
**REVIEW OF THE BANK OF ENGLAND'S
FRAMEWORK FOR PROVIDING LIQUIDITY TO
THE BANKING SYSTEM**

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Presented to the Court of the Bank of England

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Introduction

The Court of the Bank of England asked me to review whether the reformed system of operations of the Bank deals with the conclusions of the Treasury Committee’s report “The run on the Rock” and captures any further lessons from the financial crisis (hereafter referred to as the Crisis) since the time of that report in January 2008.

The Review was to examine:¹

- The operation of the Special Liquidity Scheme, established in 2008.
- The structure and terms of the Bank’s facilities, as set out in the ‘Red Book’.
- The operation of the reformed framework since its introduction in 2008.

The Review was specifically to consider:

- The effectiveness of the framework in implementing monetary policy decisions.
- Whether the framework is sufficiently flexible, and the range of collateral sufficiently broad, to satisfy demands for liquidity in times of stress.
- Whether a system of voluntary reserves targets is appropriate.
- Whether the price at which liquidity is available to the system is appropriate.
- Whether the framework deals adequately with the issue of ‘stigmatisation’.
- The capability and governance arrangements in the Bank to support the facilities in its framework.

Outline of the Review

The Review focuses on the questions raised in the Court’s remit. We begin with a Background chapter giving some history and context around the questions asked. We then consider the three broad areas referenced in the remit with sections on: Monetary policy implementation; Liquidity insurance provision; and the Governance arrangements to support the framework.

Section One: Monetary policy implementation

This Section looks at how the Sterling Monetary Framework (SMF) is used in implementing monetary policy interest rate decisions as well as other monetary policy decisions. Within it, **Chapter 2** examines the development of the monetary policy implementation framework. **Chapter 3** assesses whether the Bank should seek to return to reserves averaging, a system that has been suspended since the Bank began Quantitative Easing (QE) in Spring 2009. **Chapter 4** looks at other tools available to implement monetary policy.

¹ For the full terms of reference see **Annex 1**.

Section Two: Liquidity insurance provision

This Section examines the nature of the SMF's provision of liquidity insurance prior to the Crisis and the response at the onset and during the Crisis to provide support to the financial system. Within it, **Chapter 5** outlines the development of the current framework for liquidity insurance, and **Chapter 6** to **Chapter 10** look at some of the key issues of: stigma; pricing; maturity transformation; access; and collateral and risk management. **Chapter 11** concludes with potential changes the Bank could consider making to its liquidity insurance facilities.

Section Three: Governance

This section examines the internal and external, formal and informal governance and accountability arrangements that surround the SMF, outlining the key issues in managing the framework, not least in relation to the advent of the forthcoming Financial Services Bill. **Chapter 12** covers issues of internal governance and **Chapter 13** considers external governance arrangements and processes.

Chapter 14 summarises the conclusions and recommendations made throughout the Review. A glossary of technical terms and acronyms used in the Review is included in **Annex 6**.

Composing the Review

In the course of preparing this Review, I met with members of the Bank Executive, relevant members of the Bank's staff and with current and former members of the Monetary Policy Committee (MPC) and Financial Policy Committee (FPC). I also met representatives from HM Treasury (HMT), other central banks, banks and also consultants familiar with the issues. I greatly appreciate the time given up by all those I met, and would like to thank Bank staff in particular for sharing their views so candidly.

In addition, I received full cooperation from the Bank in providing me with unrestricted access to the Bank's files and furnishing me with the information and analysis relevant to this Review.

This Review has involved tackling a range of difficult issues which have been at the heart of evolving central bank policy-making for years, and with which I had little direct involvement prior to commencement of the Review. My discussions in preparing this Review presented me with a range of perspectives and trade-offs that need to be considered. Where several people expressed similar views, these have been given more prominence. A lack of consensus on other issues simply underlines the complexity of many of the issues under consideration and in those cases the Review attempts to frame issues for further consideration.

The limited timeframe in which to undertake this Review has prevented a full and comprehensive analysis of some of those issues. As such, I would expect further work to be necessary in order to explore the ideas and recommendations contained in the Review, not least to flesh out more fully the costs, including additional resource costs in some cases, and benefits of some of my suggestions. I would also stress the difficulty in evaluating a framework that has been developed in reaction to the recent financial crisis with a view to its efficacy in possible future crises and stresses. This will continue to present a major challenge for all central banks. Indeed even during the course of the Review the framework was continuing to evolve, with the activation for the first time of the

Extended Collateral Term Repo (ECTR) operations, and the introduction of the Funding for Lending Scheme (FLS).

I was supported in the Review by a very capable staff of three from within the Bank as well as consulting advice from Dino Kos, former Executive Vice-President and Head of the Markets Group at the Federal Reserve Bank of New York and currently at Hamiltonian Associates, Ltd. I would like to thank them for their substantial contribution, advice and objectivity.

Executive Summary

Introduction and background

1. On January 24, 2008, the Treasury Committee (TC) published its first report covering its hearings around the collapse of Northern Rock.² This report covered a broad range of important contributing factors to the deposit run on Northern Rock and its eventual nationalisation, including the business model of Northern Rock, the functioning of the Tri-partite arrangement, and inadequacies in the Financial Services Authority's regulatory approach and execution.
2. The TC report also identified a number of inadequacies in the Bank of England's (the Bank's) framework for provision of liquidity to the banking system and criticised specific actions or lack of action taken by the Bank Executive in the early stages of the Crisis. These were judged to have affected both the reaction to Northern Rock's problems and also contributed to liquidity stress in the broader banking system, requiring more extreme actions later to prevent a much more damaging break-down of the financial system.
3. There were two main criticisms of the Bank in the TC report. First, the available facilities were not sufficient to provide liquidity to solvent but needy banks.³ Second, the Bank was slow to deal with the emerging problems at Northern Rock and other banks out of fear that banks would be encouraged to run imprudent risks in future in the belief that the Bank would provide ongoing support – so-called 'moral hazard'. The relevant recommendations from the TC report are summarised in **Annex 2** along with an assessment of progress against those recommendations and references back to the body of this Review in which assessments and recommendations are detailed.

Evolution of the Sterling Monetary Framework in the context of a changing environment

4. The Bank continually develops its framework for monetary policy and liquidity operations, and summarises its approach in its Sterling Monetary Framework (SMF) document, known colloquially as the *Red Book*.⁴ As the inadequacies of the SMF became clear during 2007, a root and branch internal review was undertaken and substantial changes were made. Some of these changes address the issues raised by the TC and many others deal with other operational requirements inside the Bank.
5. The most noteworthy changes relate to a series of liquidity insurance tools designed to deal with liquidity issues faced by banks, individually or collectively, during times of stress. These

² House of Commons Treasury Committee, *The run on the Rock*, <http://www.parliament.the-stationery-office.co.uk/pa/cm200708/cmselect/cmtreasy/56/56i.pdf>

³ Throughout the Review 'banks' is used as short-hand to refer to deposit-taking institutions, principally commercial banks and building societies.

⁴ The latest *Red Book* is available at <http://www.bankofengland.co.uk/markets/Documents/money/publications/redbookjune2012.pdf>

include the introduction of a Discount Window Facility (DWF), and term repo facilities allowing banks to access Bank funding for up to six months against a broader range of collateral than that used in the Bank's conventional open market operations (OMOs). Outside the SMF, but very relevant to the financing of banks during that period, the Bank rolled out the Special Liquidity Scheme (SLS) to provide term financing collateralised by legacy securitised assets held by banks.

6. In general, the changes made to the SMF, mostly captured in the *2008 Consultation Document* and codified in the 2010 *Red Book*, have had the effect of substantially increasing the availability of Bank liquidity to the banking system and reducing ambiguity around the Bank's approach to providing liquidity insurance.⁵ As the SMF has evolved, and as the state of the banking and broader financial markets has failed completely to mend, there have been important refinements and additions that have further increased access to central bank funding and increased the predictability of Bank operations.
7. Amongst the most important contextual changes has been the commencement of the Asset Purchase Facility (APF), often referred to as Quantitative Easing (QE). This programme has rendered much of the monetary policy apparatus of the SMF redundant as the Bank has created substantial excess reserves in the banking system to help the Monetary Policy Committee (MPC) meet its inflation target (see discussion of monetary policy implementation and the APF below). QE has not in and of itself materially impacted the need for liquidity insurance, although it may have made it easier for banks to self-insure, as they have done to a material degree (this is discussed in **Chapter 6** in the Liquidity insurance provision section).
8. As the framework has evolved, so has the mandate of the Bank as well as the governance around liquidity operations. Most substantively, banking supervision is being folded into the Bank in the form of a soon-to-be constituted Prudential Regulation Authority (PRA). Separate but related, a new committee of Court (the Financial Policy Committee (FPC)) has been established to offer guidance and eventually set policy in the area of macroprudential oversight. This has led to new questions over responsibility for oversight of liquidity operations, both from a strategic and tactical perspective, as each of the MPC, FPC and PRA Board have a direct interest in some aspects of the Bank's liquidity operations.
9. At the same time, regulation of banks has progressed materially. Liquidity regulation, in particular, is highly relevant for the conduct of the Bank's liquidity operations. Banks are now required to hold significantly higher levels of reserves or very liquid assets as a form of self-insurance against liquidity risk. This reduces but does not remove the need for central bank liquidity insurance.
10. In addition, regulatory pressures, along with the liquidity requirements just mentioned, have reduced the willingness of banks to provide liquidity insurance to their customers (e.g. through committed lines of credit). For example, undrawn lines of credit are now treated by regulators

⁵ The consultation document "The Development of the Bank of England's Market Operations" is available at <http://www.bankofengland.co.uk/markets/Documents/money/publications/condococt08.pdf>

and markets as similarly risky to draw loans so banks are incentivised to reduce this form of liquidity insurance.

11. In addition, the financial system is changing substantially, with some non-bank financial institutions and capital markets becoming more important in providing key services previously provided by the banking sector. Of particular note for this Review are the increasing importance of Central Counterparties (CCPs) and the growing role of public and non-bank private capital markets for corporate financing. The trend towards greater importance of non-banks is likely to continue for some time as banks continue to adjust to new regulations and to a challenging macroeconomic environment.

Conclusions and high-level recommendations

12. This Review is broken into three sections along the lines of the areas referenced in the remit: monetary policy implementation; liquidity insurance provision; and governance. What follows are the summary conclusions of the Review, as well as high-level recommendations for Court and the Bank to consider in light of these conclusions.⁶

Overarching conclusions

13. Since the problems with Northern Rock surfaced, the Bank has consistently improved its framework for liquidity provision to banks and the banking system.
14. The Bank has been responsive to the changing market environment and demands from banks and the financial system generally. This evolution and context is set out in the Background section of this Review.
15. The Bank's SMF is robust, broadly fit for purpose in the current environment and should be able to accommodate additional new or unconventional policy actions should they be necessary. While the Bank always has the option to seek government indemnification and is well able to execute government directives, its framework gives it adequate latitude to accomplish its core objectives while maintaining the operational independence that is critical to its overall effectiveness and credibility.

Monetary policy implementation

16. The evolving SMF has functioned appropriately as regards the implementation of monetary policy with short-term market rates very close to policy rates most of the time.
17. Prior to the commencement of QE, the Bank's system of reserves averaging with voluntary reserves targets was largely effective in maintaining market rates close to policy rates. The necessary change to a floor system for implementing monetary policy upon commencement of QE has been similarly effective.
18. It appears that the SMF framework is sufficiently flexible to accommodate modifications to how the MPC's targets are achieved.

⁶ A more complete set of detailed recommendations by chapter is set out in **Chapter 14**.

19. The MPC has, to date, used only the two tools of Bank Rate and asset purchases to meet its inflation target. It has not made use of other elements of the current SMF. This seems appropriate, given that other facilities within the SMF are designed with other objectives in mind, primarily provision of liquidity insurance, and using them for monetary policy purposes risks compromising those objectives. Also, other bodies, with different objectives, specifically the FPC, are likely to have a stronger case to direct usage of the wider set of tools.
20. Nonetheless, it is important that the MPC is well informed about the design and implementation of other elements of the SMF, given their possible effect on monetary conditions. And if that influence is likely to be material, it may be the case that the MPC should have an opportunity to express opinions on the relevant SMF parameters. These issues, and interaction with other bodies, such as the FPC, are discussed in more detail in the Governance Section.

High-level Recommendations:

21. ***Recommendation 1: The Bank should consider returning to a reserves averaging approach in future, but this is not critical. As monetary policy is normalised, Court should ensure the Executive evaluates the relevant factors in deciding whether to move away from the current floor regime.***
22. ***Recommendation 2: If the Bank decides to return to reserves averaging, it should maintain a system of voluntary reserves setting, that places a burden on the banks to assess the level of reserves required for the proper functioning of the payments and other interbank systems.***

Provision of liquidity insurance

23. One of the stated aims of the SMF is to provide liquidity insurance in order to “reduce the cost of disruption to the liquidity and payment services supplied by banks to the UK economy”. Prior to the Crisis, the Bank primarily provided overnight or short-term liquidity support to banks to address temporary liquidity issues. This was seen as adequate to allow banks to perform their roles in relation to maturity transformation and liquidity provision to the broader market and economy. As the Crisis developed, however, it was increasingly apparent that this approach was insufficient to meet the aims of the SMF. The Bank therefore developed facilities that provided a more explicit backstop for these critical banking services. The Bank backstopped banks’ inadequate provision of maturity transformation and contingent liquidity to the broader economy (e.g. through committed lines of credit) by providing banks with longer term funding.
24. As part of its response, the Bank introduced term funding facilities such as the SLS and more recently the Funding for Lending Scheme (FLS), to enhance the banking system’s ability to continue to offer term funding to its customers. The Bank has also operated directly in asset markets, acting as a market-maker of last resort (MMLR) where it has deemed liquidity to be so impaired as to threaten financial stability.

25. These operations have, until now, been conducted outside of the Bank's published SMF. It appears that markets and the role of banks in markets may have changed structurally, though, so these operations should not be regarded as extraordinary. This required shift in focus, away from simply backstopping banks' short-term liquidity needs, and towards backstopping the provision of key financial services to the broader economy more generally, underlies many of the recommendations and conclusions below.
26. The intention of these recommendations is not to change the role of the central bank. The overarching objective of the Bank with respect to providing liquidity insurance remains unchanged. But the way in which the Bank needs to fulfil that role may need to evolve to reflect the changing nature of the financial system. By formally adopting such facilities into the SMF, the Bank would make clear that it expects many of the structural changes that have occurred over the past few years to be enduring. Further, the formalisation would provide a foundation for the Bank to discuss its evolving operational approach with external stakeholders, as discussed in the Governance sections to follow.
27. The Bank has broadly met ongoing demands for Liquidity Insurance through a combination of its permanent and Crisis facilities, in many cases moving in advance of its global peers. It did so with adequate, albeit at times stressed, risk controls and infrastructure. Nevertheless, several troublesome issues remain:
 - Key Bank liquidity programmes, in particular the DWF, are stigmatised. Banks would only access the DWF under very extreme circumstances fearing market, regulatory or political consequences should their use be known. This has probably contributed to banks' over self-insuring rather than appropriately factoring the potential use of Bank facilities into their planning. This is costly to the banks and to the broader economy. We review the reasons for stigma, the cost of it and possible ways to mitigate this stigma and cost in **Chapter 6** in the Liquidity insurance provision section.
 - Other programmes are not stigmatised (e.g. the Extended Collateral Term Repo (ECTR) facility) but there is a risk that they would also be shunned by banks should banks either fear some form of official sector retribution or should they fear signalling to the market that usage indicates weakness.
 - The differences between the Bank's liquidity insurance facilities and those of the European Central Bank (ECB) and the US Federal Reserve (Fed) do not undermine the Bank's ability to meet its core objectives as the Bank has consistently evolved its programmes to accommodate the changing environment. Neither have these differences given rise to 'liquidity tourism' where banks access facilities of other central banks offering more attractive terms. This likely relates to banks' concerns about their ability to swap non-sterling borrowings back into sterling. The Bank should nevertheless remain focused on this possibility.
 - Despite infrequent usage of liquidity support since the termination of the drawdown period of SLS in 2009, banks continue to benefit from the market's assumption that liquidity support will be forthcoming from central banks at times of extreme stress. Many informed

observers go as far as to state that many banks' business models would be non-viable without such support. This creates an ongoing challenge in managing moral hazard. Nevertheless, the existence of the backstop is important to manage tail risks in the banking sector. This tension is at the heart of the current banking model in the developed world and the Bank has gone some way in clarifying its stance on the trade-offs it faces.⁷

- There has been a substantial increase in the predictability of the Bank's liquidity operations, and this is to be commended. But elements of 'constructive ambiguity' remain around how the Bank will respond in certain situations, including in areas where it has used temporary facilities to respond to the Crisis and has not incorporated the objectives of these facilities into the permanent framework.

High-level Recommendations:

28. This Review highlights a number of areas in which the Bank could consider making changes in order to improve the effectiveness of its liquidity insurance facilities, including in the context of a changing market environment. Many of them work in the same direction to reduce the reluctance of banks to access central bank facilities. The intention of these recommendations is to improve transparency and clarity over the tools the Bank will use to provide liquidity insurance, making the Bank's facilities more usable without providing an implicit subsidy to the banking sector. The Bank will need to carefully consider the overall calibration and therefore impact of any combined package of reforms to ensure the right balance is struck between, on the one hand, incentivising banks to appropriately factor central bank facilities into their liquidity planning, and on the other, avoiding them becoming overly dependent on the Bank for ongoing support.
29. ***Recommendation 3: The Bank should consider changes to its DWF to make it more accessible to banks. This could include: removing the on-the-day conditions to borrowing in favour of continuous assessment; increasing the certainty of available funds; and reducing pricing. In particular, the Bank should rely less on penal pricing as a means to manage moral hazard.*** There are a number of non-price costs to bank usage of Bank facilities that act to dissuade banks from becoming overly-reliant on Bank facilities. In addition, banks are now subject to much more robust regulatory oversight, further encouraging appropriate liquidity management. The Bank should consider both the price and non-price costs associated with usage of Bank facilities in forming its views on appropriately penal pricing.
30. ***Recommendation 4: The Bank should further consider concrete action to reduce any remaining reluctance of banks to use the DWF. The best way to accomplish this would be to regularise its use so that crisis usage is less visible and, hence, less stigmatised.***

⁷ Note that we do not consider the merits and disadvantages of the current banking model, in which leveraged banks provide maturity transformation services to the broader economy. Rather we take this model as a given. As a result, we assume that banks will always be exposed to some risk should their access to funding markets become substantially impaired.

31. **Recommendation 5: The Bank should also consider moving to a pricing structure for the DWF that incorporates payment of an upfront premium reflecting the value of the insurance being provided to the banks.**
32. We suggest two approaches to address recommendations 4 and 5 that should be thoroughly explored for effectiveness.
- The first approach would force regular usage of the DWF. Drawings would be required in large enough size so that usage in the event of a significant ‘genuine’ need by a bank would be less likely to be noticed.
 - The second approach would involve selling banks options to access the DWF for specified amounts, with at least some level of drawing available at a non-penal rate, with the expectation that those options would be regularly exercised. This would have the same effect of regularising usage of the facilities, making extraordinary usage less visible and less concerning. It would, in addition, make contractual the provision of liquidity from the Bank at an agreed price, reducing uncertainty around availability and further reducing stigma.
33. **Recommendation 6: In addition to the above changes, the Bank could consider having a second tier DWF, which would provide liquidity against pre-positioned collateral on less generous terms, to deal with cases where the Bank’s Risk Management Division had determined that more rigorous monitoring of drawings was necessary.** This would be distinct from Emergency Liquidity Assistance (ELA), which would be able to deal with a wider range of circumstances when it would not always be appropriate to use the published framework.⁸
34. **Recommendation 7: The Bank should consider regularising facilities such as the ECTR that are currently exceptional. It might do this by combining the ECTR with the Indexed Long-Term Repo (ILTR) Facility to create a regular auction facility allowing banks to access term funding against a wider collateral pool.**
35. **Recommendation 8: There may be merit, nevertheless, in retaining an ECTR-type operation that could be used to respond to a market-wide shock from an external source (e.g. acts of God, disintegration of the Eurozone).** The exact terms of such a facility may need to be set at the time of activation to deal with specific circumstances, but the Bank should consider non-penal pricing for liquidity in response to truly exogenous shocks as it is not in the public interest for banks to self-insure against such tail risks.
36. **Recommendation 9: The Bank should continue to broaden the range of eligible collateral for its DWF and other facilities beyond the substantial portion of bank assets already allowed. Criteria for broader eligibility should focus on the Bank’s policy objectives of financial stability and preventing disruptions to payment and settlement services provided to the wider economy, not merely the assets held by banks and, as such, might include allowing drawn revolving credit facilities as eligible collateral.** This will require continual improvement to risk management capabilities.

⁸ The provision of ELA is discussed further in the accompanying Review by Ian Plenderleith.

37. **Recommendation 10: The SMF should be more explicit in its role in providing a maturity transformation backstop in extraordinary situations where banks appear likely to curtail their maturity transformation provision to their customers. In order to accomplish this, the Bank might consider whether it should extend the maturity of some of its current facilities or develop other facilities that would give banks the necessary confidence to maintain or extend the term of credit provision.** This is likely to be necessary as banks seek a new equilibrium in their term funding arrangements. Any liquidity support should be provided on the basis that once the uncertainties currently clouding banks' ability to obtain term funding have reduced, the banks are incentivised to access markets to repay secured borrowings from the Bank.
38. **Recommendation 11: The Bank should consider making certain liquidity facilities in the SMF available to non-banks, including for example central counterparties.** Some non-bank entities are increasingly important in financial markets and can have as great an impact on financial stability and the provision of liquidity and payment services as banks, and as such should be considered in the development of Bank liquidity facilities. A pre-requisite would be that such institutions be regulated in a similarly rigorous way to banks in exchange for having access to Bank facilities. **The Bank should also specifically consider whether the restriction of only one legal entity per group accessing the full range of SMF facilities is reasonable. This will be particularly relevant in future in the case of non-ring fenced banks.**
39. **Recommendation 12: As an extension of the previous recommendations, the Bank should address more directly its role as a market maker of last resort (MMLR).** The Bank has acted as a MMLR in order to smooth transitions in dislocated markets, where there was a fear that such dislocations might threaten financial stability and where its conventional approach of offering liquidity to the banking sector was deemed inadequate. **Structural changes to the ways markets operate and the role of banks in markets may call for the Bank to make its MMLR actions more predictable and consistent.** This may include setting out more explicitly the likely objectives of acting as a MMLR and the circumstances under which the Bank would consider doing so, as well as the types of interventions it might consider, and the broad principles it might use to set the terms of such interventions.
40. **Recommendation 13: The Bank should coordinate policies closely with the Financial Services Authority (FSA) / Prudential Regulation Authority (PRA) and other domestic and international bodies to the greatest extent possible such that policy actions the Bank pursues to encourage acceptance of Bank liquidity facilities are not effectively offset or rendered redundant by the actions of others.**
41. **Recommendation 14: As an overarching recommendation, the Bank should avoid constructive ambiguity in its published framework. Specifically, it could provide even greater clarity upfront about the terms on which it would expect to provide liquidity insurance in a range of circumstances.** For example, it could set out the broad approach to its role in backstopping maturity transformation and acting as MMLR. Nevertheless, there may be good reasons why central banks wish to retain some elements of constructive ambiguity in their frameworks around the specific terms of some facilities, in particular to

deal with externally driven market-wide shocks, where the response may need to be shaped to the specific circumstances. They will also wish to retain discretion to provide liquidity support outside the framework (ELA), given the level of judgement required in making such extreme interventions.

Special Liquidity Scheme

42. The remit of this Review specifically required assessment of the operation of the Bank's SLS. This is set out in **Chapter 5** in the Liquidity insurance provision section. Overall, the Review concludes that the SLS was effective and innovative at the time it was deployed, and accomplished its intended purpose of helping banks finance their operations at a time when markets on which they had come to rely ceased functioning. One point worth noting, though, is that the Bank did not at the outset fully consider banks' exit from the SLS, most likely as it did not expect financial conditions to remain so unsettled three years after implementation. Banks faced material difficulty refinancing their SLS funding and, as a result, may be reluctant to fully participate in future Bank programmes of a similar nature for fear that they will again find themselves in a difficult position at the point of refinancing. The Bank has considered this problem in the design of its more recent initiatives, such as the Funding for Lending Scheme (FLS). There is little indication banks fear difficulty in refinancing that facility upon maturity.

Governance

43. Internal formal governance arrangements are clear and appropriate. Authorities are properly delegated to the Governor and the Governor has clear rules for execution of that authority. In practice, the externally appointed Deputy Governors are regularly consulted, although that appears largely to be at the discretion of the Governor of the day.
44. ***Recommendation 15: The formal arrangements around internal governance could usefully be clarified. While the Governor must retain the final say, he should be required to formally seek the views of his Deputies and those Deputies should be required to record any dissenting views. Minutes should be taken and reviewed by Court, although not disclosed for some time. Court should assure that these consultative processes are carried out.***
45. Informal governance is not as robust. As is common in many public and private institutions, the Bank is a centralised and hierarchical organisation with a large decision-making burden residing with the Governor and senior management. Less senior staff undertake analysis of a wide range of policy options, and are often willing to challenge their superiors. But there appears to be some tendency for them to filter recommendations in such a way as to maximise the likelihood that senior staff will find the recommendation palatable. While this makes it easier for the Governor, as ultimate decision-maker, to reach conclusions it risks reducing the range of views he sees and, as such, might lead to a less effective overall outcome.

46. **Recommendation 16: The Court should regularly assess the efficiency of decision-making around issues relating to the SMF to ensure that the right issues are raised to senior management for a decision, with a balanced set of views and options, and that appropriate accountability is in place throughout the organisation for decisions taken in the process leading up to this.**
47. The Bank operates independently. Its remit and objectives around monetary policy and price stability are clear. The responsibility of the Executive to external stakeholders in the area of liquidity operations, specifically to Court, HM Treasury (HMT), the Chancellor, the TC, the MPC and the FPC, is not as clear and in some cases responsibilities appear to overlap. Symmetrically, the policy guidance provided by the external stakeholders relating to the provision of liquidity insurance has been lacking, making it difficult for the Executive to know what external stakeholders consider to be success in the long-term, or their preferences with respect to the trade-offs being managed.
48. **Recommendation 17: Consideration should be given to the establishment of a regular forum at which the Governors of the Bank meet key stakeholders in the Bank's liquidity operations. For example, the Governors, the Chancellor and/or senior HMT representative and the chair of Court might meet annually to discuss current issues around liquidity provision.** The objectives of such a meeting would be to allow the Bank Executive and key stakeholders to discuss these issues, and for the external stakeholders to be able to express their views about the Bank's general policy stance. A further objective would be to establish a level of confidence amongst the Executive that some of the potentially bold actions they may feel are necessary during a crisis will be understood and supported by external stakeholders, increasing the likelihood that the Bank would unhesitatingly take such action.
49. **Recommendation 18: Some thought should be given to the appropriate level of capital for the Bank.** The Bank might need greater ability to act off its own balance sheet in order to accomplish its objectives as set out in its mandate from the Government and Court. Its operations must remain independent in order to assure markets that it is not straying from its core mandate.
50. **Recommendation 19: The roles of the MPC and the FPC in relation to the design and implementation of the Bank's SMF should be clarified.**
51. **Recommendation 20: The FPC and the MPC have clear interests in aspects of the Bank's liquidity operations. The Review suggests that it would be useful for the FPC to provide as much clarity as possible to the Executive over its views regarding the Bank's provision of liquidity insurance.** Further, the FPC should have clear and well-understood processes through which to give the Executive recommendations over the design and implementation of particular liquidity insurance facilities, with the Executive explaining its reasoning should it disagree with that view.
52. **Recommendation 21: The MPC should continue to have authority over any operations intended primarily to influence monetary conditions. And it should be informed of the implications for monetary conditions of other liquidity operations, and have the**

opportunity to express views on such operations if those implications were likely to be material. As with the FPC above, if the Executive disagreed with those views, it would be expected to explain the reasons for that decision.

53. In putting forward any views to the Executive over the Bank's liquidity operations, the MPC and the FPC should be mindful of the responsibility vested in the Executive by Court for protection of the Bank's balance sheet and capital.
54. **Recommendation 22: The processes described above will require a high level of communication and cooperation between the Executive, the MPC and the FPC regarding the Bank's liquidity operations. Court should be responsible for ensuring the proper communication and coordination channels are in place.**

Chapter 1: Background

55. The Bank of England's (the Bank's) core purposes are to ensure monetary stability and to contribute to financial stability. The Bank's operations in the sterling money market, the Sterling Monetary Framework (SMF), aim to serve both those core purposes. The SMF is designed to implement the Monetary Policy Committee's (MPC's) decisions in order to meet the inflation target, and to reduce the cost of disruption to the liquidity and payment services supplied by banks to the UK economy, by providing liquidity insurance to the banking system.

The Bank's role in implementing monetary policy

56. The Bank normally implements monetary policy by influencing short-term interest rates. The Bank is able to influence market interest rates because it is the sole supplier of central bank money in the UK, the most liquid asset used to settle transactions. Central bank money takes two forms: banknotes used in every day transactions, and balances held by commercial banks (and building societies) at the Bank, otherwise known as reserves. Central bank money is the ultimate settlement asset in the UK economy and this puts it at the heart of the monetary policy transmission mechanism.
57. Banks hold reserves not only as a medium of exchange with other banks for clearing and settlement purposes, but also as precautionary balances for frictional payment shocks and to manage their broader liquidity risk.
58. The Bank commits to supply, in aggregate, the reserves that banks need to meet their liquidity needs. The Bank supplies reserves either by lending them against collateral or by buying securities outright using reserves as payment.
59. The Bank remunerates reserves balances, typically at Bank Rate, and in so doing establishes a benchmark short-term risk-free rate. From day-to-day, banks can choose to change the level of reserves they hold. The interest rate they receive from the Bank on these holdings will influence the rates they are willing to charge or pay on short-term loans and borrowings in the market. In turn these short-term rates have a bearing on interest rates on longer term borrowing and lending to a wider range of counterparties outside the banking system.
60. The Bank is currently implementing monetary policy through large-scale asset purchases financed by the creation of reserves, known as Quantitative Easing (QE).

The Bank's role in providing liquidity insurance

61. Broadly speaking, the financial system provides three key services to the economy: the intermediation of credit between savers and borrowers; payment services; and tools for risk management. The banking system has a key role across all these services. For example, a key function of the banking system is to provide services to enable customers to manage their need for access to their savings, part of what is referred to as liquidity risk. As an example, banks offer savers instant access deposits and overdraft facilities. Simultaneously,

banks extend credit through long-term loans and long-term commitments to lend. As a result banks take on liquidity risk in two ways: by providing maturity transformation in taking short-term deposits and lending them at a longer term; and by providing contingent access to funding. This liquidity risk is at the heart of the banking system, making banks vulnerable to demands to withdraw deposits or draw on credit lines.

62. Banks can self-insure in order to manage liquidity risk by holding liquid assets, such as central bank reserves and highly liquid government bonds that can be exchanged readily for cash. Recent changes in liquidity regulations have significantly increased the amount of self-insurance required of banks. But it is probably not in the public interest for banks to fully self-insure against even the most extreme liquidity shocks, as that would reduce dramatically the amount of credit available in the broader economy. As long as banks are less than fully self-insured, there is some tail risk that a bank (or banks) might find itself in a position where it cannot meet demands on its liquid assets, such as occurs in a classic run on a bank. This may cause it to fail, even if the bank is fundamentally solvent.
63. The cost of bank failure is potentially very large. Beyond the costs to a bank's direct stakeholders and its disrupted customers, a bank failure risks causing a generalised concern about the creditworthiness of all banks. This, in turn, can lead banks to stop providing the services on which the economy depends. The cost of failure to an individual bank's direct stakeholders is often far less than the broader social costs. Governments typically seek to address this 'externality' through a combination of regulation and provision of liquidity backstops to solvent banks which experience a liquidity need.
64. Central banks, as sole suppliers of central bank money, can act as backstop liquidity providers to individual banks and the banking system as a whole to reduce the risk of, and cost of, this tail risk, and help contain the costs to the wider economy that would follow from a crisis of confidence in the banking system.
65. Central banks have typically undertaken their role as providers of liquidity insurance by standing ready to lend central bank reserves, or other highly liquid assets, on a short-term basis against less liquid assets. This is known as a 'liquidity upgrade'. However, central banks have also acted to take on the maturity transformation by the banking system more directly by lending reserves for longer periods against eligible collateral. **Section Two** outlines how the Bank has acted as a provider of liquidity insurance in recent years.
66. Central banks undertake the role of backstop liquidity provider as a last resort, rather than the first port of call when a bank needs liquidity, in order to encourage banks to deal with their own liquidity risks without relying excessively on the central bank for support. There is no direct social cost to the central bank providing liquidity insurance as long as: the central bank lends to solvent banks against valuable collateral; and the banking sector does not become dependent on central bank support. These two principles are central to the questions posed in this Review and are discussed throughout.

Development of the Bank's Sterling Monetary Framework

67. The Bank continually reviews its SMF, and summarises its approach in a document generally known as the *Red Book*. Since the start of the Crisis, the Bank has reviewed every aspect of its framework and made a number of significant changes, reflecting in large part the lessons learnt from operating in the extraordinary market conditions of the last five years. This short section sets out some of the key events in the development of the SMF. A more detailed and discursive overview of the framework's development is provided in **Annex 3**.
68. The SMF has historically largely been focused on the implementation of monetary policy. In 2003, the Bank announced a review of the framework in place at the time to address a number of concerns, the key one being the relatively high volatility of short-term sterling market rates around the MPC's policy rate. Following a number of market consultation phases, a revised framework was launched in 2006, most notably introducing a system of reserves averaging that allowed banks to choose the target level of reserves they wished to hold at the Bank (voluntary reserves targets). While the framework also had other objectives, including recognising that it needed to be robust to stressed conditions, this was largely in the context of ensuring the Bank was still able to implement monetary policy effectively in all circumstances. The framework at that time did not explicitly set out how the Bank would provide liquidity to the banking system in the event of market-wide or large idiosyncratic stress. When the Crisis hit, it became clear that the measures in the framework were insufficient given the liquidity shock faced by the banking system.
69. The Bank's initial response to the onset of the Crisis was examined by the Treasury Committee (TC) in *The run on the Rock*, published in January 2008. The report identified a number of inadequacies in the Bank's framework for provision of liquidity to the banking system. In particular, the report noted that the available facilities were not sufficient to provide liquidity to solvent but needy banks. It also noted that the Bank had been slow to deal with the emerging problems at Northern Rock and other banks out of fear that banks would be encouraged to run imprudent risks in future assuming the Bank would provide ongoing support.
70. The Bank started to undertake a root-and-branch review of its framework in early 2008, and issued a consultation paper in October 2008 setting out potential ways to make the framework more robust in future.⁹ This paper for the first time recognised that it should be an explicit objective of the SMF to provide liquidity insurance to the banking system to "reduce the cost of disruption to the liquidity and payment services supplied by banks to the UK economy." This objective was incorporated in the Bank's *Red Book* in 2010, which also set out comprehensively for the first time the full range of new and amended facilities that the Bank had developed and launched as part of the SMF since 2007, including many to deal specifically with providing liquidity insurance.

⁹ The consultation document "The Development of the Bank of England's Market Operations" is available at <http://www.bankofengland.co.uk/markets/Documents/money/publications/condococt08.pdf>

71. Alongside the development of the SMF itself, the Bank launched a number of temporary crisis-related measures with specific objectives, including the Special Liquidity Scheme (SLS). It also expanded some of its SMF facilities – such as its long-term repos – on a temporary basis to provide additional liquidity to the banking system. Lessons from running such crisis operations have been incorporated into the Bank’s permanent set of SMF facilities that are now in operation.
72. In January 2009, the Bank launched the Asset Purchase Facility (APF), through which it has undertaken purchases of commercial paper (CP) and corporate bonds, as well as gilts as part of its QE programme to implement monetary policy. This programme has rendered much of the monetary policy apparatus of the SMF redundant, and the Bank has had to adapt its framework accordingly.
73. **Box 1** provides a chronology of the key events in the development of the SMF since 2003.

Box 1: Evolution of the Sterling Monetary Framework (SMF) and related facilities

2003-2004: Money Market Reforms consultation undertaken.

May 2006: Updated *Red Book* released. Introduced reserves averaging and remuneration of reserves balances.

September 2007: Bank begins to provide additional reserves in excess of the banks’ voluntary reserves targets and reserves ranges were expanded. Four three-month term auctions against ‘wider collateral’ were announced.

December 2007: Extended Collateral Long-Term Repo (ELTR) operations were introduced providing three-month funding against ‘wider collateral’. Usage peaked at £180bn in January 2009.

January 2008: *Red Book* updated to reflect the introduction of gilt open market operation (OMO) purchases used to provide reserves on longer term basis backing the Banknote liability.

April 2008: Special Liquidity Scheme (SLS) announced.

September 2008: US dollar repo operations introduced following stress in the FX swap market. Usage of the facility peaked at the equivalent of £44bn on 30 October 2008.

October 2008: Discount Window Facility (DWF) introduced and standing lending facility repositioned as an Operational Standing Facility (OSF). Wider collateral eligibility was further expanded. At this time the Bank introduced Bank of England bills as a way to drain reserves in its OMOs. The Bank also began a consultation on further changes to the framework.

January 2009: the drawdown window for the SLS closed, with peak usage of £185bn. Separately, the Chancellor authorised the Bank to set up the Asset Purchase Facility (APF) to buy high-quality assets with the aim to improve liquidity in credit markets and as a tool the MPC could use for monetary policy purposes.

February 2009: APF commercial paper (CP) purchases were initiated. Outstanding purchases peaked at £2.4bn in April 2009.

March 2009: upon the introduction of Quantitative Easing (QE), the reserves averaging framework was suspended and short-term OMOs switched to a variable rate basis. APF corporate bond purchases were initiated. Holdings of corporate bonds peaked at £1.6bn in June 2010.

August 2009: short-term OMOs were suspended given excess reserves created by QE.

October 2009: following the introduction of the Financial Services Authority (FSA) Individual Liquidity Adequacy Standards (ILAS) liquidity regime, changes were introduced to expand the number of eligible institutions in the SMF.

June 2010: Indexed Long-Term Repos (ILTR) replaced ELTRs creating auction-determined pricing and allocation against narrow and wider collateral. Wider collateral was restricted to liquid and high-quality securities. Two further collateral sets were eligible for the DWF to include illiquid transferable securitised loans and mortgages as well as own-name securitisations and covered bonds.

December 2010: *Red Book* updated to reflect the permanent changes to the framework.

April 2011: Collateral eligible in the DWF extended to include raw (that is, unsecuritised) loan portfolios.

July 2011: the range of securities taken as 'narrow collateral' in the Bank's OMOs and OSFs was adjusted removing references to *credit rating agencies* and restricting eligibility to specific debt securities.

December 2011: Extended Collateral Term Repo (ECTR) introduced as an exceptional market-wide facility against DWF eligible pre-positioned collateral. The Bank introduced information transparency requirements in relation to asset-backed securities and covered bonds eligible in its operations.

June 2012: activation of ECTR facility with the announcement of monthly auctions for a minimum of £5bn until further notice.

July 2012: launch of the Funding for Lending Scheme (FLS).

Challenges of designing a money market framework

74. There are many challenges in developing and implementing a well-functioning money market framework. Several of these challenges require assessing and dealing with trade-offs across competing objectives. Here we outline some of the key trade-offs that will be explored in more detail in this Review.

Dual objectives

75. The two central objectives of the money market framework are to:
- a. Implement the MPC's decisions in order to meet the inflation target;
 - b. Reduce the cost of disruption to the liquidity and payment services supplied by banks to the UK economy.
76. These objectives are intimately linked and most elements of the Bank's SMF affect each objective in some way.
77. In using its balance sheet to meet one objective the central bank needs to be mindful not to compromise its ability to meet the other. A number of operations provide liquidity insurance by injecting reserves into the market. The central bank, however, needs to ensure the overall level of reserves in the system is still appropriate for monetary policy implementation. That may mean those reserves need to be 'drained', or the other parameters of the monetary policy framework adjusted, to accommodate the additional reserves if they are not to compromise the Bank's ability to implement Bank Rate. Similarly the collateral policy relating to the liquidity insurance operations may influence banks' asset holdings and the nature of credit provided to the real economy with potential macroeconomic effects relevant to monetary policy implementation.

Short-term versus long-term financial stability – managing moral hazard

78. When faced with an immediate financial stability stress, policymakers often have incentives to be seen to be taking action to address the problem. But those actions may have long-term consequences, which need to be taken into account when establishing facilities to deal with such stresses.
79. Providing liquidity on generous terms may solve an immediate liquidity problem for a bank or the banking system as a whole. But if the terms are too generous, or if their availability is too certain, it could reduce banks' incentives to prudently manage their credit provision and liquidity in future as they might perceive they can rely on central bank intervention at times of moderate stress. Central banks need to be conscious of this potential for 'moral hazard' to arise as a result of their actions when setting the terms of their operations.
80. There is also a risk that overly generous support from a central bank effectively disintermediates a private market. Banks would have no incentive to maintain the capability to transact with each other if the central bank provides liquidity to lenders and borrowers at

attractive rates. This can distort competitive pressures amongst banks and make exit from support operations much more difficult in the long-term, particularly if the private market infrastructure has atrophied during the period of the support operation. Furthermore, central bank interventions create price and risk distortions in private markets. Whilst some of these may be the intended result of the intervention, there may also be undesirable side effects such as creating incentives to hold certain asset classes, or indirectly subsidising particular actions by banks.

Moral hazard and stigma

81. In attempting to mitigate the moral hazard concerns noted above, the terms of central bank facilities are often made unattractive relative to managing liquidity using private markets. However, there is a risk that this can act to stigmatise facilities, as users may be perceived as weak or vulnerable when they use a central bank facility on less attractive terms than those available to a healthy bank in the private market. In designing a money market framework, there is naturally a trade-off between setting terms that are sufficiently unattractive that they do not create moral hazard in the system, and on the other hand not making the facility so unattractive that a needy but solvent bank is reluctant to use the facility, potentially increasing the likelihood of a bigger problem.

Central bank risk management

82. In providing liquidity insurance, the central bank is assuming some tail risk that in an extreme scenario could cause it to lose money. If the Bank were to structure its facilities such that it took no risk at all, there would be no value to the insurance. If it takes too much risk, it might lose money, forcing it to be recapitalised with additional taxpayer funds. To help mitigate the risk it takes, the central bank needs to have the competence both to assess the solvency of its borrowers, and to value and manage the collateral it takes. The capacity of a central bank to take risk may depend on its capital level, or on its broader appetite to risk public funds given its mandate from the government.

Passive versus active frameworks

83. Central banks also need to make a decision about how active they wish to be in managing their money market framework. It is possible to structure a framework to operate quite passively most of the time, by providing the correct incentives for private markets to act in a way that is consistent with the desired policy stance. However, there needs to be an awareness under such a framework that, in times of crisis, there may need to be more responsive intervention and active decision-making, which will then require a step-change in behaviour on the part of policymakers.
84. It is equally possible to design a framework which has more active management on an ongoing basis. Such a framework may be appropriate for a variety of reasons, including in situations where money markets are not well developed and so cannot easily undertake the required functions to allow the central bank to step back from day-to-day involvement.

Crisis decision-making in a more active system is more likely to be continuous, with policymakers, rather than the private market, making the required decisions.

Disclosure and accountability

85. The existence of central bank liquidity operations should generate confidence in the banking system in general. But details of specific institution participation in such operations, when broadly known, can have a material and potentially negative impact on that institution, and may undermine market confidence and financial stability more generally. As such, it may at times be desirable to have less disclosure around participation in central bank operations than may be usual in commercial transactions, or for the timing around the disclosure of such information to be delayed.
86. But this reduced transparency can at times conflict with the need for the actions of the central bank to be accountable, not least as these operations may put taxpayers' money at risk.

The current Sterling Monetary Framework

87. The SMF represents the Bank's permanent set of operations in the sterling money markets. It comprises a series of regular market-wide operations and bilateral standing facilities. The former include short-term open market operations (OMOs), Indexed Long-Term Repos (ILTRs), and the Extended Collateral Term Repo (ECTR) facility. The latter encompasses the Operational Standing Facilities (OSFs) and the Discount Window Facility (DWF).
88. The Bank is also currently operating in sterling markets via a range of temporary facilities, including the APF, through which QE is executed, and the Funding for Lending Scheme (FLS).
89. The broad purpose and parameters of these operations and facilities are described in **Table 1**, and the definitions of the collateral sets accepted in each are set out in **Table 2**. Further discussion of how the different facilities are used to meet the Bank's policy objectives are provided in the Monetary policy implementation and Liquidity insurance provision sections.

Table 1: Summary of current Bank of England operations in the sterling money markets

(Note: for relevant footnotes see following page)

	SMF Market-wide operations			SMF Bilateral standing facilities		Asset Purchase Facility		Funding for Lending Scheme (FLS) ²
	Short-term Open Market Operations ¹	Indexed Long-Term Repo (ILTRs)	Extended Collateral Term Repo Facility	Operational Standing Facilities (OSFs)	Discount Window Facility (DWF)	Asset Purchase Facility: Corporate Bonds	Asset Purchase Facility: Gilts	
What is the primary purpose of the operation?	Monetary policy implementation	Liquidity insurance	Liquidity insurance	Monetary policy implementation & bilateral liquidity insurance to deal with frictional payment shocks	Bilateral liquidity insurance	Improve the liquidity in, and flow of, corporate credit	Monetary policy implementation	Increase bank lending
Who can become a counterparty?	Eligible liability reporters	Eligible liability reporters	Eligible liability reporters signed up to participate in the DWF	Eligible liability reporters	Eligible liability reporters	Eligible liability reporters or active intermediaries in sterling markets	Competitive: Market makers or active intermediaries in sterling markets Non-competitive: FSMA authorised firms	SMF participants that are signed up to the DWF
What is being borrowed?	Sterling cash	Sterling cash	Sterling cash	Deposit facility: n/a Lending facility: sterling cash	Gilts ³	n/a	n/a	Treasury bills
Eligible collateral (see Table 2 for definitions)	Narrow	Narrow Wider	Narrow Wider DWF	Deposit facility: n/a Lending facility: Narrow	Narrow Wider DWF	n/a	n/a	DWF
What securities are eligible for purchase/sale	n/a	n/a	n/a	n/a	n/a	Eligible corporate bonds	Conventional gilts as per market notice	n/a
Is there a reserves impact?	Yes – supply	Yes - supply	Yes - supply	Deposit facility: yes - drain Lending facility: yes - supply	No ³	No ⁴	Yes - supply	No
What is the price/fee for the operation?	Normally fixed amount provided at Bank Rate	Auction determined uniform spread indexed to Bank Rate ⁵	Auction determined uniform spread indexed to Bank Rate ⁵	Deposit facility: 0.00% Lending facility: 0.75% (normally Bank Rate +/- 0.25%)	Fee dependant on size of drawing and collateral delivered	Auction determined uniform spread for each bond ⁵	Determined in a variable rate auction on a discriminatory-price basis	Fee based on net lending of bank. If positive: 25bps, if negative: up to 150bps
What is the maturity of the operation/instrument?	Typically one week	Typically 3 or 6 months	6 months	Overnight	30 or 364 days	Purchase and sale of bonds with a residual maturity greater than 1 year	Purchase of gilts with a residual maturity greater than 3 years	Four years, with early termination possible
What is the frequency of the operation/facility?	Typically weekly	Typically monthly	Monthly	Available daily, all day ⁶	Available daily, all day ⁶	Purchases once a week Sales once a week	Mondays, Tuesdays and Wednesdays	18 month drawdown window ending 31 January 2014
When are statistics publicly reported?	Published same day as each operation	Published same day as each operation	Published same day as each operation	Average daily usage over the maintenance period is published three weeks after its end	30 day: published a quarter in arrears 364 day: published five quarter in arrears	Published same day as each operation	Published same day as each operation	Quarterly with a lag

Table 2: Categories of eligible collateral⁷

Collateral Type	Category	Description and examples
Narrow	Level A	High-quality sovereign debt Includes: gilts; sterling treasury bills; HM Government non-sterling marketable debt; Bank of England securities; and sovereign and central bank debt issued by Canada, France, Germany, the Netherlands and the United States.
	Level B	High-quality securities that normally trade in liquid markets Includes: other sovereign and central bank debt; major international institutions bonds; G10 government guaranteed agency bonds; government guaranteed bank debt; US agency debt; prime RMBS; regulated covered bonds; ABS backed by credit cards, auto loans, student and consumer loans; and portfolios of senior corporate bonds and commercial paper issued by non-financial companies.
DWF	Level C	Illiquid but transferable securities Includes: CMBS, other ABS, securitised portfolios of senior secured or on balance sheet corporate or SME loans, securitised portfolios of corporate bonds; and Asset-Backed Commercial Paper (ABCP).
	Level D	Own-name securities and loans Includes: residential mortgage, consumer, commercial real estate and corporate loans, own-name securitisations and covered bonds.

Footnotes for **Table 1** and **Table 2**

¹ Although short-term OMOs are part of the current framework, they are not currently being used.

² For further details see <http://www.bankofengland.co.uk/markets/Pages/FLS/default.aspx>

³ At the Bank's discretion, reserves may be lent through the DWF. In such rare circumstances, there would be a supply of reserves to the market.

⁴ The reserves impact depends upon funding of the APF. Currently corporate bond operations are funded via the issue of Treasury bills and the DMO's cash management operations.

⁵ An auction with a uniform spread pricing mechanism means that every successful bidder pays the lowest acceptable spread, or in the case of a purchase operation, all assets are purchased at the highest accepted spread.

⁶ OSFs and the DWF are available all day, every day, subject to the relevant settlement system deadlines.

⁷ For further details of the Bank's eligibility criteria see "Sterling Monetary Framework - Eligible Collateral", <http://www.bankofengland.co.uk/markets/Pages/money/eligiblecollateral.aspx>

Section One: Monetary policy implementation

In this section we review the effectiveness of the Bank's Sterling Monetary Framework (SMF) against its objective to "implement the Monetary Policy Committee's (MPC's) decisions in order to meet the inflation target".

90. In order to properly assess the current framework, and to discuss its appropriateness in future states of the world, it is important to review how the Bank arrived at its current framework – what needed to be changed and why. **Chapter 2** covers this background. In summary, the Bank's Sterling Monetary Framework (SMF) was fundamentally overhauled before the Crisis, in 2006, and a system known as reserves averaging introduced. The system was continuously updated from 2007 to the present as lessons were learned and as the market environment altered, including the suspension of reserves averaging when a policy of Quantitative Easing (QE) was introduced as an additional tool of monetary policy in 2009.
91. We also discuss the mechanics of implementation of policy rate setting in this chapter. This is by way of background but is important for understanding some of the conclusions and recommendations we make.
92. **Chapter 3** then covers the specific question of whether the Bank should return to a system of reserves averaging at some point in the future.
93. **Chapter 4** looks at how the framework can and should be used in other ways to implement monetary policy.

Chapter 2: Development of the monetary policy implementation framework

94. The Bank uses the SMF to implement monetary policy. As explained in the Background section, it is able to do this because it is the sole provider of the most liquid asset used to settle transactions – ‘central bank money’. Central bank money takes two forms – the bank notes used in everyday transactions and the balances that are held by banks at the Bank (reserves).
95. In normal times, the Bank remunerates reserves balances at its official policy rate (Bank Rate) and in so doing establishes a benchmark short-term risk-free rate. Banks can alter their holdings of reserves, and the level of Bank Rate will influence the rates they are willing to charge or pay on short-term loans and borrowings in the market. Changes in Bank Rate therefore influence money market rates and more widely rates paid on bank deposits and loans, financial asset prices and exchange rates. These impacts, and associated expectations, in turn affect spending decisions and inflationary pressures in the economy.
96. The Bank seeks to provide reserves for monetary policy implementation purposes against high-quality securities, either purchased outright or accepted in repo operations. This is because when undertaking operations for monetary policy purposes it wishes to minimise the level of credit or liquidity transformation it undertakes in the underlying asset markets. This has to be balanced against the need to accept a large enough range of collateral such that it does not constrain the implementation of policy or distort the market for the eligible securities. Collateral policy is discussed in more detail in the Liquidity insurance provision section.
97. **Box 2** outlines how the Bank's operations affect monetary policy implementation through their impact on the supply of reserves to the banking system.

Objectives of the framework

98. The Bank's framework for its operations in the sterling money markets is described in the *Red Book*. The first of the broad objectives of this framework is to “implement the Monetary Policy Committee's decisions in order to meet the inflation target”. This is usually achieved through payment of interest on reserves balances held at the Bank but more recently has involved using the quantity of reserves directly as a policy tool through QE. The aims of the framework in achieving these objectives are:
- to achieve a flat ‘risk-free’ money market yield curve at Bank Rate out to next MPC decision date;
 - to do so with very little day-to-day or intraday volatility in market interest rates at maturities to the next MPC decision date;
 - normally to seek to affect only the risk-free element of market rates, and avoid distorting the credit, liquidity and other spreads established in the market;

- d. and, with respect to QE, to purchase or sell assets through the Bank's Asset Purchase Facility (APF) in line with the MPC's target for the stock of assets purchased by the creation of reserves.

Pre-2006 framework

99. Prior to the money market reforms introduced in 2006, banks were obliged to maintain a minimum balance of zero on their reserves account at the Bank at the end of each day (the maintenance requirement). Balances on these accounts were not remunerated. The Bank conducted daily open market operations (OMOs) at a maturity of around two-weeks to supply the market with the Bank's forecast of the net funds needed by the banking system in aggregate to meet this maintenance requirement every day.
100. The Bank undertook two key operations each day to lend (via repo) at Bank Rate against high-quality collateral. Two further operations were undertaken in case additional liquidity was required later in the day, albeit at a penalty rate of up to 150bps. This penalty was to encourage participation in earlier operations.
101. Counterparties also had the option to make overnight deposits with the Bank at a rate 100bps below Bank Rate. The penalty rate on late lending and low rate on deposits effectively created an interest rate corridor that was intended to avoid discouraging active trading between market participants whilst moderating undue volatility in market interest rates.
102. This system was operationally intensive, requiring the Bank to actively operate in the market several times a day. It also led to an undesirably high level of volatility in sterling overnight rates, as illustrated by comparison with other currencies (see **Chart 1**).
103. In part this volatility was due to the wide interest rate corridor formed by the rates on the Bank's overnight deposit facility and late lending operations (200bps or more) and the fact that direct access to those facilities was limited to a narrow range of firms. But it also resulted from the fact that the Bank lent at Bank Rate for maturities spanning MPC meetings. Through a process of normal market arbitrage, overnight market rates would start to adjust ahead of MPC meetings to equalise the cost of borrowing from the Bank at two weeks and the expected cost of rolling borrowing in the overnight market over the same period. Thus, overnight rates ahead of the MPC meeting would tend to fall if overnight market rates following the meeting were expected to rise due to an increase in official rates.

Box 2: Which operations are used to implement monetary policy?

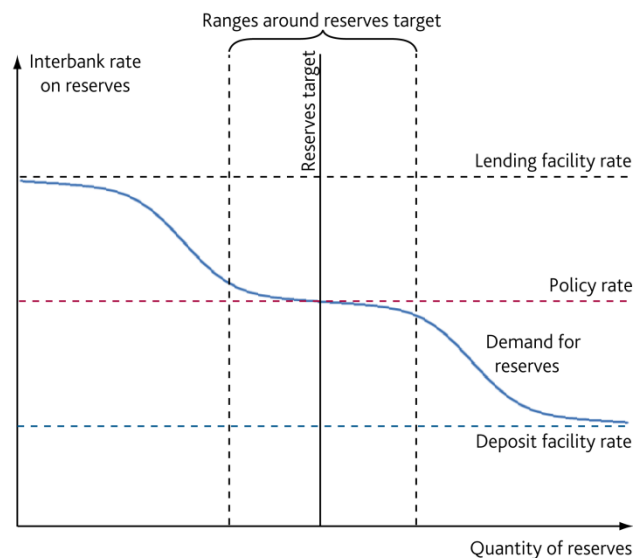
- A. The Bank's SMF carries out two distinct functions – to implement monetary policy, and to provide liquidity insurance to the banking system. Different elements within the framework are designed with a greater focus on one or other of these two objectives. But in practice, most elements of the framework will have some degree of influence as regards both objectives.
- B. Monetary policy implementation stems from the Bank's ability to influence financial and therefore macroeconomic conditions, through its monopoly on providing the most liquid assets to the banking system. In 'normal' (non-QE) circumstances, it is the rate paid on reserves that is the key instrument of monetary policy, as this establishes a benchmark short-term risk-free rate in the market. Around this, the rates on the Bank's Operational Standing Lending and Deposit Facilities (OSFs) create an interest rate 'corridor' as commercial banks will typically be unwilling to transact in the market on worse terms than those available at the Bank.
- C. But market rates will only be close to the rate paid on reserves if the Bank supplies the amount of reserves in aggregate to meet banking system demand: too few and banks will bid up to compete for the reserves they demand for liquidity management purposes; too many and, in a reserves averaging system, rates will fall as banks try to lend out excess reserves. The Bank's primary tool for providing the banking system with the level of reserves it demands is its regular short-term Open Market Operations (OMOs). Short-term OMOs provide reserves via reverse repo against very high-quality collateral, and drain reserves via repo or by issuing Bank of England Bills.
- D. The Bank's Indexed Long-term Repos (ILTRs) and Extended Collateral Term Repo (ECTR) facility also affect the level of reserves in the market. But they are primarily liquidity insurance operations, and are not used to steer the level of reserves for monetary policy purposes. The Bank's Discount Window Facility (DWF) can also provide reserves, although more usually it would be expected to provide gilts to the market. Again, however, it is a liquidity insurance rather than a monetary policy facility. Reserves provided to the market via these types of operations would be taken into account when deciding the quantity of reserves to be provided in regular short-term OMOs.
- E. Against the current backdrop of asset purchases being used to set monetary policy, the APF gilt purchases are the operation through which monetary policy with respect to QE is implemented, with purchases of assets being paid for by crediting banks' reserves accounts. In contrast, the APF for corporate bond purchases is primarily intended to improve liquidity in the corporate bond market and is currently funded by Debt Management Office (DMO) issuance of Treasury bills or other cash management operations and so does not have an impact on reserves.

2006 framework – introduction of reserves averaging and voluntary reserves targets

104. The money market reforms introduced in 2006 aimed to mitigate these problems. A key feature of the reforms was the use of reserves averaging. This allowed banks to set voluntary reserves targets that they would hold at the Bank on average over the month-long maintenance period between MPC decisions.¹⁰ If a bank's average balance was within a specified range around their target, then the balance would be remunerated at Bank Rate. The Bank would use a weekly OMO (and an additional fine-tuning OMO at the end of the maintenance period) to provide to the banking system the amount of reserves needed to enable reserves account holders in aggregate to meet their reserves targets. Because the maintenance period was now one month long, and the demand for reserves was known ex-ante, the Bank could run operations less frequently.
105. During the maintenance period, if market rates deviated from Bank Rate, then banks would have an incentive to run down their level of reserves to lend into the market if rates were high or build up their reserves balance by borrowing from the market if rates were low. This arbitrage mechanism was designed to keep market rates close to Bank Rate. Standing facilities that allowed banks to borrow or deposit unlimited amounts at a penalty rate were introduced to limit volatility by acting as a backstop for market rates, thereby creating an interest rate corridor within which market activity might be expected to take place.
106. The key parameters of this framework were the rate at which reserves were remunerated (normally Bank Rate), the width of the standing facility corridor, and the tolerance bands around the reserves targets. A stylised illustration of how these different elements interact to influence banks' demand for reserves is shown in **Figure 1**. If reserves were in short supply, banks would be willing to bid higher rates in the money markets to gain additional reserves, but generally not above the rates at which they can borrow from the Bank in its operational standing lending facility. As a bank's stock of reserves increases, the additional benefit from each extra pound of reserves diminishes. Once a bank has a stock of reserves sufficient for liquidity management purposes, the rate it would be willing to pay for an additional pound of reserves would be no higher than the rate at which it would be remunerated — Bank Rate. And equally it would not lend in the interbank market at a lower rate than it could earn at the Bank. If there were an excess of reserves relative to aggregate demand, banks would be willing to lend in the money markets at low rates to avoid overshooting their reserves target ranges and incurring a charge, but generally not below the rate at which they can deposit at the Bank in its operational standing deposit facility. The flat part of the demand curve around the reserves target reflects the tolerance allowed for small deviations in average reserves balances from their target (the range of balances at which banks continue to be remunerated at Bank Rate).

¹⁰ The next chapter provides more detail on the use of voluntary reserves targets.

Figure 1: Commercial banks' demand for reserves under a reserves averaging system



107. The Bank could change these key parameters at its discretion, affecting the demand for reserves.
108. To meet the demand for reserves, the Bank undertook to supply, in aggregate, the reserves that banks needed to meet their collective targets using its OMOs. The timetable for short-term OMOs was aligned with that for MPC decisions - short-term OMOs all matured on or before the final day of a maintenance period. So, unlike the pre-2006 system, participation in the operations and the transmission of the policy rate to the market should be unaffected by any expectations of a change in Bank Rate. The Bank could change the scale and/or maturity of its OMOs, including intra-maintenance period, in response to market conditions.
109. As well as changing the structure of its money market operations, the 2006 model also saw an expansion in the number of counterparties who were able to sign up to the Bank's facilities. In 2005, there were 17 counterparties in the Bank's OMOs. In 2006, following the money market reforms, this rose to 32 and access has expanded further since to 50 with total SMF participants now in excess of 100. (This expansion of access is discussed in more detail in **Chapter 9**.)

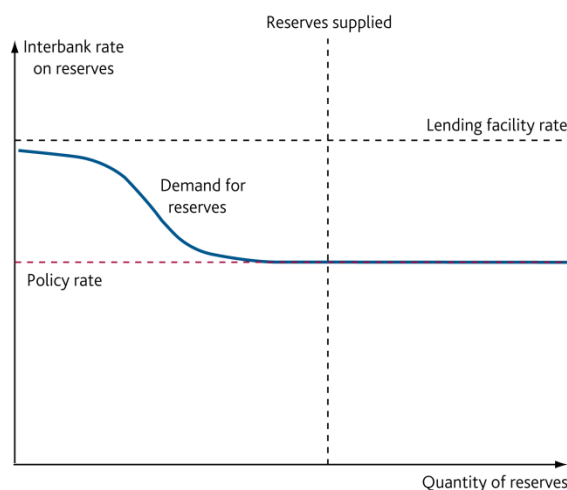
Quantitative easing and the suspension of reserves averaging

110. In March 2009, the MPC reduced Bank Rate to 0.5%, which it indicated it considered an effective lower bound for Bank Rate. In order to give further monetary stimulus to the economy when its normal policy tool had reached its limit, it also decided to undertake a series of asset purchases (QE). Under QE, the Bank creates new reserves and uses these to purchase assets – largely gilts – from private investors, such as pension funds and insurance companies.
111. Since the Bank began this policy of QE through the APF, the use of reserves averaging with voluntary reserves targets has been suspended. QE created additional reserves far beyond

those needed by the banking system. Without changes to the SMF, substantial operations to drain the excess supply of reserves would have been necessary to avoid downward pressure on market rates, as banks would be incentivised to lend reserves as long as they could achieve a rate above that on the Bank’s standing deposit facility.

112. Upon suspension of reserves averaging, the Bank effectively initiated what is commonly called a ‘floor’ system whereby it remunerates all reserves held by banks at Bank Rate. In such a floor system, banks can either choose to lend reserves to other counterparties or hold them on their reserves account. An excess of reserves (above those demanded by the banking system for their liquidity needs) should stem any upward deviation in market rates from Bank Rate (see **Figure 2**). The ability for the most important participants in the money market to leave unlimited quantities of reserves with the Bank at Bank Rate should act to limit activity in the money market taking place at lower rates.

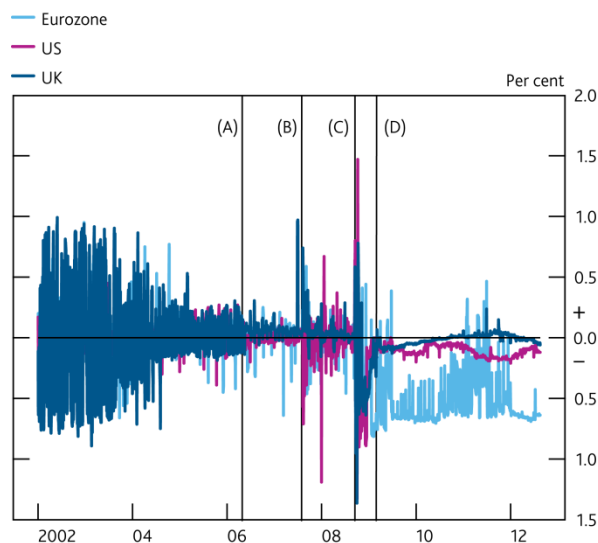
Figure 2: The current reserves framework – the ‘floor’ system



Evaluating the success of the different frameworks

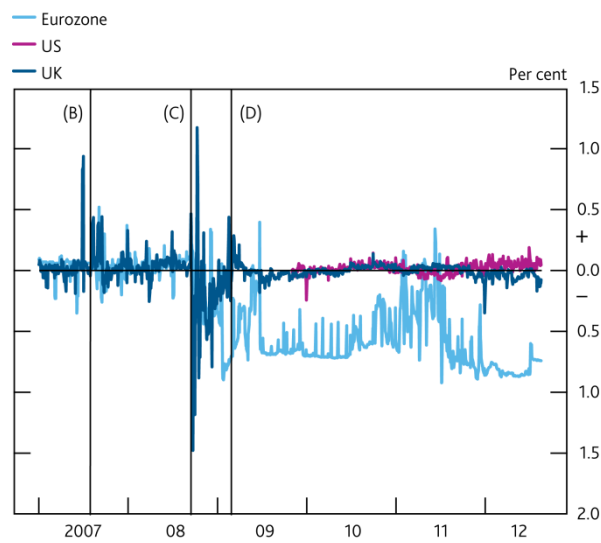
113. The three periods of different reserves frameworks can help provide a basis for comparing how well they achieved the current key objectives of the framework.
114. From 2002-06, before reserves averaging was introduced, the short-term risk free rate observed through the secured and unsecured sterling overnight rates (**Chart 1** and **Chart 2**) were very volatile around Bank Rate. Reserves averaging proved successful at reducing this volatility and achieving the objectives of the framework until the onset of the Crisis in August 2007. However, reserves averaging proved less effective from the onset of the Crisis due to dysfunction in money markets as concerns around interbank counterparty credit risk impeded trading and prevented desirable redistribution of reserves in the banking system. Indeed the Bank had to intervene more actively to supply and drain reserves in order to implement monetary policy over this period.

Chart 1: Spread of overnight unsecured rates to policy rate in UK, Eurozone and US



A) Money Market Reforms (May 2006)
 B) Money Market Dysfunction (August 2007)
 C) Failure of Lehman Brothers (15 September 2008)
 D) Reserves averaging Suspended (March 2009)
 Source: Bloomberg, Brokertec, Wholesale Markets Brokers' Association and Bank calculations

Chart 2: Spread of overnight secured rates to policy rate in UK, Eurozone and US



B) Money Market Dysfunction (August 2007)
 C) Failure of Lehman Brothers (15 September 2008)
 D) Reserves averaging Suspended (March 2009)
 Source: Bloomberg, Brokertec, Wholesale Markets Brokers' Association and Bank calculations
 Note: DTCC data only available since December 2009

115. Over this period, there was no evidence of reluctance by market participants to engage with the Bank through its OMOs and other operations. But in August 2007 Barclays used the Standing Lending Facility for purely operational reasons and journalists contacted UK banks the following day to find out which bank did not deny usage. The story of Barclays' use of the facility ended up on the front page of the *Financial Times* and acted to stigmatise the facility.
116. If Bank facilities are stigmatised such that they inhibit the Bank from injecting and draining reserves or setting hard caps and floors on the risk-free rate, then the Bank may lose its influence over short-term interest rates, impeding monetary policy implementation. Therefore, it is critical that the Bank position these operations so that they are never stigmatised and this should be an area of concern for the MPC and Executive. Issues around stigma are discussed in more detail in **Chapter 6** in the Liquidity insurance provision section.
117. Banks were able to increase their voluntary reserves targets and the Bank used its OMOs to supply the increased amount demanded. But at times demand for reserves has increased markedly within a maintenance period for which reserves targets had been set, due to the volatile market environment. Indeed from August 2007, UK banks' demand for reserves increased in such a fashion and the Bank did not inject additional reserves despite overnight rates moving materially (as much as 44bps) away from Bank Rate. Furthermore, the banks did not markedly increase their reserves targets initially in spite of higher demand for liquidity as evidenced by elevated money market rates. This was perhaps because they failed

to recognise the magnitude and potential longevity of the systemic shock that hit in 2007. It may also be because increasing their holdings of reserves would have been difficult or costly in stressed market conditions and they were reluctant to commit to doing so by setting a higher reserves target.¹¹ Banks did eventually start to raise their reserves targets, from £16.6bn in early 2007 to £36.6bn by March 2009.

118. The framework provided a number of routes for the Bank to supply more reserves to meet these abrupt shifts in demand without banks increasing their targets. Although it had initially been reluctant to do so in August 2007, as noted in *The run on the Rock* report,¹² in four subsequent maintenance periods (September 2007, and March, September and October 2008) the Bank did choose to inject additional reserves relative to banks' targets as well as widening the acceptable ranges around these targets, in order to allow scope for additional reserves to be remunerated at Bank Rate. The wide ranges gave banks additional flexibility to manage their liquidity, helping to dampen volatility in market overnight rates. The surplus reserves were drained by conducting OMOs to sell short-term Bank of England bills. So whilst the reserves averaging system did provide flexibility to steer overnight rates during this period, it required more intervention by the Bank to use the levers over which it had discretion particularly as reserves targets did not appear to respond to an underlying demand shift as market rates moved higher. ***The Bank needs to ensure that a robust process is in place to make the pro-active, discretionary decisions that may be required to ensure the framework is still able to meet its monetary policy objectives even in stressed circumstances.***
119. Indeed, the experience in 2007 suggests operating on a month-long maintenance period meant intra-month intervention would be extraordinary and may have made the Bank slow to react to intra-period shifts in demand. In contrast, the US Federal Reserve (Fed) were operating in the market every day so were more used to reacting to such demand shifts, though this approach is more operationally intensive and does not benefit from banks being responsible for managing demand for reserves. A brief description of the Fed, European Central Bank (ECB), Bank of Japan and Norges Bank frameworks is provided in **Annex 4**.
120. From March 2009, when asset purchases began and the floor system was initiated, volatility in rates was very low. Market rates (e.g. short-term secured/repo rates), though, have actually drifted a little below Bank Rate in the last couple of years. This may be because participants in the money market do not all have access to a Bank reserves account (e.g. non-banks) and so accept rates on their deposits below Bank Rate. But overall, the current framework appears appropriate for implementing monetary policy decisions on interest rates whilst less conventional policy tools, such as QE, are used.

¹¹ This is particularly likely to have been the case given banks' overall low levels of liquid assets that could easily have been converted into cash to meet higher targets. This is less likely to occur in future given higher overall levels of regulatory required liquid asset holdings.

¹² See *The run on the Rock* report, recommendation 10. This is discussed further in **Annex 2** to this Review.

Chapter 3: Should the Bank seek to return to reserves averaging?

121. Monetary policy is currently highly accommodative with Bank Rate at 0.5% and Quantitative Easing (QE) continuing with targeted purchases totalling £375bn. At some point, however, the Bank will want to normalise policy. The Bank has signalled that it currently plans to do so initially by raising Bank Rate, with asset sales being conducted later, in an orderly programme over a period of time, leaving Bank Rate as the active instrument.¹³
122. As part of its exit from unconventional policies, the Bank will need to decide whether to revert to a reserves averaging system, or whether to retain the current floor system as the more effective way to implement policy. Another potential option would be a ‘zero-width corridor’ system which is discussed in **Box 3**, though this is unlikely to be suitable. The Bank has indicated that it is likely to revert to reserves averaging,¹⁴ and set out the rationale for this in an article in its *Quarterly Bulletin* in December 2010.¹⁵ But the banking system and markets are constantly evolving, and those developments may make a difference to what is seen to be the optimal regime. Below are some of the factors that may weigh on that decision, and should be carefully considered by the Bank in light of the circumstances at the time.

Supplying appropriate reserves

123. One of the key advantages of the Bank’s reserves averaging system is that it allows banks to reveal their actual demand for central bank reserves by setting their reserves targets at the beginning of each maintenance period (see **Box 4** on the advantage of voluntary reserves targets). The Bank can then use this information to provide an equivalent amount of reserves to the system as a whole, via its Open Market Operations (OMOs). Given the demand for reserves is set at the start of the maintenance period, OMOs can be planned in advance to a scheduled timetable.
124. Under a floor system, in contrast, the central bank does not know (nor does it need to know) the shape of the demand curve for reserves, and specifically does not know the minimum level of reserves that banks feel they need to hold to meet their aggregate liquidity needs (point X in **Figure 3**). The central bank needs to ensure it supplies reserves in excess of this amount in order to effectively implement Bank Rate decisions. If the amount it chooses to supply turns out to be too low, market rates are likely to rise above Bank Rate as banks compete for reserves to meet their individual liquidity needs.

¹³ Mervyn King, Mansion House Speech, June 2010.

<http://www.bankofengland.co.uk/publications/Documents/speeches/2010/speech437.pdf>

¹⁴ Paul Fisher, “An unconventional journey: The Bank of England’s Asset Purchase Programme” October 2010
<http://www.bankofengland.co.uk/publications/Documents/speeches/2010/speech453.pdf>

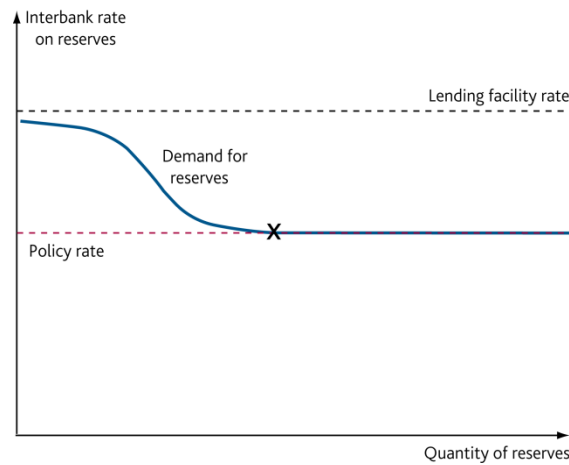
¹⁵ Clews, Salmon and Weeken, “The Bank’s money market framework”, *Quarterly Bulletin* 2010 Q4, pp 292-301. <http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/qb100404.pdf>

Box 3: zero-width corridor

- A. Narrowing the interest rate spread between the overnight standing facilities can enable the Bank to keep overnight rates more in line with Bank Rate. In the extreme the Bank can offer both its standing lending and deposit facilities at Bank Rate, a 'zero-width corridor'. Under a floor system only the deposit facility would in effect be provided at Bank Rate.
- B. Since no bank will transact at a less favourable interest rate in the interbank market than it can obtain at the central bank, overnight interbank interest rates will converge to Bank Rate. OMOs are not required as standing facilities play the central role in supplying and absorbing reserves at Bank Rate. With the supply of reserves automatically adjusting to demand, this system should provide the most robust interest rate control in the face of changes to the demand for reserves or disruption to the money market.
- C. The main drawback of the zero-width corridor is that it would bring about a very substantial increase in the degree of intermediation by the Bank. By offering to borrow and lend overnight on demand the central bank effectively relinquishes control over the size (and potentially the composition) of its balance sheet.
- D. With more reliance upon transacting with the central bank, this system becomes more susceptible to shortages of eligible collateral, which may impede the implementation of monetary policy. As a result, the central bank may need to accept a broader range of collateral which may create distortions in the markets for this collateral and pose greater risks to the central bank in managing this collateral.
- E. The zero-width corridor system also makes it harder for the central bank to distinguish use of its facilities for day-to-day liquidity needs with that for more fundamental liquidity shocks.
- F. Overall, therefore, we do not see merit in moving to a zero-width corridor system in future.

125. Under the Bank's current floor system, providing too few reserves is not an issue because of the vast quantity of excess reserves in the system as a result of QE. And indeed, the ability to inject additional money into the system without losing control of the target interest rate is an attractive feature of the floor system, particularly in times of stress. But in a world where monetary policy is not operating at close to the zero bound, such an oversupply of reserves may not be desirable.

Figure 3: The demand for reserves under a 'floor' system



126. An oversupply of reserves means banks may find themselves with a higher ratio of liquid to total assets than they would choose. Whether and how banks respond to this disequilibrium in their balance sheet will depend on a number of factors, and may not be easily predictable in advance. If the additional liquidity allows banks to extend profitable loans, then they might return towards their desired ratio by increasing lending.¹⁶ A floor system thus has the potential to impact on monetary conditions in ways that extend beyond influencing short-term market rates. While this is exactly one of the outcomes which QE intends to achieve, it is not necessarily an appropriate part of the policy framework once QE comes to an end. Furthermore, the supply of reserves has to be backed up by high-quality securities either purchased by the Bank or taken as collateral in its OMOs. As such it is possible that the supply of excess reserves may distort the relative pricing of high-quality securities eligible in the Bank's operations. The decision on how many reserves to inject would be largely an operational decision, and as such reflects the Bank undertaking monetary stimulus outside the MPC decision-making process.
127. This means that when operating a floor system in steady state, it may be desirable to supply a level of reserves close to (or only very slightly above) the inflection point on the demand curve. In such a scenario, OMOs tend to need to be more frequent and responsive to changes in market rates than under a reserves averaging system. This may mean a higher level of resourcing and decision-making is required by the central bank to run its framework on an ongoing basis. But it can also mean that it is in a position to react more quickly to rapidly changing market conditions, such as those that occurred in the summer of 2007.

¹⁶ In other words, that they are not capital or funding constrained.

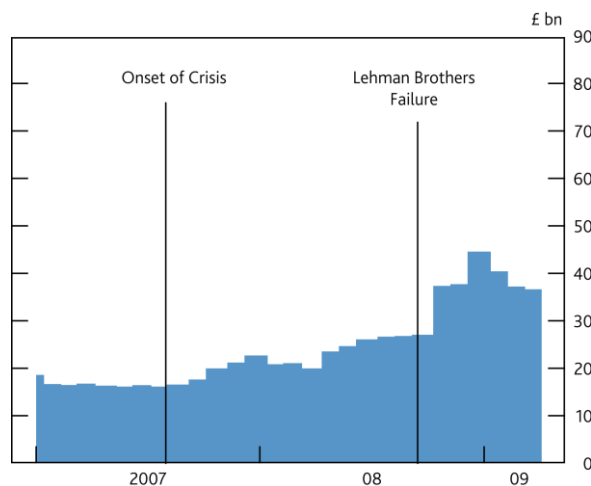
Box 4: Voluntary Reserves – Assessment and Recommendations

- A. Voluntary reserves targets were a key feature of the Bank’s reserves averaging framework before it was suspended upon the advent of QE in March 2009. We believe that on balance voluntary reserves setting is valuable and should be included in the Bank’s liquidity framework should reserves averaging be reintroduced.
- B. Reserves account holders were free to choose their own reserves targets, and could change this at the start of each maintenance period. This is in contrast to many other countries where banks are subject to minimum reserves requirements, typically related to the size of their deposit liabilities, with reserves held in excess of this requirement often being unremunerated.
- C. A bank’s choice of reserves target related to: the precautionary balances they wished to hold at the Bank in light of their view of possible shocks to payment flows; their overall regulatory liquid asset buffer requirements; and their capacity to manage their need for intraday and overnight liquidity.
- D. In this way, the voluntary reserves target regime allowed banks to reveal their true demand for reserves to the central bank. The Bank, in turn, committed to supply sufficient reserves for all banks to meet their targets through its OMOs.
- E. A key advantage of this system was that banks could adjust their targets in response to market conditions. In times of stress, banks may wish to increase their precautionary balances held at the Bank. They could do this by raising their target and the Bank would automatically provide the additional reserves required by the market without penalty. Indeed, this is what happened throughout the Crisis (**Chart 3**), with banks collectively raising their targets from £16.6bn to £36.6bn between early 2007 and March 2009. Under a minimum reserves requirement system, the decision to increase reserves is at the discretion of the central bank, which may not be best placed to judge the overall liquidity needs of the system.
- F. Nevertheless, there is some evidence that banks did not do much better than the central bank in assessing the appropriate level in a fast-moving crisis. Events during August 2007 show that, at the beginning of the maintenance period, banks had substantially underestimated their demand for reserves and were not able to adjust these until the next maintenance period. Subsequent increases in their voluntary reserves targets appear to have lagged their actual requirements throughout the most acute phase of the Crisis. Indeed the Bank had to use its ability to unilaterally increase reserves during maintenance periods in response to market conditions on several occasions, despite being initially reluctant to do so in August 2007.¹ However, while the voluntary system did not lead to perfect target reserves levels, there is no reason to believe the Bank could have better forecast appropriate target reserves levels for the maintenance period ahead.

G. We conclude from this that in some cases neither the Bank nor the banks collectively have complete clarity on the necessary level of reserves. But we do believe that the process of assessment by the banks, in addition to the view of the Bank, should help get closer to an appropriate level more often than if either body was making the assessment alone.

H. The regime of voluntary reserves targets also allows for the fact that the required distribution of reserves between banks may change over time. Some banks may wish to hold more reserves than others with the same size balance sheet, given their different business models. And some banks may wish to increase their reserves holdings by more than others in times of stress depending on the nature of the stress experienced. The regime of voluntary reserves targets allows for this flexibility.

Chart 3: Aggregate Reserves Targets (2007-2009)



Source: Bank calculations

I. The regime of voluntary reserves targets also, arguably, sits better with the new liquidity regime, as it gives banks greater flexibility in managing the composition of their liquid asset buffers. They are free to choose between holding reserves and other liquid assets without any limits imposed. They can also reduce their holdings of reserves over time if they need to run down their liquid asset buffer by changing their target each maintenance period, without being constrained by a central bank-imposed minimum level.

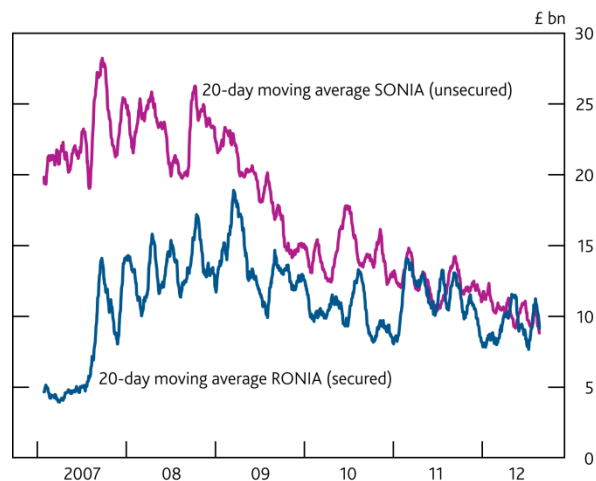
J. ***Overall, there seem to be benefits in having a system of voluntary rather than minimum reserves targets, as it allows banks to exercise their own judgement about the level of reserves they wish to hold. They should be better placed than the central bank to estimate their demand for reserves.***

¹This period of the Crisis is discussed further in paragraphs 117-118 in **Chapter 2**.

The role of money markets

128. The interbank market forms the centre of a wider money market in which non-bank financial institutions and some non-financial companies participate. Without a liquid overnight interbank market and transparent pricing, there is a risk that this wider market would not function efficiently. (See **Box 5** for a fuller discussion of the desirability of an active money market.)
129. The reserves averaging system relies on the interbank market to distribute reserves through the banking system. As long as there is an active money market, such as there has traditionally been in the UK, this works well. Indeed the use of a reserves averaging system supports an active money market by incentivising banks to transact with each other. But a dysfunctional money market, such as seen in the recent Crisis, may inhibit this activity, and the Bank may need to intervene to provide and drain reserves regularly to keep overnight rate in line with Bank Rate.
130. The floor system is not as reliant on an active money market, as banks are able to transact directly with the central bank without penalty on either borrowing or lending of reserves. As such the central bank becomes the preferred counterparty, disintermediating the interbank money market and thereby inhibiting interbank money market activity. Indeed the UK has seen a marked decline in activity in the unsecured money market since the floor system was introduced in 2009 (**Chart 4**). This is likely the result of counterparty credit concerns that have limited banks' appetite for credit risk to other banks, and liquidity regulation that has reduced the funding value from short-term borrowing, as well as the impact of the move to a

Chart 4: Brokered unsecured and secured money market activity



Unsecured overnight (SONIA) and secured overnight (RONIA) trading volumes.

SONIA and RONIA include trades other than interbank.

Source: Bloomberg, Wholesale Market Brokers' Association

floor system. It may also reflect a shift towards secured activity. The May 2012 Money Market Liaison Group Sterling Money Market Survey found that over two-thirds of transactions by value were conducted on a secured basis with around 70% of these between banks.¹⁷

131. Some bank treasurers have suggested the sterling short-term unsecured money market may not return – both due to liquidity regulation that makes short-term funding sources less desirable, and atrophy of the money market infrastructure whilst the current floor system is in place. The current lack of an active unsecured money market may prove to be an obstacle to a resumed reserves averaging system working effectively, unless it is believed that the move to reserves averaging will stimulate activity sufficiently, or that the secured interbank market will be able to fulfil this role.
132. Over time the infrastructure may revive as the Bank returned to reserves averaging. This conclusion is supported by the experience of the Bank of Japan when it exited QE in 2006. Money markets had indeed atrophied in the preceding five years and banks were reluctant to re-invest into the necessary infrastructure and skills development. Under substantial Bank of Japan pressure, though, the banks did eventually rebuild their money market capabilities. Nevertheless, there were in Japan, and would likely be in the UK, transitional costs and frictions while markets re-adjust, imposing some costs on banks and the broader economy. And there is no guarantee that the unsecured money market will revive at all, given a greater focus on counterparty credit risk by banks and the impact of changes in the regulatory framework. This is something on which the Bank will need to make a judgement at the point it returns to more conventional monetary policy implementation.

Box 5: The desirability of an active interbank money market

- A. Prior to the Crisis there was an active interbank sterling money market. Depending on its design, the Bank's Sterling Monetary Framework (SMF) can act to encourage or hinder such a market. However, the desirability of such a market is not clear cut.

Benefits of an active interbank money market

- B. A robust interbank money market provides pricing benchmarks, which can help non-banks to participate in short-term unsecured money markets both as lenders and borrowers. Prior to the Crisis, that wider unsecured money market acted as a useful short-term funding market for banks, enabling them to diversify their funding sources and borrow from non-banks, e.g. corporate treasuries who are often not active in the secured repo markets.

¹⁷ Bank of England Quarterly Bulletin 2012 Q3, pg 196-198
<http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/qb1203.pdf>

- C. The interbank money market can provide information on sentiment in the banking system. Unsecured money markets may be more useful in this regard than secured (repo) markets as secured rates are affected by judgements on collateral as well as counterparty credit risks.
- D. Further, the interbank money market may play an important role in the early stages of the monetary policy transmission mechanism. The Bank's monetary policy effectively targets the risk-free rate between policy decisions. This relies on the assumption that such short-term rates can have an impact on longer term rates more relevant to the real economy. An active interbank money market may be an important bridge between very short-term rates and longer term rates and may therefore make monetary policy actions more effective. This role was typically served by the unsecured money market as the secured (repo) market was traditionally used for overnight transactions, although there is some evidence that longer term activity is now increasing.¹

Problems of an active interbank money market

- E. An active interbank money market may have contributed to banks' over reliance on short-term wholesale funding prior to the Crisis, leaving them vulnerable to withdrawal of that funding during periods of market and banking system stress.
- F. An active interbank money market also contributes to the network of funding interconnections between banks that may be deleterious for financial stability by increasing the risk of contagion.

Other considerations

- G. Some bank treasurers are unconvinced of the need for short-term unsecured money markets in future, given they are no longer viewed as a useful source of funding, not least given new liquidity regulation. Indeed, in the US where there are more active non-bank money market participants (e.g. money market funds) there appears to be less concern about the return of unsecured interbank activity.
- H. The Norges Bank sought to move away from a pure floor system in order that a money market might develop allowing banks to expand their liquidity management beyond reserves and government bond holdings. Further details of policy rate implementation by other central banks are provided in **Annex 4**.

¹ See, for example, the increase in European repo activity with maturity greater than 12 months shown in the June 2012 ICMA European Repo Survey: <http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/short-term-markets/Repo-Markets/repo/latest>

Interaction with liquidity regulations

133. One of the most important changes made as a result of the Crisis has been the introduction of new liquidity regulations for banks. These regulations require that banks hold a buffer of liquid assets against potential outflows, which can be run down in response to a liquidity shock. Reserves held at central banks are considered as liquid assets under this regime.
134. Under the current floor system, individual banks are free to choose the level of reserves they wish to hold on a daily basis, and all holdings will be remunerated at Bank Rate. Therefore, if they hold reserves as part of their liquid asset buffer, and need to run them down to deal with a liquidity outflow, they are free to do so without penalty.
135. The reserves averaging regime also allows banks to manage their reserves on a flexible basis, but with more restrictions. Indeed, one of the advantages of reserves averaging over a floor system is that it incentivises banks to manage their day-to-day liquidity more closely to avoid being penalised for missing their reserves target. Under this framework, if a bank wishes to run its reserves down over a reasonably extended period of time, it can do so by changing its reserves target each maintenance period. There is also scope for a bank to run its reserves down intra-maintenance period to deal with a short-term shock. But if it needs to run its reserves down by more than the range around its reserves target, it will be penalised for doing so (a charge of Bank Rate on the shortfall between the target range lower limit and the actual average reserves balance would be applied for ending the maintenance period below the lower end of the target range). The reserves averaging system is therefore slightly less flexible in allowing banks to use reserves as truly liquid assets in response to very sudden, unforeseen liquidity shocks.

Overall Evaluation

136. Both the reserves averaging and floor systems have proved effective at implementing decisions on the level of Bank Rate, with low volatility in market rates around this. As such, the decision on which regime to employ longer term is therefore unlikely to be driven by their relative effectiveness in implementing monetary policy. It is more likely to be a function of the wider implications of operating either regime and how it fits with the overall policy framework. In particular, a number of changes since 2006, such as the introduction of the new liquidity regulations for banks and the decline in money market activity, mean that the merits of the reserves averaging system over the floor system are perhaps more marginal than they once were.
137. ***Overall, it is difficult to judge now the relative importance of these aspects at the future point when a decision will need to be made.*** A return to the reserves averaging approach with voluntary reserves targets may be appropriate. But it is not critical to the effective implementation of monetary policy. When deciding whether to return to reserves averaging or maintain a floor system, Court should ensure the Executive evaluate the balance of various factors in the context of the circumstances at the time, including: how each system

supplies an appropriate level of reserves; the role of money markets in their potential effectiveness; and their interaction with liquidity regulation.

138. ***Should reserves averaging be reintroduced, the Bank should adopt voluntary reserves targets that place the burden on banks to assess their appropriate level of reserves.***

Chapter 4: Additional monetary policy tools

139. Traditionally the Monetary Policy Committee (MPC) has used short-term interest rates as its policy tool to meet its monetary policy objective. The MPC agrees the appropriate level of Bank Rate and the Bank implements that decision using money market operations, aiming to keep short-term rates in line with Bank Rate, as discussed in the previous two chapters. Operating to influence short-term rates enables the MPC to meet its inflation objective given the influence of such rates on longer term rates, asset prices and so nominal spending.
140. There may, however, be instances when the MPC feels that it needs to use alternative or additional tools. Most obviously, this happened when the policy rate reached its effective lower bound in early 2009. The MPC wanted to loosen monetary conditions further, and turned to asset purchases, a programme which has become known as Quantitative Easing (QE). In effect, the Bank started to conduct monetary policy by increasing the quantity of money, rather than reducing its price.
141. QE asset purchases act to increase the level of reserves in the system, boosting asset prices and reducing longer term interest rates.¹⁸ This policy is clearly a monetary policy action, taken with the intention of influencing monetary conditions in order to meet the inflation target.
142. Under QE, the MPC decides the target amount of assets to be purchased. The Bank then uses its money market operations to implement that decision, undertaking outright purchases of assets (mainly gilts) using a reverse auction process. While the MPC decides on the amount of assets to be purchased, and is consulted on broad parameters of the programme such as the maturities of purchases, the Executive takes decisions on more operational details, such as the size of particular auctions and the range of eligible counterparties.
143. The operation of the SMF has had to be adapted as described in **Chapter 1** to accommodate this policy, but this has been done successfully, allowing the Bank to continue to meet both Bank Rate and QE purchase targets, consistent with the MPC's policy decisions.
144. At present, the MPC uses only the two tools of Bank Rate and asset purchases to meet its inflation target. It is, however, possible that at some time in future the MPC might wish the Bank to use other types of market operations to enable it to meet its objective, either if it thought the current tools were impaired for some reason, or because it thought some other tool would be more effective. A range of options are theoretically possible including: other types of asset purchases; setting Bank Rate below zero; tiered remuneration on reserves; and using long-term repos to influence longer term rates. Although the operational details

¹⁸ For further detail on the transmission channels for QE see Benford et al, "Quantitative Easing", Quarterly Bulletin 2009 Q2, pp 90-100. <http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/qb090201.pdf> and Joyce et al, "The United Kingdom's Quantitative Easing policy: design, operation and impact", Quarterly Bulletin 2011 Q3, pp200-212. <http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/qb110301.pdf>

would need to be worked out at the time, it appears that the SMF framework itself is sufficiently flexible to accommodate such additional policy measures.

Effects of other elements of the SMF on monetary policy

145. Many other elements of the SMF, including facilities that are designed to meet other objectives – such as the provision of liquidity insurance – are also likely to have some effect on market interest rates, asset prices and macroeconomic conditions more generally. For example, the availability and price of liquidity insurance against certain types of collateral may affect banks’ holdings of such assets, and therefore their relative price versus other asset types.
146. The observation that many of the parameters of the Bank’s SMF can influence monetary conditions raises the question of which tools the MPC should seek to use to meet its objectives. Up until now, the MPC has not made use of other elements of the SMF as tools to help it meet its target. This seems sensible, for two (related) reasons.
147. First, many other facilities within the SMF are designed with other objectives in mind – in most cases, to provide liquidity insurance. Using the parameters of those facilities for monetary policy purposes risks jeopardising those other objectives. Rather, it should be possible, should the MPC ever feel that it needed other tools, to design other operations that were specifically targeted to achieve monetary policy objectives.
148. Second, there are likely to be other bodies, with other objectives, that would have a stronger case to direct usage of the wider set of tools, most obviously the Financial Policy Committee (FPC).
149. Nonetheless, even if it would not be sensible for the MPC to itself use other elements of the SMF to achieve its objectives, it is likely to be important that it is well informed about their design and implementation, given their likely effect on monetary conditions. And if that influence is likely to be material, it may be appropriate that the MPC should have an opportunity to express opinions on those parameters. These issues, and interaction with other bodies such as FPC more generally, are discussed in more detail in **Chapter 13** in the Governance Section.

Section Two: Liquidity insurance provision

The development of a set of permanent liquidity insurance tools has been the largest change in the Bank's framework since the start of the Crisis. This section reviews the performance of those liquidity insurance facilities to date, and examines whether the current facilities in the published framework are able to provide effective liquidity insurance, and whether they do so in an appropriate way.

150. In this section, we start by describing the development of the liquidity insurance framework in **Chapter 5**.
151. We then look at a number of different aspects of liquidity insurance provision. While several of the areas considered are inter-linked, we break our conclusions and the detail underlying them into the following categories:
 - **Stigma:** Are banks willing to use the facilities as the Bank would hope? (**Chapter 6**)
 - **Pricing:** Is the structure for charging for central bank liquidity insurance appropriate? (**Chapter 7**)
 - **Maturity transformation:** Does the Bank have a role in providing a maturity transformation backstop, and if so, should it set out that role more explicitly in its permanent facilities? (**Chapter 8**)
 - **Access:** Is current access to the Bank's facilities appropriate? (**Chapter 9**)
 - **Collateral and Risk Management:** Is the Bank's approach to taking and managing collateral appropriate? (**Chapter 10**)
152. Finally, in **Chapter 11**, we attempt to bring some of these issues together and explore some potential changes the Bank could make to improve the overall effectiveness of its framework.

Chapter 5: Development of the liquidity insurance framework

153. Financial stability is a public good. Confidence in the liquidity of individual banks and the banking system as a whole is a pre-condition for financial stability. But liquidity crises occur, and can affect individual banks or the banking system more widely. Individual bank liquidity shocks might come as a result of large losses or bank fraud that are not severe enough to render the bank insolvent, but cause enough concern in the market that the bank is temporarily unable to fund itself. The banking system as a whole might also experience a liquidity shock, perhaps from a failure of payments systems or a generalised run on the back of a financial crisis originating outside the UK. Banks can and should protect themselves against these liquidity shocks by self-insuring: holding adequate liquid assets to protect against a substantial withdrawal of deposits or other funding, and through funding themselves with longer term liabilities that are not subject to early redemption. This has been a central tenet of prudent bank management and bank regulation and has been strongly reinforced since 2007.
154. But for a bank to protect itself against every conceivable adverse scenario it would need to hold such a large pool of liquid assets that it would materially inhibit the bank from conducting its central role of lending to businesses and consumers. It is in the public interest, therefore, that government, via the central bank, provide banks with some degree of liquidity insurance against more extreme 'tail risks' in order to smooth liquidity crises for banks that are otherwise solvent and viable. This liquidity insurance is valuable for the banks, but need not be costly for the taxpayer as long as banks adequately collateralise their borrowings from the central bank. Banks which do not have adequate collateral or are deemed insolvent can be dealt with through other channels.

Pre-Crisis liquidity insurance framework

155. The 2006 Sterling Monetary Framework (SMF) provided liquidity insurance in two ways. First, it allowed banks to vary their reserves balances at the Bank both intra-day and from day-to-day over the maintenance period, allowing them to respond to very short-term liquidity shocks without the need to draw on an explicit central bank facility. This was a step-change from the pre-2006 model, under which banks were incentivised to hold a balance close to zero with the Bank every night, as reserves were not remunerated. Second, the Bank provided overnight liquidity insurance via its Standing Facilities. These facilities allowed banks to borrow reserves bilaterally from the Bank in unlimited amounts, secured against very high-quality collateral, or deposit excess reserves directly with the Bank. This gave banks a way of managing larger liquidity shocks than could be accommodated by varying their reserves balances alone.

The Crisis response from the Bank

156. When the Crisis began to unfold in August 2007, the Bank's published facilities proved insufficient. It quickly became clear that there was a need for the Bank to provide liquidity

insurance on a much broader basis and in larger size than had ever been envisaged within the 2006 framework.

157. There were two key challenges for the Bank as the Crisis developed. First, the Bank only provided liquidity insurance against a relatively narrow set of collateral – predominantly highly-rated sovereign debt. But the closure of some asset-backed securities (ABS) markets had made a range of non-sovereign assets illiquid, and left banks with an ‘overhang’ of such illiquid assets on their balance sheets. These assets were not eligible as collateral at the Bank, and so there was effectively no central bank liquidity insurance available against them.
158. Second, only a small proportion of the Bank’s lending was conducted at maturities over a week. Due to heightened credit concerns, institutions were reluctant to lend to each other at the same maturities as they had done previously. Indeed, a large part of the interbank market was conducted on an overnight maturity basis only. So banks were faced with rolling an increasing proportion of their funding on a short-term basis, increasing the liquidity risks they were facing.
159. The Bank responded by widening the range of collateral it accepted in its operations, and extending the proportion of its lending at longer maturities, effectively using its own balance sheet to undertake liquidity and maturity transformation when the banking system struggled to do so itself.
160. The first operations it introduced were the Term Auctions in September 2007.¹⁹ Four £10bn, three-month, fixed allotment, variable rate auctions were offered with the minimum spread set at 100bps above Bank Rate (in line with the rate on the Bank’s Standing Lending Facility). Eligible collateral included: AAA-rated ABS and covered bonds; commercial paper (CP) rated at least P1; corporate bonds rated at least A1; and raw (that is, unsecuritised) mortgage loans. But there were no bids in the four auctions, with the spreads and haircuts deemed to make them prohibitively expensive at the time, particularly given uncertainty about how long stressed conditions would persist.
161. In December 2007, in light of continuing stress in bank funding markets, the Bank introduced its Extended Collateral Long-Term Repo operations (ELTRs).²⁰ These effectively acted to extend the range of collateral eligible in the Bank’s three-month Long-Term Repo operations, which had hitherto been used as a complement to the weekly open market operations (OMOs) to supply reserves to the banking system on a longer term basis, in large part to back the Note Issue.²¹ These operations were for a term of three months, at first had no minimum bid rate and eligible collateral included AAA-rated ABS and covered bonds (though

¹⁹ The Market Notice setting out details of the Term Auctions is available at

<http://www.bankofengland.co.uk/markets/Documents/money/documentation/statement070921.pdf>

²⁰ The final consolidated Market Notice setting out the details of the Extended Collateral Long-Term Repo operations is available at

<http://www.bankofengland.co.uk/markets/Documents/marketnotice100326eltrcon.pdf>

²¹ Among the Bank’s liabilities are the banknotes used in everyday transactions. They are supplied on demand. Demand fluctuates around holiday periods but the trend is one of steady growth, and so most of the necessary financing for banknotes can be provided via the purchases of longer maturity assets such as long-term repos, rather than weekly short-term repos.

not the corporate assets and raw loans eligible in the Term Auctions). A minimum bid rate of Bank Rate +50bps was introduced for bids against wider collateral in 2008. Usage of ELTRs reached around £180bn in January 2009. In order to continue to supply reserves in line with the banks' voluntary reserves targets, the Bank drained reserves by issuing one-week Bank of England bills. As a result it was undertaking a large volume of maturity transformation (taking deposits at one week and lending reserves at three months).

162. In April 2008, the Special Liquidity Scheme (SLS)²² was launched allowing banks to swap their high-quality mortgage-backed and other securities for UK Treasury bills for up to three years. The Scheme was designed to finance part of the overhang of illiquid assets on banks' balance sheets by exchanging them temporarily for more easily tradable assets. The drawdown period for the SLS closed on 30 January 2009 and all drawings were repaid by 30 January 2012 when the Scheme officially closed. In total the Scheme provided £185bn of Treasury bills against collateral securities with a nominal value of £287bn, providing significant liquidity support to the banking system. **Box 6** provides more information on the Scheme and its impact on the Bank's operations. It concludes that the launch of the SLS was a sensible response to the liquidity issues faced by the UK banking system, allowing them to liquefy a significant proportion of their balance sheets.

Crisis management capability

163. These facilities – the Term Auctions, ELTRs and SLS – were designed and implemented very quickly. That was necessary because the Bank had not contemplated running such operations in advance, and so was largely unprepared, both operationally and in terms of its policy thinking, for such a major step-up in its provision of liquidity insurance.
164. Nevertheless, the Bank went into the Crisis in a better position operationally than it would have been in a few years earlier. Having re-launched the SMF in 2006, many of the systems were new, and the staff who designed and built those systems were still working in the Bank's Markets directorate and related IT department. So when it came to designing new operations quickly, there was a well understood infrastructure and body of knowledge on which to build. Nevertheless, its IT systems were far from up to the task of being able to deal with the range of new operations and types of collateral that the Bank started to accept as part of its crisis response. Initially, the Bank had to rely heavily on manual processes and ill-equipped systems. For example, a large part of the SLS was run on spreadsheets, and much of the wider collateral accepted in the ELTRs was also managed in spreadsheets while the Bank's back office systems were developed to deal with a wider range of securities. The Bank did act quickly to address the largest operational risks, contracting in external expertise where relevant, for example in the development of a collateral database to help eligibility checking and haircut management when the SLS was launched. A more sophisticated collateral risk management system, including functionality to look at raw loan data, was introduced in 2011.

²² The final consolidated Market Notice setting out the details of the Special Liquidity Scheme is available at <http://www.bankofengland.co.uk/markets/Documents/marketnotice090925sls.pdf>

Box 6: The Special Liquidity Scheme¹

Background

- A. At the onset of the Crisis, the closure of some ABS markets led to funding and liquidity problems for banks. It became increasingly difficult for banks to sell securities backed by mortgages or other assets, or to use them as collateral to borrow cash. This left banks with an 'overhang' of illiquid assets on their balance sheets which they could not fund. This overhang created uncertainty about the financial position of banks, including whether they had sufficient capital in the event of a decline in the value of their assets. This made it more difficult for banks to attract funding and, in turn, affected their ability and willingness to lend money to individuals and businesses.
- B. The Bank launched the SLS in April 2008 to deal with that overhang of illiquid assets. The SLS operated as a 'collateral swap', allowing banks to exchange their illiquid assets (principally packaged as ABS or covered bonds) for liquid UK Treasury bills which banks could then use to finance themselves. The collateral swap structure was off balance sheet and so did not have to be disclosed in the weekly publication of the Bank's balance sheet (the 'Bank Return'). This allowed the Bank to retain flexibility in making disclosures around facility usage and also avoided any impact on monetary policy operations that would have resulted from providing reserves.
- C. Assets could be swapped for up to three years, to give banks time to diversify their funding sources and strengthen their balance sheets. The SLS was designed to deal with the overhang of existing assets, not finance new lending, so only securities formed from loans extended before 31 December 2007 (known as 'legacy assets') were eligible.
- D. The SLS was designed as a temporary measure such that drawings could only be made within a pre-determined period - the 'drawdown window'. This was set to be long enough to allow banks to securitise portfolios of legacy loans that could then be accepted in the SLS. Following an extension, the drawdown window closed on 30 January 2009.
- E. In total, the SLS provided £185bn of Treasury bills against collateral securities with a nominal value of £287bn, providing significant liquidity support to the banking system.
- F. Credit risk on the collateral securities remained with the banks, and the Bank used a combination of collateral eligibility, collateral valuation and haircuts to manage its risk in the event of a default by a bank counterparty. The Bank was indemnified by HM Treasury (HMT) for any losses related to the SLS. In the event, the Scheme closed without any defaults and generated a £2.26bn surplus, which was paid in full by the Bank to HMT in April 2012.

Managing Stigma

- G. Stigma, as discussed in **Chapter 6**, was recognised as a key issue when designing the SLS, which incorporated a number of features to help reduce the risk that usage became stigmatised.
- H. First, neither the Bank nor participant banks disclosed individual institutions' borrowing levels. Banks were subject to strict confidentiality clauses under the legal terms of the SLS, and so could not reveal their own borrowing throughout the life of the Scheme. Second, there was controlled disclosure of aggregate SLS usage whilst the Scheme was in operation.
- I. As an additional protection against stigmatisation, the larger banks, after some suasion, committed to draw on the Scheme for a minimum amount, and maintain at least that level of drawing for a period from the end of the drawdown window until three years from the date of their first drawing. This meant that even those institutions that were generally perceived to be in stronger financial positions were locked into the Scheme for a minimum of three years and for a meaningful drawing amount. This was to ensure that, if there was (even inadvertent) disclosure of an individual institution's drawings, no signal could be taken about the financial strength of the institution from the value of those drawings or length of time the institution remained in the Scheme. The minimum drawing amount was set by the Bank in relation to the size of each institution's sterling balance sheet. It was possible to repay borrowings above this amount ahead of contractual maturity, but the minimum drawing amount had to be maintained.
- J. Pricing was based on market rates, with no explicit penalty rate, and refixed every three months.² A wide range of banks were comfortable accessing the facility at this price against the backdrop of a serious deterioration in the functioning of ABS markets, particularly as it provided certainty of funding for three years. A minimum fee was set at 20bps. This was higher than market rates prior to the Crisis, and so was designed to make the Scheme relatively less attractive if market rates fell close to pre-Crisis levels, helping to incentivise exit.
- K. These actions acted to limit stigma attached to usage of the SLS. Indeed the main users of the Scheme were apparent to the wider market, but did not appear to suffer undue stigma as a result.

Managing Collateral

- L. The Bank used its eligibility criteria to restrict the collateral it accepted principally to covered bonds, RMBS, other ABS, and high-quality government securities. Covered bonds and ABS made up almost all collateral pledged and the overwhelming majority

was 'own-name' (pledged by the issuer of the underlying assets). The Bank required a AAA credit rating as a broad indicator of credit quality and indeed took some comfort, at least initially, from rating agencies reviewing security structures given the inexperience of the Bank in managing securitised assets. But the Bank also exercised its own discretion when judging the quality of securities, with all securities independently verified before being accepted.

- M. Portfolios of raw (that is, unsecuritised) loans were not eligible for the Scheme due to the extraordinary infrastructure that would be needed to analyse and risk manage them. Therefore they had to be packaged in securitisations before being used as collateral. This added additional costs to participating banks, including going through ratings agency processes, and in some cases requiring them to set up completely new securitisation structures. This was particularly onerous for smaller banks with limited experience of securitisation.
- N. The haircuts applied to collateral reflected uncertainty surrounding pricing and liquidity. Where observable market prices were not available, haircuts were higher to reflect the greater valuation uncertainty. Higher haircuts were used for 'own-name' securities to reflect the risk of correlation between the quality of the loans and the creditworthiness of the counterparty.

Managing exit

- O. The nine-month drawdown window meant almost all the Treasury bills borrowed were contractually due to be returned in the nine months to end-January 2012, with a significant proportion due in the final month. Such a concentration of maturities posed refinancing risks to the banks, not least as the market may have found it difficult to absorb the required issuance. Furthermore, there was concern about potential coordination problems between the banks in undertaking their individual refinancings in the event that they all needed to issue new debt at the same time.
- P. Following discussions with the banks, the Bank agreed voluntary repayment plans that created a much smoother profile for return of the Treasury bills. In practice, the banks were able to repay at a faster rate than these plans.
- Q. Nonetheless, some banks reported that they faced material difficulty in refinancing their SLS funding, not least as this occurred alongside the introduction of liquidity regulation that added to their fund-raising needs, with the voluntary repayment plans perceived as a binding requirement. As a result of this challenge, there is a risk that some banks may be reluctant to fully participate in future Bank programmes of a similar nature for fear that they will again find themselves in a difficult position at the point of refinancing.

Conclusions

- R. The SLS was highly effective and innovative at the time it was deployed, and accomplished its intended purpose of helping banks finance their operations at a time when the funding markets on which they had come to rely ceased functioning.
- S. It would seem, though, that initially the Bank did not fully think through banks' exit from the SLS, most likely as it did not anticipate bank funding market conditions remaining difficult for such an extended period. This raises some risks that banks may be wary about participating in similar future schemes.
- T. Nevertheless, the Bank has learnt a lot from the SLS that it has been successfully able to incorporate into its permanent liquidity insurance facilities.³ The design of the DWF benefited from a number of features of the SLS. For example, like the SLS, drawings from the DWF are made via collateral swaps with illiquid assets exchanged for gilts. And in terms of disclosure, no individual institution usage of the DWF is disclosed, with instead the Bank providing disclosure on an aggregate usage basis. In the Funding for Lending Scheme (FLS), the Bank has explicitly considered exit in the design, allowing an 18 month drawdown (and therefore repayment) window, such that there is little indication banks fear difficulty in refinancing that facility upon maturity.
- U. The knowledge developed in managing the risks from SLS-eligible collateral has been used to broaden the range of collateral acceptable in the Bank's permanent liquidity facilities, including in the DWF and ILTRs. Indeed the Bank's experience of managing ABS and covered bonds improved its understanding of these assets facilitating an expansion of eligible collateral to include portfolios of raw loans. This means a much larger proportion of the assets held by commercial banks have become eligible for use as collateral, without the need for costly securitisation and other structuring processes. The experience also clarified the requirements the Bank had in assessing ABS and covered bonds that led to the Bank adopting public transparency requirements as part of the eligibility criteria for accepting these assets as collateral.

¹ For further details on the SLS see John, Roberts and Weeken, "The Bank of England's Special Liquidity Scheme", Quarterly Bulletin 2012 Q1, pp 57.

<http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/qb120105.pdf>

² The fee was the spread between three-month sterling Libor and the three-month sterling general collateral (GC) repo rate, as published daily by the British Bankers' Association.

³ The operation of the SLS also proved helpful in designing the ELA provided to HBOS and RBS, as discussed in the accompanying Review by Ian Plenderleith.

165. On the policy side, many of the decisions taken around these operations were made under great time-pressure, and often without the depth of analysis that the Bank would normally desire. For example, the pricing of minimum spreads for bids against wider collateral in the ELTRs was somewhat arbitrary rather than based on a full analysis of the liquidity premium the collateral should attract.
166. It is clear from talking to Bank staff that this was an uncomfortable position to be in, and one which they are understandably keen to avoid in future. From early 2008, the Bank therefore started thinking about the design of a permanent set of facilities that could be used to provide liquidity insurance to the banking system. It set out its thinking publicly in a consultation document in October 2008.²³
167. One of the most significant elements of the 2008 consultation document was, for the first time, the setting of an explicit, specific objective for the Bank's operations in the sterling money markets to provide liquidity insurance to the banking sector. Since the consultation document was published, a number of changes have been made to the Bank's SMF, including the addition of new permanent liquidity insurance facilities, building on the experience of the Bank in using its crisis response facilities. The terms of these facilities are public and have now been incorporated into the Bank's *Red Book*.

The move away from constructive ambiguity

168. Central banks face a choice in how predictable their provision of liquidity assistance will be in times of stress. At times, as was the case in the Bank's pre-2006 model, they have chosen to retain almost complete discretion over the circumstances in which they will provide liquidity assistance, and on what terms. The use of such constructive ambiguity in central bank support has traditionally been thought of as a way to mitigate against moral hazard; unpredictability in a central bank's liquidity insurance provision means that banks cannot have confidence in an escape route being forthcoming when they might require it, which should incentivise them to take steps to manage their own risk prudently.
169. There are, however, well-known drawbacks to such an approach, some recognised as early as the criticism of the Bank by Bagehot in his pioneering work on lender of last resort: *Lombard Street*.²⁴ First, the act of finally stepping in to provide liquidity support sends a signal that the central bank has now concluded that there is a fairly extreme problem and that they need to take action to solve it. In some cases, the trigger for such action will be obvious, and so the central bank's decision is unlikely to come as a surprise. But absent a clear external driver, activation of a liquidity facility is likely to cause participants to question what the central bank knows that they do not, which may in itself increase tension in markets, potentially with a destabilising influence. An example of this was the leaked announcement of emergency liquidity assistance to Northern Rock, which was seen to spark the retail deposit run on the bank.

²³ The consultation document "The Development of the Bank of England's Market Operations" is available at <http://www.bankofengland.co.uk/markets/Documents/money/publications/condococt08.pdf>

²⁴ Walter Bagehot, "Lombard Street: A Description of the Money Market" (1873)

170. Furthermore, ambiguity around access to central bank liquidity support reduces banks' ability to factor such support into their liquidity management, and so is likely to lead to them self-insuring against liquidity risk to a larger degree. If a trade-off exists between a bank reducing this liquidity risk and extending credit provision, this self-insurance may lead to a sub-optimal level of credit provision by the banking system.
171. The central bank can avoid the signalling effect of activating a facility by having liquidity insurance facilities permanently available and setting out ex-ante the terms under which the central bank would expect to lend. And greater knowledge of the terms of central bank liquidity insurance allows banks to factor this into their planning, and take out what they see as an appropriate level of self-insurance, consistent with having the central bank insurance available to help manage the very extreme 'tail' risks that might arise.
172. That is not to say that there are no issues that arise from setting out the terms of liquidity insurance in advance. Permanent facilities with pre-defined penal backstop pricing can become stigmatised if they are not used for a period of time. Even if a facility has been used in the past, it does not mean it will be used again when market prices go through the backstop. For example, European banks used central bank dollar-swap facilities in 2008/9 but were reluctant to use those facilities at the same price in 2010/11, even though market pricing was higher than the facility price. This may argue for keeping a level of constructive ambiguity in some operations by publicising the general terms of the facility but only activating it when necessary, and only then announcing the specific terms, such as pricing and maturity. But, as noted above, given the risks around activating new facilities in times of stress, such an approach is perhaps best suited to situations where facility activation can be seen to be driven by a clear external market-wide shock.
173. ***On balance, there would seem to be significant merit in being clear about the availability and terms of central bank liquidity insurance, and the Bank has moved a long way in this direction.*** The December 2010 *Red Book* was the first to incorporate the permanent liquidity insurance facilities, setting out for the first time the detailed terms of a suite of facilities to deal with both market-wide and institution-specific liquidity shocks, which have been launched since October 2008. This is to be commended. Nevertheless, there may be good reasons why central banks wish to retain elements of constructive ambiguity in their frameworks around the specific terms of some facilities, in particular to deal with externally driven market-wide shocks, where the response may need to be shaped to the specific circumstances. They may also wish to retain discretion to provide liquidity support outside the framework (Emergency Liquidity Assistance (ELA)), given the level of judgement required in making such extreme interventions.

The Bank's current liquidity insurance framework

174. The 2010 *Red Book* set an objective for the Bank's operations in the sterling money markets to: "Reduce the cost of disruption to the liquidity and payment services supplied by banks to the UK economy. The Bank does this by balancing the provision of liquidity insurance against

the costs of creating incentives for commercial banks and building societies to take greater risks, and subject to the need to avoid taking risks onto its own balance sheet.”

175. There are a number of ways in which the framework provides liquidity insurance, with each facility aimed at a different set of scenarios. Some facilities are primarily intended to implement monetary policy, but also have liquidity insurance aspects. Others are more specifically designed to provide liquidity insurance. This establishes a spectrum of liquidity insurance options that are available to banks. These are set out below, roughly in order of the severity of the liquidity shock with which they are intended to cope.
176. **Reserves:** As in the pre-Crisis framework, banks are still able to obtain a measure of liquidity insurance by varying their reserves balances both intra-day and day-to-day. Indeed, with reserves averaging currently suspended, they have even greater flexibility in this regard.
177. **Short-term OMOs:** The weekly OMOs were used to provide the reserves demanded by banks as per their voluntary reserves targets. As such they were principally related to monetary policy implementation, but they did allow individual banks to bid for more or less reserves on a weekly basis. With reserves averaging suspended, these operations have also been suspended.
178. **OSFs:** The Operational Standing Facilities provide bilateral liquidity insurance to deal with very short-term frictional payment shocks that could otherwise cause banks to go overdrawn or to fail on other transactions. The lending facility allows banks to borrow reserves against high-quality collateral, while the deposit facility allows banks to deposit excess reserves with the Bank on an unsecured overnight basis. Currently, the rate on the deposit facility is set at zero, so there is no incentive for any reserves account holder to use the deposit facility while all reserves balances are remunerated at Bank Rate.²⁵ But the lending facility is used infrequently to manage payment issues that may arise.
179. **ILTRs:** Indexed Long-Term Repos take the form of a monthly auction of reserves for three or six months against a narrow and wider set of collateral. As such they provide regular liquidity insurance to the banking system. The wider set of collateral includes assets such as covered bonds and RMBS, but is not as wide as the collateral set accepted in the Extended Collateral Term Repo (ECTR) and Discount Window Facility (DWF). For example, own-issued securities and raw loans are not eligible in ILTRs. Participants pay a premium to borrow against the wider set of collateral relative to the narrow set, with the premium determined in the auction itself.²⁶ Since their introduction in June 2010, ILTR auctions have not seen large-scale participation. That is likely to reflect three factors. First, there is little demand for reserves against narrow collateral given an excess of reserves provided by Quantitative Easing (QE) and the fact that banks are currently able to fund narrow collateral more cheaply in the market than at the Bank. Second, banks have reduced their holdings of the eligible wider collateral set and so demand to raise liquidity against this is now limited. Finally, the

²⁵ The rate is normally 25bps below Bank Rate, but was reduced to zero when reserves averaging was suspended.

²⁶ For further detail see Paul Fisher, “Recent developments in the sterling monetary framework”, March 2011 pp5-15. <http://www.bankofengland.co.uk/publications/Documents/speeches/2011/speech487.pdf>

relatively short maturity of the transactions does not allow for material contributions to banks' regulatory liquidity requirements as those requirements only recognise funding with more than three months of remaining maturity. As a result, the ILTR facility currently provides only limited liquidity insurance to the banking system in the event of stress.

180. **ECTR:** The Extended Collateral Term Repo facility is a contingency liquidity facility that the Bank can choose to activate, at its discretion, to provide support to the banking system in the event of potential or actual system-wide stress. It uses an auction mechanism to provide six-month liquidity against collateral pre-positioned for the DWF (the widest collateral eligible in the SMF). This facility was activated for the first time in June 2012 as a precautionary measure in light of potentially turbulent future market conditions arising as a result of ongoing troubles in the Eurozone and perhaps also pending bank credit downgrades. The first operation was fully allotted. Subsequent auctions have seen some further usage, indicating that banks are willing to access the facility, but not all the reserves on offer have been bid for. This reduction in demand is perhaps unsurprising given that banks are not currently constrained by their sterling liquidity given the large amounts of excess reserves being provided by the MPC's QE policy.
181. **DWF:** The Discount Window Facility is the Bank's key facility for bilateral liquidity insurance, normally providing gilts (although reserves can be provided at the Bank's discretion) against the widest collateral set. The UK banking sector holds a large amount of this collateral set, with over £265bn of collateral pre-positioned at the Bank for use in the DWF as at March 2012.²⁷ But the facility has not reported any usage to date and clearly suffers from stigma, limiting its effectiveness – we explore this further in the following chapters.
182. **ELA:** Emergency Liquidity Assistance encompasses liquidity support operations outside the Bank's published framework. Although ELA is outside the scope of this Review, it is included here as it is part of the complete spectrum of liquidity insurance options available to the Bank. The Bank is responsible for providing ELA, when authorised or directed by HM Treasury (HMT), to firms that are at risk but are judged to be solvent. The terms around ELA are not established in advance but determined to meet the particular circumstances for which it is being used.
183. The above set of liquidity insurance facilities appear coherent and well thought through. Each has a clear purpose and set of circumstances in which it is envisaged it will be used. But it is not yet clear whether this range of facilities will operate in practice as it was designed to in principle. In part, that is because the conditions have not been such that the facilities have needed to be used in crisis since they were launched. But there is also a risk that the facilities have been developed with the last crisis in mind. The banking sector and regulatory environment are constantly evolving, so the measures used to deal with that crisis may not be appropriate in future.

²⁷ Paul Fisher, "Liquidity support from the Bank of England: the Discount Window Facility", March 2012 pp8. <http://www.bankofengland.co.uk/publications/Documents/speeches/2012/speech561.pdf>

Chapter 6: Stigma

What is stigma?

184. In the financial world, stigma occurs when a bank fears being differentiated amongst its peers as weak or vulnerable. Revealed usage of central bank facilities can be perceived as such a sign of weakness. If a Bank facility suffers from stigma, banks may fear that discovery that they have used it might actually make their liquidity problems worse rather than better, for example by reducing their access to other sources of funding. In addition, some banks may fear political or regulatory reprisal in exchange for having been 'bailed out' by usage of central bank liquidity facilities. This can act as a further disincentive to access Bank facilities.

The fundamental causes of stigma

185. Essentially stigma arises due to information issues – in particular whether there is sufficient information available to distinguish liquidity and solvency problems. If investors and other market participants are comfortable with the underlying solvency of a firm, in theory there should be no stigma associated with using central bank facilities to deal with a short-term liquidity problem.
186. But banks are special. The banking model involves running maturity mismatches, for example between the bank's short-term funding (e.g. demandable retail deposits) and long-term lending (e.g. mortgages and corporate loans). This exposes banks to liquidity risk as their borrowings may need to be paid back before they are repaid on their loans. If this risk crystallises, what started out as a liquidity problem can quickly become a solvency or viability problem. Specifically, if creditors of a bank see it accessing a central bank liquidity facility, they may fear that the bank is insolvent or otherwise non-viable and stop lending the bank additional funds. The blurring of this distinction between liquidity and solvency makes distinguishing liquidity problems from solvency problems very difficult. This may be even more difficult to judge in times of stress. And part of the reason for stigma in central bank facilities is likely to be that the market does not believe central banks are always able or willing to make this distinction. Indeed, a solvency problem may initially manifest itself as a liquidity problem. So the discovery that a firm has used central bank liquidity can be taken as a signal that they are in trouble and may become or already be insolvent.
187. The link between liquidity and solvency may be self-fulfilling in some circumstances. Investors may think that a bank accessing a particular central bank facility reflects a liquidity problem alone. But it is difficult for an investor to know whether that means the bank also has a solvency problem, so the prudent thing to do may be to stop funding that bank. And investors know that other investors are likely to think in this way, so other funding is also likely to dry up, and therefore the liquidity issue being faced by the bank is likely to increase. As liquidity dries up, banks may be forced to sell their assets at fire-sale prices to cover demands for funds, causing losses that could turn their liquidity issue into a solvency issue.

188. Furthermore, this behaviour is likely to be self-reinforcing. If a facility is perceived to be stigmatised, then investors will know that a bank will be reluctant to access it. Therefore if a bank is seen to access it, it is likely to be taken as a sign that it has very serious liquidity issues.

Is there evidence of stigma in the Bank of England's facilities?

189. Not all central bank facilities are stigmatised. And where there is stigma, it may be greater in some facilities than others, largely due to the design features of the facility. But the degree of stigma in a given facility may also vary over time depending on prevailing conditions, and certain facilities will be more stigmatised for certain institutions than others given how they are perceived. For example, a bank that is widely perceived as strong may get more benefit of the doubt if they access a facility than one widely regarded as weak.
190. While the absolute level of stigma in a facility is difficult to measure accurately for these reasons, it is nevertheless possible to make a broad assessment of whether the Bank's facilities are generally perceived as stigmatised by the market.
191. **Operational Standing Lending Facility (OSF).** The OSF's predecessor facilities, the Standing Facilities, were deemed to be stigmatised in 2007, following Barclays' usage of the facility being discovered and reported by the media. There was a severe market reaction with rumours (incorrect in fact) that Barclays had material liquidity problems. As a result, the facilities were recast in 2008 to provide liquidity insurance only in the event of frictional payment shocks. The revised operating standing lending facility is now generally viewed as usable for its intended purpose, although some banks expressed slight concern about how usage would be seen by their internal management – a hangover from Barclays' revealed usage in 2007.
192. **Indexed Long-Term Repo (ILTR).** As a routine, market-wide facility with non-penal pricing there is little evidence that usage is stigmatised.
193. **Extended Collateral Term Repo (ECTR).** The Bank activated this market-wide facility in June 2012. It now appears to be well understood that this was done to manage a market-wide issue (potential future market turbulence, particularly in light of Eurozone stress) rather than to provide cover for individual institution access, though this was rumoured initially. As pricing is currently only slightly penal at Bank Rate +25bps (the same as the OSFs), the facility, whilst extraordinary in nature, appears not to be stigmatised at present. But there remains a risk that its activation in future precipitates stigma, particularly if it is perceived to be launched to assist specific institutions.
194. **Discount Window Facility (DWF).** The DWF is widely viewed as stigmatised. Amongst the banks with which we spoke, most consider accessing the DWF as very similar to seeking a recovery or even resolution facility, with severe repercussions for management and other stakeholders. As such, they make little distinction between drawing from the DWF and accessing Emergency Liquidity Assistance (ELA). Factors they point to as contributing to the stigmatisation of the facility are the penalty level of pricing, the need to produce a

repayment plan as part of the drawdown request, the uncertainty created by the on-the-day solvency and viability (S&V) assessment, and the bilateral nature of the facility, which, taken together, mean usage would be considered extraordinary, leading to problems should usage be disclosed.

Is stigma worth trying to address?

195. While it is clear that some Bank facilities are stigmatised, particularly the DWF, the real cost of that stigma, either to banks or to the economy as a whole, is not clear. We have tried to assess these costs in order to form views on how much effort the Bank should make to reduce stigma in its facilities.
196. If a Bank facility suffers from stigma, banks will be more reluctant to use it because they fear that discovery of its use might actually make their liquidity problems worse rather than better. There are two potential ways in which this reluctance caused by stigma could be costly.
197. First, reluctance to access central bank facilities could result in excess self-insurance by banks against the types of tail-risks that the facilities are designed to address. That could reduce banks' ability to carry out lending to the real economy, which could, in turn, have a detrimental economic impact.
198. Second, fears of the consequences of accessing a central bank facility could cause a needy but solvent bank to delay accessing that facility to the point that its financial condition materially worsens, and it retreats from provision of key financial services, creating a larger and more costly problem to solve.
199. Below we look at the evidence around each of these channels.

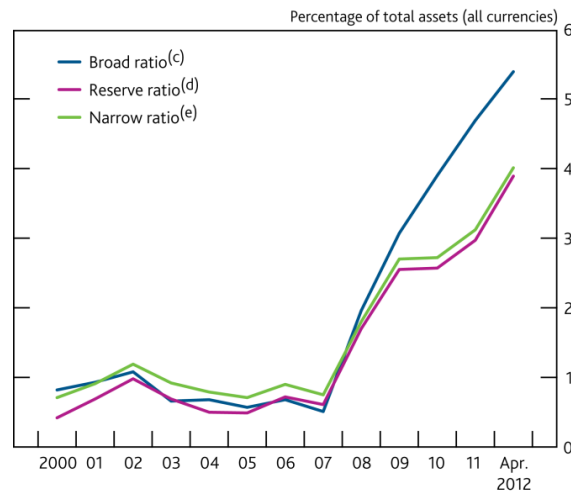
Does stigma result in banks excess self-insuring against liquidity risk?

200. The Financial Services Authority (FSA) currently sets an 'Individual Liquidity Guidance (ILG) ratio for each bank based largely on the potential outflows of the bank in a variety of stressed scenarios. Their effect is to reduce the risk that banks under self-insure against liquidity risk, at least to the extent they appear to have done pre-Crisis, as shown in **Chart 5**. But by their nature, the ILGs cannot guard against excess self-insurance. While the incentives to over self-insure are likely to vary over time, the existence of regulatory liquidity guidance ratios is overall likely to lead to a bias to over rather than under self-insure to some degree.
201. In aggregate the current ILG ratios suggest UK banks should be holding collectively around £380bn of liquid assets. In fact, UK banks are holding around £120bn of liquid assets in excess of this.²⁸ There are a number of possible reasons banks have elected to self-insure to such a degree, as set out in **Box 7**. But one possible reason of particular relevance to this

²⁸ Based on figures published in the *Financial Stability Report* (June 2012), pg 55 and Chart 5.8, <http://www.bankofengland.co.uk/publications/Documents/fsr/2012/fsr31sec5.pdf>

Review is that due to stigma, banks are unwilling to factor access to central bank liquidity facilities into their liquidity planning, choosing instead to hold large quantities of low-yielding, 'risk-free' assets (reserves and government bonds).

Chart 5: Sterling liquid assets relative to total asset holdings of UK banking sector^{(a)(b)}



(a) Data for building societies are included from 2010 onwards. Prior to this, data are for UK banks only.

(b) Data are end-year except for 2011 where end-September data are used.

(c) Cash plus Bank of England balances plus money at call plus eligible bills plus UK gilts.

(d) Proxied by: Bank of England balances plus money at call plus eligible bills.

(e) Cash plus Bank of England balances plus eligible bills.

Source: Bank and Bank calculations

202. It is not possible to determine the specific amount of excess self-insurance that is due to stigma in central bank facilities, rather than being held for other reasons. But it seems reasonable to think that if banks felt freer to draw on central bank liquidity as and when they required it, they would not choose to hold such a large proportion of highly liquid, but low yielding, assets on their balance sheets.

Does excess self-insurance crowd out bank lending to the real economy?

203. There is inevitably some degree of uncertainty around the degree to which banks' holdings of large liquidity buffers crowds out real economy lending. A number of conditions are necessary for crowding out to occur, most importantly that there is unmet demand for credit from corporations and individuals. In addition, banks face a number of different constraints on their capital positions and risk appetite that could affect the degree of crowding out.
204. Crowding out is most likely if a bank is constrained by its ability to raise funding, or if a bank is constrained by a gross leverage ratio, as a limit on a bank's total assets would mean it had to choose between holding liquid assets or loans. Banks who find themselves constrained by a risk-weighted capital ratio are less likely to find excess liquidity self-insurance crowding out lending as high-quality liquid assets typically do not attract high capital requirements, and so reducing liquid asset holdings will not free up capital necessary to increase lending. Indeed the heterogeneous composition of the UK banking sector may mean different banks are facing different constraints. But at least some UK banks do appear to be constrained by leverage and funding, meaning there is the potential for crowding-out to occur.

Box 7: Reasons for excess self-insurance

- A. In the UK, banks are required to hold a minimum regulatory liquid asset buffer based on the maturity mismatch they run. If this minimum is set appropriately to ensure the banking system is adequately resilient, liquid asset buffers far in excess of the regulatory requirements may be indicative of excess self-insurance. But beyond the effects of stigmatised central bank liquidity insurance, there are several factors that might affect banks' asset allocation between liquid assets and real economy lending:
- B. **Buffers on buffers:** Minimum regulatory requirements may be perceived as a hard floor so banks hold a buffer above this to avoid ever breaching this regulatory requirement.
- C. **Future liquidity regulation:** Banks may expect regulatory liquidity requirements to increase in future, e.g. given the introduction of Basel III to replace ILAS.
- D. **Capital regulation:** Such regulation may incentivise banks to hold higher stocks of liquid assets because the return on risk-weighted capital is attractive.
- E. **Credit rating agencies/investors:** Investors themselves assess whether central bank facilities are usable when judging appropriate liquidity management, and calibrate their appetite to lend to banks based on their own assessment of a bank's resilience to a liquidity event. This has become more evident since governments have made clear that bank creditors are at risk to 'bail-in' should a bank fail. Investors and ratings agencies contemplate scenarios where a bank experiences a liquidity event and is put into resolution (with creditors bailed in) despite being otherwise solvent.
- F. **Internal risk management / risk weighted return analysis.** Banks' holdings of liquid assets will depend on the perceived liquidity risk between their assets and liabilities. As a result, higher liquid asset holdings may reflect an extension of the expected term of their real economy lending, such as from reduced mortgage refinancing, or heightened concerns about the flightiness of their liabilities, perhaps from greater retail deposit competition.
- G. **Demand for real economy credit:** If credit demand is subdued, even if a bank is willing to extend credit on prudent terms, assets may nonetheless be allocated toward liquid assets.
- H. **Behavioural response to the Crisis:** Given the recent proximity of the Crisis, and the extreme liquidity stresses this involved, banks are likely to err on the side of caution when setting their own internal liquidity tolerances.

205. In addition to choosing to hold a larger stock of liquid assets, banks may act to self-insure by increasing the term of their funding relative to the term of their lending (lowering their maturity mismatch). This funding would be expected to be more expensive and be passed on in higher cost of lending. Similarly, banks' holdings of liquid assets usually yield less than their cost of funding so banks need to charge more on their lending to maintain their level of profitability.
206. Quantifying the scale to which over self-insurance is costly is fraught with difficulty. But it seems likely that over self-insurance is, to at least some degree, currently reducing the quantity, or raising the price, of bank lending. This may occur through a number of channels including the composition of bank's assets and funding profile. For example, if UK banks sold even half the £120bn of liquid asset holdings in excess of their ILG requirements and used the entire £60bn to expand lending to UK households and businesses, this would be equivalent to around a 4% expansion of the current stock of lending.

Does crowding out from excess self-insurance have a macroeconomic impact?

207. Even where excess self-insurance inhibits the quantity, or raises the price, of bank lending to the real economy, this may have little negative macroeconomic impact if other financial institutions and capital markets step in to fill the gap. Further, over time, we would expect banks' funding costs to decrease as investors realise the degree to which they have self-insured.
208. But this re-alignment of the nature of credit provision is likely to take time, during which harm may be done to the economy. In the meantime, it may lead to a restricted and higher cost of credit for bank-dependant borrowers, such as households and SMEs, and borrowers in need of long-term finance, e.g. infrastructure and utility companies. In contrast, issuers of liquid assets, primarily governments, will benefit from a higher level of demand for their debt than would be the case were there to be less self-insurance.
209. In addition to the cost to the macroeconomy, if banks' excess self-insurance reduces their prominence in real economy credit intermediation, this may also impair the ability of the central bank to effectively transmit monetary policy decisions through the banking system.

Is delayed usage of liquidity facilities costly?

210. If fear of stigma makes a bank reluctant to use central bank liquidity facilities in a timely manner, this delay may have significant costs for the bank itself and might contribute to financial sector instability with implications for the wider economy and the taxpayer.
211. Rather than access central bank liquidity, a bank may resort to fire-sales of assets to raise funds to meet their funding outflows. This may damage the bank's solvency and may also reduce the value of assets held by other banks, potentially also creating problems for those banks as well. In less acute situations, the bank may choose to de-leverage by reducing lending, impacting the real economy as a result of their contraction in credit provision.

212. The longer a bank's liquidity problem is allowed to fester, the more likely it is that the bank and the broader economy will be impacted. A prolonged period of reduced lending and / or asset sales, usually combined with a higher cost of funds, could affect the bank's solvency to the point that what started as a liquidity problem can become a solvency problem requiring formal resolution. The process of resolution is likely to be far more costly to the taxpayer than if liquidity support enabled a solvent bank to continue operating. Furthermore, a single bank solvency event may spread to other banks and the broader financial system via various channels of interconnectedness and contagion.
213. In seeking to improve its liquidity position, a bank may act to further encumber its balance sheet by pledging assets to lenders or fund at ever shorter maturities. Encumbering assets makes resolution more expensive for unsecured creditors, including government deposit insurance schemes, as the highest quality assets are pledged elsewhere. Outside a resolution, more support may be required by the central bank as the bank's liquidity profile is weakened by these actions.
214. It is clear that during the Crisis, banks facing liquidity problems took precisely the actions listed above. But it is difficult to distinguish how much was due to reluctance to access central bank facilities. Conversations with banks while preparing this Review have, however, confirmed that they would seek to avoid using central bank facilities, including taking quite extreme and costly actions to avoid doing so in many cases.

Overall Evaluation

215. At the moment, it seems likely there is a real cost to the economy from central bank facilities being stigmatised. In particular, UK banks appear to be over self-insuring against liquidity risk, with a consequent impact on lending and therefore economic activity.
216. The FPC discussed the issue of excess self-insurance at their June 2012 meeting and reached a similar conclusion.²⁹ The Record of the meeting notes that "banks might also be looking to self-insure if they were uncertain about their access to liquidity from the Bank" and goes on to comment that there was therefore "no guarantee that relaxation of regulatory guidance would lead to a fall in banks' holdings of liquid assets." Overall they concluded that "there were macroprudential grounds for banks using their liquid asset holdings to facilitate greater lending, with positive consequences for the economy and in turn resilience over the medium term," indicating they believe there is currently a real cost to such excess self-insurance. Following this, the FSA, with encouragement from the FPC, has begun to make changes to the liquidity regime with the aim of encouraging banks to substitute access to Bank facilities for holding large amounts of liquid assets.³⁰ In particular, the changes allow banks to count a proportion of collateral pre-positioned for Bank facilities towards their required liquid asset buffers.

²⁹ Record of the Interim Financial Policy Committee Meeting 22 June 2012

<http://www.bankofengland.co.uk/publications/Documents/records/fpc/pdf/2012/record1207.pdf>

³⁰ FSA Statement "Adjustments to FSA's liquidity and capital regime for UK banks and building societies", 27 September 2012. <http://www.fsa.gov.uk/library/communication/statements/2012/fpc.shtml>

217. Given the costs associated with stigmatised facilities, there is merit in considering what steps the Bank could take to complement the regulatory changes in order to reduce banks' reluctance to access its facilities. While it may not be possible to completely de-stigmatise the Bank's facilities without making the Bank the lender of first resort, it may be possible to reduce the disincentives of using central bank facilities such that banks more actively take central bank liquidity insurance into account in their planning. This would be beneficial in reducing the potential social cost of stigma.

Design features that affect stigma in central bank operations

218. The extent to which usage of central bank facilities is stigmatised depends in large part on the design of the facility. In particular there seem to be six key design features that affect the level of stigma associated with a facility: pricing; non-price costs; disclosure; collateral; the bilateral/multilateral nature of the facility; and the existence of trigger points. Below we set out the issues around each of these design features, and what the Bank may wish to consider doing if it wishes to reduce stigma in its operations. Some of these actions may in themselves also incur cost. For example some may require the Bank to take more risk onto its balance sheet, or may involve operational costs to implement. Such costs would need to be weighed against the wider costs of stigma as described above. This Review does not attempt to undertake that analysis.

Pricing

219. Pricing is often used by central banks to ensure that, for their liquidity insurance operations, they are seen as a lender of last resort, rather than first resort. Providing liquidity on generous terms could create moral hazard as banks would have insufficient incentive to manage their own liquidity appropriately, preferring to rely on central bank funding. As such, the pricing of central bank liquidity is typically set at a penal level relative to where banks might ordinarily obtain this liquidity in functioning private funding markets.
220. Such penalty pricing, however, if it is too high, increases the likelihood that a facility becomes stigmatised, by marking out those who use it as unable to raise funding more cheaply elsewhere. It may also act to stigmatise holdings of asset classes with higher penalty drawing fees than others, implicitly branding them as poorer quality. In general, the higher the price, the more stigmatised a facility or asset class is likely to be.
221. The interaction between pricing and stigma, together with other issues around the pricing of the Bank's liquidity insurance facilities, are discussed in more detail in **Chapter 7**.

Non-price costs to usage

222. There are also various non-price factors that banks consider to be costs to using central bank liquidity facilities.
223. Making a drawing on a central bank liquidity insurance facility can attract additional supervisory or central bank scrutiny. For example, one of the requirements for undertaking a

drawing in the Bank's DWF is that the bank passes an on-the-day solvency and viability test before being allowed to draw, injecting uncertainty about their ability to draw on funding and potentially additional scrutiny.³¹ Furthermore, the bank must provide details of how it plans to repay its drawings, which it would then expect to be monitored against.

224. Banks are also concerned they may suffer reputational risk from using central bank facilities. Even if use of a facility is commercially viable, and expected to be non-stigmatised, banks factor in the risk that if/when it is revealed that they have used it, it will damage their reputation as a result of being seen to need or profit from public sector 'support'.
225. There is some evidence from other central banks on the impact of such non-price costs. Prior to 2003, the US Federal Reserve Banks' (Fed) discount window carried a discount rate below the policy rate but was nonetheless highly stigmatised. In that regime the Fed asked intrusive questions about the reasons for the borrowing and whether all other funding sources had been drawn. That level of scrutiny dissuaded bank managements from using the discount window, even in circumstances when borrowing was appropriate, for example when aggregate reserves in the system were short. To address this problem, in 2003 the Fed's discount window was changed to a largely 'no questions asked' facility, with a new, more penal, pricing structure. But even under the new framework, US banks remain concerned that using Fed facilities will elicit political retribution for having accepted a 'bail-out'. The episodic appearance by bank management in front of the US Congress throughout the Crisis and new disclosure requirements on discount window borrowing re-enforces this concern.
226. ***The Bank should consider whether it could remove some of the non-price barriers to use of its facilities, such as the need for an on-the-day S&V test and repayment plan in the DWF in favour of more continuous assessment. But there are some non-price factors that the Bank cannot directly influence meaning that pricing is not the only factor discouraging use of central bank facilities. The Bank should take such factors into account when setting its pricing structure. A lower financial price may be required to achieve the desired stance (in terms of the relative attractiveness of central bank versus market liquidity) than would be implied by just looking at the financial costs of usage alone.***

Disclosure

227. Ultimately, if no one knows that a bank has accessed central bank liquidity, they cannot be marked out and so will not suffer stigma. But disclosure is a crucial means of safeguarding accountability, both of central banks themselves, particularly given that central bank support involves putting public funds at risk, and of banks, which are accountable to various stakeholders including shareholders and investors. So central banks need to think carefully about what level of disclosure is appropriate for usage of their facilities.

³¹ This is in addition to regular solvency and viability assessment updates that the Bank conducts on all firms to ensure they continue to meet the eligibility conditions for SMF access.

228. Following the early events of the Crisis, many central banks sought to limit disclosure around usage of their facilities as a way to avoid stigma. The Bank itself made a number of changes to its disclosure practices, stopping publishing the following:
- Daily Standing Facility usage the day after a drawing was made. Instead, aggregate average daily OSF usage over a maintenance period is now released with a lag. This followed the events of August 2007 when Barclays used the Standing Lending Facility for purely operational reasons and journalists contacted UK banks the following day to find out which bank did not deny usage.
 - Monthly list of reserves and standing facility participants. This was so that the list of potential drawers was not known in order to minimise the chance of another such ‘witch hunt’, but also to remove the risk of potentially damaging speculation about the reasons for an institution being added to or removed from the list.
 - The daily forecast of reserves requirements and constituent flows over the Bank’s balance sheet. This was because usage of some Bank facilities could be worked out from the information on daily flows.
229. Disclosing usage on an anonymous, aggregated basis, released with a lag following repayment, is now a feature of a number of the Bank’s bilateral facilities, including OSFs and DWF. The average daily amount outstanding in each of the OSFs during the maintenance period is published on the third Wednesday of the following maintenance period. For the DWF, usage is averaged across counterparties over a three-month period. The average aggregate daily value of gilts (or cash) lent with a maturity of 30 days or less in any given calendar quarter is published with a lag of between three and six months depending when in the quarter the drawing was made. The average aggregate daily value of gilts (or cash) lent with a maturity of more than 30 days in any given calendar quarter is published with a lag of between 15 and 18 months. This compares to disclosure by the Fed of aggregate DWF usage within a week of drawing, and full details, including the name of institutions drawing, after two years.
230. The purpose of lagging disclosure in this way is that accountability is maintained, but usage is only revealed after a sufficiently long time that the bank has repaid the facility and can therefore demonstrate that their liquidity issue has been resolved. But it may be difficult ex-ante to determine the appropriate period for the lag. In particular, it is unclear how long it can take for a bank to sufficiently disassociate itself from their past usage of central bank facilities. Nonetheless, it is clear that lengthening the lag for disclosure would, at the margin, reduce stigma. And this should be possible without significantly reducing the level to which external stakeholders can hold the Bank accountable.
231. ***The Bank should ensure that its own disclosures do not reveal usage of facilities on an individual institution basis, which could add to concerns over stigma. Its current publication of usage on an aggregated, lagged basis seems appropriate. If anything, the length of the lag, particularly for short-term DWF drawings, could be extended to further reduce disclosure risks.***

232. But limited disclosure on the part of the central bank itself may not be sufficient to prevent stigma. Banks' own formal disclosure requirements may prevent central banks from limiting disclosure. This is a particular concern for activity that is considered to be out of the ordinary. For example, some banks think they might have to disclose usage of the DWF to meet listings requirements, whereas they do not need to disclose usage of standard OMO facilities.
233. Requirements on banks to disclose their activities come from a wide variety of sources, including legislative and regulatory requirements both domestically and internationally. Following *The run on the Rock* report, a number of these requirements, such as the Market Abuse Directive, were clarified, making it clear that central banks should be able to act for financial stability reasons without their support needing to be immediately disclosed by the recipient. But this was done largely in the context of ELA, and there still appears to be some uncertainty about the extent to which the guidance applies to other central bank operations.
234. More recently, the *Sharman Inquiry* looked at whether there should be a special going-concern disclosure regime for banks. The main conclusion was that a separate regime was not necessary.³² But this was on the basis that it was clear that central bank liquidity support could be considered a normal funding source for a bank. This suggests that regularly used facilities would be less likely to raise issues around a bank's going concern status than those of an exceptional nature.
235. The report further noted that the judgement on whether central bank facilities could be considered a normal funding source would be at the discretion of the directors and auditors. In particular, they would need to satisfy themselves that such facilities would be accessible to a sufficient extent for sufficient time period for them to be able to conclude that the bank would remain a going concern for the foreseeable future. Certainty over access to facilities therefore has a bearing on disclosure requirements.
236. Given the important social benefit of reducing stigma in central bank facilities, it should be a priority for policymakers to ensure that banks are free to use central bank facilities without fear of additional disclosure requirements being triggered when they use specific facilities or hit certain levels of usage.
237. Action to address this issue is not solely within the gift of the Bank. ***But the Bank should work closely with the relevant authorities, at both a domestic and international level, to ensure as far as possible that specific usage of central bank facilities does not need to be disclosed by banks. This should apply as a minimum for the duration of the usage.***
238. There is also the potential for inadvertent disclosure of facility usage, for example via a change of behaviour being noticed by other market participants. The Bank currently uses collateral swaps to provide liquidity from its DWF, as it did with the Special Liquidity Scheme (SLS). This enables the Bank to report its balance sheet without showing an expansion due to provision of such support as such transactions are off-balance sheet. But banks need to use

³² For further details see <http://www.frc.org.uk/Our-Work/Headline-projects/The-Sharman-Inquiry.aspx>

the gilts or Treasury bills provided by the Bank to raise funding in the repo market. An unusual amount of activity in the repo market from a particular counterparty may be conspicuous.

239. There is also the possibility that usage is leaked from within an institution, either via the support groups or elsewhere.
240. ***One possible way to help manage these risks is to make usage of particular facilities as regular as possible, making it more difficult for observers to distinguish any extraordinary usage. The Bank should consider ways to facilitate such regular usage, perhaps involving compulsory regular drawings or incentivising usage via tiered pricing. Such usage may also reduce concerns about the length of the lag for disclosure. Additionally, the risks around observed changes in market behaviour would be reduced if banks regularly tested their ability to liquidate gilt collateral (which could be obtained either from the DWF or their own liquid asset buffers) in the market.***³³

Collateral

241. The wider the set of collateral accepted in a facility, the more likely it is to be perceived as a potential support operation and therefore be stigmatised. For example, OSFs use collateral that can easily be funded in markets so there should be no indication of stress. If a bank has the collateral to access the OSFs, they can just as easily fund themselves in private markets, so usage should only be for purely frictional and/or timing reasons (for example, once private markets have closed for the day).
242. This does not mean that wide collateral operations are necessarily stigmatised, just that narrow collateral ones are less likely to be. This and other issues around the Bank's collateral sets are discussed in more detail in **Chapter 10**.

Bilateral nature

243. As noted above, stigma occurs when a bank risks being differentiated from its peers. Therefore, stigma is more likely to arise where an individual bank is drawing on a bilateral facility rather than being one of a number of banks drawing on a market-wide facility. A Federal Reserve study found that banks were willing to pay more for liquidity in the market-wide Term Auction Facility (TAF) auctions than the rate on the discount window, even though the two accepted the same collateral.³⁴ This is likely to have reflected stigma in the discount window.
244. It may, in principle, be possible to use the smokescreen of a market-wide facility to assist an individual bank with idiosyncratic liquidity issues. For example, the European Central Bank (ECB) Long-Term Repo Operations (LTROs) avoid stigma in part due to the broad take up of

³³ Regular realisation of a bank's liquid assets in the market is already a requirement under the FSA's regulation, which should help in this regard.

³⁴ Armantier, Ghysels, Sarkar and Shraderr "Stigma in Financial Markets. Evidence from liquidity auctions and discount window borrowing during the crisis", March 2010.
http://www.unc.edu/~eghysels/papers/TAF_DW_stigma_AFA_Mar_15_10.pdf

the liquidity on offer. Such an approach carries risks though. The operation would need to be priced so that non-stressed banks participate as well, which may compromise a central bank's ability to manage moral hazard (if moral hazard is a concern given the circumstances). There is also the danger that the single bank objective could be discovered, which could result in stigma spreading to the market-wide facility itself. This could compromise the ability of the central bank to use the market-wide facility for the purpose that was originally intended. In other words, in using a market-wide facility to deal with an idiosyncratic shock, a central bank could damage its ability to respond to a future market-wide shock.

245. ***It is appropriate that the Bank has a range of both bilateral and market-wide facilities available. As discussed above, it appears that stigma is principally associated with bilateral facilities and in particular the DWF. As yet, the market-wide facilities appear not to be stigmatised, but there is a risk that they become so over time if they are not actively used. Indeed, they may become ineffective at managing market-wide liquidity stress if they are perceived as being used to provide support to individual institutions. The Bank should guard against being seen to use its market-wide facilities for idiosyncratic support.***

The creation of trigger points

246. Stigma is most likely to be attached to a discrete event because the signal is most clear in those circumstances – i.e. one has either drawn on a facility or has not. It is much more difficult to take a signal from something that happens on a sliding scale – i.e. one has done a little bit more of something. So creating trigger points, where there can be a clear signal of a change in behaviour, risks increasing the stigma associated with a facility.
247. The liquidity insurance provided by various central bank facilities can in some ways be viewed along a spectrum, with the key variables being the collateral accepted in each operation and its pricing. Facilities that enjoy regular or routine usage are more likely to be viewed as being part of the bank's ordinary activities, and so their usage does not create a signal in the same way as would accessing a facility that has been dormant for some time. Where these variables change markedly between facilities this can create points at which stigma occurs. Arguably the current step-ups between pricing and collateral points in the Bank's facilities are very high. For example, OSFs charge just 25bps for lending against narrow collateral, while the DWF charges 50bps for lending against the same collateral set, albeit for a longer term (one-month rather than overnight). The step-ups within the DWF are also high. The facility has just four collateral sets, with drawings against the most liquid set of collateral priced at 50bps, and with step-ups to 75bps, 125bps and 200bps for drawing against increasingly less liquid collateral.
248. The step ups are helpful in that they act as barriers to stop stigma spreading across facilities. For example, the sharp distinction between the parameters of the OSF lending facility and the DWF has helped to relatively de-stigmatise the former. But it has done so at the cost of stigmatising the latter even more.
249. ***The Bank may wish to consider introducing a more continuous spectrum of pricing and collateral across and within facilities to remove trigger points that can lead to stigma.***

Conclusions

250. Banks currently appear to be holding more liquidity than might be optimal from the perspective of society as a form of self-insurance against liquidity shocks. There are likely to be a number of reasons for this, including apparent demands from regulators, investors and rating agencies. Relevant to this Review, though, there is also a perception that planning to use, or actually using, Bank liquidity facilities could elicit negative reactions from the same stakeholders, as it would demonstrate some sort of weakness. In other words, some Bank facilities are stigmatised, particularly the DWF.
251. This stigma is likely to be costly to the extent that excess self-insurance crowds out real economy lending, and the gaps left by banks are not filled by others in the financial system. Furthermore, such stigma may cause banks to delay usage of central bank facilities, which could cause financial instability and result in higher overall costs to taxpayers if a bank subsequently needs to be resolved.
252. Given these costs, the Bank should consider steps it can take to reduce banks' reluctance to access its facilities. While it may not be possible to completely de-stigmatise the Bank's bilateral facilities without making the Bank the lender of first resort, it may be possible to reduce the disincentives of using central bank facilities such that banks more actively take central bank liquidity insurance into account in their liquidity planning. Other stakeholders, in particular regulators and rating agencies, would need to accept this change for it to change the behaviour of banks. The Bank can contribute to this through clear communication and coordination as appropriate.
253. There are a number of possible factors that contribute to the reluctance of banks to access liquidity insurance, including pricing, non-price costs, disclosure, collateral, the bilateral nature of facilities and the presence of defined trigger points. The Bank may wish to consider acting in a number of these areas in order to reduce stigma in its facilities. Some of these elements are addressed by the specific recommendations outlined in **Chapter 11**.

Chapter 7: Pricing

254. Pricing in liquidity insurance operations is often set by central banks to manage the risk of moral hazard – the risk of creating incentives for individual banks to undertake riskier activities because of the presence of a central bank backstop. The higher the backstop price, the more banks will be incentivised to manage their liquidity risk themselves in private markets.
255. Pricing is also used to ensure that the central bank does not end up disintermediating private markets in non-stressed circumstances. This reflects the central bank’s role as a lender of last resort rather than first resort. It may be appropriate for a central bank to offer liquidity at a discount to market pricing where market prices are elevated due to stressed liquidity premia. But in normal market conditions it would not be appropriate for a central bank to use its balance sheet in this way. Over-reliance on the central bank for liquidity may distort wider market prices by offering inappropriate subsidies, and possibly making banks (or whole markets) dependent on central bank support for an extended period. In the worst case, this could result in the central bank propping up markets that would not exist independent of public sector support, causing an inefficient allocation (redistribution) of resources for the economy as a whole.
256. The pricing of central bank liquidity is therefore typically set at a penal level relative to where banks might ordinarily obtain liquidity in functioning private funding markets. This establishes the central bank liquidity as a backstop. In normal times, banks are incentivised to use private markets to manage their needs, and only in stressed circumstances, when market prices rise above the backstop, would banks wish to use central bank facilities. This backstop pricing model also ensures that, when market conditions start to normalise, banks are incentivised to exit from central bank support operations.
257. Backstop pricing is used in the Bank’s facilities for providing liquidity insurance to banks. In the DWF, the fee is set at different backstop rates depending on the type of collateral pledged (see **Table 3**). Less liquid collateral attracts a higher fee to reflect the extent of liquidity upgrade performed by the facility, and therefore the higher market price that would be attached to such transactions. The fee is also higher the greater the borrowing relative to the size of the institution, making higher usage more penal to further enforce the incentive for banks to manage their liquidity risk in private markets as far as possible. Finally, there is an additional fee on drawings with an initial maturity of greater than 30 days to reflect term premia.

Table 3: Fee table for DWF drawings of gilts

Fee in basis points	Collateral type ^(a)			
	Level A	Level B	Level C	Level D
Percentage of sterling Eligible Liabilities				
0%-10%	50	75	125	200
10%-20%	75	125	200	300
20%-30%	100	175	275	400
>30%	At the discretion of the Bank			

(a) For definitions of collateral types see **Table 2**.

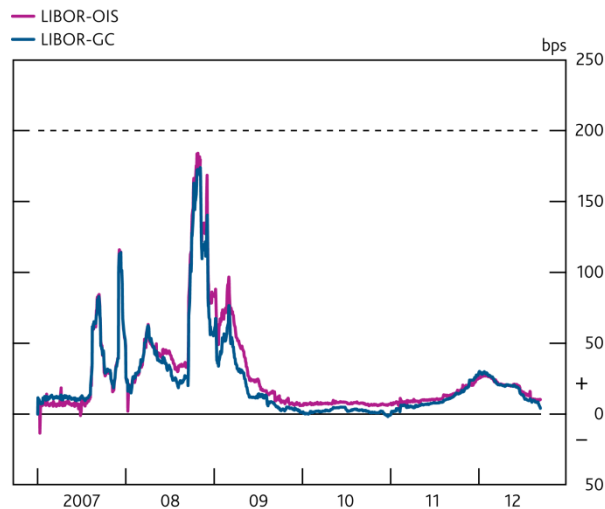
258. Aspects of this pricing mechanism are also used in the Indexed Long-Term Repos (ILTRs) where there is a premium paid to borrow against wider collateral relative to narrow collateral.

Should the Bank use pricing to manage moral hazard?

259. It seems clear that the Bank currently places significant weight on using pricing to manage moral hazard in its provision of liquidity through the SMF. As noted above, the price terms upon which liquidity support is made available are often set at a relatively penal level to ensure the central bank is seen as a backstop and so avoid moral hazard from banks being dependent on central bank support and not managing their own liquidity prudently.
260. Further, the Bank's position appears to attach more weight to managing moral hazard through pricing than other central banks, including the European Central Bank (ECB) and the US Federal Reserve (Fed). This was noted, for example, in *The run on the Rock* in relation to the Bank's interventions in the early part of the Crisis, and also features in its current range of liquidity facilities.³⁵ For example, drawings on the BoE discount window are charged at up to 200bps, compared to 50bps (reduced from 100bps earlier in the Crisis) for the equivalent Fed facility. DWF rates are also high compared to market rates. While it is not possible to calculate a direct market equivalent rate for one-month lending against the range of collateral accepted by the Bank, one-month LIBOR-OIS rates (an indicator of bank funding costs over something close to a 'risk-free' rate) give a proxy for the scale of unsecured funding costs experienced during the Crisis, probably the best comparator. As **Chart 6** shows, such rates did not reach 200bps, even in the aftermath of Lehman Brother's bankruptcy. This makes the DWF, which charges 200bps for one-month drawings against wider collateral, a very extreme backstop for banks, with it very rarely making commercial sense for them to use the facility. As noted in **Chapter 6**, this high level of pricing is one important reason the DWF is currently so acutely stigmatised.

³⁵ See paragraph 89, p43, of *The run on the Rock* Report

Chart 6: Sterling one-month Libor-OIS and Libor-GC spreads



Source: Bloomberg, Bank calculations

261. There are a number of reasons to conclude the Bank may be relying too much on pricing to manage moral hazard in its current approach.
262. First, and as noted in **Chapter 6**, there are likely also to be a number of non-price real or perceived costs to using central bank facilities that the Bank cannot remove. Thus, the central bank does not need to rely on pricing alone to manage this moral hazard risk. These may include the additional scrutiny attracted from central banks, regulators and others that may accompany use of central bank facilities.
263. Second, attempts to guard against moral hazard may not be credible. For the time being, in any case, markets fully expect central bank support to fill extreme liquidity gaps, be they idiosyncratic or systemic, albeit the timing and cost to other creditors and shareholders is by no means certain, and even if banks themselves say they are reluctant to use some central bank facilities. These costs, in addition to predictable microprudential intrusion in the event of an idiosyncratic event, are most likely sufficient to incentivise banks to err on the side of caution with respect to liquidity management, hence the current levels of excess self-insurance.
264. Finally, microprudential regulation can be more specifically targeted to manage this moral hazard risk, and is arguably the more appropriate tool for doing so. The Financial Services Authority (FSA) Individual Liquidity Adequacy Standards (ILAS) regime and forthcoming Basel liquidity regulations will require banks to manage appropriately their own liquidity risk, taking into account their potential need in stressed circumstances. To the extent that new liquidity risks arise, perhaps for the system as a whole, there may also be a role for the macroprudential authority (the FPC) to capture and reflect on such risks. The combination of these regulatory structures means there may be less of a need than in the past for the pricing of central bank liquidity provision to try to fulfil the role of managing moral hazard.

265. *As such, it is questionable whether it is appropriate for the parameters of the Bank's SMF to be used as a way in which to ensure banks manage their liquidity appropriately. The Bank should consider whether it has the correct balance between using pricing to manage moral hazard and creating stigma in its facilities. In particular, DWF pricing is very high, making it a very extreme, and highly stigmatised, backstop facility.*
266. *Nevertheless, it may still be appropriate to have some penalty element built into facilities to ensure that the Bank does not undercut the market and become a lender of first rather than last resort, and to reflect the true value of liquidity insurance to the banking sector. Such a penalty is unlikely to have to be as high as implied by the current pricing structure, particularly given the non-price costs that banks associate with use of central bank facilities.*
267. One way to discourage dependence on central bank facilities is to have higher fees for higher levels of relative usage. This creates the incentive for banks to regularly use facilities in small amounts, helping to reduce stigma, but to use private sector solutions for the majority of their liquidity needs given the increasing penalty that the central bank would impose on higher levels of usage. The Bank already uses such pricing structures in some of its facilities, including the DWF. Such a pricing structure seems sensible, but ***perhaps could be made more granular than the current structure*** shown in **Table 3**, which recognises just four pricing categories in relating to the size of drawing, creating significant trigger points as usage of the facility increases (see **Chapter 6** paragraphs 246-249 for further discussion of trigger points).
268. In certain extreme systemic liquidity shocks it is not appropriate for central bank liquidity insurance facilities to have any element of penalty pricing at all. Banks should be expected to, and indeed do, plan to manage a variety of market-wide as well as idiosyncratic shocks. But where market-wide liquidity is affected by extreme systemic liquidity issues outside of individual banks' control, it is not appropriate to discourage usage via pricing. This reflects the fact that it was not the banks' individual behaviour that led them to need to access central bank liquidity, and that it would not be reasonable to have expected them to plan to deal with such an extreme tail-risk.³⁶ The Bank has recognised this in its most recent set of crisis responses. Extended Collateral Term Repo (ECTR) operations were set to be priced at 125bps when they were introduced in December 2011. But when they were activated in June 2012 in response to a potential escalation of funding stresses due to problems in the Eurozone, pricing was lowered to 25bps reflecting the fact that this was an external, system-wide issue. Such operations appear less stigmatised partly due to this less penal pricing.
269. But the Bank could consider going further. The objective of an operation launched in response to a truly exogenous market-wide shock is to provide the market with sufficient liquidity to continue to function effectively in providing key financial services to the real economy. Participation by banks in the operation is fundamental to achieving that objective,

³⁶ For example, after the attacks on September 11, 2001 the Federal Reserve set the discount rate at the target Fed Funds rate and invited banks to borrow in order to deal with liquidity shortages caused by damage to physical infrastructure that affected some key participants.

and so designing the operation to minimise stigma, which may inhibit participation, is key. ***With little risk of moral hazard relating to pricing for facilities targeted at system-wide, exogenous shocks, the Bank should consider offering funds at the policy rate, with no additional liquidity premium, in such circumstances.***

Structures for charging for liquidity insurance

270. We consider here whether it is appropriate to consider imposing some form of upfront fee in order to have access to the Bank's liquidity insurance. This fee would be analogous to the premium on an insurance policy or the purchase price or premium of an option in financial markets. The rationale of considering such a fee would include recognising the value of a facility provided to banks and also to create a mechanism to encourage the Bank's facilities to be more regularly used, helping with the stigma issues discussed in **Chapter 6**.
271. Liquidity insurance is valuable to banks. Several bankers and analysts commented to us in the course of preparing this Review that, given the maturity mismatch that banks run, it would not be possible to run a bank with anything like current levels of gross leverage without some degree of central bank liquidity insurance to manage tail liquidity risks. In other words, banks cannot fully self-insure against liquidity risk and at the same time operate their existing business models.
272. But at the moment, banks do not explicitly pay for the ability to draw on central bank liquidity insurance in relation to their potential need to draw. Banks make payments in the form of balance sheet and bonus taxes intended to at least partly recoup some of the value banks derive from (implicit) government support. They also pay to access the Bank's SMF facilities as a whole. Larger banks have to lodge cash ratio deposits (CRDs) with the Bank at a level of 0.11% of their eligible liabilities.³⁷ These are non-interest bearing deposits and the interest earned from the deposits is used by the Bank towards funding its operations. Smaller banks, that do not pay CRDs, pay a fixed annual fee of £10k to access the SMF. So banks do pay to access the SMF, and there is a link between the size of an institution and the fee they pay for access to the Bank's facilities. But the size of an institution does not directly relate to their need for liquidity insurance; some smaller institutions may need more liquidity insurance than larger ones if they operate a more liquidity-intensive business model. In any case, the cost to banks of having access to Bank facilities appears to be very low relative to the value of that backstop, most obviously in the stressed environment of the past five years.
273. The specific charge for using liquidity insurance in the SMF comes solely from the fee a bank pays if they make a drawing. But there is no upfront 'premium' such as you might expect to find in an insurance policy. This seems appropriate with respect to auction-based facilities where the Bank sets the size of operations and institutions are not guaranteed to receive liquidity from such operations. But it may be less appropriate with respect to bilateral facilities – specifically the DWF – where effectively banks are currently being offered 'free' insurance, albeit with a large charge for drawing on the policy, on a scale limited only by the

³⁷ Banks with eligible liabilities in excess of £500mn.

amount of eligible collateral they can mobilise. This will affect the way they view such insurance in their liquidity planning.

274. Were the Bank to introduce an upfront fee, some of the cost of liquidity insurance would be factored into a bank's regular operations, rather than being exceptional, and the fee needed for undertaking a live drawing could then be reduced. This is likely to have two benefits. First, it would reduce stigma as the marginal cost of undertaking a drawing is reduced. Second, it would introduce a business-as-usual element to the facility, reducing some of the non-price barriers to usage.
275. At present, the Bank does not commit to provide liquidity to an institution ex-ante in its bilateral facilities. It would be inappropriate to charge a premium upfront without making such a commitment. But ***it may be possible to move some of the cost of using a facility to be an upfront premium if the framework moved towards a more committed facility structure. This could then lower the drawing price which may reduce the stigma of drawing.*** Should the Bank move to implement such an upfront fee structure, the Government would, of course, be free to reduce other taxes on banks if it deemed it appropriate to do so.

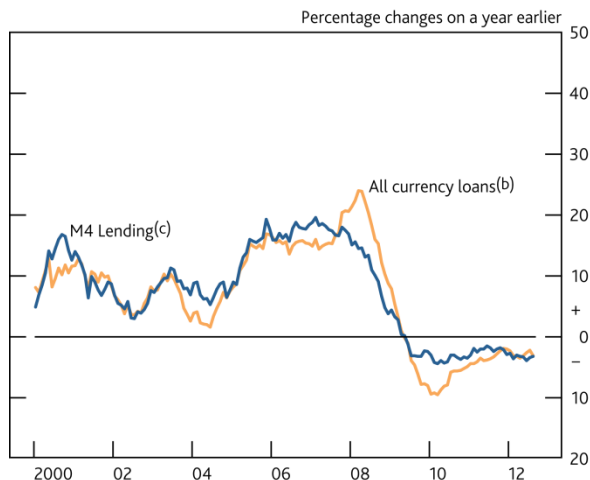
Chapter 8: Maturity transformation

276. As described in **Chapter 1**, one of the primary roles of the banking sector is to undertake maturity transformation – borrowing shorter term and lending longer term – when providing liquidity insurance and credit provision to the real economy. But this makes banks susceptible to liquidity risk as their borrowings may need to be repaid before they are repaid on their loans. One of the key roles of a central bank in a system with inherent maturity mismatch is to backstop solvent banks in the event of severe liquidity shocks. In other words they have a role in insuring against tail events, which result in the crystallisation of that liquidity risk.
277. Central banks have traditionally provided liquidity insurance on an overnight or short-term basis. Prior to the Crisis, this was seen as adequate to allow banks to perform their roles in relation to maturity transformation and liquidity provision to the broader market and economy.
278. As the Crisis developed, however, it was increasingly apparent that this approach had become insufficient to meet the aims of the SMF. Banks were reducing both the amount of funding they were willing to provide, as shown in **Chart 7** and **Chart 8**, as well as the term of that funding, with the Bank's credit conditions survey reporting a shortening in corporate loan tenors in 15 of 20 quarters from mid-2007. In response, central banks developed facilities that provided longer term funding to banks, therefore more directly backstopping their provision of maturity transformation to the broader economy. For example, the Bank's Extended Long Term Repos (ELTRs) provided funding via repo to banks for three months, whilst draining reserves by issuing one-week Bank of England bills. In early 2008, the Bank's Special Liquidity Scheme (SLS) provided liquid assets in a collateral swap against illiquid assets, effectively helping banks fund these assets for up to three years. The European Central Bank (ECB) Long Term Repo Operations (LTROs) have also supported the maturity transformation role of the banking system by providing up to three-year funds.
279. But whilst recognising the central bank has a maturity transformation backstop role in its temporary crisis response facilities, this function does not feature explicitly in the permanent facilities of the Bank's framework.

Should maturity transformation be more explicit in the Sterling Monetary Framework (SMF)?

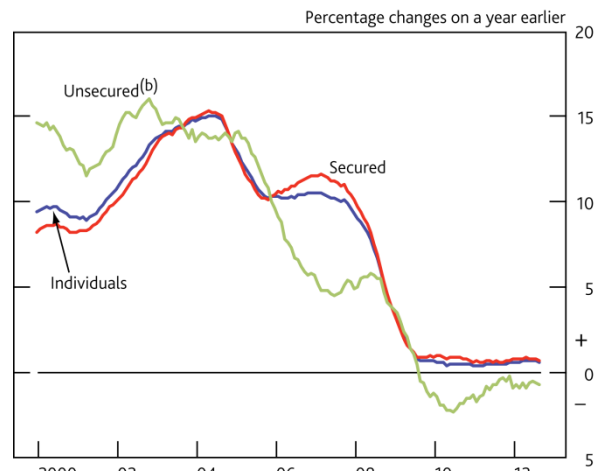
280. The Crisis has highlighted the high liquidity risks that banks were running. The reduced term of funding that banks have been able to access at times through the course of the Crisis, alongside new liquidity regulations and banks' own desire (under investor and credit rating agency pressure) to reduce maturity mismatch to bring down this liquidity risk, has acted to reduce the amount of maturity transformation they are willing to provide to the wider economy. This has affected the amount of long-term credit they feel able to provide.

Chart 7: Lending to UK businesses^(a)



Source: Bank of England Trends in Lending
(a) Lending by UK monetary financial institutions to PNFCs. Rate of growth in the stock of lending. Seasonally adjusted.
(b) Data cover lending (loans) in both sterling and foreign currency, excluding the effects of securitisations and loan transfers, expressed in sterling terms.
(c) M4 lending to PNFCs excluding the effects of securitisations and loan transfers. Data cover sterling lending (loans and securities) only.

Chart 8: Lending to individuals^(a)



Source: Bank of England Trends in Lending
(a) Sterling lending by UK monetary financial institutions and other lenders to UK individuals. Rate of growth in the stock of lending. Seasonally adjusted.
(b) Consists of credit card lending and other loans and advances. Consumer credit data exclude student loans.

281. With banks' reduced appetite to take on liquidity risk, the UK economy is currently adjusting to the reduced degree of maturity transformation on offer from the banking system. It seems likely that the eventual equilibrium will involve a greater role for non-bank financial institutions and capital markets, with corporations issuing public debt directly to mutual funds and other non-banks. That would be somewhat closer to the model of the US financial system. But the process of adjustment to a new bank / non-bank equilibrium may involve a painful contraction of credit in the medium term, presenting possible macroeconomic reasons for the central bank to play a role in smoothing the transition away from banks as the key providers of maturity transformation to the broader economy.
282. The Bank's recently launched Funding for Lending Scheme (FLS) goes some way to address this challenge by providing funding for four years, deemed to be in line with the typical duration of key lending products. But both this scheme and the SLS, which also provided longer term liquidity, were temporary in nature and not part of the Bank's permanent framework. This leaves some ambiguity about the Bank's role as a backstop for the provision of maturity transformation.
283. It is likely to be in society's interest for a central bank to provide some degree of backstop for the specific maturity transformation role of banks, as well as for their liquidity position more generally, particularly during a prolonged period of adjustment in the financial and banking system. It is the maturity transformation aspect of liquidity provision that gives corporate borrowers the confidence to invest in the real economy. In order to invest, borrowers

require some certainty that they will have access to future borrowings to provide for their ongoing needs. Without this certainty, they are likely to be less comfortable investing, potentially hindering economic growth.

284. The temporary central bank term credit facilities that have been developed have been successful in supporting bank funding at a time of severe crisis. To be effective in smoothing the transition back to a more normally functioning financial market where banks lend for term, banks will need to regain confidence that their access to term funding is more certain. This should in turn help to build confidence amongst borrowers to invest. This process appears incomplete as yet. This is perhaps in part because the temporary nature of the central bank maturity backstop has not provided sufficient confidence about the long term availability of term credit.
285. The structural changes to the way in which maturity transformation services are provided to the wider economy are likely to take some time before a new equilibrium is reached. That suggests an ongoing need for a central bank maturity transformation backstop, albeit transitory, to smooth that process. Nevertheless, ***the need to smooth maturity transformation dislocations is unlikely to be unique to this Crisis. Reflecting an explicit maturity transformation backstop role in the permanent framework would ensure that the Bank is well placed to respond to such a situation in future, and help provide confidence to the wider market that such a backstop would be available if needed.***

How might the Bank backstop maturity transformation?

286. The Bank's SMF currently provides liquidity insurance facilities of up to six-month maturity. With banks in the UK now subject to new liquidity regulation, which gives little liquidity benefit to liabilities of less than three months, the value of the short-term liquidity insurance available in the Bank's permanent facilities has reduced. Indeed, banks have suggested that funding of less than one year is of limited value for liquidity purposes. As such, whilst the three-month funding provided by the ELTRs was welcomed in 2008, it would be of much less value to the banks now. Likewise, a common criticism of the Bank's Extended Collateral Term Repo (ECTR) operations is the six-month term, which does too little to arrest a contraction in banks' ability and willingness to provide meaningful maturity transformation to households and businesses.
287. ***The Bank may look to extend the maturity of some of its facilities or develop other facilities that would give banks the necessary confidence to maintain or extend the term of credit provision.*** As with any central bank backstop, the terms should be set such that these facilities would not be used once the uncertainties inhibiting banks' ability to on-provide maturity transformation, for example those clouding banks' ability to obtain term funding, have passed.
288. In considering the design of such facilities, it should be noted that a central bank may provide liquidity on different terms when it is pursuing different objectives. When it is trying to incentivise banks to provide liquidity insurance to their clients, for example, as part of a macroprudential policy aimed at avoiding a potential credit crunch, the action will be most

effective if the liquidity insurance offered is for a defined term and at a favourable price. By contrast, facilities intended to help a bank (or banks) with short-term liquidity challenges may not require the explicit maturity transformation of a longer term facility. The Bank should always be free to alter its facilities on offer with the appropriate objective in mind.

Chapter 9: Access

289. The Bank designs its SMF to provide liquidity insurance to reduce the costs arising from disruption of liquidity and payment services. Traditionally, the banking system has been the key provider of these services for the UK economy, and so is the focus of the current liquidity insurance framework. But non-bank financial institutions are increasingly relevant providers of such services. This raises questions both about whether the right banks have access to Bank facilities, and also whether, and if so how, non-banks should be able to access Bank facilities.

Do the right banks have access?

290. Access to the Bank's facilities was historically (pre-2006) focused on a small number of banks, with just 17 having direct access to central bank liquidity in the Bank's open market operations (OMOs). This was based on the premise that as the key participants in the money market had central bank access, they could on-provide liquidity to other smaller institutions.

291. The 2006 reforms widened access to central bank facilities. This was intended to improve the effectiveness of the framework, both by fostering competition in the money markets, and by ensuring that the behaviour of a wide range of institutions would be directly influenced by the policy variables that the Bank set in the new regime, such as the width of the Standing Facilities corridor. It was also intended to make the system more robust to stress by allowing more institutions direct access to the Bank's balance sheet. All banks that paid CRDs were eligible to apply for access to the SMF, meaning both large and mid-tier institutions were captured. 66 participants initially signed up for the revamped SMF facilities: 32 of those were signed up for OMOs and 58 of them had access to Standing Facilities.

292. Access was further widened in 2009 following the introduction of the Financial Services Authority (FSA) Individual Liquidity Adequacy Standards (ILAS) liquidity regime in recognition that Bank reserves were a suitable liquid asset for banks to hold. All banks are now eligible to apply to join the SMF, irrespective of size. There are now 106 SMF participants: 50 are signed up for OMOs, and 95 have access to Operational Standing Facilities (OSFs).

293. The Bank has a number of criteria for access to the SMF facilities. A key element of this is that banks are deemed to be 'solvent and viable' on a medium-term basis, with the analysis undertaken by the Bank's Risk Management Division. In parallel to this, bank supervisors at the FSA assess whether banks meet the 'threshold conditions' required to undertake regulated activities. There is already a degree of coordination and information sharing across these processes. But once supervisory responsibility moves to the Prudential Regulation Authority (PRA) as a subsidiary of the Bank, more coordination will be appropriate with respect to the judgements themselves. The two assessments have different purposes and, even when based on the same information, it is feasible that the Bank could make a different S&V judgement when looking to potentially lend to an institution than the supervisor makes about broad viability. It will be necessary for the Bank to understand the reasons underlying

any such differences in judgements in order that a consistent view from the Bank as a whole is achieved.

294. A specific issue with the Bank's current access criteria is that, in order not to encourage legal complexity, only one entity from each banking group can access the Bank's facilities (other than the DWF, which multiple entities can access). This seems an inappropriate restriction. For regulatory purposes, entities are usually required to manage their liquidity on an individual entity basis rather than a group basis, but central bank liquidity insurance is largely only available at the group level. Reducing legal complexity of bank corporate structures does not seem an appropriate objective of the SMF, and in fact this restriction on access may inhibit the effective provision of liquidity insurance by the framework. ***The Bank should consider whether this restriction is reasonable, or whether the objective it is trying to achieve would be better met in other ways.***
295. This will be of particular relevance when considering the impact of the implementation of the Independent Commission on Banking (ICB) proposals.³⁸ Under the current SMF rules, either the ring-fenced or the non-ring-fenced bank in a group would be able to access Bank facilities (other than the DWF, which both entities could access). But with restrictions on the flow of transactions over the ring fence, having only one group entity able to access a reserves account may be problematic. It would also mean that the full range of central bank liquidity insurance would only be available to one of the subsidiaries in effect.

Should a wider set of institutions have access to the SMF?

296. While the banking sector has traditionally been the key provider of liquidity and payment services to the wider economy, that is increasingly not the case. Some non-bank financial institutions are now systemically important in providing these key services of the financial system, and for the foreseeable future their failure may pose a threat to financial stability.³⁹ For example, central counterparties have become important nodes in the payment and settlement services. Broker-dealers also perform substantial functions in the provision of liquidity to the market and in payment services.
297. This raises the question whether it is still appropriate to provide a backstop only to the banking system, or whether central banks should be providing a backstop to providers of liquidity and payment services more generally. From a financial stability point of view, there is a strong case that they should be doing the latter. This was a role that the US Federal Reserve (Fed) recognised early on in the Crisis, setting up a range of facilities that non-bank providers of key financial services in the US, such as primary dealers, could access. At present, support to non-bank financial institutions in the UK could only be provided by ELA with approval from the Chancellor, reducing the ability of the Bank to present an integrated response to a crisis.

³⁸ See <http://webarchive.nationalarchives.gov.uk/+bankingcommission.independent.gov.uk>

³⁹ In August 2012, HMT issued "Financial sector resolution: broadening the regime" setting out proposals to broaden the resolution regime to recognise some non-bank financial institutions can pose risks to financial stability if there is no way for them to fail safely.

298. That is not to say that any non-bank whose failure could create financial instability should be given access to central bank facilities. The objective of liquidity insurance is to reduce the overall cost of disruption to liquidity and payment services, so it should only be those non-banks who provide these critical services, on a scale that could conceivably lead to wider financial disruption, either individually or collectively, that should be considered for central bank facility access.
299. One way to ensure that such institutions have access to central bank facilities would be to force them to become banks. But that may not always be logical or appropriate, and would potentially create a significant barrier to the development of non-bank provision of such services. A more suitable approach would be to recognise that, to the extent that non-bank financial institutions are providing such services, and are suitably regulated in the same way a bank would be in doing so, it would be appropriate for the central bank to extend liquidity support to them to minimise the risk of liquidity disruption to the financial system.
300. ***The Bank should consider whether it would be appropriate to set access criteria for liquidity insurance facilities based on the nature of facilities provided to the wider economy, specifically the provision of payment and liquidity services, rather than only providing liquidity insurance to banks. A pre-requisite would be that such institutions be regulated as rigorously as banks for providing such services.***

Market maker of last resort

301. Since the onset of the Crisis, and partly in response to the reduction in banks' ability to provide liquidity to the wider economy, banks are increasingly being disintermediated by capital markets in their provision of key financial services. Indeed the sterling (non-financial) corporate bond market has grown from around £92bn in 2007 to around £160bn this year, an increase of 74%, as larger corporates have sought to issue public debt rather than rely on bank loans for their funding.⁴⁰ The presence of capital markets is even more marked in the US where banks' share of credit intermediation is around 25%⁴¹ whereas in the UK for private non-financial corporations, banks make up around 70%⁴² of credit provision. It seems that the UK is heading closer to the US model.
302. As a result of their increased importance in providing key financial services to the wider economy, there may in future be instances where markets (as opposed to institutions) would benefit from liquidity insurance. In such circumstances, there may be a role for a central bank to act as market maker of last resort (MMLR) – providing a liquidity backstop to improve the functioning of individual markets.

⁴⁰ Figures based on Merrill Lynch Investment Grade industrials and utilities corporate bond indices which do not cover all sterling corporate bonds, with exclusions including bonds of less than one year to maturity.

⁴¹ Figure based on Institution of International Finance estimates at end-2009, see "Interim Report on the Cumulative Impact on the Global Economy of Proposed Changes in the Banking Regulatory Framework", <http://www.iif.com/press/press+151.php>

⁴² See Pattani & Vera Table A, "Going public: UK companies' use of capital markets", <http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/qb110403.pdf>

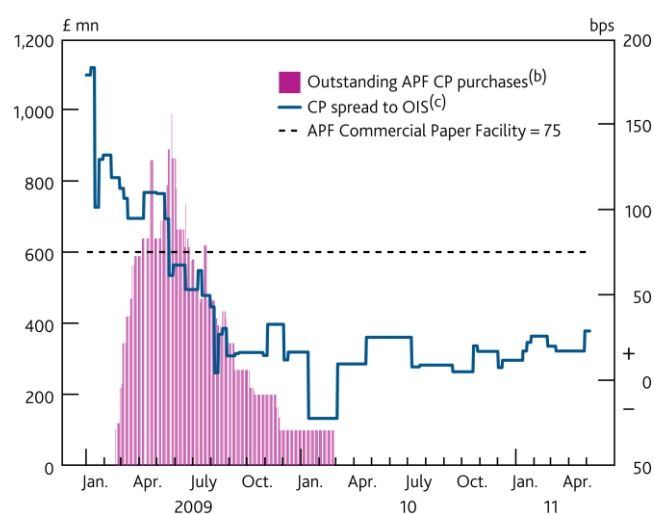
303. During the Crisis, the Fed established a number of special programmes to repair the functioning of the commercial paper (CP) and securitisation (ABS) markets to restore the flow of credit from them, recognising their importance within the US financial system. Similarly, the European Central Bank (ECB) initiated its covered bond purchases to ease bank funding conditions, encouraging banks to maintain and expand lending and improve market liquidity for covered bonds given their importance in supporting bank funding for credit provision within Europe.
304. But a central bank should only act in a MMLR role where there is clear relevance for its core purposes; the markets should be deemed to be critical either to the monetary policy transmission mechanism or to financial stability. It would not be appropriate for the central bank to support a dying market, or one that was just experiencing very high pricing premia, if those premia were not having either monetary policy or financial stability implications.
305. The Bank's current framework allows for this, and the Bank has acted as MMLR during the Crisis, although in much smaller scale than the Fed.⁴³ The Asset Purchase Facility (APF) was used to purchase high-quality commercial paper to support this market that relies on bank liquidity lines (see **Box 8** for more details). The APF was also used in the purchase and sale of corporate bonds where the Bank was regularly providing backstop pricing to improve liquidity in this market. But whilst this role is contemplated in the *Red Book*, it is only in very general terms. ***The Bank should give consideration to making its MMLR actions more predictable and consistent. This may include setting out more explicitly the likely objectives of acting as a MMLR and the circumstances under which it would consider doing so, as well as the types of interventions it might consider, and the broad principles it might use to set the terms of such interventions.***

⁴³ Further details of the market maker of last resort intervention by the Bank are given in Tucker, "The repertoire of official sector interventions in the financial system: Last resort lending, market making, and capital", May 2009, pp 13-16, <http://www.bankofengland.co.uk/publications/Documents/speeches/2009/speech390.pdf> and Fisher, "The Corporate Sector and the Bank of England's Asset Purchases", February 2010, <http://www.bankofengland.co.uk/publications/Documents/speeches/2010/speech423.pdf>

Box 8: The Bank's Commercial Paper Facility

- A. The Bank's Commercial Paper Facility (CPF), part of the APF, was launched in February 2009 aiming to improve "the liquidity in, and increase the flow of, corporate credit by making purchases of high-quality private sector assets including commercial paper." This was an example of the Bank acting as a MMLR to provide liquidity to a market rather than individual banks.
- B. The Bank offered to purchase newly issued CP via dealers, as well as offering to buy CP in the secondary market. It set the pricing for its purchases at a spread of 75bps over Overnight Index Swap (OIS) rates for P1-rated issuers and 125bps over OIS for P2-rated issuers. These levels were well above the rates at which corporates had traditionally been able to issue CP, and so would not normally have been attractive. But at the time the CPF was launched, many corporates were posting CP rates above those levels, reflecting additional liquidity premia being sought by investors given stressed market conditions.
- C. Following the launch of the facility, market rates quickly fell to below the backstop rates established by the CPF, as issuers chose to issue direct to the Bank rather than pay higher market rates (**Chart 9**). Usage of the CPF was therefore initially relatively high; at its peak the CPF accounted for roughly 36% of the sterling CP market. Over time, rates began to normalise, at least in part due to the backstop rate being offered by the Bank, which gave investors confidence that they could exit CP positions easily if necessary. Usage of the CPF naturally dwindled as firms were able to issue below backstop rates. The CPF eventually closed on 15 November 2011 after a period of no usage for over 12 months.

Chart 9: A1/P1 sterling commercial paper spreads and APF purchases (a)



Sources: Bloomberg, Euroclear and Bank Calculations

(a) Split ratings, eg, A2/P1 are included as lower rating

(b) Outstanding A1/P1 purchases under APF (LHS)

(c) Corporate 3-month A1/P1 sterling ECP issued in Euroclear (spread to OIS) (RHS)

Chapter 10: Collateral and risk management

306. The Bank has greatly expanded the range of collateral it accepts in its facilities over the past few years. In 2006, it accepted predominantly high-quality government securities to back its money market operations. This eligibility list increased rapidly, starting in 2007 with the introduction of the Term Auctions, as it became apparent that, given the scale of the Crisis, the Bank needed to offer liquidity against a wider range of assets than had previously been envisaged. The Bank now has the ability to provide liquidity insurance against a wider range of assets through its permanent facilities. It accepts a broad range of assets, including covered bonds, asset-backed securities (ABS) and portfolios of raw (that is, unsecuritised) loans in its liquidity insurance facilities. **Box 9** provides an overview of how eligible collateral has developed in recent years.
307. This section looks at whether the Bank now takes the right collateral, and also the Bank's capability to manage the collateral it does take.

What collateral should a central bank accept?

308. Central banks take collateral in their operations to protect themselves from counterparty credit risk. If a counterparty fails to repay when due, the central bank can sell or retain the collateral to make good any loss it may face. Central banks apply a 'haircut' so that they lend an amount less than the market value of the collateral they take. The Bank's haircuts are designed to protect the Bank against possible falls in the value of collateral in the period between the default of a counterparty and the sale of the collateral, including in times of stress. In order to have a reasonable degree of certainty that the amount of collateral they have taken would be sufficient to cover losses in the event of default, central banks need to be able to value the collateral provided, and have enough information about the risk characteristics of the asset to set an appropriate haircut.
309. Theoretically, central banks should be able to accept as collateral any assets they can appropriately value and risk manage (i.e. for which they can set haircuts). But central banks often take different types of collateral in different facilities, usually dependent on the key policy objectives of the particular facility.
310. As noted in **Chapter 2**, in order to implement monetary policy, central banks need the eligible collateral set they accept to be large enough that it does not constrain their operations. Some central banks choose only to accept their domestic currency, and so may need to accept lower quality assets to ensure there is a broad enough pool of collateral to meet this criterion. The Bank has chosen instead to maintain a high credit and liquidity threshold for its monetary policy operations, and accept securities that meet these criteria, but to allow multiple currencies.
311. Central banks may then accept a wider range of collateral in their operations designed primarily to provide liquidity insurance to the banking system.

312. The Bank tends to categorise collateral according to its relative liquidity. The three broad categories are:⁴⁴

- **Narrow collateral:** collateral accepted to implement monetary policy. This is very high-quality collateral that is liquid in all but very extreme states of the world, to reduce the risk that monetary policy implementation is compromised by financial market stress. No real liquidity upgrade is provided when lending against this collateral. There should be no stigma associated with use of this collateral as it could be used just as easily in private markets.
- **Wider collateral:** collateral accepted in the provision of standard liquidity insurance. This category comprises assets that banks hold and usually trade in liquid markets, but in a crisis have become illiquid. There is a reasonable expectation, in the Bank's view, that such assets will be liquid again in future.
- **DWF collateral:** collateral accepted in the provision of extended liquidity insurance. This category comprises potentially illiquid assets, including raw loans, to provide additional liquidity in extreme circumstances.

313. **Table 4** below shows which collateral categories are eligible in which operations.

Table 4: Collateral eligibility in the Bank's facilities

Collateral	Narrow	Wider	DWF
Short-term OMOs	✓	✗	✗
OSFs	✓	✗	✗
ILTRs	✓	✓	✗
ECTR	✓	✓	✓
DWF	✓	✓	✓
FLS	✓	✓	✓

Link between collateral and pricing

314. As well as accepting different types of collateral in its different facilities, the Bank sets fees for using its facilities such that they increase as the collateral being lent against becomes less liquid. This is to incentivise banks to hold more liquid assets on their balance sheet and to manage moral hazard. This can be seen most clearly in the fee structure for the DWF, where a drawing against narrow collateral is charged at 50bps, and against DWF collateral at between 125 and 200bps.

⁴⁴ For more detailed definitions see **Table 2**.

Box 9: Expansion and development of the Bank's eligible collateral

- A. In 2006, eligible collateral for the Bank's short-term and long-term OMOs and standing lending facility comprised only securities issued by UK and EEA (European Economic Area) central governments, central banks and major international institutions rated Aa3 or higher. This was later known as 'narrow collateral'.
- B. After the onset of the Crisis in summer 2007, the Bank initiated its Term Auction Facility as a way to provide system-wide liquidity. The collateral accepted was the start of a significant widening of eligibility for Bank operations. Eligible securities included BBB-rated government debt, government-guaranteed debt, US agency debt, AAA-rated covered bonds and credit card ABS, Aa3-rated Residential Mortgage-Backed Securities (RMBS), P1-rated commercial paper, A1-rated corporate bonds and portfolios of raw mortgage loans.
- C. In December 2007, the Bank decided to extend the collateral available in its long-term repo (LTR) operations, creating a set of operations that became known as Extended Collateral Long-Term Repo (ELTR) operations. Whilst the ELTR collateral set was somewhat narrower than that of the now-defunct Term Auction Facility, 'wider collateral' securities included AAA-rated government-guaranteed debt, US agency debt, credit card ABS, RMBS and covered bonds.
- D. With the Crisis intensifying in Autumn 2008, the Bank further extended the eligible collateral in its ELTRs. These now included other AAA-rated ABS, Commercial Mortgage-Backed Securities (CMBS), covered bonds backed by commercial mortgages, Collateralised Loan Obligations (CLOs), Collateralised Bond Obligations (CBOs), P1-rated Asset Backed Commercial Paper (ABCP) and Credit Guarantee Scheme (CGS) debt.
- E. The DWF was also launched in Autumn 2008. This accepted broadly the same types of assets as the ELTRs, but often with a lower rating requirement. For example, covered bonds and ABS only needed to be rated A3 provided they had been rated AAA at issue, compared to a contemporaneous AAA-rating requirement in ELTRs.
- F. The next significant development in the Bank's collateral eligibility came upon the introduction of the ILTRs in June 2010, replacing the ELTRs. The wider collateral accepted in ILTRs was narrower than the extended collateral accepted in the ELTRs. While liquid and high-quality securities were still accepted, only ABS and covered bonds from certain jurisdictions were eligible, and importantly own-name securities were no longer accepted.
- G. In July 2010, the Bank set out proposals with respect to information transparency in relation to ABS and covered bonds eligible in its operations. This has been enforced

since December 2011 and, among other things, requires issuers to publicly provide loan-level data in relation to eligible securities.

- H. The Bank began to accept raw loan portfolios in the DWF in April 2011, prior to a similar move by the ECB.
- I. Finally, in July 2011, the Bank adjusted the eligibility of its narrow collateral, removing references to credit rating agencies. This restricted eligibility to debt issued by the governments and central banks in the UK, Canada, France, Germany, the Netherlands and the US.

Is this the right model?

- 315. As mentioned above, not all central banks follow this model. For example, the European Central Bank (ECB) takes a broad range of collateral across its operations, with no real distinction between monetary policy and liquidity insurance operations. That set-up partly reflects the history of the ECB's operations. There are downsides to this approach, though, including the risk that facilities critical to the implementation of monetary policy become stigmatised. In order to avoid this, the ECB must be sure that its terms and pricing are such that banks will always be prepared to access these facilities, making it more difficult for the ECB to manage moral hazard and avoid becoming a lender of first resort. But it demonstrates that, although the framework that the Bank has put in place is logically consistent, it is not necessarily the only way to construct a collateral policy.
- 316. There is a balance of risks in deciding how wide to make a collateral pool for a given operation. Taking a very wide range of collateral in operations that are predominately conducted for monetary policy purposes risks stigmatising those operations if they become seen as support operations in stressed times. That may in turn impede the implementation of monetary policy. But on the other hand, in separating out monetary policy and liquidity insurance operations by taking different collateral in each, a central bank protects its monetary policy operations from stigma, but arguably increases the stigma associated with its liquidity insurance operations as a result.
- 317. Keeping operations with a monetary policy role de-stigmatised is clearly an important objective, and the Bank's current framework appears to be successful in this regard. But there is a big distinction between the Bank's monetary policy operations and liquidity insurance operations in terms of the collateral that can be used, and the premium for drawing against that collateral, which does act to stigmatise the Bank's liquidity facilities.
- 318. In particular, while there is a sliding scale of (auction-determined) pricing for borrowing against the wider collateral set in the ILTRs, banks do not tend to hold much of this

collateral.⁴⁵ So the effective step-up in obtaining liquidity insurance is from short-term OMOs and OSFs (against narrow collateral) straight to the ECTR for market-wide liquidity and DWF for bilateral transactions (DWF collateral). Arguably the step-up to ECTR is not that large at the moment, with liquidity available at Bank Rate +25bps. This is, however, only a contingent facility, not available in all states of the world, and normal pricing for the facility is Bank Rate +125bps. This is a much larger step-up. In the DWF (which would be the main facility available if the ECTR is not activated), drawing against DWF collateral costs upwards from 125bps, with drawings against own-name collateral (the most commonly pre-positioned) priced at 200bps.

319. ***While it seems reasonable that the Bank should charge a premium for lending against less liquid collateral, as discussed in Chapter 6, removing or reducing the size of some of the 'step-up' points between the different facilities to make more of a continuum of facilities available may help manage the stigma in liquidity insurance operations. This applies equally to the step-ups in collateral accepted and should be taken into account in the design of the collateral set eligible for the Bank's facilities.***

Is the overall set of eligible collateral wide enough?

320. The Bank's current list of eligible collateral has grown organically during the Crisis. As the scale of the Crisis grew and as pressures on bank funding increased, the Bank recognised the need to provide liquidity against a broader set of banks' assets. That has proved sufficient to deal with the current Crisis, but in order to deal with potential future crises, ***the Bank needs to ensure that it can accept the widest possible range of assets as collateral in order that it can respond appropriately to a wide range of scenarios.***
321. To a large extent, that is what the Bank has done: it now accepts as collateral most asset types that it currently has the capability to risk manage. In particular, the Bank's expansion into taking pools of raw loans, in advance of similar action by many other central banks, has significantly increased the proportion of assets on domestic retail-oriented banks' balance sheets that the Bank is willing to accept in its ECTR operations and the DWF. But more work may be required to ensure collateral eligibility appropriately supports liquidity provision to banks with large non-retail operations, particularly given the proposals for ring-fencing. Such work will not be possible, however, until there is more certainty about the shape of non-ring fenced banks and the impact this will have on the make-up of the UK banking sector in coming years.

⁴⁵ The fall in the value of ILTR wider collateral held by banks has primarily been driven by regulatory changes. Some of the assets in this category were previously counted as liquid for regulatory purposes under the old stock liquidity regime. But that is no longer the case under the new regulations, and so the attraction for banks of holding such assets has reduced.

322. Most other assets that banks hold are considerably more difficult to risk manage, for example because:
- a. they are difficult to value;
 - b. their valuation is likely to be highly correlated with the credit-worthiness of the institution delivering the asset, making it difficult to set an appropriate haircut to manage an event of default. (For example, the default of a bank may have a large impact on the value of bank debt more generally, making it an unsuitable asset to take as collateral from a bank.);
 - c. there is legal complexity in transferring, realising or managing the collateral in an event of default.
323. Nevertheless, there may be some instances where the Bank should worry slightly less about the risk to its own balance sheet in support of its policy objectives. If one of the roles of the Bank is to backstop the liquidity insurance that banks themselves provide to the wider economy, it may need to accept as collateral those instruments that directly fulfil this role, as a bank may not have sufficient alternative assets on its balance sheet to provide to the central bank to support its role in this area. For example, in a crisis, borrowers are likely to want to draw down on their revolving credit facilities at banks. Such facilities are an important part of the way in which the banking sector provides liquidity insurance to the wider economy. But drawn revolving facilities are not eligible in the Bank's facilities, so banks are unable to access central bank liquidity insurance against such drawings directly.
324. There are examples of the public sector taking on risk where the importance of meeting the policy objective is seen to outweigh the additional balance sheet risk being run. For example, the APF is backed by an indemnity from HMT, recognising that any direct financial loss would be more than offset by the benefit to the wider economy of having the policy in place. And the Funding for Lending Scheme (FLS) involves the Bank itself taking on risk by providing funding against a very wide range of collateral, including loan portfolios, potentially on a large scale. ***The Bank should consider accepting as collateral assets such as drawn revolving credit facilities and other private insurance products, where it believes such a policy would directly support its policy objectives, even if they entail taking greater risk onto the balance sheet or require more complex risk management.***
325. This is not a one-off task. Given the constant evolution of financial markets and products, the assets that the Bank may need to take to fulfil its objectives are likely to change over time. ***The Bank needs to constantly monitor how the financial system generally is providing its key services to the wider economy and ensure that its facilities are adapted as necessary to be able to deal with possible future disruptions.***
326. It is also necessary to recognise that the demand for collateral at a system-wide level may change over time. For example, recent structural and regulatory changes have contributed to an increase in the demand for previously unsecured exposures to be backed by high-quality assets. The Bank is conscious of these pressures, and at the moment its collateral list

appears to be wide enough to avoid creating unnecessary distortions in specific asset markets where there is high demand. The Bank should nevertheless continue to monitor its collateral eligibility requirements in this context.

Other potential collateral policy objectives

327. The eligibility of assets at the central bank can and does affect the desirability of holding certain assets, which can in turn affect the underlying liquidity of an asset class. In particular, central bank collateral criteria can skew banks' asset holdings towards those assets that are eligible, creating potential discontinuities in the relative pricing and liquidity of those asset classes relative to non-eligible assets.
328. Such effects should not be the primary consideration in setting the standard collateral policy of the central bank. But there may be circumstances where liquidity problems in certain markets are deemed to be critical to either the monetary policy transmission mechanism or to financial stability, and in such cases the central bank could choose to accept such assets as collateral temporarily to try to aid liquidity in the market. This is similar to the potential role of the Bank in acting as a Market Maker of Last Resort through outright purchases, as discussed in **Chapter 9**. As with MMLR, the challenge in acting in such circumstances is to ensure that support is not given to markets that are dying, or that are in need of restructuring in order to function without central bank support over the long term.
329. As the Bank is such an important participant in collateral markets, it is also possible for it to use its eligibility criteria to influence standards in the markets of those assets it accepts. The Bank, along with other central banks, has done this to some extent in recent years. For example, the Bank has published a set of transparency requirements, covering what documentation and information must be publicly available about ABS and covered bonds in order for them to be eligible in Bank operations. While other organisations may be better placed to take a leading role in setting standards for asset classes, to the extent that the Bank can support this work, and help move the market towards a better outcome, it should be welcomed in doing so.

Do different central bank collateral policies create any challenges for the Bank in implementing its policy objectives?

330. As mentioned above, not all central banks structure their collateral policies in the same way. They take different assets according to the structure of their banking sectors, their key markets and their own objectives and risk tolerance. Many banks have access to facilities at multiple central banks. Many UK banks, for example, also have access to both ECB and US Federal Reserve (Fed) facilities.
331. The differences in collateral policies between central banks, including the relative cost of access, influence how banks view different central bank facilities. For example, although the list of collateral accepted by the ECB is broadly similar to that accepted by the Bank in ECTRs and DWF, the cost of using ECB facilities is cheaper as there is no penalty imposed for using less liquid collateral. Likewise, the Fed's discount window is cheaper than the Bank's DWF.

At the margin this has the effect of making the Bank's liquidity operations relatively less attractive.

332. Banks' willingness to take advantage of the differences in the various policies appears, however, to be limited. Prior to the Crisis, banks may have engaged in 'liquidity tourism' – drawing down on central bank facilities according to which were cheapest and swapping back into the currency in which they required funding. But the Crisis has demonstrated that the foreign exchange (FX) swap market cannot always be relied on in times of stress. So the banks we spoke to were reluctant to engage in this sort of activity, as they may find they do not have an effective liquidity backstop when they need it most. ***To the extent that liquidity tourism does still occur, it is only likely to be at the margin. But it is an issue that central banks should continue to monitor.***

Is there sufficient clarity on what the Bank will take as collateral in its various facilities?

333. The Bank sets out an exhaustive list, security by security, of the instruments that it will take as collateral in its monetary policy operations (narrow collateral). For the other categories it only sets out the high level principles and definitions of eligible collateral. Banks have to submit details of individual securities privately to the Bank to determine whether they are eligible.
334. The benefits of this system are that it prevents the central bank from becoming a quasi-ratings agency, and reduces any signalling risk that may be associated with removing securities from the list. And in practical terms, given the Bank's approach to reviewing each individual security (as indeed should be its practice), it would not be possible to put out an exhaustive list of eligible securities, as it would be too resource intensive to look at the whole universe of potentially eligible assets. But there is a potential cost of not publishing such a list, in terms of certainty that the banks have over which assets they can borrow against in which facilities. The ECB, for example, publishes a list of all eligible assets on an individual security basis without analysing all individual securities itself.
335. Given that the purpose of taking the wider ranges of collateral is to provide liquidity insurance, it seems reasonable to expect banks to be able to plan for what they may need to draw against, and pre-position that with the Bank in advance if necessary. If they do this effectively, they should individually know ex-ante those assets that they can draw against, and the value that the Bank will lend against those assets. A published list of collateral should not therefore be necessary, especially given the potential downsides to producing one.

Is the Bank capable of managing the collateral it now takes?

336. The rapid expansion in the range of collateral the Bank accepts has led to an equally rapid need to expand the ability of staff and systems to manage that collateral. The Bank appears to have managed this effectively, hiring in experts externally as required to help train staff, using external advisors with relevant expertise, and investing in IT systems to enable them to

manage the new types of instruments they are now accepting. The Bank has been at the forefront of efforts to move away from using credit rating agencies, making its own internal credit judgements on institutions and collateral. More generally its risk management processes appear robust, including the separation of front, middle and back office functions used in managing the SMF.

337. The Bank uses haircuts as a tool to manage the fundamental risk inherent in the collateral it accepts in its facilities, rather than as a tool to incentivise or disincentivise usage of various operations or asset classes. It seems entirely appropriate to use haircuts in this way, allowing them to be set purely on the basis of risk parameters to ensure that the Bank's balance sheet is not put at risk, and using other elements of the facilities to meet broader policy objectives.
338. There is no evidence that the Bank took undue risks in its management of collateral in the early part of the Crisis in terms of valuing securities or setting appropriate haircuts. And while there may be an external perception that the Bank's valuations and haircuts are more penal than they need to be, for most asset classes there is very little concrete evidence of this. Haircuts appear to be broadly in line with those used by other central banks where they accept similar asset classes, and there have been various exercises run to benchmark the Bank's valuations of less liquid collateral, which have not found them to be overly conservative. It is the case, though, that for very illiquid asset classes, such as raw loans, the Bank's current haircuts are conservative. This appears largely to reflect the fact that the haircut model for these assets has only recently been implemented, and understandably conservative assumptions have been applied in areas where detailed analysis is still being undertaken to improve precision. But, as the model is refined over time, staff expect that some haircuts will fall from their current levels, while remaining within the overall risk tolerances of the Bank.
339. It is clear that the process of widening the eligible collateral pool has been a steep learning curve for the Bank. The Bank's Internal Audit Division periodically assessed the SLS, DWF and APF, often noting that the speed with which new facilities were operationalised was putting a strain on the Bank's resources. They also raised concerns about the systems for managing collateral in the SLS and the manual spreadsheet processes used in operating the APF. But, as would be expected, the models and systems used to run these operations, and specifically to analyse the risk characteristics of more complex products, have become more developed and precise over time. In terms of staff, both running the SLS, and the process of banks pre-positioning over £200bn assets in the DWF, has helped build up experience levels, and the fact that institutions are expected to maintain pools of assets at the Bank will help to ensure knowledge of the assets remains fresh in future.
340. The main area that has not been fully tested in terms of collateral management is whether the Bank could realise the wider collateral it takes in an event of default. This would have been a very big challenge for the Bank earlier in the Crisis.⁴⁶ Much work has subsequently

⁴⁶ Following the collapse of Lehman Brothers, the Bank did need to realise collateral to cover an open OMO position and its risk management processes were able to deal with this. But the position was held against

been undertaken to ensure that this process would run smoothly, with as little risk to the Bank's balance sheet as possible. But there is further work to do in this area, and ***the Bank should continue to work to improve its processes for dealing with some of the less liquid assets that it now accepts in an event of default.***

highly liquid collateral, and so did not test the Bank's ability to realise the broader set of collateral it now accepts.

Chapter 11: Potential changes the Bank could consider making to its liquidity insurance facilities

341. Having reviewed the issues related to the provision of liquidity insurance, this chapter brings some (but not all) of the themes and recommendations together into specific proposals that the Bank could consider making to the SMF. Most of the proposals in this chapter focus on the DWF – the most stigmatised, but perhaps most important, of the facilities as regards the provision of liquidity insurance. These are necessarily high level proposals, and the Bank would need to consider carefully the overall calibration, and therefore impact, of any combined package of reforms, including the implementation of other recommendations made in this Review, to ensure that the overall framework were able to meet its objectives.
342. The main aims of the specific proposals set out below are two-fold: to incentivise banks appropriately to factor the Bank’s facilities into their liquidity planning; and to require banks to pay for the benefit of having access to those facilities. If calibrated appropriately, this should reduce the need for banks to carry excess self-insurance, thereby both freeing up some of the current dead-weight cost on their balance sheets and increasing the likelihood that they can promote growth through lending to the real economy, and reducing the risk that delayed usage of the Bank’s facilities could generate wider disruption to financial stability.

Repositioning the DWF

343. As noted in previous chapters, there is not a smooth continuum of Bank liquidity facilities as they relate to usefulness in response to different types of bank needs. There are good tools for dealing with system-wide stress (Indexed Long-Term Repos (ILTRs), Extended Collateral Term Repos (ECTRs)) and for dealing with relatively small bank-specific events (Operational Standing Facilities (OSFs)) but there is little gradation of facility to deal with increasing levels of idiosyncratic stress. The next step after OSFs for an individual bank experiencing an idiosyncratic liquidity shock is to draw from the DWF, risking severe consequences from the market should usage be discovered. This action is not seen by the banks or the market as substantively different from taking Emergency Liquidity Assistance (ELA), with the negative consequences for management and shareholders that that would typically entail.
344. Market reaction to the introduction of the DWF has been to conclude that the Bank is prepared to provide ELA against pre-positioned collateral through a prescribed facility. This is not how the Bank describes the facility in the *Red Book*, where it is positioned as a core tool to be used by solvent banks with a liquidity issue. Reducing the ‘constructive ambiguity’ around the Bank’s true expectations for DWF usage would be helpful in reducing stigma, but the positioning of the facility is problematic and should be addressed. We explore here ways to open the gap along the spectrum of bilateral liquidity insurance facilities between the DWF and ELA in market perception, thereby narrowing the gap between the DWF and other Bank facilities that are more regularly accepted.

345. One approach would be to make the DWF a more accessible facility, with less uncertainty about the implications of usage. Concrete steps towards this, mentioned in the previous chapters include:
- a. reducing penal pricing, at the very least for smaller usage, but potentially for larger drawings as well;
 - b. removing the 'on-the-day' Solvency and Viability (S&V) test;
 - c. removing the need to produce a repayment plan on the day of drawing.
346. The objective would be to position usage of the DWF rather closer to participation in ECTR auctions. The DWF could then effectively become a committed facility with ongoing S&V assessment to ensure compliance with SMF access rules, as for auction-based facilities. Moral hazard could be seen as a concern as the DWF becomes a more staple feature of bank funding plans. But this has in large part already been addressed by microprudential oversight and liquidity regulation. In addition, non-price factors would be expected to help manage residual moral hazard concerns.
347. To further improve and smooth the continuum of Bank facilities, the Bank could either leave ELA to deal with the most extreme liquidity events, or retain a backstop, or second tier, DWF facility, with characteristics more similar to the current arrangement. Under a second tier DWF, banks with severe difficulties, where ongoing monitoring, including discussion with regulators, highlighted questions around solvency or their ability to repay, could be put through a more rigorous on-the-day test and pay a higher penalty rate. It would be important that institutions knew in advance whether they would be able to draw on the main DWF facility, or whether they would need to use the second tier facility. This approach is similar to the US Federal Reserve (Fed) discount window, which has a two-tier risk assessment based structure.
348. A second tier DWF facility would probably remain stigmatised, but for good reason. There would, nevertheless, be benefits in having the facility, not least as it would incentivise institutions that fell into the high-risk category to pre-position collateral with the Bank, allowing for smoother support operations if required. The facility would also remain distinct from ELA, allowing the Bank to offer this facility as long as pre-positioned collateral is in place.
349. This repositioning of the DWF, including a backstop second tier facility, would create more of a continuum of bilateral facilities, similar to the range of facilities that exist for market-wide liquidity provision.

Further improving the effectiveness of the DWF

350. Depending on the regulatory treatment of the revised facilities, these changes should make banks more likely to factor the DWF into their liquidity management, which should reduce the social cost of excess self-insurance and delayed use of central bank support. But even with these changes, the DWF is likely to remain stigmatised to some degree simply because it

will remain a bilateral central bank backstop facility. One way to reduce the residual stigma would be to decrease the likelihood that anyone in the market becomes aware that a bank has accessed the DWF on any sort of unusual basis.

351. As noted in **Chapter 7**, this Review has also recommended that the Bank should look to charge banks more explicitly upfront for the provision of central bank liquidity insurance.
352. We make two suggestions below that seek to address both these points. The feasibility of these suggestions relies on moving the DWF onto a more committed basis as recommended above.
353. The first suggestion is to compel regular usage of the DWF, thereby making more extraordinary usage less conspicuous. The fees paid by the banks for undertaking such compulsory trades would constitute an ‘upfront fee’ for accessing DWF in the future. The second suggestion is that the Bank might explicitly auction access to the DWF via liquidity options structured in such a way that banks regularly acquire these options in lieu of self-insurance. Each approach is discussed in some detail below. They could be used together or separately.

Compulsory drawings

354. The Bank could consider requiring infrequent, but large-scale usage of the DWF. The required level of usage should be sufficiently large as to obfuscate meaningful extraordinary use of the facility, with the size of required usage ideally linked to the potential stressed drawing requirement of each institution. The Bank would need to coordinate the programme so that there was sufficient variability in the pattern of revealed usage to disguise a spike due to a sizeable stressed drawing. It might choose to do this by having multiple institutions draw on the same day, so that the burden of undertaking, and paying for, compulsory drawings did not fall too heavily on a single institution.
355. Such a requirement need not be unduly costly to the banks. As an example, if the Bank in aggregate required £200bn of compulsory usage in one year (with varying amounts each quarter) with drawings outstanding for three days, the cost to the banking sector as a whole would be £33mn, based on the current fee of 200bps for drawings against the widest range of collateral (which we suggest above should be substantially reduced). Compulsory drawings should be undertaken on the same terms as any other DWF drawing, including the fee paid. As discussed in **Chapter 7**, a more granular pricing structure, such that fees increase in relation to the size of drawings, may be appropriate. This would reduce the penalty that banks pay for compulsory usage, reflecting the fact that undertaking compulsory drawings has the wider social benefit of reducing stigma, at the same time as discouraging over-reliance on the DWF.
356. A change to the Bank’s disclosure regime of the DWF might increase the effectiveness of a compulsory usage requirement. At present, disclosure is of average DWF usage over a quarter. A move to disclosing peak usage instead would allow the Bank to generate a more

volatile usage series, and would arguably increase accountability by giving a clearer indication of the maximum exposure under the facility in any given quarter.

357. Importantly, though, banks would need to be prevented from making proclamations about the nature of their DWF usage. They might otherwise be tempted to declare at the point of each drawing that this is a 'required' drawing, not an emergency drawing, thereby obviating the benefit of the arrangement.
358. The advantage of compulsory usage is that it should act to create regular DWF activity, which would reduce both stigma associated with usage and the need for additional disclosures from banks relating to usage. The fees paid for usage by banks would act as a small upfront payment in exchange for reaping the benefit of having a de-stigmatised DWF. Regular usage would also have the benefit of making the process around drawdown more practised and streamlined.
359. But there are drawbacks in such an approach. First, this is a contrived structure designed to prevent the market from obtaining information that could be damaging to an individual bank or for financial stability more broadly. While the motivation is worthy, such a blunt approach to managing information risk could lead to further questions around the Bank's transparency, perhaps offsetting some of the value that comes from increasing banks' willingness to use the DWF when they really need it.

Liquidity insurance options

360. Liquidity insurance options would provide banks with a contractual agreement from the Bank to provide liquidity over a given timeframe, at a pre-agreed price, should it be required. Banks would pay upfront for this commitment to reflect the benefit to them of having such an agreement in place. As an explicit contract, with an explicit cost, banks should be more likely to factor such a liquidity insurance instrument appropriately into their planning.
361. Under a liquidity options scheme, banks would decide the amount of liquidity insurance options they wished to purchase, which could be for a range of different maturities or against different types of collateral. Such options would give banks the ability to draw down on central bank liquidity for a reduced drawing fee (relative to current pricing), having paid an upfront option fee. The options would need to be exercisable at any time ('American style') to provide a true bilateral liquidity backstop. If banks needed drawings in excess of the amount of options they had purchased, those could be charged at the current, penal DWF prices. This would incentivise banks to buy sufficient options to cover what they saw as their true liquidity insurance requirement.
362. Options would be valid for a set period of time, providing clarity to the Bank regarding the horizon over which it would have to be comfortable with its S&V assessment. To reduce some of the stigma inherently associated with bilateral facilities, options for a range of maturities could be made available to the whole market via regular, unlimited size, fixed rate auctions.

363. This approach would encourage banks to consider in advance how much liquidity insurance they require, and weigh it up against undertaking further self-insurance. This should, in principle, be preferable to the Bank or the Financial Services Authority (FSA) / Prudential Regulation Authority (PRA) imposing an amount of pre-positioned collateral for banks to hold or setting an arbitrary level of compulsory usage. Further, changes in the quantum of options purchased by banks might give the Bank and regulators useful information about banks' assessment of liquidity conditions and their individual needs.
364. The contractual nature of the option approach may be helpful in removing some of the perceived non-price barriers associated with central bank facility usage. The use of options would put the DWF onto clear commercial terms. Banks drawing on the facility would be exercising an option for which they had previously paid. Occasional drawings could, therefore, be seen as being a more regular part of banks' liquidity management, and not, as currently, an extraordinary event with perceived extreme repercussions. Part of the objective of introducing these options would therefore be to generate some regular usage of the DWF to help de-stigmatise more extraordinary usage. This could be achieved by setting terms such that banks had an incentive to regularly exercise at least part of the stock of options they purchase. Nonetheless, it may need to be complemented with a programme of compulsory usage to have maximum effect. For example, continued access to liquidity options could be made dependent on exercising a minimum amount of purchased options on a regular basis.
365. The pricing of such options, both in terms of the upfront fee ('premium' in option terminology) and the drawing price ('exercise price' in option terminology) would be key to their success. They would need to be attractive enough relative to holding other liquid assets to reduce banks' desire to over self-insure, while being expensive enough to avoid the Bank becoming liquidity provider of first resort for the whole banking system, with the potential consequence of banks becoming overly dependent on the central bank for their liquidity needs. For banks to be willing to exercise their options regularly, the drawing price would need to be at a rate comparable to their alternative cost of funds. Further thoughts on pricing are set out in **Annex 5**.
366. Regulatory policy, and specifically how such options might be treated under that policy, would also play an important role in setting up the right incentives for usage. The FSA has recently set an important precedent in this regard in its treatment of collateral pre-positioned at the Bank following the activation of the ECTR. Recognising that there is now a regular opportunity to liquefy such collateral at the central bank, pre-positioned collateral is now eligible as part of a bank's liquid asset buffer up to a fixed proportion of their Individual Liquidity Guidance (ILG).⁴⁷ A similar approach to DWF options, replacing the treatment of pre-positioned collateral above, and instead allowing the options themselves to be recognised as liquid assets but not relied on as a bank's sole liquidity resource, would be appropriate to achieve the overall objective of reducing over self-insurance. The Bank, in its new role as the microprudential regulator from next year, will be in a position to ensure that

⁴⁷ FSA Statement "Adjustments to FSA's liquidity and capital regime for UK banks and building societies", 27 September 2012. <http://www.fsa.gov.uk/library/communication/statements/2012/fpc.shtml>

- the combination of the design of its facilities and their treatment in liquidity regulation achieves the best overall outcome – something which may not have been so easy in the past.
367. The international debate on liquidity regulation is of course also relevant here, and it is not yet certain how such options might be treated under the, yet to be finalised, Basel III liquidity rules. But making the DWF a more committed facility, as would be the case under the options approach, seems likely to be important in ensuring that banks could treat DWF options as liquid assets, which would be key to the success of this recommendation.
368. This approach has many of the same features as the Committed Liquidity Facility offered by the Reserve Bank of Australia (RBA).⁴⁸ Under the RBA Facility, banks choose a pre-specified amount of liquidity they wish to be able to access and pay an upfront commitment fee to the RBA (currently 15bps per annum) based on the size of the commitment. Such commitments are then eligible to be counted as liquid assets for regulatory purposes. Any drawings under the Facility are charged a rate of interest, currently set at 25 bps above the Board's target for the cash rate, in line with the arrangements for the RBA's overnight repo facility.
369. Unlike the RBA facility, this Review suggests the Bank consider selling liquidity options with an exercise price that is completely non-penal, at least for some level of drawing, to incentivise regular exercise of the options. The overall drawing cost faced by banks could still be higher than their alternative cost of funds after factoring in the upfront payment, but the non-penal drawing price would assure the options are actually exercised rather than being allowed to expire unused. This regular exercise would have the effect of normalising some usage of the DWF.
370. The additional difference between the options approach described above and the RBA Facility is the contractual nature of the specific options being purchased – in the RBA case the commitment is simply to access a general facility. While both approaches have a similar overall effect on banks' ability to factor liquidity insurance into their planning, it would be easier to structure the options approach to provide a more graduated liquidity insurance facility, perhaps with different maturities, collateral sets and pricing structures. This may help address residual stigma in the DWF by incentivising regular usage and removing trigger points as far as possible. It is also possible that having a specific, time-limited, option contract would seem a more credible and concrete backstop than a more general commitment by the Bank to lend in a given facility. Giving banks this certainty would be an important consideration when setting the legal terms of such an option contract.
371. Given the potential complexity of an options programme, it would be likely to require additional resources to set up and run on an ongoing basis. This cost would need to be weighed against the benefits to be gained from implementing such a scheme.

⁴⁸ For further details of the RBA Committed Liquidity Facility see <http://www.rba.gov.au/media-releases/2011/mr-11-25.html>

Folding ECTR collateral into ILTR

372. The activation of the ECTR sent a very important signal to the market that the Bank will provide term liquidity to banks during times of systemic stress. It is not a permanent facility, though, and could be considered highly penal if activated at its original pricing of Bank Rate plus 125bps.⁴⁹ As such ECTRs do not feature to the extent they might in banks' liquidity planning. The ILTR is a permanent market-wide facility but only accepts relatively narrow collateral that the banks can usually finance in the private market, even in moderately stressed circumstances. This leaves a potential gap in the Bank's provision of market-wide liquidity insurance; the step-up between ILTR and ECTR is very big, both because of the uncertainty around ECTR activation and the potentially large step up in pricing between ILTRs and ECTRs.
373. To address this, the Bank should consider adding the ECTR-eligible collateral to the ILTR, to put the provision of liquidity insurance against such collateral on a more routine footing. This could be done by creating one or more additional collateral sets, ideally with low incremental premiums to avoid creating stigmatised trigger points in the facility. If pricing was structured in a similar way to the current ILTR, with low pricing for low levels of usage against the wider collateral sets, this would incentivise some regular drawings against ECTR collateral, further helping to reduce the possibility of the operation becoming stigmatised.
374. ILTR operations with an expanded collateral set would be appropriate for providing liquidity insurance in normal times, and in response to market-wide shocks originating in the banking sector. But there may be merit in retaining a separate ECTR-type operation that can be used to respond to a market-wide shock resulting from a truly external source. Such a facility, as set out in **Chapter 7**, may not require penalty pricing, and so charging the normal premium for borrowing in such circumstances may not be appropriate. It may therefore be beneficial to retain discretion around the pricing and maturity of such an operation, announcing these specific terms on activation of the facility, dependent on the circumstances at the time.

⁴⁹ ECTRs are currently priced at Bank Rate +25bps reflecting that they are responding to a shock from outside the banking sector itself. But the Bank has not yet clarified whether, in other circumstances, the original higher pricing would still be applied.

Section Three: Governance

This section considers governance and accountability arrangements around the Bank's money market operations. It does so by considering both internal and external governance.

375. **Chapter 12** discusses the internal governance around the Bank's Sterling Monetary Framework (SMF). First, we consider the formal governance arrangements within the Bank around the SMF. Second, we discuss the informal governance procedures within the Bank regarding the SMF – that is, how those formal arrangements are implemented in practice.
376. **Chapter 13** discusses the arrangements and processes around external governance and accountability, including the roles and interaction of the Financial Policy Committee (FPC), Monetary Policy Committee (MPC) and the Bank Executive in relation to the SMF.

Chapter 12: Internal governance

Formal internal governance and accountability

377. The Court of Directors (Court) of the Bank is responsible for managing the affairs of the Bank, other than the formulation of monetary policy. Court comprises nine non-Executive Directors, appointed by the Crown for periods of three years, the Governor of the Bank, in future to be appointed by the Crown for a period of eight years, and the Deputy Governors of the Bank, currently appointed by the Crown for periods of five years.
378. Court delegates the day-to-day management of the Bank to the Governor, and through him to other members of the Executive. But Court reserves certain key decisions to itself.⁵⁰ In particular, Court reserves to itself responsibility for the risk management policies of the Bank, including the risk to the Bank's balance sheet arising from the Bank's SMF. The Audit and Risk Committee (ARCo) of Court reviews and reports to Court on the Bank's risk framework, and Court receives and discusses quarterly reports on the Bank's balance sheet.
379. The framework for the Bank's liquidity operations – the SMF – is set out publically in the *Red Book*. That document describes the aims, objectives and principles underlying the SMF. The design and implementation of the *Red Book* is delegated by Court to the Governor, but Court is informed of any changes to the *Red Book*.
380. To implement the *Red Book*, the routine management of the Bank's money market operations is set out in the Balance Sheet Remit (the 'Remit'). That Remit from the Governor to the Executive Director of the Bank's Markets Directorate (ED Markets) is revised annually, and is put before Court for approval at the beginning of each financial year.
381. The Remit delegates some authority for decisions relating to the operation of the SMF to ED Markets. For example, ED Markets is given the authority to decide on counterparty eligibility; to judge on the eligibility of particular securities; and to determine and implement specific haircuts on collateral. All of those delegated decisions are expected to be made with reference to the overall parameters set out in the Remit (and therefore, ultimately, in the *Red Book*).
382. The Remit makes clear, however, that those delegations are subject to ED Markets consulting the Governor prior to making any decision which is considered to be "sensitive, controversial, or have serious consequences". In addition, a number of specific cases are set out where the Governor would need to be consulted before a decision is taken:

⁵⁰ The document *Matters Reserved to Court* is available on the Bank's website, at http://www.bankofengland.co.uk/about/Documents/pdfs/matters_court.pdf

- a. Regarding SMF eligibility, any cases which are “complex, potentially sensitive or raise significant policy issues would be raised with the Governor in Resolution Committee for decision”;⁵¹
 - b. Any variations to reserves-remuneration framework, including for non-routine circumstances are to be approved by the Governor;
 - c. The Governor must approve any decision to undertake Extended Collateral Term Repos (ECTRs);
 - d. Amendments to the collateral authorised for the Bank’s operations are to be determined by the Governor, following recommendation by ED Markets;
 - e. Temporarily expanding the collateral eligible in the Bank’s SMF operations, or extending the term or type of SMF operations or facilities, require pre-authorisation by the Governor.
383. Further, members of the Asset and Liability Committee (ALCo), and subsequently the Governors and the Executive, are provided with a summary of significant changes to collateral eligibility haircuts and concentration limits through the Bank’s regular quarterly risk reporting processes.⁵²
384. Taken together, those arrangements are appropriate and sensible formal procedures for the internal governance of the Bank’s money market operations. As appropriate, Court retains overall responsibility for the Bank’s risk management policies. The Governor, and through him or her the Executive, have responsibility for setting and implementing policy consistent with the overall risk profile approved by Court. There are formal processes in place through which the design, implementation and day-to-day operation of the Bank’s SMF are delegated from the Governor to ED Markets. In particular, it is understandable and sensible that issues of a controversial or sensitive nature should be escalated by ED Markets to the Governor.
385. It is notable, however, that the delegation procedures from Court, and the processes set out in the Remit, give little formal role to the Deputy Governors in discussing the design and implementation of the SMF. They, like the Governor, are appointed by the Crown, presumably with a view to ensuring there is a diversity of experience and perspective amongst the senior management of the Bank. The Deputy Governors are appointed to have responsibility for particular areas of the Bank’s responsibilities – monetary policy, financial stability, and, in future, microprudential financial regulation. The Bank’s money market operations have clear relevance for all of those areas of the Bank’s responsibilities. But the formal reporting lines for the SMF are from ED Markets to the Deputy Governor for

⁵¹ The Resolution Committee, or ResCo, is a high-level Executive committee that considers strategy in relation to firms at risk of entering the Special Resolution Regime (SRR) and actions outside the SRR to reduce financial stability risks. It comprises the Governor (chair), the Deputy Governors, Executive Directors for Banking, Financial Stability and Markets, and the Head of the Special Resolution Unit.

⁵² The Asset and Liability Committee is an Executive committee which considers the management of the Bank’s balance sheet and associated risks. It comprises the Executive Directors for Banking and Markets, the Finance Director, the Heads of Division in the Banking and Markets Directorates, and Finance’s chief accountant.

Monetary Policy, with no formal reporting line to the Deputy Governor for Financial Stability. Court is explicit that it delegates responsibilities to the Governor, not to any particular structure of Executive committees. And the Remit, which is approved by Court, makes little reference to the Governor consulting the Deputy Governors over SMF issues.

386. In fact, it is clear from discussions with the Governors and with Bank staff that the arrangements currently work well in practice. The Governor consults both Deputy Governors, as well as ED Markets, over SMF design and implementation. But that appears to be largely at the discretion of the Governor of the day – there is little within the current internal governance arrangements to ensure that this is the case.
387. The Court and the Bank should give consideration to formalising these arrangements. As at present, final authority should continue to rest with the Governor. But it seems desirable that ***the externally-appointed Deputy Governors should be formally consulted, and should be expected to give their opinions, on the design of the SMF, and on its implementation. Court should undertake regular monitoring to ensure that such consultation is taking place.*** In doing so, Court would, however, need to recognise that there may be occasions, for example during acute financial market stress, in which SMF decisions need to be made quickly: in those circumstances it may not be possible for the Governor to consult all Deputy Governors.
388. To facilitate consultation, there could be a requirement for issues around the Bank's SMF to be discussed regularly at meetings of the Governors and relevant Executive Directors. Minutes of those discussions could be made available to Court, so that Court would be aware if there were significant differences of view between the Governors over policy decisions. While Court should have no powers of override or arbitration in such circumstances, it should aim to ensure that any opposing views are aired, and that they lead to sufficient debate and challenge within the Bank over its money market operations.

Informal governance procedures within the Bank

389. Even if there are appropriate formal internal governance arrangements around the SMF, the effectiveness and efficiency of the framework is likely to depend, in part, on how those procedures work in practice.
390. As described above, it is apparent from discussion with Bank staff that the Governor regularly consults the Deputy Governors and other senior staff over the Bank's SMF. It is also clear that less senior staff regularly undertake significant in-depth analysis of a wide range of policy options, and are often willing to challenge the views of their superiors on SMF-related issues. Nonetheless, the Bank retains a highly centralised decision-making structure, with ultimate authority and accountability residing with the Governor. There are understandable reasons for such a structure around the money market operations of a central bank. Errors or misjudgements in those areas may put public money at risk, or they may damage the credibility of the central bank, which could jeopardise the ability of the institution to carry out its functions effectively in future.

391. There are, however, also likely to be costs associated with such a structure, the most significant one being the large volume of decisions that are required to be taken by the Governor and senior management. This has two potential consequences. First, it risks senior management being distracted from other pressing or strategic issues on which they might otherwise focus. And second, it may contribute to a perceived need by staff to undertake a degree of pre-filtering of policy options to streamline the decision-making process.
392. Filtering of analysis and options by staff is a necessary process to allow effective decision-making by senior staff. Ideally, the decision-makers in an organisation should be presented with options that represent a complete range of relevant views from the organisation, on a timely basis, with clear accountability in place as to the ownership of those analyses and recommendations. But there appears to be some tendency within the Bank for staff to filter recommendations in such a way as to maximise the likelihood that senior staff will find the recommendation palatable. This facilitates an easier and speedier decision-making process on the issue at hand. But it risks reducing the range of views and options that senior management see and, as such, might lead to a less effective overall outcome, and with less clear accountability for the decisions that have been taken during that process.
393. There are no easy ways to address this issue, particularly given the understandable reasons for the current decision-making structure. But ***the Court of the Bank should regularly assess the efficiency of decision-making around issues relating to the SMF to ensure that the right issues are raised to senior management for a decision, with a balanced set of views and options, and that appropriate accountability is in place throughout the organisation for decisions taken in the process leading up to this.*** This will likely require a combination of direct discussions with staff members as well as more formal surveying of employee impressions.

Chapter 13: External governance and accountability

395. There are a number of external stakeholders who have an interest in the design and operation of the Bank's SMF. Those stakeholders include the Chancellor and HM Treasury (HMT) (as the Bank's sole shareholder), the Treasury Committee (TC), the two policy committees in the Bank – the MPC and the FPC – which both include external as well as internal members, and, in future, the Board of the Prudential Regulation Authority (PRA).
396. While the Chancellor and the government of the day set the objectives of the Bank, it would not be appropriate for them to be involved with day-to-day decisions around the specific design or the operation of the SMF. The central bank needs to have operational independence to carry out its liquidity operations using its own balance sheet. The design and implementation of the SMF is critical to maintaining the credibility of the Bank in order for it to carry out its core purposes regarding monetary and financial stability.
397. At the same time, the government sets the objectives of the Bank, and by extension those of the SMF. The Chancellor / HMT do, therefore, have legitimate interest in whether, in using the SMF, the central bank achieves the objectives set for it. In particular, they may consider giving greater guidance as to the general policy stance the Bank should be taking as regards those operations. The Bank inevitably faces trade-offs in policy design and implementation in these areas. HMT might wish to give some guidance as to where the Bank should position itself as regards those trade-offs. That could not only give the Bank some ex-ante guidance as to how it should design and operate the SMF, but it might also help the Chancellor / HMT, or other bodies such as the TC, when judging ex-post whether the Bank had used the SMF effectively and in line with its remit. Indeed, because the guidance provided would be used as the basis for ex-post accountability, it should provide a strong incentive for appropriate ex-ante decision-making by the Bank.
398. The policy trade-offs inherent in the SMF are likely to be particularly stark regarding the provision of liquidity insurance. The current *Red Book* explicitly recognises that the Bank, in designing and implementing the SMF, “balances the provision of liquidity insurance against the costs of creating incentives for banks and building societies to take greater risks”. Those trade-offs are discussed in detail in the Liquidity insurance provision section. At some points during the Crisis, the Bank appeared to position itself at a different place as regards those trade-offs than some other central banks. For example, as discussed in the TC *The run on the Rock* report, during the early stages of the Crisis the Bank seemed to place relatively greater emphasis on avoiding the creation of undesirable incentives, relative to the competing objective of providing liquidity to the banking system.⁵³ As discussed in Section Two, the Bank has materially adjusted course since that report, moving away from ‘constructive ambiguity’ and broadening the range of facilities it has made available to the banking system. This has been accomplished with little formal guidance from external stakeholders, although it would appear there has been substantial informal encouragement. There may be a useful

⁵³ See, for example, paragraph 89, p43, of *The run on the Rock* report.

role for guidance from external stakeholders on where the Bank might position itself as regards those conflicting objectives.

399. ***An alternative to giving specific guidance on the trade-offs the Bank faces in operating the SMF might be for the establishment of a regular forum at which issues around the SMF are discussed.*** For example, the Chancellor and/or senior HMT representatives and the chair of the Bank's Court of Directors (Court) might meet the Governors annually to discuss current issues around liquidity provision. The minutes of such a meeting could be released publically after an appropriate period.
400. Such a meeting would not be a forum for external stakeholders to give operational guidance to the Bank – the design and implementation of the SMF should remain a matter for the Bank. Rather, the objectives of such a meeting would be to allow the Bank Executive and key stakeholders to discuss the current key issues around liquidity provision, and for those stakeholders to be able to communicate their views about the Bank's general policy stance. For example, HMT or its appointees may be interested in assessing and discussing other steps they themselves could take to avoid moral hazard – tax policy, other forms of regulation and other forms of persuasion to induce particular practice by banks, to disincentivise inappropriate usage of Bank liquidity facilities – while assuring the Bank is providing adequate liquidity to achieve stability and growth objectives.
401. A further objective would be to establish a level of confidence amongst the Executive that some of the potentially bold actions they may feel are necessary during a crisis will be understood and supported by external stakeholders, increasing the likelihood that the Bank would unhesitatingly take such action.
402. In its regular reviews of the Bank and its operations, the TC would be in a position to assess the degree to which the Bank had successfully factored in guidance from external stakeholders in its operational decisions and actions. It regularly meets with members of the Bank Executive, HMT and Court so would be well placed to assure the communication and cooperation between those bodies is carried out effectively.

The capital of the Bank

403. ***One particular lever for policy which HMT might consider revisiting is the amount of capital the Bank holds.*** Although liquidity insurance is provided against collateral, and haircuts are applied to that collateral to reduce the risk of the Bank suffering losses, there will nonetheless be some risk to the Bank's capital from the provision of liquidity insurance. The larger the amount of liquidity insurance the Bank provides, the greater that risk is likely to be. Therefore the amount of capital that the Bank holds is likely to be one factor that it takes into account when making decisions regarding the provision of liquidity insurance.
404. At present, the Bank holds around £2bn of potentially loss-bearing capital. This could be considered low given the potential scale of the Bank's lending exposures. For example, the recent Funding for Lending Scheme (FLS), which is not indemnified by the government, involves the Bank lending Treasury bills against collateral. There is no upper limit on the size

of the FLS, but if participating banks borrowed an amount up to 5% of existing loans to the UK non-financial sector, the Bank would be lending roughly £80bn under the FLS. Separately, the Bank's current programme of Extended Collateral Term Repos (ECTRs) had, by October, reached £11.6bn of lending against the collateral eligible in those operations, with at least one more operation scheduled in 2012. And, at the height of the Crisis, the Bank was exposed to £180bn of lending in its Extended Collateral Long-Term Repo (ELTR) operations alone.

405. Given the potential scale of those and other operations, the Bank's current level of capital could clearly imply an extremely high level of leverage. To reduce the risk to its capital, the Bank can impose substantial haircuts on the collateral it takes in its lending. It is likely, though, that very large haircuts would undermine the effectiveness of the Bank's operations.
406. In addition to such examples of collateralised lending, other potential operations discussed in Section Two, such as the Bank acting as a market maker of last resort (MMLR) in particular markets that were temporarily dysfunctional, might require outright purchases of assets. That could put significantly greater pressure on the Bank's capital base.
407. At present, the Bank's relatively low level of capital is likely, other things equal, to lead the Bank to be more conservative in its provision of liquidity insurance than it might be were it to hold a higher level of capital. That might be appropriate and in line with the objectives of the Bank's shareholder, HMT, and HMT always has the option of acting directly or via the Bank but with indemnification. Furthermore, should the Bank undertake operations that result in losses, HMT can always recapitalise the Bank. But such recapitalisation might call into question the Bank's independence; and would be very likely to be occurring at a time when it would be most important that the Bank retained that independence.

The roles of the FPC and the MPC

408. In addition to the roles of fully external stakeholders, the two policy-making committees of the Bank, the FPC and the MPC, also have clear interests in the Bank's liquidity operations.
409. The liquidity insurance elements of those operations have clear relevance for the FPC's macroprudential remit. They are likely to influence banks' liquidity planning, and therefore affect both the resilience of the banking system and, to some degree, the provision of credit. But the MPC also has an interest in the Bank's money market operations in so far as they affect monetary conditions – for example if they affect the amount of reserves in the system, the level of market interest rates relative to Bank Rate, or more generally if they are likely to have a material macroeconomic impact.
410. This raises the question of what input the two committees ought to have into the design and implementation of the Bank's operations. And this issue is complicated further because, as discussed in Sections One and Two of this Review, it is not possible to neatly divide the SMF into facilities that only provide liquidity insurance, and those that only affect monetary conditions. Therefore, there are likely to be some aspects of the Bank's SMF operations which are relevant for the deliberations of both the FPC and the MPC. As a recent example,

the activation in June 2012 of the Bank's ECTRs proved to be of interest to both committees. The MPC has been consulted on the size of the auctions, given that they inject reserves into the banking system and may have some macroeconomic impact. And partly in response to those operations, the FPC recommended that the Financial Services Authority (FSA) should consider adjusting its microprudential liquidity guidance.

411. Notwithstanding those interactions over the activation of the ECTRs, discussions with FPC and MPC members and Bank staff suggest that there is currently some lack of clarity over the precise roles of the two committees as regards the Bank's liquidity operations. That is not surprising: the FPC is a new committee, still not yet established in statute and currently working to identify the tools it is likely to use; and the macroeconomic challenges facing the MPC have required it to consider new tools and policy approaches in recent years.
412. ***The Bank, in discussion with the two committees, should set out a framework which establishes more clearly the appropriate roles and responsibilities of the two committees as regards the Bank's liquidity operations. Further, the Bank should formalise processes which ensure sufficient information sharing between the Executive and the two committees, and which give the two committees opportunity to express their views on those operations where appropriate.*** The remainder of this sub-section puts forward some suggestions for the broad principles which might underlie such a framework.

The role of the FPC

413. The FPC is likely, over time, to take a close interest in the Bank's policies for the provision of liquidity insurance, given its objective to protect and enhance the resilience of the UK financial system – and given that the Bank's provision of liquidity insurance is designed and implemented with that same objective very much in mind. The FPC should therefore have the opportunity, through clear and well-understood processes, to give the Executive any view it held over the design and implementation of those facilities, with the Executive explaining its reasoning should it disagree with that view.
414. More broadly than simply the design of any particular facility, ***it would be useful for the FPC to provide as much clarity as possible to the Bank's management on its views regarding the trade-offs the Bank faces as it designs and implements the SMF.*** The Bank could help to facilitate this through regular reviews with the FPC of its provision of liquidity insurance. A clear expression of the FPC's views and objectives regarding the Bank's liquidity insurance policies should give the management of the Bank greater confidence to take bold and proactive decisions regarding the SMF, with confidence that it has a clear view of the objectives and preferences of a key stakeholder in this area.

The role of the MPC

415. It seems clear that the MPC should have authority over any facilities that are being used with the primary intention of affecting monetary conditions. That has indeed been the case since the formation of the MPC regarding the setting of Bank Rate, and more recently with respect to the size of the Bank's Quantitative Easing (QE) programme.

416. Many of the Bank's SMF operations are, however, designed primarily to provide liquidity insurance, rather than to influence monetary conditions. As discussed in **Chapter 4**, it would not seem sensible for the MPC to use those tools to implement monetary policy, both because that might jeopardise their effectiveness in their primary goal of providing liquidity insurance, and also because of their clear relevance for the FPC.
417. But ***it will be important that the MPC is fully informed about the design, implementation, and likely impact on monetary conditions of the Bank's liquidity operations.*** Further, if those operations are likely to have a material impact on monetary conditions, despite not being designed with that objective in mind, then it would seem appropriate that the MPC should not only be informed, but should also have an opportunity to give a view on those operations. As with the FPC above, if the Executive of the Bank disagreed with that view, it would be expected to explain the reasons for that decision.

The role of the Executive

418. Despite the legitimate interest of both committees in SMF operations, there are some factors that would make it difficult to give either policy-making Committee final authority over most decisions regarding those operations. First, it is possible that the two committees may have differing views over some policy decisions. Second, neither Committee has responsibility for the Bank's balance sheet, although both committees should be mindful of the implications of any recommendations they make for the Bank's balance sheet. Third, it is possible that during times of acute financial market stress, it may not be possible to convene meetings of the MPC or FPC at sufficiently short notice to make the necessary policy decisions.
419. Therefore final authority over the design and implementation of the SMF, other than for those operations carried out with the express intention of affecting monetary conditions, should continue to rest with the Executive of the Bank, and ultimately the Governor, who is accountable to Court for those decisions. As set out above, however, if the Bank chooses not to comply with the view of either the MPC or the FPC over the SMF, senior management should need to explain to the committee in question the reasons for that decision.

Ensuring the necessary communication between the Executive and the two committees over SMF operations

420. The shared interest of both policy committees in the design and implementation of the SMF means that there will need to be significant information sharing between the Executive and the committees in this area.
421. The composition of the two committees should itself play a major role in facilitating this exchange of information. Four members of the Executive – the Governor, the Deputy Governors for monetary policy and financial stability, and the Executive Director for Markets – will also sit on both policy committees. They should therefore be well placed to help ensure that members of each committee are sufficiently aware of issues under discussion by the Executive or the other policy committee. Further, there may be occasions when, as a

committee considers a particular policy decision, those members may usefully be able to give guidance on how the other policy committee was likely to react to that decision, if that policy reaction would be relevant to the decision at hand.

422. But over and above that, ***it will also be important to ensure that formal processes are in place to ensure the sharing of relevant information on developments in the SMF between the Executive and both committees.*** There is some evidence from discussions with Bank staff and with members of those committees that those arrangements have yet to be fully established, but could usefully be built into existing processes.
423. It is important to note, however, that the information exchange and consultation described above should not be confused with policy coordination between the two committees, as regards the operation of the Bank's SMF. Individual committee members, including those who sit on both policy committees, will, when participating in a committee debate or vote, be required to make all policy decisions with respect only to the remit of that committee. That is clear from the current remit of each committee. But it could feasibly result in a different outcome to that which would result if such decisions were taken with the objectives of both committees in mind.
424. As with all other Bank processes, ***the Court of the Bank should continue to have responsibility for ensuring that all of these processes, and more generally the flow of information between the two committees and the Executive of the Bank, are functioning effectively and to the satisfaction of all parties.***

Chapter 14: Summary conclusions and recommendations

Section One: Monetary policy implementation

Development of the monetary policy implementation framework

425. The 2006 reserves averaging system with voluntary reserves targets appears to have been successful in addressing the issues with the prior money market framework. It was well-designed, and effectively addressed the shortcomings of the previous regime, leading to lower volatility in short-term market rates around Bank Rate. It also provided sufficient flexibility to allow the Bank to respond to stressed market conditions at the start of the Crisis, albeit with more volatility in interest rates than in non-stressed conditions.
426. But from the onset of the Crisis some problems became apparent. In particular, the Bank and banks struggled to respond rapidly and flexibly enough when money market liquidity dried up, perhaps as they failed to recognise the magnitude and potential longevity of the systemic shock. The Bank did eventually provide additional reserves beyond banks' targets but ***should ensure a robust process is in place to ensure such decisions are made in a timely manner.***
427. The reserves averaging framework was not compatible with the shift to Quantitative Easing (QE) and so a floor system was introduced. This is working well, enabling the Monetary Policy Committee (MPC) to undertake asset purchases, whilst keeping short-term interest rates in line with their target.

Should the Bank seek to return to reserves averaging?

428. Both the reserves averaging and floor systems have proved effective at implementing decisions on the level of Bank Rate with low volatility in short-term market rates around this. As such, the decision on which regime to employ longer term is therefore unlikely to be driven by their relative effectiveness in implementing monetary policy. It is more likely to be a function of the wider implications of operating either regime and how it fits with the wider policy framework. In particular, a number of changes since 2006, such as the introduction of the new liquidity regulations for banks and the decline in money market activity, mean that the merits of the reserves averaging system over the floor system are perhaps more marginal than they once were.
429. Reserves averaging has a number of benefits. The banks' demand for reserves is known, making supplying reserves operationally simpler, and also avoiding the potential provision of too many reserves, which may result in undesirable monetary stimulus. It may also encourage the re-emergence of an interbank money market, providing information for the Bank and other market participants and encouraging banks not to be reliant on the Bank with respect to their liquidity management.
430. But reserves averaging relies on a functioning money market to be effective and it is not clear when and if that will return or even if it is desirable. Reserves averaging also possibly

interacts less well with new liquidity regulation than the floor system as banks are less able to make flexible use of their reserves in response to a sudden shock.

431. On the other hand, while the floor system has proved effective in current market conditions, that effectiveness has come at the expense of atrophying interbank markets and is particularly suited to the current excess reserves environment so may not be as appropriate in future.
432. Overall, it is difficult to judge now the relative importance of these aspects at the time when a decision will need to be made. A return to the reserves averaging approach with voluntary reserves targets may be appropriate. But it is not critical to the effective implementation of monetary policy. ***When deciding whether to return to reserves averaging or maintain a floor system, Court should ensure the Executive evaluate the balance of various factors in the context of the circumstances at the time***, including: how each supplies an appropriate level of reserves; the role of money markets in their potential effectiveness; and their interaction with liquidity regulation.
433. ***Should reserves averaging be reintroduced, the Bank should also return to using the system of voluntary reserves targets*** that place the burden on banks to assess their appropriate level of reserves.

Additional monetary policy tools

434. Traditionally the MPC has used short-term interest rates as its policy tool to meet its monetary policy objective. More recently it has also used asset purchases via its QE programme to implement its policy remit. It is, however, possible that at some time in future the MPC might wish the Bank to use other types of market operations to enable it to meet its objective. It appears that the Sterling Monetary Framework (SMF) itself is sufficiently flexible to accommodate a range of such additional policy measures should they be required.
435. Many other elements of the SMF, including facilities that are designed to meet other objectives – for example the provision of liquidity insurance – are also likely to have some effect on monetary conditions more generally. But it would not seem sensible for the MPC to use these elements as direct monetary policy tools, as that might compromise the other objectives for which they are designed, and other bodies, such as the FPC, would probably have a stronger case to direct their usage.
436. Nonetheless, it is likely to be important that the MPC is well informed about the design and implementation of SMF tools, given their potential effect on monetary conditions. If that influence is likely to be material, it may be the case that the MPC should have an opportunity to express opinions on their design. These issues are discussed in more detail in paragraphs 471-474.

Section Two: Liquidity insurance provision

Development of the framework

437. The Bank's pre-Crisis framework set out only limited facilities for the provision of liquidity insurance. What facilities were available quickly proved inadequate. It therefore launched a number of crisis liquidity measures, including the Special Liquidity Scheme (SLS), which we evaluate in more detail in **Box 6**.
438. The Bank worked to incorporate the lessons learnt from the Crisis into a set of permanent liquidity insurance facilities, which were substantively incorporated into its 2010 *Red Book*. In setting out the full details of its facilities in this way, the Bank moved a long way from the so-called 'constructive ambiguity' that it had employed in the past. This is to be commended. But ***there are a number of areas where the Bank could provide further clarity upfront about the terms on which it would expect to provide liquidity insurance through its published framework***. This is in contrast to liquidity support provided outside the framework (Emergency Liquidity Assistance (ELA)), where the Bank may wish to retain a degree of discretion given the level of judgement required in making such extreme interventions.

Stigma and reluctance to use Bank facilities

439. Banks currently appear to be holding more liquidity than might be optimal from the perspective of society as a form of self-insurance against liquidity shocks. There are likely to be a number of reasons for this, including apparent demands from regulators, investors and rating agencies. Relevant to this Review, though, there is also a perception that planning to use, or actually using, Bank liquidity facilities could elicit negative reactions from those same stakeholders as it would demonstrate some sort of weakness. In other words, some Bank facilities are stigmatised, particularly the Discount Window Facility (DWF).
440. This stigma is likely to be costly to the extent that excess self-insurance creates a dead-weight cost on banks' balance sheets and crowds out real economy lending, unless or until those gaps are filled by others in the financial system. Furthermore, such stigma may cause banks to delay usage of central bank facilities, which could cause financial instability and result in higher overall costs to taxpayers if a bank subsequently needs to be resolved.
441. Given these costs, the Bank should consider steps it can take to reduce banks' reluctance to access its facilities. While it may not be possible to completely de-stigmatise the Bank's bilateral facilities without making the Bank the lender of first resort, it may be possible to reduce the disincentives of using central bank facilities such that banks more actively take central bank liquidity insurance into account in their liquidity planning. Other stakeholders would need to accept this change, in particular regulators and rating agencies, for it to change the behaviour of banks. The Bank can contribute to this through clear communication and coordination as appropriate.

442. There are a number of possible factors that contribute to the reluctance of banks to access liquidity insurance that the Bank may wish to consider acting on in order to reduce stigma in its facilities and to otherwise reduce banks' reluctance to use its facilities:

- *Pricing:* Use of penalty pricing increases the likelihood that a facility becomes stigmatised. This, together with other issues around pricing of central bank facilities, is covered in more detail in paragraphs 443-446 below.
- *Non-price costs:* There are other non-price costs to using central bank facilities, such as additional scrutiny from central banks and regulators, which may accompany such usage. ***The Bank should consider whether it could remove some of these non-price elements, such as the need for an on-the-day solvency and viability assessment (in addition to ongoing assessment) and a repayment plan prior to approving a drawing. It should also take into account any remaining non-price costs to usage when setting the pricing structure for its facilities.***
- *Disclosure:* Usage of central bank facilities will only be stigmatised if there is a risk that individual institution usage will be disclosed, either intentionally or inadvertently. But limiting disclosure reduces accountability, so the right balance needs to be struck. Limiting disclosure may also be difficult for practical reasons, such as usage being conspicuous to third parties due to changes in bank behaviour in the market, and the potential for leaks.

The Bank should ensure that its own disclosures do not reveal usage of facilities on an individual institution basis. Its current publication of usage on an aggregated, lagged basis seems appropriate in this regard. But the length of the lag, particularly for short-term DWF drawings, could be extended to further reduce disclosure risks.

The Bank should also work closely with the relevant authorities, at both a domestic and international level, to ensure that as far as possible specific usage of central bank facilities does not need to be disclosed by those accessing the facilities.

One possible way to help manage disclosure risks is to make usage of particular facilities a more routine part of banks' activities and so reduce the risk that extraordinary usage of these facilities is distinguishable. ***The Bank should consider ways to facilitate such regular usage***, perhaps involving regular compulsory usage or incentivising regular drawings via tiered pricing.

Additionally, risks around observed changes in market behaviour would be reduced if banks regularly tested their ability to liquidate gilt collateral (which could be obtained either from the DWF or their own liquid asset buffers) in the market.

- *Collateral:* Operations against relatively high-quality collateral are less likely to be stigmatised than operations against a wider range of collateral because being able to pledge high-quality collateral provides a signal of a bank's strength. So stigma issues generally arise around operations against wider collateral. Issues around collateral are covered in more detail in paragraphs 452-456 below.

- *Bilateral facilities:* It is appropriate that the Bank has a range of both bilateral and market-wide facilities available. Currently, stigma is most obviously an issue for the Bank's bilateral facilities and in particular for the DWF. As yet, the market-wide facilities appear not to suffer from stigma. But there is a risk that they become stigmatised over time if they are not actively used or are perceived to be used to provide support to individual institutions. ***The Bank should guard against being seen to use its market-wide facilities for idiosyncratic support***, as this may reduce their effectiveness as a tool for managing market-wide stress.
- *Trigger Points:* Use of some central bank facilities is seen as an acceptable part of banks' regular activity. In contrast, other facilities incorporate features that distinguish their use as extraordinary, such as their high cost or wide collateral eligibility. These facilities are more likely to suffer from stigma because of their more extreme features – in effect there is a 'step-up' in the features between facilities considered acceptable and those that are more exceptional in nature. The presence of such step-ups can create trigger points for stigma to be introduced. Arguably the Bank's framework contains large step-ups between different operations, such as the pricing and collateral sets accepted in the DWF relative to the Operational Standing Facilities (OSFs) and the need to activate the Extended Collateral Term Repo (ECTR) facility compared to the regular use of the Indexed Long-Term Repo (ILTR) operations. ***The Bank may wish to consider introducing a more continuous spectrum of pricing and collateral across and within facilities in its liquidity insurance framework.***

Pricing

443. Moral hazard is a valid concern for policymakers. But the Bank has probably placed too much emphasis on using pricing in its permanent liquidity insurance facilities to manage moral hazard. It is not clear that pricing is the best method to manage moral hazard, and the high pricing that has resulted from this approach has led to excessive stigmatisation of some of the Bank's facilities. ***The Bank should consider reducing the penal pricing on Bank facilities, considering its approach to moral hazard in the context of the other substantial non-price contributors to stigmatisation of Bank facilities, such as additional scrutiny that usage may attract from central banks, regulators and others.*** In particular, DWF pricing is high, making it a very extreme, and highly stigmatised, backstop facility.
444. It may still be appropriate to have a penalty pricing element built into facilities to ensure that the Bank does not undercut the market and become a lender of first rather than last resort. One way to discourage dependence on central bank facilities is to have higher fees for higher levels of relative usage. The Bank already makes use of such pricing structures, but these ***could be made more granular to minimise the number of trigger points where stigma could arise***, as discussed in paragraph 442.
445. ***The Bank should consider whether it would be appropriate to move to a pricing structure for the DWF that incorporates payment of an upfront premium reflecting the value of the insurance being provided to the banks.***
446. The Bank should also recognise more explicitly that there are times when it is not appropriate for central bank liquidity insurance facilities to have any element of penalty

pricing at all. ***For facilities targeted at system-wide, exogenous shocks, the Bank should consider offering funds at the policy rate, with no additional liquidity premium.*** This would reflect the fact that the objective of such an operation is to provide the market with sufficient liquidity to continue to function effectively, that participation by banks in the operation is fundamental to achieving that objective, and so designing the operation to minimise stigma, which may inhibit participation, is key.

Maturity transformation

447. The Bank's current facilities play a valuable role in backstopping the liquidity of a bank's balance sheet by providing short-term liquidity support. This is important in terms of the continued survival of a solvent institution facing a short-term liquidity shock. But it does not truly backstop the liquidity services that banks provide to the broader economy, and in particular their role in providing maturity transformation. This limits the social benefit of the central bank backstop.
448. Indeed, through its temporary crisis response facilities, the Bank has recognised that the central bank also has a maturity transformation backstop role. But this does not feature explicitly in the permanent facilities of the Bank's framework. ***The Bank should be more explicit in its role in providing a maturity transformation backstop to smooth disruptions in these liquidity services when they occur. In order to accomplish this, the Bank may look to extend the maturity of some of its facilities or develop other facilities that would give banks the necessary confidence to maintain or extend the term of credit provision.***

Access to Bank facilities

449. The Bank restricts access to most of the Bank's facilities to one legal entity per group in order to disincentivise legal complexity in bank holding structures. But this may not be the most appropriate way to meet this objective, and may unnecessarily complicate banks' liquidity management, particularly once ring-fencing is introduced. ***The Bank should consider whether this restriction is reasonable, or whether the objective the restriction is trying to achieve would be better met in other ways.***
450. Given the wider range of financial institutions now involved in the provision of core financial services, it would seem sensible to consider whether access to the Bank's facilities should be extended beyond the banking system. ***The Bank should consider whether it would be appropriate to set access criteria for liquidity insurance facilities based on the nature of facilities provided to the wider economy, specifically the provision of payment and liquidity services, rather than only providing liquidity insurance to banks.*** A pre-requisite would be that such institutions be regulated as rigorously as banks for providing such services.
451. Throughout the Crisis, the Bank, along with other central banks, has occasionally operated directly in asset markets in order to normalise a dysfunctional market. This is consistent with its objective to ensure there is no disruption to the provision of liquidity and payment services. In other words, the Bank has occasionally acted as Market Maker of Last Resort (MMLR). The basis on which it does so, however, is not explicit within the framework. ***The***

Bank should give consideration to making its MMLR actions more predictable and consistent. This may include setting out more explicitly the likely objectives of acting as a MMLR and the circumstances under which it would consider doing so, as well as the types of interventions it might consider, and the broad principles it would use to set the terms of such interventions.

Collateral eligibility and risk management

452. **The Bank needs to ensure that it can accept the widest possible range of assets as collateral in order that it can respond appropriately to a wide range of scenarios.** To a large extent, that is what the Bank has done. The Bank has greatly increased the range of collateral eligible in its framework since the Crisis, and now accepts most assets that it feels it can effectively risk manage. But in some cases there may be good reason for the Bank to worry slightly less about the risk to its own balance sheet in order to support its policy objectives. For example, banks provide liquidity insurance to the wider economy via specific products, such as overdrafts and revolving credit facilities. **It may be appropriate for the Bank to accept those products directly as collateral in its facilities in order to provide an effective backstop for such services, even if that entails taking further risk on its balance sheet, or requires more complex risk management.**
453. **The Bank also needs to constantly monitor how the financial system generally is providing its key services to the wider economy and ensuring that its facilities are adapted as necessary to be able to deal with disruptions.**
454. The Bank's collateral framework charges higher fees when banks pledge lower quality collateral. This is a sensible principle to reflect the extent of the liquidity upgrade being provided. But it can create large step-ups in the pricing of facilities that accept different collateral sets which may introduce stigma. **The Bank should seek to reduce the size of such step-ups to help manage stigma.**
455. While different central bank collateral policies generate the opportunity for 'liquidity tourism' between central banks, this behaviour does not seem to be particularly prevalent. **It is nevertheless an area that central banks should continue to monitor.**
456. **The Bank's ability to realise the wider collateral it takes in the event of default remains untested and the Bank should continue to improve its processes for managing some of the less liquid assets it now accepts.**

Potential changes the Bank could consider making to its liquidity insurance facilities

457. There are various specific changes the Bank could consider making to its liquidity insurance facilities, picking up on a number, but not all, of the individual recommendations made throughout this Review.
458. **The Bank should consider re-positioning the DWF to create a clearer distinction between the DWF and ELA.** To do this it would need to consider at the least reducing pricing, removing the need for an on-the-day solvency and viability (S&V) test and removing the need

- for banks to provide a repayment plan at the point of drawing. The objective would be to position usage of the DWF rather closer to participation in ECTR auctions. The DWF could then effectively become a committed facility with ongoing S&V assessment to ensure compliance with SMF access rules, as for auction-based facilities.
459. Even then the DWF may remain stigmatised because of its nature as a bilateral backstop facility. And such a repositioning of the DWF would not in itself address our recommendation to move to a pricing structure for the DWF that incorporates payment of an upfront premium reflecting the value of the insurance being provided to the banks.
460. Two suggestions, which could be used together or separately to help address these objectives, are to:
- a. **Require banks to regularly undertake large-scale compulsory drawings of the DWF facility.** This would generate a background pattern of usage against which extraordinary usage would be less apparent.
 - b. **Sell 'DWF options' for an upfront premium, which would allow banks to draw on the DWF for a lower fee than is currently charged.** Such options could be structured with a view to incentivising at least partial exercise of options on a regular basis to again create a level of background usage. The pricing of the options and their treatment in regulatory liquidity rules would be important factors in the success of such an approach. A facility based on such options would have many similarities to the Committed Liquidity Facility offered by the Reserve Bank of Australia (RBA).
461. There may, though, be merit in the Bank retaining a backstop, or second tier, DWF facility, with characteristics more similar to the current arrangement, for cases where a more rigorous approach to granting and monitoring drawings was warranted. Such a facility would probably remain stigmatised, but for good reason, given it would be the most penal form of liquidity assistance available in the framework. Such a second tier facility would be distinct from Emergency Liquidity Assistance (ELA), which would be able to deal with a wider range of circumstances when it would not always be appropriate to use the published framework.
462. While most of the issues relating to liquidity insurance are around bilateral facilities, there is also a potential gap in the Bank's provision of market-wide liquidity insurance. This is because the ECTR is a contingent facility, and potentially has a penal pricing structure. **The Bank should consider expanding its ILTR operations to additionally cover the ECTR collateral set** to put provision of market-wide liquidity insurance against this wider collateral on a more regular footing.
463. There may, however, be **merit in retaining a separate ECTR-type operation that can be used to respond to a market-wide shock resulting from a truly external source.** It may be beneficial to retain discretion around the pricing and maturity of such an operation, announcing these specific terms on activation of the facility, dependent on the circumstances at the time.

Section Three: Governance

Internal governance

464. The formal internal governance arrangements around the Bank's SMF, whereby the Court of Directors (Court) reserves to itself responsibility for the risk management policies of the Bank, and delegates the design and implementation of the Bank's SMF to the Governor, are broadly sensible. But it is notable that little formal role is given to the Bank's Deputy Governors. The Deputy Governors are externally appointed to the Bank, presumably with a view to assuring a diversity of experience and perspective amongst the senior management of the Bank. And they have responsibility for different aspects of the Bank's responsibilities, all of which are affected to some degree by the Bank's SMF. Therefore, ***we suggest that Court considers formalising, and monitoring, the arrangements through which the Deputy Governors are consulted and give their views on those operations.***
465. ***Additionally, minutes of the Governors' discussions of SMF issues should be made available to Court, so that Court would be aware if there were significant differences of view between the Governors over policy decisions.*** In such circumstances, Court would not have powers of override or arbitration, but should ensure that those opposing views are aired and lead to sufficient debate and challenge over the Bank's SMF.
466. Effective governance of the SMF also depends on how those formal procedures are followed in practice. As is common in many public and private institutions, the Bank is a centralised and hierarchical organisation. This has meant that the Governor and senior management has been left with too great a decision-making burden at some important times.
467. While it appears that less senior staff are often willing to challenge their superiors, they appear to have some tendency to filter recommendations in such a way as to maximise the likelihood that senior staff will find the recommendation palatable. While this makes it easier for the Governor, as ultimate decision-maker, to reach conclusions it reduces the range of views he sees and, as such, might lead to a less effective overall outcome. ***The Court should regularly assess the efficiency of decision-making around issues relating to the SMF to ensure that the right issues are raised to senior management for a decision, with a balanced set of views and options, and that appropriate accountability is in place throughout the organisation for decisions taken in the process leading up to this.*** This will likely require a combination of direct discussions with staff members as well as more formal surveying of employee impressions.

External governance and accountability

468. It is crucial that the Bank retains independence to design and use its money market operations to meet its objectives as it sees fit. There are, nonetheless, external stakeholders, including HMT, who are likely to have views on the policy stance the Bank takes in carrying out those operations. It would be useful if those stakeholders were able to share their views on those matters, for example over how the Bank should position itself regarding the trade-offs it inevitably faces in providing liquidity insurance to banks.

469. ***Consideration could be given to the establishment of a regular forum at which the Governors of the Bank meet key stakeholders in the Bank's SMF.*** For example, the Chancellor and/or senior HM Treasury (HMT) representatives, and the chair of Court might meet the Governors annually to discuss current issues around the SMF. The objectives of such a meeting would be to allow the Bank Executive and key stakeholders to discuss the current key issues around liquidity provision, and for those stakeholders to be able to express their views about the Bank's general policy stance. That should give the management of the Bank greater confidence to take bold and proactive decisions regarding the SMF, with confidence that it has a clear view of the objectives and preferences of its key stakeholders. In its regular reviews of the Bank and its operations, the Treasury Committee (TC) would be in a position to assess the degree to which the Bank had successfully factored in guidance from external stakeholders in its operational decisions and actions.
470. ***One particular lever for policy which HMT might consider examining is whether the amount of capital the Bank currently has is large enough to allow it to carry out its responsibilities effectively,*** and with sufficient operational independence.
471. In addition, the two policy committees at the Bank, the MPC and the FPC, will also have legitimate interest in the approach the Bank takes to the SMF. Where appropriate, this may also apply to the Prudential Regulation Authority (PRA) Board, when it is established. Nonetheless, the Executive, and ultimately the Governor, should retain final authority over the SMF, except insofar as operations are carried out primarily to influence monetary conditions (see paragraph 474).
472. ***The Bank, in discussion with the two committees, should set out a framework which establishes more clearly the appropriate roles and responsibilities of the two committees as regards the Bank's liquidity operations. Further, the Bank should formalise processes which ensure sufficient information sharing between the Executive and the two committees, and which give the two committees opportunity to express their views on those operations where appropriate.***
473. It would be useful for the FPC to provide as much clarity as possible to the Executive over its views regarding the Bank's provision of liquidity insurance. And the FPC should have clear and well-understood processes through which to give the Executive recommendations over the design and implementation of particular liquidity insurance facilities, with the Executive explaining its reasoning should it disagree with that view.
474. The MPC should continue to have authority over any operations intended primarily to influence monetary conditions. And it should be informed of the implications for monetary conditions of other liquidity operations, and have the opportunity to express views on such operations if those implications were likely to be material. As with the FPC, if the Executive disagreed with those views, it would be expected to explain the reasons for that decision.

Annex 1 – Terms of reference for the Review

In January 2008, alongside the publication of the Treasury Committee’s Report “The Run on the Rock”, the Bank committed to improving the way its money market framework operated in stressed conditions. The process of reforming the Bank’s operations began early in 2008 with the introduction of the Special Liquidity Scheme. A consultative paper was published in October of that year and further changes were made. The resulting framework was described fully in the Bank’s ‘Red Book’ in 2010.

The Court has asked Bill Winters, Chief Executive of Renshaw Bay and former Co-CEO of JPMorgan Investment Bank, to review whether the reformed system of operations deals with the conclusions of the Treasury Committee’s report “The Run on the Rock” and captures any further lessons from the financial crisis since the time of that report in January 2008.

The review will examine:

- The operation of the Special Liquidity Scheme, established in 2008.
- The structure and terms of the Bank’s facilities, as set out in the ‘Red Book’.
- The operation of the reformed framework since its introduction in 2008.

Specifically, the review will consider:

- The effectiveness of the framework in implementing monetary policy decisions.
- Whether the framework is sufficiently flexible, and the range of collateral sufficiently broad, to satisfy demands for liquidity in times of stress.
- Whether a system of voluntary reserves targets is appropriate.
- Whether the price at which liquidity is available to the system is appropriate.
- Whether the framework deals adequately with the issue of ‘stigmatisation’.
- The capability and governance arrangements in the Bank to support the facilities in its framework.

Overall, the review will make recommendations to inform the future development of the Bank’s operations, consistent with its objectives to implement the MPC’s decisions and to provide liquidity insurance to the UK banking system.

Annex 2 – Assessment against *The run on the Rock* recommendations

- A1. This annex sets out the recommendations from the Treasury Committee (TC) *The run on the Rock* report that are relevant to this Review of the Bank’s Sterling Monetary Framework (SMF). This Review provides an assessment of progress against those recommendations, and references back to the body of this Review where these points are discussed in more detail.

Recommendation 10

The Bank of England, the European Central Bank and the Federal Reserve each pursued a different course of action in response to the money market turmoil in August 2007. Only the Bank of England took no contingency measures at all during August, in order to protect against moral hazard, that is, the fear that an injection of liquidity would offer incentives for banks to take on more liquidity risk, secure in the knowledge that the Bank of England would step in to resolve future liquidity crises. The European Central Bank appeared to attach far less weight to the moral hazard argument than the Bank of England. Instead, it adopted a proactive approach in resolving what it saw as a practical problem of a faltering market resulting from banks losing confidence in each other. Although the European Central Bank injected no net additional liquidity in August, it did alter the timing and term profile of its regular operations, front-loading its credit supply towards the start of August, and draining this liquidity before the end of the maintenance period. In doing so, the European Central Bank appeared to satisfy the immediate liquidity demands of the Eurozone banking sector, whilst UK banks’ sterling demands went unmet. We are unconvinced that the Bank of England’s focus on moral hazard was appropriate for the circumstances in August. In our view, the lack of confidence in the money markets was a practical problem and the Bank of England should have adopted a more proactive response.

Assessment

- A2. Subsequent to *The run on the Rock*, the Bank did become more proactive in providing additional liquidity to the market. In four maintenance periods (September 2007, and March, September and October 2008) the Bank used contingency measures available within the SMF, choosing to inject additional reserves relative to banks’ aggregate targets, and to widen the ranges around targets in order to allow scope for the additional reserves to be remunerated at Bank Rate.
- A3. Changes to the Bank’s SMF since then mean such a demand for liquidity would in future be more readily met. The Bank’s Indexed Long-Term Repos (ILTRs) now provide regular market-wide liquidity against a wider range of collateral. The bids received in these operations are used to generate indicators of money market stress to which the Bank is able to respond by increasing the amount of liquidity provided to the market.⁵⁴ A more proactive stance in market-wide liquidity provision has also been demonstrated by the Bank’s activation of the Extended Collateral Term Repo (ECTR) operations in response to concerns around stresses emanating from the Eurozone. The Discount Window Facility (DWF) also provides individual

⁵⁴ *Red Book*, paragraph 34

institutions with the ability to access liquidity against a wide range of collateral, including raw (that is, unsecuritised) loans.

- A4. Nevertheless, as set out in **Chapter 7**, the Bank may still place undue weight on moral hazard as regards the pricing of some facilities. This Review suggests the Bank considers this issue, particularly given the effects that other non-price factors can have on banks' willingness to use central bank facilities.

Recommendation 11

We accept the Governor's comments that the Bank of England injected additional liquidity into the money markets in September, when the ECB and Fed did not. This was not a decision on the part of the Bank, but a consequence of banks being able to choose their reserve requirement for each maintenance period. The Bank of England should set out, in its response to this Report, the rationale for having a voluntary reserves system, rather than a system that stipulates reserves requirements for each bank.

Assessment

- A5. The Bank set out its rationale for having voluntary reserves targets in the 2008 Consultation Document.⁵⁵ This Review concludes that voluntary targets are appropriate under a system of reserves averaging. (See **Box 4** in **Chapter 3**.)

Recommendation 13

The fact that the European Central Bank accepted a wide range of collateral, including relatively illiquid assets, certainly assisted European banks, throughout the period of turmoil. The broadening of acceptable collateral by the Bank of England in September similarly assisted UK banks. The Governor depicted the Bank's decision as being finely balanced between giving the banks the liquidity they wanted and moral hazard. If the Bank were always to accept a wider range of collateral, banks would have an incentive to alter their asset portfolios away from the safest classes and towards higher-risk classes, and we consider this moral hazard argument to be important. Nevertheless, with the benefit of hindsight, we have concluded that the Bank of England should have broadened the range of acceptable collateral at an earlier stage in the turmoil.

Assessment

- A6. The Bank now accepts a much wider range of collateral in its permanent facilities than it did at the time of *The run on the Rock*, including raw loans in the DWF and ECTR. It also accepts a wider basket of collateral in its regular ILTR operations than in its previous standard long-term repo open market operations (OMOs).

⁵⁵ See Box B in "The Development of the Bank of England's Market Operations." <http://www.bankofengland.co.uk/markets/Documents/money/publications/condococt08.pdf>

- A7. This significant expansion of the Bank’s collateral list was very rapid, with the Bank responding quickly to worsening market conditions from 2008. The subsequent expansion into taking raw loans in 2011, prior to a similar move by the ECB, was also an important enhancement to collateral eligibility. The Bank continues to develop its collateral eligibility list, in particular looking to accept a wider range of loan types over time. But this is now a more gradual process, in which the Bank has appropriately given priority to asset classes that it can most easily risk manage, and will be of most benefit to the banking sector. The Review suggests, though, that there may be some additional assets the Bank should consider taking as collateral in future, specifically where such products support its objective of backstopping liquidity provision to the wider economy. The Bank should also continue to monitor how the financial system generally is providing key services to the wider economy to ensure that its collateral list remains appropriate. (See **Chapter 10**.)

Recommendation 15

We recommend that the Bank of England, in its response to this Report, set out the rationale behind the design of its standing facilities, and any changes to them that it is considering making.

Assessment

- A8. In the 2008 Consultation Document, the Bank split its bilateral standing lending facility into two separate facilities:
- a. purely frictional Operational Standing Facilities (OSFs), the principal aim of which is rate-setting and so absorbing essentially technical frictions in the overnight money markets; and
 - b. the DWF, the principal function of which is to provide liquidity insurance in the event of a liquidity stress.
- A9. This Review concludes that the split was appropriate, and has had some success in destigmatising the OSFs, making them once again a useful monetary policy tool as well as an effective way for banks to deal with frictional, short-term, payment shocks.
- A10. The introduction of the DWF was an important step in the development of the framework to include permanent liquidity insurance facilities. It is perhaps the most important facility for providing liquidity insurance, but also the most stigmatised. This Review suggests some changes to the design of the DWF that the Bank should consider. These are discussed more fully in **Chapter 11**.

Recommendation 16

There are many circumstances where UK banks might be able to participate in money market operations conducted by the European Central Bank and the US Federal Reserve, although the fact that such operations would neither be conducted in sterling, nor accept sterling-denominated collateral, is a significant obstacle to UK banks extending their use of these

facilities. In these circumstances, the Bank of England’s policy on money market operations cannot be reviewed in isolation from those of other central banks. In view of the fact that some, but not all, UK banks have access to the money market operations provided by foreign central banks, the review of the Bank of England’s money market operations should be informed by an awareness of the case for closer alignment of the Bank of England’s money market operations with those of the European Central Bank and of the Federal Reserve.

Assessment

- A11. Whilst it is important to be aware of other central banks’ liquidity support and look to adopt best practice, the Review does not think it appropriate to mechanically realign the Bank’s framework with those of the European Central Bank (ECB) or US Federal Reserve (Fed). The Bank’s programmes are designed to provide appropriate liquidity facilities to banks operating in the UK with an objective to maintain financial stability in the UK. Other central banks will have different objectives and it would not be appropriate to compromise the UK framework on account of those objectives.
- A12. This Review concludes that the current differences between the Bank’s liquidity insurance facilities and those of the ECB and the Fed, do not undermine the Bank’s ability to meet its core objectives. Neither has it given rise to ‘liquidity tourism’ where banks access facilities of other central banks offering more attractive terms. This likely relates to banks’ concerns about their ability to swap non-sterling borrowings back into sterling in stressed conditions. The Bank should nevertheless remain focused on this possibility and continue to monitor developments in this area. (See paragraphs 330-332 in **Chapter 10**.)

Recommendation 17

‘Stigmatisation’, whereby financial institutions will not approach the central bank for assistance for fear of being regarded by the market as weak, appears to be a substantial problem in money markets across the world. Although this problem is not unique to the UK, we recommend that the Bank of England place particular emphasis, in its further reforms of its money market operations, on measures to deal with stigmatisation.

Assessment

- A13. Some of the reforms made to the Bank’s SMF have been designed specifically to tackle stigma, such as the repositioning of the OSFs, and the change to disclosure arrangements for usage of its facilities. Indeed, stigma was one of the key concerns of the Bank when designing the Special Liquidity Scheme (SLS), and a number of measures were taken to help manage the risk that the SLS became stigmatised (see **Box 6** in **Chapter 5**).
- A14. However, it appears that the DWF in particular remains heavily stigmatised, and we conclude that there is likely to be a cost attached to that stigma. This Review makes suggestions to address this issue with some specific proposals the Bank may consider to deal with such stigmatisation in **Chapter 11**.

Annex 3 – Development of the Sterling Monetary Framework

- A1. In May 2002, the Bank released an updated version of its paper describing the arrangements for its money market operations (the *Red Book*). At this time, the primary aim of the Bank's operations in the sterling money markets was "to implement the Monetary Policy Committee's (MPC's) interest rate decisions while meeting the liquidity needs, and so contributing to the stability, of the banking system as a whole." The framework also included aims to "promote sound practices, to encourage the development of private sector markets in which banks and other market participants can manage liquidity and foster efficiency and competition in these markets." This reflected the Bank's three core purposes at that time: "maintaining the integrity and value of the currency, maintaining the stability of the financial system, and seeking to ensure the effectiveness of the UK's financial services."
- A2. The Bank used its daily operations to meet the liquidity demands of the banking system. If normal market mechanisms became impaired, the Bank's operational deposit taking and open market operations (OMOs) would be used to intermediate between banks with liquidity shortages and surpluses.
- A3. In 2003, the core purposes of the Bank were amended to "ensuring monetary and financial stability". In October 2003, the Governor announced a review of the Bank's operations in the sterling money markets, including their objectives, to bring them into line with the revised core purposes, and the implications for markets and the wholesale payment systems that support them. This mainly highlighted a desire for greater stability in sterling overnight interest rates. But it also recognised that the Bank's operations at this time made no provision for banks to change the level of reserves they held as part of their liquidity management. Indeed as reserves were unremunerated, banks were incentivised to minimise their holdings such that in practice they could not draw on reserves in order to meet intraday liquidity needs. At this time, incomplete access to the operations meant they could not be used by many banks. Furthermore, the liquidity management of the framework did not include arrangements for liquidity provision beyond the Bank's forecast of the system's demand, even in extraordinary circumstances.
- A4. Following a period of consultation, the framework was redesigned in May 2006.⁵⁶ The main changes included: remunerating reserves; allowing banks to choose their own targets for reserves; introducing a maintenance period over which reserves targets would be held on average; scheduling OMOs to correspond to MPC decision dates; and widening access to the Bank's facilities.
- A5. In August 2007, the interbank money markets became impaired with overnight secured rates spiking 44bps over Bank Rate. The Bank was approached by banks asking for an injection of additional reserves to help bring rates under control, as well as additional measures, including lending at longer maturities, without a penalty rate and against a wider range of collateral, to help banks manage their longer term liquidity in the light of the closure of some

⁵⁶ The 2006 version of the *Red Book* is available at <http://www.bankofengland.co.uk/markets/Documents/money/publications/redbook0506.pdf>

key funding markets. The Bank was reluctant to meet these requests, arguing that the banking system as a whole could ask for more reserves at the beginning of the next maintenance period by setting higher reserves targets; was strong enough to fund the assets of their conduits and vehicles that had become impaired; and that market liquidity would return to asset-backed securities (ABS) markets. In taking this position, the Bank sought to avoid incentivising banks to take on imprudent risks by making clear that the Bank did not provide a liquidity backstop on demand and that banks should undertake to manage their own liquidity requirements prudently.

- A6. At the start of the September 2007 maintenance period, the banks raised their reserves targets by around 6% and the Bank changed its stance, noting that if the secured overnight rate did not fall from its higher-than-usual level above Bank Rate, the Bank would be prepared to offer additional reserves, amounting to 25% of the aggregate reserves target. These were supplied on 18 September following the run on Northern Rock and its drawing on Emergency Liquidity Assistance (ELA). On three other occasions in 2007/8 the Bank provided additional reserves within a maintenance period and widened the ranges around reserves targets from 1% to as high as 60% to accommodate these additional reserves.
- A7. In September 2007, the Bank also announced Term Auction operations to provide a fixed amount of three-month liquidity against wider collateral, though these were not taken up. A penalty rate (Bank Rate +100bps) was used in the operations to guard against moral hazard.
- A8. Amidst ongoing stress, in December 2007, the Bank enlarged its regular three-month repo operations and extended the range of collateral that would be eligible, relabeling them Extended Collateral Long-Term Repos (ELTRs). At its peak, the Bank provided around £180bn in these operations. In October 2008, the Bank began to issue one-week Bank of England bills in order to drain the additional reserves from ELTRs for monetary policy purposes.
- A9. In April 2008, the Bank introduced the Special Liquidity Scheme (SLS), enabling banks to swap legacy mortgage-backed and other securities for UK Treasury bills. And in September 2008, the Bank began conducting US dollar repo operations as strains emerged in the foreign exchange (FX) swap market.⁵⁷
- A10. The Bank had for some time allowed banks to ‘pre-position’ collateral for use in its operations, though this had rarely been used. But this became more common once a wider range of collateral became eligible in the ELTRs, not least to provide some surety that this collateral would indeed be eligible in a crisis situation when a time-consuming approval process could reduce the expediency with which liquidity was provided. Such pre-positioning became a required element of the SLS with banks also typically drawing down on the pre-positioned collateral over a period of time to spread out the subsequent maturities.
- A11. In October 2008, the Bank consulted on refinements and additions to its published framework and set out three major reforms:

⁵⁷ The impact on the Bank’s balance sheet following these changes is described in detail in Paul Fisher’s speech “The Bank of England’s Balance Sheet: Monetary Policy and Liquidity Provision during the Financial Crisis”, November 2009 <http://www.bankofengland.co.uk/publications/Documents/speeches/2009/speech413.pdf>

- a. amending the terms of the existing standing lending facility to underline its purpose as a monetary policy tool and to manage frictional payment shocks;
- b. the establishment of the Discount Window Facility (DWF) allowing banks to borrow gilts and Treasury bills against a wide range of collateral providing backstop liquidity; and
- c. proposals for reforming the auction design of long-term repo operations to lend funds against different types of collateral depending on the degree of stress in the system.

Pre-positioning of collateral was encouraged for the DWF and has become a key element of its use as a contingency measure.

- A12. In January 2009, the Chancellor authorised the Bank to set up an Asset Purchase Facility (APF) to buy high-quality assets with the aim to improve liquidity in credit markets and as a tool the Monetary Policy Committee (MPC) could use for monetary policy purposes. Purchases of commercial paper (CP) began in February and corporate bonds in March. Following the MPC's March 2009 meeting, the Bank announced it would use the APF to undertake Quantitative Easing (QE) through large-scale purchases of gilts funded by the creation of reserves.
- A13. In March 2009, following the introduction of asset purchases, the Bank suspended reserves averaging and voluntary reserves targets. All reserves balances were remunerated at Bank Rate effectively moving the Bank to what is known as a 'floor' system.
- A14. In autumn 2009, the Bank adjusted its reserves account requirements in order to allow a broader range of banks to make use of reserves accounts for their liquidity requirements. This was in response to the Financial Services Authority (FSA) setting out its policy on strengthening liquidity standards, including guidance to banks on holdings of liquid assets, in October 2009.
- A15. Having been flagged in the October 2008 consultation, in June 2010 the Bank introduced its Indexed Long-Term Repo (ILTR) operations, replacing its ELTRs. These allowed banks to bid for reserves against either narrow or wider collateral. Banks' ability to bid at different prices against different types of collateral provided information to the Bank about the degree of stress in the banking system. One in three operations would also be for a maturity of six months, rather than the three months of ELTRs, partly reflecting the reduced value of shorter term funding in light of the new FSA liquidity regulations.
- A16. In December 2010, the permanent changes to the framework over the previous three years were reflected in a revised *Red Book*. The aims and objectives of the framework were confirmed as to: (i) implement MPC decisions in order to meet the inflation target; and (ii) reduce the cost of disruption to the liquidity and payment services supplied by banks to the UK economy. This was the first *Red Book* to explicitly outline the Bank's role as a backstop provider of liquidity to individual, creditworthy institutions and to the banking system as a whole and the terms of the facilities through which it would do this.

- A17. The *Red Book* stated that liquidity insurance would ordinarily be provided to the banking sector alone given the crucial role of banks in the payment system: borrowers rely on banks for provision of liquidity insurance. The 2010 framework also noted that capital markets are important sources of liquidity and recognised that the Bank could provide liquidity to capital markets by acting as a market maker of last resort (MMLR).
- A18. In April 2011, in recognition of developments in its risk management capability, the Bank announced it would begin accepting portfolios of raw (that is, unsecuritised) loans as collateral in the DWF, greatly increasing the proportion of banks' balance sheets eligible as collateral against borrowings from the Bank.
- A19. Against a backdrop of market stresses stemming from the Eurozone, in December 2011, the Bank added an additional market-wide liquidity facility to its framework to provide reserves against pre-positioned DWF collateral on an auction basis. This Extended Collateral Term Repo (ECTR) facility would be activated at the Bank's discretion in response to actual or prospective market-wide stress of an exceptional nature. In June 2012, amidst concerns around the Eurozone, the Bank activated the ECTR announcing it would undertake £5bn monthly operations for six-month funding until further notice. In recognition that the circumstances of activation were outside of the banks' control, the minimum bid rate in the operations was reduced from the earlier-announced 125bps over Bank Rate to a relatively less penal rate of 25bps over Bank Rate.

Annex 4 – Policy rate implementation by other central banks

<p>US Federal Reserve (Fed)</p>	<p>US depository institutions are required by the Fed to hold reserves in relation to the size of their deposit liabilities with Federal Reserve banks. Interest is paid on these required reserves.</p> <p>The Fed seeks to achieve an overnight interest rate in the Fed Funds (collateralised lending) market in line with the Federal Open Market Committee's (FOMC's) policy rate objective. It does this through open market operations (OMOs) conducted by the Federal Reserve Bank of New York with its primary dealer (government securities dealers) counterparties on a daily basis to supply reserves to the banking system and thereby influence the interest rate paid on reserves in the interbank market.</p> <p>Banks' demand for reserves in the Fed Funds market comes from their need to meet their reserves requirements and also ensure they have adequate balances to cover payments and settlements processed by the Fed.</p> <p>In normal times, the system operated under a "structural deficiency" such that the permanent supply of reserves balances (from securities purchases) is somewhat less than the total demand with additional temporary reserves (provided by repos) used to meet the desired level. The discount window is a standing lending facility to provide additional reserves at a rate above the target policy rate acting as a cap to market rates.</p> <p>Since October 2008, the range of programmes introduced to provide liquidity to the financial system increased the level of reserves balances supplied by the Fed and acted to push down the market interest rate paid on these balances. As a result, the Fed began to remunerate excess reserves held by banks. This rate paid on excess reserves acted as a floor to rates that would be paid in the market. Currently required and excess reserves are remunerated at the target policy rate such that the Fed is effectively operating under a 'floor system'. The onset of Quantitative Easing (QE) policies has meant this excess of reserves beyond banks' requirements has continued.</p> <p>Reserves requirements rarely change and are no longer seen as a tool of monetary policy.</p>
<p>European Central Bank (ECB)/ Eurosystem</p>	<p>Eurozone banks are subject to minimum reserves requirements that relate to various elements of each bank's balance sheet. Compliance with the reserves requirement is determined on the basis of the institution's average daily reserves holdings over a maintenance period of around one month. Required reserves holdings are remunerated at the average rate paid on the ECB's weekly OMOs over the maintenance period, usually the policy rate.</p>

	<p>The Eurosystem operates a “structural liquidity shortage” for reserves with some permanent supply of reserves provided by securities purchases, but mainly providing reserves on a temporary basis through repo. Reserves are provided through OMOs, typically the weekly one-week main refinancing operations (MROs) undertaken by the National Central Banks (NCBs). Longer term refinancing operations are conducted monthly with a maturity of three-months to provide additional longer term reserves and may also be conducted at irregular intervals and varying maturities. The Eurosystem also uses fine tuning operations on an ad hoc basis to manage fluctuations in demand for reserves that may occur during a maintenance period.</p> <p>Standing facilities for overnight deposits and loans are used to: absorb overnight liquidity fluctuations during a maintenance period; signal the general monetary policy stance; and constrain overnight market interest rates.</p> <p>Banks typically attempt to meet their reserves requirement early in the maintenance period which can lead to market rates being high early in the maintenance period before gradually falling. Currently, excess reserves from long-term repo operations (LTROs) have made the standing deposit rate the binding rate in the market.</p>
<p>Bank of Japan (BOJ)</p>	<p>The BOJ use OMOs to control the amount of reserves in the banking system in order to bring the unsecured overnight rate in line with their target policy rate. Demand for reserves comes from banks’ reserves requirements.</p> <p>The BOJ conduct OMOs daily to manage the excess or shortage of reserves relative to demand. OMOs involve outright purchase of assets as well as fixed and variable rate repos at various maturities. The BOJ operate with a large number of counterparties including domestic and foreign banks and securities companies.</p> <p>The BOJ use a standing lending facility to provide reserves at the official discount rate at the request of counterparties, this is designed to act as a ceiling to overnight market rates. The BOJ operates a standing deposit facility for overnight reserves with the rate designed to act as a floor to overnight market rates. Balances exceeding required reserves are remunerated by the standing deposit facility.</p>
<p>Norges Bank</p>	<p>The Norges Bank supplies reserves at the policy rate and acts to ensure that the total supply of reserves is sufficient to keep overnight interest rates close to the policy rate. Banks hold reserves for short-term liquidity needs relating to payments and settlements.</p>

The Norges Bank recently began to issue banks with a quota of reserves that would be remunerated at the policy rate with any excess reserves remunerated at a lower rate. The quota levels were initially set at a point below the level banks had previously demanded, and will continue to be calibrated with the aim of gradually reducing reserves held at the central bank to encourage banks to establish liquid asset portfolios to manage their liquidity risk rather than rely solely on central bank reserves. As market lending and borrowing incentives are somewhat asymmetric – lenders are incentivised to lend in the interbank market to avoid a lower rate at the central bank whilst borrowers can still borrow from the central bank at policy rate – the market rate tends to be in equilibrium slightly below the policy rate.

Annex 5 – DWF options

- A1. This annex explores some of the issues around the potential structure of Discount Window Facility (DWF) options. The exact calibration of the various parameters would need to be decided by the Bank, but we set out some of the considerations that should feed into that analysis.

Auction

- A2. Using an auction to sell DWF options would help remove some of the concerns around the DWF being a bilateral facility. For example, the Bank could offer DWF options in a monthly or quarterly operation, the frequency in part being determined by the term of the option. There would be merit in having reasonably frequent operations to allow banks to change their liquidity insurance requirements in response to developing market conditions. The Bank could always add an auction outside of the prescribed schedule should circumstances merit.
- A3. Option auctions would ideally be unlimited such that the Bank was not artificially constraining the amount of liquidity insurance it would provide. Banks would then be free to choose how much liquidity they want to hold in the form of DWF options in the certainty that they will receive their desired allocation.
- A4. An unlimited auction would need to be at a fixed rate. An unlimited, fixed rate format is not really a true auction, as the auction is not being used to regulate the quantity of options provided, or their price. But banks are likely to take comfort from the fact that they would be accessing the facility as a group, rather than on an individual basis. This is similar to the behaviour observed in the European Central Bank's (ECB's) Long Term Repo Operations (LTROs), which are also unlimited size, fixed rate auctions.

Structure of options

- A5. The options would need to be time-limited, so that they could only be exercised over a fixed period and would entitle the bank to make a DWF borrowing for an agreed term at an agreed rate during that fixed period. For example, an option could be able to be drawn any time within three months of purchase and provide a one-year DWF drawing, with early repayment possible at any point.
- A6. Under an options approach, solvency and viability (S&V) would need to be assessed at the point of entering into the option contract, not the point the option is exercised. This is to give banks certainty that they would be able to draw should they need to do so, allowing them to factor the liquidity insurance into their planning. The Bank should not be able to refuse a drawing unless the bank failed to provide adequate collateral or if the bank's regulator revoked its license to operate as a bank (if, for example, the bank failed to meet its 'threshold conditions'). The Bank would therefore need to be content with the S&V of a bank over the total of the exercise period and the subsequent potential maturity of the loan. In the example above, this would mean the Bank would need to be content from an S&V

perspective to enter into a 15-month contract with a bank. This is conceptually identical in nature to the exposure the Bank takes when it enters into any other term operations.

- A7. A short exercise period would help ensure banks regularly review their need for options and force them to participate regularly in auction operations.
- A8. The Bank may wish to consider auctioning options with different maturities. But having at least some options available with at least one-year maturity would seem sensible to provide banks with a meaningful level of maturity transformation to support their onward provision of liquidity insurance to the wider economy as discussed in **Chapter 8**.

Pricing

- A9. The options would have both an upfront option fee for buying the option and an exercise price at which a bank could draw from the DWF upon exercising the option. Below we set out some thinking of how to price these appropriately. In particular, the pricing should be designed to:
 - a. Position DWF options as a viable alternative to buying liquid assets as self-insurance, such that banks have an incentive to regularly purchase some amount of options and factor usage of those options into their liquidity planning.
 - b. Avoid the Bank becoming a lender of first resort to the banking system, with the potential consequence of banks becoming dependent on the central bank for all their liquidity needs.
 - c. Incentivise banks to exercise some portion of the options purchased in order to have regular usage of the DWF.
 - d. Provide an income stream to reflect the public sector cost of providing liquidity insurance to the banking system.

Upfront Option Fee

- A10. The upfront option fee is designed to compensate the Bank for the value of the insurance provided to the individual institution, and incentivise holdings as an alternative to other eligible liquid assets. In the insurance world, pricing is usually linked to the probability that the insurance will be drawn upon, i.e. that the insurer needs to pay out, in order to guard against adverse selection. While this is more difficult to achieve in financial liquidity insurance, the closest analogy would be to have the option premium be a function of some risk or solvency rating. A risk-based approach has some appeal but may not be advisable for several reasons. First, banks' exposure to systemic liquidity risk is similar. Second, microprudential liquidity regulation should materially reduce the differences in exposure across UK banks. Third, if the premium was set in relation to a bank's remaining liquidity risk, this would in fact incentivise further self-insurance – the very effect we are seeking to avoid. As such it may be more appropriate, and simpler (for communication and from banks to factor into their liquidity management), to have a flat per unit upfront fee for the options.⁵⁸

⁵⁸ A crude link between the fee and solvency risk would be maintained if the Bank chose to have a second tier DWF facility with more penal pricing.

- A11. The upfront option fee would be set to incentivise banks to hold DWF options instead of holding excess levels of self-insurance in the form of other liquid assets. This may be achieved by setting the upfront option fee at or below the cost to a bank of holding a liquid asset – effectively the cost of carry between a bank’s unsecured funding costs and the return on liquid assets over a similar maturity. When determining that upfront fee, it will also be important to factor in the exercise price; banks will consider the all-in-cost of using these options – that is, the upfront fee and exercise price together – when deciding how many to purchase. A higher exercise price would, other things being equal, mean the upfront fee would need to be lower to incentivise banks to purchase the same amount of DWF options.
- A12. As market pricing varies over time and between banks, it would be preferable to fix the upfront option fee, based on some measure of banks’ long-term, non-stressed costs of holding liquid assets. As stress increases, and banks’ funding costs rise relative to gilts, this would mean the options became relatively cheaper, incentivising increased option purchases relative to liquid asset holdings. This counter-cyclical behaviour would act in the desired way to smooth banks’ reaction to stressed conditions by giving them more insurance in times of stress and therefore less incentive to reduce their liquidity provision to the wider economy.
- A13. Such a pricing structure should be feasible. The cost to the Bank of providing liquidity insurance to banks is materially less than the cost to banks of self-insuring. Our rough estimates suggest this difference could currently be as much as 2.00% p.a., representing the difference between banks’ term funding costs and the yield on gilts or Bank reserves they would otherwise hold. The DWF option premium would likely fall in a range that would allow some of that saving to be retained by the banks and the rest paid to the Bank through the upfront option fee.

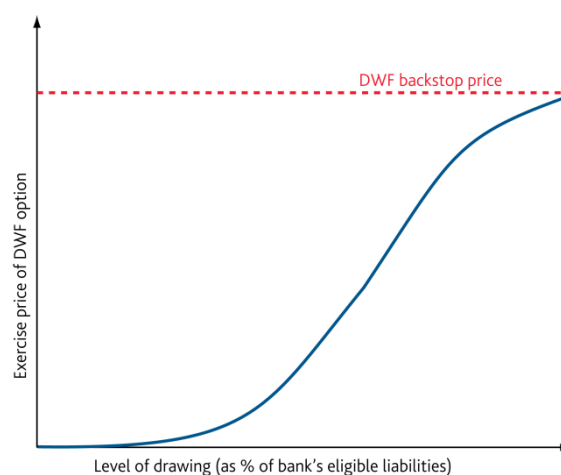
Exercise Price

- A14. In setting the exercise price, the Bank would aim to balance the incentive to encourage some portion of the DWF options to be exercised, to create regular usage of the DWF, but also seek to avoid excessive usage such that the Bank becomes the exclusive provider of short-term liquidity to the banking system.
- A15. This would suggest that the exercise price should be low for low levels of usage and higher for greater usage relative to the size of the institution. Whilst not perfect, Sterling Eligible Liabilities (ELs) are a crude measure of an institution's size and used here for illustrative purposes.⁵⁹ Ideally, the exercise price would use a continuous pricing spectrum to avoid introducing trigger points where stigma could be introduced as discussed in **Chapter 6**.
- A16. **Figure 4** below shows a possible pricing schedule. At low levels of usage the cost of exercising options should be attractive to banks. The slope of the pricing schedule then increases, providing a low marginal cost of additional use, but increasingly encouraging banks

⁵⁹ ELs were originally a monetary policy concept – funds available for sterling lending – calculated by adjusting sterling deposit liabilities for various factors. Due to the various adjustments, some banks have negative ELs. For liquidity insurance purposes there may be a much better measure of size, related more directly to a firm’s provision of liquidity services.

to use private funding markets for larger liquidity needs. Finally, the pricing schedule levels off as it approaches the DWF backstop price. The Bank would need to calibrate at which point the schedule meets this backstop price. Currently, the price of DWF drawings steps up once a bank's usage goes above 10% of its ELs, and it may be that this is the appropriate level.

Figure 4: DWF Option Pricing Schedule



- A17. The level of the exercise price would ideally be set relative to the price at which banks could fund the assets eligible in the DWF in private transactions.⁶⁰ Banks would only be expected to exercise the options voluntarily if the price was below this alternate cost of funds. A sufficient part of the pricing schedule would need to be below this price in non-stressed conditions to incentivise drawings in adequate size to regularise usage of the DWF, thereby making extraordinary usage less recognisable. And the overall schedule should not be set at such a high level as to deter banks from factoring usage of the options they have purchased into their liquidity planning.
- A18. As with the upfront option fee, ideally the exercise price schedule would be fixed, rather than constantly varying with market prices. This would be consistent with the DWF's role as a backstop facility; exercising the options would become relatively cheaper in stressed conditions. Pricing certainty would also help banks factor use of the facility more easily into their planning.

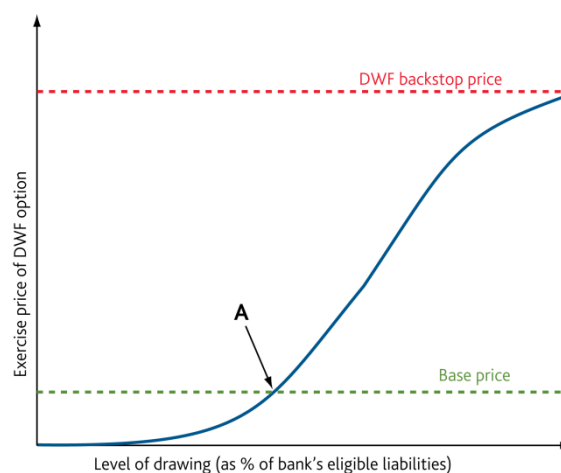
Incentivising the purchase of options for liquidity management

- A19. Ideally banks would purchase sufficient options to manage their tail-risk liquidity needs. But there is a danger that an exercise price schedule that increases in line with the size of drawings means banks only purchase the 'cheap' options that they intend to exercise as part of their regular funding, rather than factoring in an ability to draw against more expensive options in times of stress.

⁶⁰ In practice, the market for such transactions is small at the maturities offered by the DWF. So an easier, if slightly more conservative comparator may be a bank's unsecured funding cost less the cost of raising cash from the gilts they would receive on exercising the option.

- A20. One way to avoid this would be to allow only a portion of the options purchased to be exercised below a set price – the ‘base price’ in the diagram below. The base price might be set at some point close to but below the price at which even the most highly rated banks can borrow in the market, such that all banks would be incentivised to draw at this price, making the DWF part of normal operations and creating a level of background usage of the facility.
- A21. But in order to benefit from funding at the favourable base price, banks would need to hold more options than they can exercise at this price, i.e. they would have to buy some options they could only exercise at more expensive pricing as well. For example, assume banks could exercise a third of their options at or below the base price, and the base price was set on the pricing schedule to correspond to 3% of ELs (point A in **Figure 5**). If a bank with £10bn ELs held £900mn options, it could exercise £300mn of these at or below the base price. If it only held £600mn options, it could only exercise £200mn of those below the base price, even though its pricing schedule for drawings between £200mn and £300mn was below this price purely on the basis of its ELs. If it wanted to exercise, say, £250mn of its options, £50mn of that would be charged on the higher part of the pricing schedule. In buying fewer options, the bank would have restricted their ability to access funding at the favourable price.
- A22. The ability to make drawings below the base price should help to incentivise banks to buy, and regularly exercise, DWF options. But limiting the proportion of drawings at this price would prevent the facility being used by some banks solely as a source of cheap funding, and ensure that each bank that bought options was truly buying an element of liquidity insurance for stressed times.

Figure 5: Pricing Schedule with Base Price



Cost comparison with current provision of DWF liquidity

- A23. It would be difficult to calculate the appropriate pricing for the upfront option fee and exercise price to reflect the risk to the public sector. But it is possible to look at what the structure of an upfront fee framework may need to look like to provide the same expected cost as the current framework.

- A24. Currently, the DWF may be drawn upon by a bank when it is in trouble. If we assume that every ten years a bank gets into difficulties and needs £30bn of liquidity for six months, then based on a 200bps drawing fee this equates to a payment to the Bank of £300mn over that ten-year period for providing the DWF.
- A25. To raise a similar amount over ten years, the Bank could sell 30,000 DWF Options (exercisable for one year, to draw £1mn for at least six months) each year for ten years at 8.75bps each, raising £262.5mn. The remaining £37.5mn would be raised from an exercise price of 25bps on 30,000 of the options for a period of six months. If options were also regularly exercised over this ten-year period, this would raise more fees so the upfront option fee and/or exercise price could be lower to raise the same amount.

Disclosure issues

- A26. Over time banks may hold and exercise a stable level of options. Any disclosures around option purchases or DWF drawings would then be reasonably stable and so any higher purchases or usage, particularly if it coincides with a particular bank's funding issues, may then act as a signal of distress. Stigma may then remain such that banks may be wary of altering their regular usage for fear of giving a negative signal. As a result, some element of compulsory DWF usage may still be necessary to create some desirable degree of volatility in its usage.

Annex 6 – Glossary

ABCP	Asset-backed commercial paper
ABS	Asset-backed security
ALCo	Asset and Liability Committee
APF	Asset Purchase Facility
ARCo	The Audit and Risk Committee of Court
The Bank	The Bank of England
Bank of England bills	Own-name sterling bills issued by the Bank from October 2008 to drain reserves from the market.
Bank Rate	The Bank of England’s key policy rate as determined by the MPC. The rate at which reserves are remunerated in the current SMF.
BOJ	Bank of Japan. The central bank of Japan.
CBO	Collateralised Bond Obligation
CCP	Central Counterparty
CGS	Credit Guarantee Scheme
CLO	Collateralised Loan Obligation
CMBS	Commercial mortgage-backed security
Collateral swap	A feature of some Bank facilities, such as the SLS and the DWF, in which counterparties exchange one type of security – for example, a mortgage-backed security – for another, more liquid security, for example a UK Treasury bill.
Constructive ambiguity	Used to describe an element of uncertainty which central banks can introduce into their provision of liquidity support, often intended to maintain pressure on banks to act prudently, since they will not know for certain whether, or on what terms, liquidity support will be provided in future.
Court	The Court of Directors of the Bank, responsible for managing the affairs of the Bank, other than the formulation of monetary policy.
CP	Commercial Paper
CPF	Commercial Paper Facility – a facility offered under the APF.

CRDs	Cash Ratio Deposits
Credit rating agencies	Private companies that assign credit ratings.
The Crisis	Used in this Review to refer to the period of financial market instability from the middle of 2007 to the present day.
DMO	Debt Management Office
DWF	Discount Window Facility
ECB	European Central Bank. The central bank for the euro area.
ECTR	Extended Collateral Term Repo
ELs	Eligible Liabilities. A measure of the sterling liabilities of banks or building societies.
ELA	Emergency Liquidity Assistance. Liquidity support provided outside the Bank's published framework.
ELTR	Extended Collateral Long-Term Repo
Executive	Used to describe the Governors and Executive Directors of the Bank, who together are responsible for the executive management of the Bank.
Fed	Federal Reserve System. The US central bank system.
Floor System	A system for implementing monetary policy decisions where the policy rate provides a floor to interbank money market rates.
FLS	Funding for Lending Scheme
FOMC	Federal Open Market Committee. The committee within the Federal Reserve System that determines the appropriate stance of monetary policy.
FPC	Financial Policy Committee
FSA	Financial Services Authority
FX Swap	Foreign exchange swap
Governors	The Governor and Deputy Governors of the Bank.
Haircut	The difference between the current market value of an asset that is being used as collateral, and the amount that the Bank is willing to lend against it.

HMT	Her Majesty's Treasury
ICB	Independent Commission on Banking
ILAS	Individual Liquidity Adequacy Standards set by the FSA.
ILG	Individual Liquidity Guidance. Part of the ILAS regime.
ILTR	Indexed Long-Term Repo
LIBOR-OIS	Spread between London Interbank Offered Rate and the Overnight Index Swap rate
Liquidity tourism	Attempts to arbitrage differences in central bank liquidity provision policies.
LTRO	Longer Term Refinancing Operations, run by the ECB.
Maintenance period	The period between MPC policy decisions, over which the MPC sets Bank Rate.
Maintenance requirement	A requirement for a bank to hold a particular amount of reserves, usually over the maintenance period.
Market Abuse Directive	A European Commission Directive that forms the basis of the European framework to tackle market manipulation and insider trading.
MMLR	Market Maker of Last Resort
Moral hazard	In the context of this Review, this refers to the risk of creating incentives for individual banks to undertake riskier activities because of the presence of a central bank backstop.
MPC	Monetary Policy Committee
MROs	Main Refinancing Operations. Short-term OMOs run by the ECB.
OIS	Overnight Index Swap
OMO	Open Market Operations
Operational Standing Deposit Facility	A facility within the SMF which allows participating institutions to deposit reserves directly with the Bank on a bilateral basis throughout each business day.
Operational Standing Lending Facility	A facility within the SMF which allows participating institutions to borrow reserves directly from the Bank on a bilateral basis throughout each business day against high-quality, highly liquid collateral.

OSFs	Operational Standing Facilities, comprising the Operational Standing Deposit Facility and the Operational Standing Lending Facility.
Payment system	A system enabling the transfer of funds between parties.
PRA	Prudential Regulation Authority
QE	Quantitative Easing
Raw loans	Loans that have not been securitised.
RBA	Reserve Bank of Australia. The central bank of Australia.
<i>Red Book</i>	The publically-available document that sets out the framework for the Bank's operations in the sterling money markets.
Repo	A contract in which the seller of securities agrees to buy them back at a specified time and price.
ResCo	Resolution Committee
Reserves	Balances held by commercial banks and building societies at the Bank. The ultimate settlement asset in the UK economy, used as a medium of exchange between banks for clearing and settlement purposes.
Reserves averaging	A system under which banks have a target for their reserves balances that they must meet on average over the maintenance period. There is normally a charge if their average reserves balance falls outside a range around their target.
Reverse Repo	A purchase of securities with an agreement to resell them at a specific future date.
RMBS	Residential mortgage-backed security
S&V	Solvency and viability
SLS	Special Liquidity Scheme
SME	Small and Medium-sized Enterprise
SMF	Sterling Monetary Framework
SRR	Special Resolution Regime
Standing Facilities	The predecessor to the Operational Standing Facilities.
Tail risk	An outcome perceived to have a very low probability of occurring.
TC	House of Commons Treasury Committee

Threshold conditions	Minimum standards which an institution needs to meet in order for the FSA to allow it to continue undertaking a regulated activity – in the case of the examples in this report, deposit taking.
Voluntary reserves targets	A form of reserves targets for banks, in which banks themselves choose their own targets for reserves.