most/all banks be required to hold a survival stock of high-quality assets, as in effect the quantitative requirement at the short term end of a mismatch-based regime?
Why, and how, should we differentiate between banks?

6.23 Within the overall banking sector, we recognise there are major differences. For instance, between:

- banks that are primarily wholesale, taking no, or very few, retail customer deposits;
- banks that are mainly funded by retail customer deposits (this includes, necessarily, all building societies); and
- banks whose wholesale and retail deposit bases are of comparable importance.

6.24 Other relevant distinctions are:

- whether a bank is integral to the UK payments and clearing systems;
- whether a bank has access to the Bank of England’s liquidity facilities;
- whether a bank has access to central bank liquidity support in other financial centres; and
- whether the bank is based overseas, and operates in the UK only through a branch.

6.25 Our broad sense at the moment is that these distinctions can be taken account qualitatively and quantitatively within a unified liquidity regime, rather than using some of them as the basis for separate quantitative regimes. Our supervision of individual banks will, of course, differentiate extensively according to these, and other, criteria that go to make up the composite picture of the bank’s liquidity risk, and its capability to manage it. So they will affect the nature and intensity of the stress-testing we expect to be done, the frequency and focus of our on-site reviews of the bank, and the amount of liquid assets it should hold. The issue we highlight here is how far differentiation should be hard wired into our policy too.

Q25: Have we captured the most important differences between banks? Are there other criteria relevant to liquidity risk? Do you agree that these do not justify the continuation of different quantitative regimes?
7 Supervisory information

Reporting during the market turmoil

7.1 One of the lessons from recent events is that we need to continue to improve the content and frequency of the information available to us on the liquidity position of banks, although some measures were already in train long before the recent market turbulence. As we learned during recent events, previous reporting requirements did not always provide supervisors with sufficient, timely and comparable information allowing them to judge accurately the impact of the liquidity squeeze on banks. Exposures to off-balance sheet items, such as liquidity facilities granted to SIVs and ABCP conduits, and potential funding vulnerabilities, are some examples of valuable pieces of information that were not fully captured by the standard reporting framework. Similarly, assumptions about market liquidity, banks' likely funding needs and rollover of certain liabilities were difficult to infer from the information on hand.

7.2 Supervisors responded swiftly to these difficulties by engaging in a more proactive and thorough dialogue with banks. Depending on the liquidity regime in question, we supplemented our existing returns by calling for additional material, both quantitative (e.g. on liquidity positions and funding needs) and qualitative (e.g. review of banks’ internal policies and contingency decisions taken). In some cases, this exercise involved the creation of ad hoc reporting forms.

7.3 For sterling stock banks, the data on the liabilities side normally covers the net wholesale five-day sterling position. However, the short timeframe in which recent events developed has stressed the importance of examining the liquidity positions of firms day to day out to 25 days. In view of that, in the aftermath of the market turmoil, we asked sterling stock banks to submit their net sterling and non-sterling wholesale positions out to 25 days. This information was used to:

- identify possible changes in the underlying pattern of business and any wholesale funding pressures;
- compare data between banks; and
- gauge the size of banks’ aggregate positions.
In respect of sterling stock banks we were also able to get additional data on collateral eligible at other central banks and on collateral not accepted by any central bank.

7.4 For the mismatch banks, we required supplementary information from other regulators and group management information to improve our judgement on the liquidity position of other entities in the group and to safeguard the standing of locally supervised banks.

7.5 Additionally, the market turmoil experienced in August triggered requests for additional data from a number of banks in the form of Factbooks. A Factbook gives the Tripartite Authorities key information on a major firm (or firms) before it is affected by a financial crisis. This additional information is intended to improve the quality of our decisions and the allocation of resources during the crisis. Factbook-reporting requirements provided us, for example, with detailed information on the maturity and structure of banks’ assets and liabilities in the form of firm-specific management information.

**Reporting of liquidity data going forward**

7.6 Recent events showed that it is essential for the FSA and other authorities to be able to count on a regular flow of data on banks’ liquidity positions. This both ensures we gain a clear picture of the liquidity position of the markets as a whole, and helps us assess the resilience of individual banks.

7.7 To satisfy both these objectives, we will develop new reporting requirements over the next year, along with the international and domestic review of the liquidity regulatory framework. We are working towards an approach based on a standard form that all banks would complete monthly, allowing us to capture a wide range of cash flows over shorter periods of time. The cash-flows collected might include: wholesale money market (gross and net by major currency); cash-flows from longer liabilities and derivatives; gross and net retail cash-flows on a behavioural basis; contractual and behavioural corporate cash-flows; and other significant items. This information may be complemented with ongoing information on the availability of funding for specific banks and could be submitted more regularly in a market crisis. This would therefore minimise the need for banks to give us supplementary information on an ad hoc basis.

7.8 In the meantime, from 30 June 2008, banks will have to submit the new return for stock liquidity reporting – FSA013 – and for mismatch liquidity reporting – FSA010. Building societies will be required to submit the new liquidity report – return FSA011 – from 1 January 2008.

7.9 As part of the FSA’s Integrated Regulatory Reporting project banks and building societies will also be required from 30 September 2008 to submit FSA044. This new return seeks to obtain information on assets and liabilities across the whole maturity spectrum (up to five years) in order to monitor funding profiles and trends, both in terms of source and maturity mismatch. FSA044 will help us identify, in a risk-based way, potential/emerging areas of concern.
We proposed and consulted on FSA044 before the recent market turbulence erupted, as an attempt to address certain information gaps identified in our reporting requirements. Recent events have underlined the importance of gathering this information and prompted some minor reviews to this return. We have now amended the off-balance sheet elements slightly to ensure we capture all the necessary information on the commitments that have caused problems over the last few months. Moreover, return FSA044 may evolve and we may enhance it further (to include, for example, behavioural adjustments) if justified by market events.

7.10 Together with FSA044, new return FSA046 – Securitisations will allow us to monitor asset performance within securitisations with a view to identifying implicit support and to understand the relevance of securitisation to a bank’s risk profile.

7.11 Alongside the new Integrated Regulatory Reporting project, we are developing Business Intelligence tools that will allow us to process, analyse and interpret more efficiently and expeditiously the data that firms submit.

7.12 Our supervisors will continue to engage proactively with banks and, where appropriate, their home supervisors on liquidity related issues. Work planned for the next year will focus on the following areas:

- review of banks’ liquidity policy statements, focusing on the quality of internal and external contingency funding arrangements and stress testing arrangements;
- review of behavioural adjustments, mismatch guidelines and historical trends in mismatches reported;
- analysis of banks’ funding status; and
- review of parental support arrangements.

We will continue to cover liquidity routinely during all our Arrow supervisory visits to banks and during Pillar 2 reviews. And we remind banks that liquidity planning is an important part of their Internal Capital Adequacy Assessment Process (ICAAP).

7.13 Finally, in response to the latest market turmoil, we are also exploring the feasibility and the merits of designing an early warning system for liquidity that would help us identify and manage future a financial crisis more effectively. We will build on those pieces of information that would have helped us manage recent events better, such as calls on liquidity back-up lines, build-up of assets in banks’ pipelines and hitting triggers on complex products. Input from industry will be key to the successful development of any such initiative.

Q26: What information would, in your view, help us get a clear picture of the liquidity position of the markets as a whole and understand the liquidity positions of individual banks and their implications? What information should, in your opinion, be considered as part of an Early Warning System on liquidity?
Chapter 2 – Liquidity risk – context

Q1: Have we established the right objectives for liquidity policy? If not, what alternatives would you suggest?

Q2: How well is the role of central bank standing facilities in banks’ liquidity risk management understood? Should all UK banks be required to sign up to these facilities, or (if they do not have access) have an agreed alternative in place?

Q3: How should the wider banking reform work influence the reform of liquidity policy?

Chapter 3 – Market failure and cost-benefit analysis

Q4: Are there other market failures or cost benefit issues that we should consider?

Chapter 4 – Lessons learned from recent events

Q5: How did your liquidity planning address (i) both firm-specific and market-wide scenarios and (ii) both ‘chronic’ and ‘shock’ plausible liquidity stresses?

Q6: How did your market-wide stress tests take account of disruptions both in the unsecured funding markets and in the secured funding markets (and both at the same time)? What were your assumptions on the correlation between short-term funding and long-term funding markets and on the effectiveness of diversification across sources of funding during a liquidity stress? Do you plan to revise your assumptions?
Q7: How far were contingent exposures arising from both on-balance sheet and off-balance sheet activities incorporated into your liquidity planning? How did your behavioural and correlation assumptions compare with recent events? How will you revise your assumptions?

Q8: To what extent have constraints in cross-border liquidity (e.g. trapped pools of liquidity, time zone differences, freezing of FX swap markets) and regulation (e.g. large exposure limits on intra-group lending and other rules and legal restrictions) impacted on your liquidity management during the market turmoil?

Q9: In light of recent events, how would you improve the stress testing for retail deposits, including the behavioural assumptions used in stress scenarios?

Q10: How severe was your firm’s experience of the market turmoil? Describe how your firm was exposed to a drying up of inter-bank funding and a flight to quality.

Q11: In what ways do you think stress testing – including the assumptions used to build stress scenarios - could be strengthened in light of recent events? How has the output from your stress testing informed and challenged your ongoing liquidity management? Please provide some examples.

Q12: To what extent have your ‘treasury assets’ been affected by the liquidity freeze in the asset markets? What assets, in your opinion, can be considered consistently liquid?

Q13: In your experience, what has been the role of liquidity promises and liquidity facilities in your liquidity management during the recent market-wide liquidity stress? How well did liquidity promises perform when and if called upon and did ‘committed’ lenders invoke material adverse change or market disruption clauses to refuse lending?

Q14: Which of the courses of action contained in your contingency funding plans have been more useful in ensuring enough liquidity to remain operational? At what point and for what reason did you activate your contingency funding plans?

Q15: In what ways do you think contingency funding plans could be strengthened in light of recent events? Do you think that a necessary component of a contingency funding plan is to have access to central bank’s standing facilities?
Chapter 5 – Review of existing regimes

Q16: What other comments would you like to make on the operation of the sterling stock regime? How could the regime be refined if it were to continue?

Q17: What is your experience of applying the mismatch regime? How well does it address core liquidity risk? In what ways could it be improved?

Q18: How successful, in your experience, is the building society regimen regulating societies’ liquidity?

Chapter 6 – A more principles-based way forward

Q19: How effective do you think our high-level standards are? Do they make sufficiently clear that liquidity remains the responsibility of the bank and its board/senior management?

Q20: What are your views on the correct risk appetite? Should the same 1 in 200 one year risk appetite that applies for capital also be applied to liquidity, if necessary converted to the equivalent for a shorter time horizon?

Q21: How should we apply our risk appetite to our stress-testing requirements? Which assumptions should be applied and over which periods? How should we develop what we mean by ‘forward looking’ in SYSC 11.1.11R?

Q22: Are the proposals for amplifying our qualitative requirements sufficient to improve the robustness of banks’ liquidity management?

Q23: What changes, if any, are you planning to make to your liquidity policies and liquidity risk management practices in response to the recent market turmoil?

Q24: What role do you think models should play in regulating liquidity?

Q25: Do you agree that quantitative requirements are a necessary component of our liquidity regime? Do you agree that we should aim for a single quantitative regime to replace the three existing ones?

Q26: Would the mismatch approach, suitably refined, provide an effective framework for quantitative requirements for all banks? Should most/all banks be required to hold a survival stock of high-quality assets, as in effect the quantitative requirement at the short term end of a mismatch-based regime?
Q27: Have we captured the most important differences between banks? Are there other criteria relevant to liquidity risk? Do you agree that these do not justify the continuation of different quantitative regimes?

Chapter 7 – Supervisory information

Q28: What information would, in your view, help the FSA obtain a clear picture of the liquidity position of the markets as a whole and understand the liquidity positions of individual firms and their implications? What information should, in your opinion, be considered as part of an Early Warning System on liquidity?