



BANK OF ENGLAND

The Development of the Bank of England's Market Operations

A consultative paper by the Bank of England

October 2008



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This paper sets out developments in the Bank of England's market operations.

It is being issued for public consultation. Comments are invited and should be sent by 27 November 2008 to:

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Further copies of the paper are available on the Bank's website at www.bankofengland.co.uk, from the above address and email, and by telephone 020 7601 3187 or fax 020 7601 5810.

The Bank stands ready to discuss these issues with interested parties.

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I Introduction

1 This paper sets out recent and proposed developments in the Bank of England's market operations. It is issued for public consultation and asks for comment from interested parties on a number of specific issues.

2 The main objective of the Bank's sterling money market operations is to implement monetary policy by stabilising very short-term interest rates in line with its policy rate, Bank Rate, set by the Monetary Policy Committee. In the stressed market conditions prevailing since Summer 2007, the Bank has utilised contingency measures set out in its *Red Book*⁽¹⁾ to achieve that goal, taking into account that banks have been unwilling to make use of the standing lending facility for fear that it would be misunderstood as a sign of financial weakness.

3 In addition, in common with other central banks and sometimes in conjunction with them, the Bank has deployed other measures to provide financing to, and so underpin confidence in, the commercial banking system. The Bank's regular three-month repo operations have been enlarged, and extended to include lending against a wide range of collateral, including in particular residential mortgage-backed securities. In addition, in April 2008 the Bank introduced the Special Liquidity Scheme (SLS), enabling banks to swap some mortgage-backed and other securities for UK Treasury bills. The SLS window is due to close on 30 January 2009, but the swaps may be outstanding for up to three years. And, on the back of a swap with the Federal Reserve Bank of New York, the Bank has conducted US dollar repo operations since September 2008.

4 In the light of experience over the past year, the Bank has concluded that it should make some refinements and additions to its published framework of permanent facilities. To that end, this paper sets out three major reforms:

- (i) Amending the terms of the existing standing lending facility to underline that it exists to absorb technical problems in the operation of the very short-term money markets and payment systems and not to provide longer-term financing to stressed firms.
- (ii) The establishment of a Discount Window Facility from which banks will be able to borrow gilts against a wide range of collateral, at fees reflecting the type of collateral and the size of drawing and designed to avoid encouraging imprudent liquidity management in the future.

- (iii) The introduction, after further consultation, of a reformed auction design for permanent long-term repos against some broad classes of collateral, with the auctions designed to lend funds against different types of collateral depending on the degree of stress in the system.

5 The Bank's *Red Book* states the purpose of its operations in the sterling money markets as being to implement monetary policy while meeting the liquidity needs, and so contributing to the stability, of the banking system as a whole. In Section II, this paper elaborates the underlying monetary and financial stability objectives of the Bank's market operations. Those two Objectives are intertwined. The provision of sufficient reserves to meet demand is a necessary condition for both implementing monetary policy and for maintaining financial stability. And underpinning the liquidity of the banking system, and so facilitating its provision of liquidity and payments services to the economy, affects banks' demand for reserves. Together, the Objectives drive the design of the reforms described in later Sections.

6 As the Governor made clear on 8 October, as part of the UK Government's three-part package to address the current crisis, the Bank will extend and widen its current facilities in whatever way is necessary to ensure the stability of the financial system. This paper is not about the range of exceptional operations and facilities currently being offered by the Bank. It is about plans for a permanent framework that will persist once the current crisis has eventually passed.

7 Two of the key elements in that framework are being introduced now. From Monday 20 October the Bank is introducing the Discount Window Facility; and reforming the existing standing facilities to create new Operational Standing Facilities. The detailed terms of these facilities will be set out in a Market Notice to be issued on Monday, consistent with the broad summary set out later in this paper. The other proposals in this paper, including for a revised auction structure for long-term repos, will be introduced in the light of consultation.

(1) *The Framework for the Bank of England's Operations in the Sterling Money Markets*, available at www.bankofengland.co.uk/markets/money/publications/redbookjan08.pdf. This is the January 2008 edition of the *Red Book*. Please note that all references in this document relate to this latest edition.

II Objectives

8 The Bank's market operations have two Objectives, stemming from its monetary policy and financial stability responsibilities as the United Kingdom's central bank. They are:

- (i) To implement monetary policy by maintaining overnight market interest rates in line with Bank Rate, so that there is a flat risk-free money market yield curve to the next MPC decision date, and there is very little day-to-day or intraday volatility in market interest rates at maturities out to that horizon.
- (ii) To reduce the cost of disruptions to the liquidity and payments services supplied by commercial banks. The Bank does this by balancing the provision of liquidity insurance against the costs of creating incentives for banks to take greater risks, and subject to the need to avoid taking risk onto its balance sheet.

Monetary policy

9 The Bank is able to implement monetary policy because there is demand for its monetary liabilities — central bank money. That money is the ultimate settlement asset in the UK economy. It takes two forms: banknotes and banks' balances with the Bank (reserves). Reserves are a risk-free asset of unquestionable liquidity. Just as households use banknotes as a means of payment, reserves are used by banks to settle interbank payments, and as a buffer to absorb unexpected payment flows.

10 The Bank's Monetary Policy Committee (MPC) sets interest rates but does not take decisions on the quantity of central bank money to supply. To implement interest rate decisions, the Bank must, through its market operations, adjust the supply of central bank money in response to changes in the demand for banknotes and reserves, given the MPC's policy rate (Bank Rate). By doing so, the Bank can ensure that short-term market interest rates are broadly in line with the rate set by the MPC.

11 Bank Rate is set each month and the Bank's objective in implementing monetary policy is to ensure not only that overnight rates are in line with Bank Rate but also that they are expected to remain so out to the date of the MPC's next monetary policy decision. Market interest rates with a

maturity within this period are all short, but can nevertheless include premia compensating for credit risk, liquidity risk, and uncertainty. The price of those risks is not something that the Bank tries to influence directly in its operations. Compared to the 2006 *Red Book*, the Bank is now clarifying that it is the *risk-free* yield curve that should be consistent with Bank Rate out to the next MPC decision date.

12 In delivering this Objective, the Bank needs to ensure that the day-to-day needs of the banking system for overnight liquidity are met, in normal and stressed conditions. The framework is therefore designed to accommodate sterling flows between the Bank and the banking system that are not directly related to the monetary framework; fluctuations in banks' demand for reserves at different points of the year, or resulting from changes in their business; pronounced shifts in demand for reserves in the wake of financial system stress; and breakdowns in the infrastructure of the money markets. If the framework could not cater for a wide range of circumstances in which the demand for reserves could change, not only would the resilience of the financial system be impaired but, in addition, overnight rates would be undesirably volatile. The monetary policy and financial stability purposes of the Bank's market operations are therefore intimately linked.

Financial stability

13 Disruptions to the liquidity and payments services provided by the commercial banking system are costly. The provision of liquidity insurance can reduce those costs. But that must be balanced against the incentives for banks to manage the risk of the liquidity of their own balance sheets less carefully in future as a result of that provision. Moreover, it is not part of a central bank's role to take on credit risk arising from the provision of liquidity insurance.

14 Commercial banks provide liquidity to the rest of the economy through the provision of loan facilities and deposit accounts that can be drawn upon on demand or at short notice. Deposits with banks and building societies form the vast majority of the money circulating in the economy for buying goods, services and financial assets. Banks are, therefore, at the core of the payments system supporting all economic activity; and they perform an essential role in facilitating the functioning of the financial markets, many of

which rely on 'market-making' intermediaries having access to funding facilities from the banking system.

15 As well as providing deposit accounts, banks transform those liquid savings into much less liquid loans. In consequence, they run a mismatch between the liquidity of their assets and their liabilities. Banks' 'liquidity transformation' services expose them to the risk of large liquidity needs, especially in the event of a sudden loss of confidence, even if their loan assets are almost certain to generate sufficient income to repay all liabilities over time. Generally, the greater the amount of maturity transformation undertaken by commercial banks and the greater the riskiness of their assets and other business lines, the more exposed they will be to this liquidity risk.

16 When those risks crystallise and confidence in the banking system is fragile, its capacity to provide liquidity to the wider economy can change abruptly, as underlined over the past year. In general, when seeking to restore confidence in their financial strength, banks may reduce the availability of lending to households, who want to borrow to finance house purchase and consumption; and to companies, who want to borrow for investment projects and working capital. In addition, banks may rein in the provision of credit to non-bank financial intermediaries, which can impair arbitrage and market-making and so reduce liquidity in financial markets, which ultimately feeds back to end-users of capital markets — companies and households.

17 By providing liquidity insurance to commercial banks, central banks can help to contain the costs to the wider economy of a crystallisation of the liquidity risks to which banks are exposed.

18 The shocks against which such liquidity insurance may be needed are diverse. Some may arise in normal conditions simply because a bank finds itself short of liquidity in the payments system late in the day, when it may be difficult to find funds as the market thins. Some may arise because part of the financial infrastructure is not working properly and banks find, for example, that they are not receiving payments they expected. Some may arise because of a longer-lasting unexpected change in financial market conditions (such as the sudden loss of liquidity in asset-backed markets in 2007), when time can be needed for banks to adjust to the new environment before resuming the normal provision of liquidity services to the economy.

19 Although the central bank provides liquidity insurance to the banking system, it would be imprudent for banks to rely on that except for short periods or in stressed circumstances. Liquidity management is a major responsibility of the banks themselves. In the normal course of their business, they should insure themselves against liquidity risk in private

markets — for example, by holding a stock of assets that can unquestionably be exchanged readily in the financial markets for cash in anything other than the gravest market distress; by maintaining funding with a prudent maturity structure relative to that of their assets and contingent commitments; and in the case of smaller banks, by buying insurance in the form of completely committed lines of credit from larger banks, alongside holdings of unquestionably liquid assets. Banks earn a return from providing liquidity services, and so make a trade-off in deciding how much liquidity risk to run. But, because of the potential spillover effects described above, the overall social cost of banks' liquidity risks crystallising can be greater than the costs for the individual banks themselves. Liquidity regulation is the primary tool for dealing with that issue, but central banks also give it weight in designing their facilities.

20 In providing access to liquidity insurance, central banks could inadvertently have the perverse effect of reducing banks' incentives to contain their exposures to liquidity risk in the future. By running greater risks, banks might temporarily make higher profits, but the potential costs to the wider economy of their liquidity risk crystallising would increase. This trade-off — between minimising the wider economic costs of liquidity risk, and discouraging banks from taking excessive liquidity risks given the existence of such insurance — cannot be avoided. The Bank therefore needs to take into account the impact of its framework and operations on the collective risk-taking behaviour of the banking system.

21 The Bank intends that the terms of its permanent facilities should underpin incentives for banks to manage liquidity risk prudently, in the long-run interests not only of the banking system but of the wider economy. It is this concern that drives the pricing structure planned for the new Discount Window Facility; and the proposals, on which the Bank is consulting, for the design of the auction mechanism for long-term repos against non-sovereign securities to be included in its permanent operational framework.

22 To protect its balance sheet, the Bank aims to exclude from its operations and facilities any bank whose solvency or viability is seriously in doubt, but otherwise has little discretion to choose the banking counterparties with which it will deal (quite unlike commercial banks dealing among themselves). For these reasons, the Bank needs strong risk controls around the assets it acquires in its operations. In its lending operations, it insists on robust legal agreements with all of its counterparties; takes initial margin (pays less than its valuation of the asset that it buys); revalues the collateral daily; and calls for additional margin if the value of the collateral has fallen by more than a specified amount in the meantime. The Bank would plan to take as collateral only instruments which it believes it could value, and where it

would be capable of managing an outright holding in the event of a counterparty defaulting.

23 Central banks can and do provide liquidity insurance via a wide range of facilities and operations. The Bank provides insurance by offering reserves balances — a prime liquid asset for banks to hold. The system of reserves averaging allows banks to vary their reserves holdings from day to day to absorb payment shocks; and the system of voluntary reserves targets allows banks to exercise their own judgement on the volume of reserves they wish to hold from month to month. The Bank's Open Market Operations provide a means for banks to obtain reserves by borrowing against high-quality collateral (or, exceptionally, to acquire high-quality assets in the form of very short-term Bank of England bills in exchange for reserves); and the standing facilities were designed to provide a buffer to absorb *day-to-day* payment shocks. Beyond that, the Bank can in principle make liquidity available at longer terms and against broader collateral. The Bank has decided to be more transparent about the place of those broader facilities in its permanent framework, including the securities that it will in future accept routinely in exchange for central bank money or other highly liquid assets.

24 In particular, the Bank can provide liquidity insurance by giving banks access to liquid securities, eligible as collateral in its reserves operations and usable in the market, in exchange for other securities that cannot be exchanged readily for cash in the markets. As well as contributing to financial stability, such facilities can potentially reduce the incidence of large and unpredictable shifts in the demand for central bank money, and so help to forestall complications in the implementation of monetary policy.

25 In summary, in a permanent framework for providing liquidity insurance to the banking system, the Bank can help to underpin confidence in the financial system; and, in the event of a renewed episode of severe stress in the future, help smooth the transition of the system to a sustainable path; but on terms that avoid inducing imprudent risk management.

Other considerations

26 In designing the longer-run framework for its market operations, the Bank also takes into account two other considerations.

27 The first is the wish that market operations have broadly neutral effects on relative asset prices, in normal circumstances. In the past, some central banks have occasionally wanted actively to use market operations to influence relative asset prices when the short-term nominal interest rate was very close to zero and deflation threatened, so that the normal monetary transmission mechanism was not operating. The Bank does not rule that out if those conditions

were ever to arise in the United Kingdom, but it is not the subject of this paper.

28 In stressed financial conditions, the Bank's focus is on the financing needed by the banking system. In alleviating liquidity strains through its financing operations, the Bank's actions may in some circumstances have the indirect effect of changing risk premia and so relative asset prices, but in the main that would not be the direct goal. Indeed, as a general matter, the Bank would wish to avoid supporting the value of particular securities artificially; if a particular class of assets were in the future to become less liquid or fundamentally impaired, the Bank would most likely also change its assessment of the value of those securities. Also, although it may lend against securities for which private markets have closed suddenly in order to reduce the wider economic costs of the banking system's necessary adjustment, the Bank would wish to avoid permanently underpinning the existence of markets that were not fundamentally viable.

29 The second consideration is that the Bank wishes to foster competitive and fair sterling money markets. Individual banks obtain the reserves they need not only directly via the Bank's operations but also indirectly via the money markets. It is therefore important that markets are efficient, since the effective distribution of reserves will affect the stability of overnight rates and the ability of banks to manage their day-to-day liquidity position.

30 The wholesale money markets go wider than the interbank market. They are used by a range of other financial and non-financial companies, long-term savings institutions, hedge funds, and others. And within the interbank market are players of very different size and degrees of expertise. It is important that the wholesale market is not distorted, by the exercise of market power or in any other way. That would make the market less efficient for borrowing and placing short-term funds, and by discouraging participation could damage the liquidity of the market itself. The Bank fosters competitive and fair markets in a number of ways, including giving wide access to its facilities and contributing to the market's supporting infrastructure. In addition, it is a condition of access to the Bank's operations that counterparties act in a way consistent with the Bank's objective of achieving competitive and fair sterling markets. Uncompetitive or unfair behaviour could lead to exclusion from the Bank's operations.

Summary of objectives

31 In summary, the Bank's Objectives for its market operations are:

- (i) To implement monetary policy by maintaining overnight market interest rates in line with Bank Rate, so that there is a flat risk-free money market yield curve to the next

MPC decision date, and there is very little day-to-day or intraday volatility in market interest rates at maturities out to that horizon.

- (ii) To reduce the cost of disruptions to the liquidity and payments services supplied by commercial banks. The Bank does this by balancing the provision of liquidity insurance against the costs of creating incentives for banks to take greater risks, and subject to the need to avoid taking risk onto its balance sheet.

32 Against the background of those Objectives, the remainder of this paper sets out the Bank's planned refinements of its arrangements for managing day-to-day liquidity conditions in the overnight markets; and its three major reforms — to the standing lending facility; a new Discount Window Facility; and permanent long-term repos against wider collateral. In each of these areas a section containing an analytical assessment of the issues is followed by a section summarising practical questions on which the Bank is consulting.

III Establishing the overnight rate in the money markets

33 During the past year, a number of questions have been asked about the Bank's framework for implementing monetary policy.⁽¹⁾ These included for example:

- Why the Bank focuses on *overnight* money market rates when many financial contracts are linked to longer-term rates.
- Which overnight rates the Bank particularly focuses on.
- Why the system of reserves averaging is based on banks *voluntarily* choosing a level of reserves to target each month.
- The purpose of the current Standing Facilities to deposit with and borrow from the Bank overnight, given that the lending facility became stigmatised during the turmoil.
- Whether a system, in which the Bank borrowed and lent (against wide collateral) in unlimited amounts at the policy rate, would deliver the Bank's objectives more effectively.
- How the Bank's lending to Northern Rock affected the implementation of monetary policy.
- Why the Bank sometimes needs to drain reserves in its operations.

34 This Section reviews the Bank's framework in order to answer those questions. As such, it draws on material set out in the current *Red Book*, and in consultation papers leading up to the Bank's 2006 reforms, in the light of experience over the past year. Against that background, some proposed technical reforms are outlined for consultation in the following Section.

Why monetary policy is implemented via the overnight rate of interest

35 The first Objective of the Sterling Monetary Framework is to implement monetary policy by maintaining overnight market interest rates in line with Bank Rate, so that there is a flat risk-free money market yield curve to the next MPC decision date, and there is very little day-to-day or intraday volatility in market interest rates at maturities out to that horizon.

36 In common with central banks of other large market economies, the Bank of England sets monetary policy by establishing an interest rate. In the past, by contrast, some monetary authorities implemented policy by setting a path for the quantity of central bank money (reserves) available to the commercial banking system. But experience suggested that short-term interest rates, reflecting the price of central bank money, could then become very volatile and that the transmission of monetary policy through the banking system and other financial markets could be erratic. The Bank accordingly takes the view that a better method of implementing policy is to set a price.

37 That price is Bank Rate, which is the rate paid on reserves balances that commercial banks hold at the Bank overnight. The Bank is risk free, and so Bank Rate is a risk-free overnight rate.

A broadly flat risk-free money market curve out to the next MPC meeting

38 Bank Rate is decided by the MPC for a month at a time. Interest rates beyond the next MPC decision date are determined by the market's expectations of what the Committee will decide in the future. The Sterling Monetary Framework operations are designed, therefore, to have a direct influence on interest rates only for the period for which Bank Rate has already been decided.

39 Out to the next MPC decision date, the short-term money market yield curve should be broadly flat, in line with the policy rate. Interest rates for terms of, say, one and two weeks will be determined largely by expectations of the path of the overnight rate for each day. The Bank's operational framework is, therefore, directed at ensuring that current and future overnight rates are expected to be broadly in line with Bank Rate.

Why the Bank does not target a specific market rate but defines the policy rate as the rate paid on reserves

40 The Bank monitors a range of market overnight rates in order to gauge the transmission of its policy decisions into the money markets, as the first link in the transmission mechanism. This entails identifying the frictions affecting market efficiency that can cause overnight and other very

(1) Notably, by the Treasury Select Committee in 'The run on the Rock', Fifth Report of Session 2007–08, as well as by market participants and academic commentators.

short-term market rates to deviate from Bank Rate, as reviewed in Box A.

41 The Bank is sometimes asked why it does not target a 'benchmark' market rate, for example three-month Libor, to which the rates on many financial transactions are currently explicitly linked. The Bank sees two disadvantages in such an approach. First, as the MPC meets monthly, three-month rates cover long periods for which the policy rate has not yet been decided. Second, term money market rates include premia required by lenders to compensate for credit risk, for locking up their funds for a period, and for uncertainty. In its rate-setting operations the Bank does not aim to control the elements of market rates that reflect risk premia. They are best priced in the market itself.

42 This second reason also explains why, unlike some other major central banks, the Bank does not set policy in terms of a target for a specific *market* overnight interest rate. The risk premia between such rates and the risk-free rate vary over time. Targeting a market overnight rate would, therefore, require the Bank to employ frequent market operations, even in normal circumstances, in order to react to transient, high frequency deviations of market overnight rates from the policy rate.

43 Although the Bank seeks to control only overnight interest rates out to the MPC's next decision date, expectations of the future path of the overnight Bank Rate do, of course, affect the whole structure of market interest rates and asset prices. But market interest rates and asset prices will sometimes, as over the past year, be affected powerfully by changes in risk premia of various kinds. Alongside other financial and real economy indicators, including money and credit quantities, such developments are essentially an input to the MPC's decisions on the path of the risk-free Bank Rate needed to achieve the inflation target over the medium term.

How the Bank's operating framework works

44 In essence the Bank implements the MPC's decisions by paying Bank Rate (the policy rate) on its reserves liabilities and relying on arbitrage to keep market overnight rates broadly in line. That essential feature could be embedded in a number of different frameworks. The Bank's choice between the various possibilities is not primarily determined by their expected effectiveness in controlling short-term money market rates; they would be unlikely to differ much in that respect. The Bank's choice is driven, rather, by other considerations as described in Section II. Box B discusses three other possible systems.

Setting Bank Rate

45 The three main elements of the Sterling Monetary Framework introduced in May 2006 are reserves, standing

facilities and open market operations. They come together to keep overnight and other very short-term rates broadly in line with Bank Rate. Over a month as a whole, a bank's reserves holdings are remunerated at Bank Rate so long as, on average, they fall within a range around the reserves target it has chosen. There is thus a region within which an individual bank has a choice between varying its reserves position at the Bank (at Bank Rate) and financing itself in the market. Outside that region banks may still transact with the Bank, in unlimited amounts, in the Bank's standing facilities (for both lending and deposits) but they do so at less favourable interest rates. The framework accordingly gives banks an incentive to manage their day-to-day payments flows actively, and not simply to rely on the Bank, even in normal or mildly stressed conditions.

46 For the rate-setting objective to be met, the Bank needs to ensure that its (net) supply of reserves is in line with demand. That entails ensuring that banks in aggregate are in the region where their reserves will be remunerated at Bank Rate so that the arbitrage with and between market rates can work correctly. The Bank uses its Open Market Operations (OMOs) to achieve this, relying on the sterling money markets to provide an efficient mechanism for distributing reserves to where they are demanded, and to act as the medium for the arbitrage described above. For that reason, the Bank admits as OMO counterparties regulated firms that are active intermediaries in the money markets; and takes a close interest in the effectiveness of those core markets and the infrastructure underpinning them.⁽¹⁾

Reserves averaging

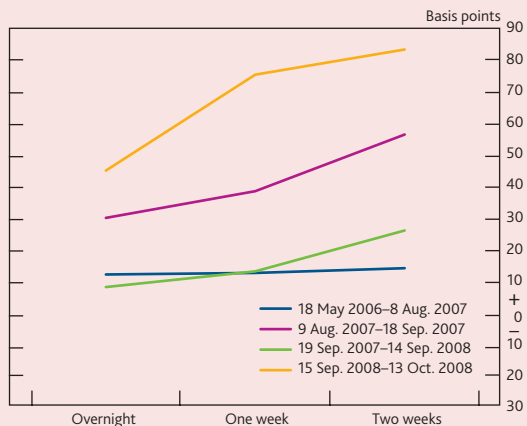
47 Banks that are members of the reserves scheme set targets for their average holdings of reserves over each period between monthly MPC decisions (the reserves 'maintenance period'). Provided that a bank's actual average holding of reserves is within the specified range around its target, those reserves are remunerated at Bank Rate. During a maintenance period a bank can vary its reserves from day to day. If its reserves happen to be low relative to its target on one day, it is not obliged to go into the market to borrow on that day to increase them; it can make good any shortfall relative to its target later in the maintenance period. Indeed, if on any particular day market rates happen to be high relative to the overnight rates that banks expect to prevail later in the maintenance period, banks have an incentive in normal conditions to run down their reserves in order to lend into the market to take advantage of the high rates. Banks' attempts to do this will tend to bring market rates back down again. The same applies when market rates are low. In this way the averaging provisions of the reserves scheme tend to smooth interest rates from day to day. Such transactions will have the

(1) The senior-level forum for consideration of issues relating to the sterling money markets is the Money Markets Liaison Group, chaired by the Bank. The group comprises senior practitioners from the main UK settlement banks, other key money market participants, the main infrastructure providers and the UK authorities.

Box A: Monitoring of money market rates out to the next MPC meeting

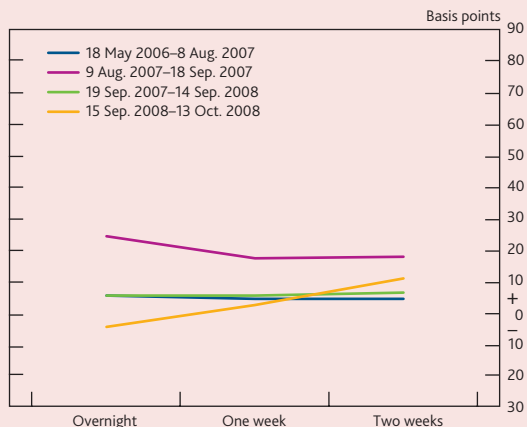
Chart 1 Average short-term money market yield curve relative to Bank Rate^(a)

1.a Unsecured cash^(a)



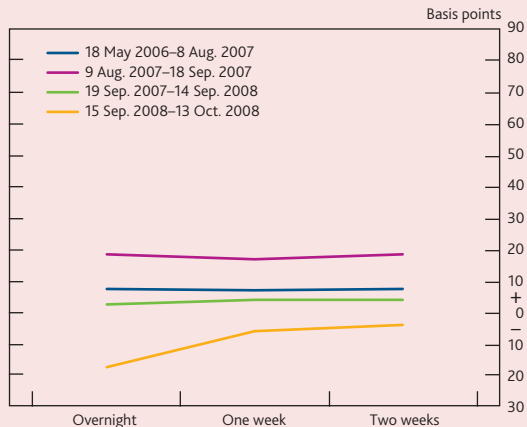
(a) In the chart the period since the introduction of the current Sterling Monetary Framework is divided into subperiods bordered by the onset of market turmoil in August 2007, the Bank's first injection of above-target reserves in September 2007 and the onset of heightened turmoil in September 2008. One-week and two-week calculations exclude transactions maturing after the next MPC meeting.

1.b Gilt repo^{(a)(b)}



(a) See footnote (a) of Chart 1.a.
(b) BBA benchmark rate for general collateral repo.

1.c Overnight index swaps^(a)



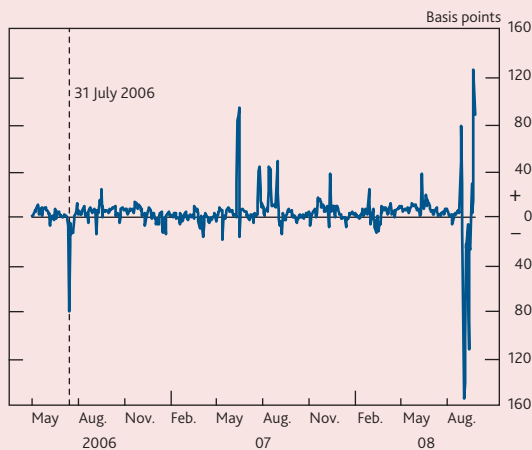
(a) See footnote (a) of Chart 1.a.

In sterling, there are three material short-term money market instruments: unsecured deposits, gilt repurchase agreements and overnight index swaps (OIS). To different degrees the rates on these instruments each embody premia compensating for credit risk, liquidity risk, and uncertainty. Most of the time these premia will be stable, but they can change over time, and be subject to high-frequency volatility.

Unsecured interbank deposits contain a premium for credit risk, which will vary by bank. The sterling overnight index average (SONIA) is a weighted average of the rates paid on actual *overnight* deposits each day, and so contains a premium reflecting the average credit risk across banks. At the overnight maturity, the average premium will generally be expected to be small, and so SONIA should typically be at a stable, small spread to Bank Rate. But the premium will tend to increase with maturity, even over a week or so, especially in stressed conditions. In consequence, the term structure of unsecured rates out to the next MPC meeting would not necessarily be flat. That is, indeed, the experience since the current framework was introduced, particularly since the onset of the turmoil (Chart 1.a).

Loans *secured* on government debt, which is essentially free of credit risk, come close to being risk free. The spread between Bank Rate and the overnight repo rate on general gilt collateral should therefore typically be small (Chart 1.b). Gilt repo market rates can, however, also be affected by developments in the market for government debt. Holdings of government bonds are highly liquid, but the demand for and supply of (repo) financing for government bonds vary, sometimes sharply. That was particularly apparent on 31 July 2006, when there was a short-lived but generalised shortage of gilts in the overnight repo market, and has been again since the onset of heightened market tensions in September 2008 (Chart 2).

Chart 2 Sterling secured overnight interest rates relative to Bank Rate



OIS are derivative transactions referenced to SONIA. OIS rates for different maturities reflect market expectations of future unsecured *overnight* rates, which as noted above embody a small premium for expected credit risk. But, as derivatives, OIS transactions are typically conducted so that the counterparty credit risk is mitigated by collateral. In consequence, the credit risk premium embodied in OIS rates should not increase with maturity, as would be typical for unsecured cash-market money market deposits. Also, in contrast to both unsecured deposit and gilt repo transactions, the rates on OIS transactions with maturities beyond overnight should probably be affected less by liquidity premia compensating lenders for locking up their resources. But, in common with the rates on those cash-market transactions, term OIS rates will compensate investors for bearing uncertainty about future overnight rates and can therefore differ slightly from expected future overnight rates. So the OIS swap curve should in most circumstances be a reasonably good, but not perfect, indicator of the short-term risk-free money market yield curve (Chart 1.c).

Box B: Alternative approaches to setting Bank Rate

(a) Compulsory reserves

In the Bank's framework commercial banks choose their own reserves targets. The Bank sees advantage in this voluntary system. If by contrast the system had been based on the Bank setting a standard reserves requirement but that requirement had proved to be too low during the past year, the Bank itself would have had to make a judgement about the scale of the extra demand for reserves. That would probably have involved trial and error, responding either to persistently elevated overnight rates, or to soft rates if reserves were inadvertently oversupplied. Alternatively, a very high reserves requirement could be set, but in normal conditions that would have the effect of withdrawing from the system collateral that could be used by banks in the private markets and so could distort relative asset prices.

(b) Remunerate reserves without limit

One alternative to the reserves-averaging system that the Bank deploys would be for the Bank to pay Bank Rate on any amount of reserves, without limit, and to acquire assets in order to inject a discretionary amount of reserves into the banking system (say using one-week OMOs). Individual banks could aim, privately, to hold a particular amount of reserves, but in aggregate the banking system would end up holding all the reserves that the Bank had created, and so individual banks would not necessarily be able to achieve their private targets. Provided the Bank had at least satisfied aggregate demand for reserves, overnight money market rates would lie above Bank Rate only to the extent of risk premia. Even if the Bank were to inject reserves well above the amount demanded in aggregate, overnight rates should not fall much below Bank Rate; no bank would accept a rate lower than Bank Rate on an interbank placement when it had the alternative of earning Bank Rate at the Bank.

But, as a permanent system for normal circumstances, this system would have two drawbacks. First, in the event that the Bank did not meet the incipient demand for reserves, overnight rates would rise relative to Bank Rate. That risk would create an incentive for the Bank to supply reserves in excess of its estimate of the banking sector's overall demand. This would give rise to the second drawback; namely, that by injecting extra reserves, the Bank would be acquiring more financial assets (either via repo of collateral, or outright purchase of securities) than would be necessary to meet the demand for reserves. Or in other words, the Bank would be 'over lending' at OMO maturities, compensated for by 'over borrowing' at the overnight maturity. That would tend to cause the prices of

the assets acquired by the Bank when lending to rise (yields to fall) relative to the risk-free rate. As discussed in Section II, the Bank seeks to implement monetary policy without distorting other (relative) asset prices as that would degrade the signals that those prices give.

A similar 'over borrowing/over lending' consideration influences the structure of the Bank's OMOs. The Bank could provide the net supply of reserves needed to meet the banking system's day-to-day demand, and so stabilise overnight rates in line with Bank Rate, in a very large number of ways. It could, in principle, lend large amounts at long maturities and borrow at medium-term maturities, with the difference equal to the required net supply of reserves (for example, by way of theoretical illustration, if the demand for overnight reserves was £25 billion, the Bank could lend £100 billion at ten years and borrow £75 billion at five years). The targeted net supply of reserves would in effect be injected into the overnight markets. But the term structure of interest rates would be distorted: in this case by depressing long-maturity interest rates relative to medium-term rates. There may be some instances where approach would be desirable — for example, when operating monetary policy close to, or at the zero nominal interest rate bound. But as discussed in Section II this is beyond the scope of this consultative paper. As such, in its lending and outright-purchase operations directed specifically at managing the supply of reserves, in normal circumstances the Bank generally:

- Seeks to make its gross provision of reserves equal to the net supply that is demanded.
- Taking into account the prospective duration of the Bank's liabilities, operates in short-term money markets where that is most efficient to manage the path of reserves.
- Accepts a very wide range of the highest-quality securities traded in very liquid markets (not only British government securities but also other very highly rated government bonds).

(c) Remunerate reserves and lend overnight at Bank Rate without limit

Under this model the Bank would effectively operate a zero interest rate corridor and banks would have complete freedom to decide how much to hold at the Bank and how much to borrow from the Bank (secured). Overnight interbank rates would be expected to be very close to Bank Rate because transacting with the Bank at Bank Rate would be an alternative to every overnight money market transaction. Such a framework would, in the Bank's view, have a substantial drawback. For it to work, the Bank would have to stand ready in normal circumstances routinely to lend against a wide range

of collateral; if the Bank lent only against say gilts, there could easily be occasions on which the demand to borrow exceeded the availability of collateral held in the banking system, so that the wedge between overnight rates and Bank Rate could vary substantially. But allowing banks to borrow in unlimited amounts from the Bank against a wide range of lower-quality collateral at no penalty would fail to set the banks incentives to manage their liquidity prudently and so would not be in the long-run interest of the system as a whole. Banks would, for example, have an incentive to create more risky collateral, which lies within the control of the private sector. In theory, that hazard could be mitigated by setting appropriate haircuts. But the Bank does not believe that it could wholly rely on that in practice, as it is impossible to be sure of exactly compensating for the risk in risky assets. For similar reasons, this system would mean that the Bank could not control the size of its balance sheet or the composition of the collateral it was holding. In summary, the Bank believes that this kind of system would be difficult to reconcile in practice with its objective, set out in Section II, to avoid creating incentives for imprudent banking system liquidity management in the future, and to protect the integrity of the Bank's balance sheet.

In addition, there are some other, practical considerations. First, such a system would likely be very resource intensive for the Bank, because firms would be transacting with the Bank throughout the day every day against a wide range of instruments and the Bank would have to manage a large portfolio of complex collateral. Second, it is possible that the freedom for banks to transact with the Bank in any amount they chose at Bank Rate would cause interbank transactions to atrophy. As banks would be certain of being able to roll their overnight transactions with the Bank, the interbank market could be damaged at maturities beyond overnight. Without a reasonably liquid interbank market with transparent pricing, banks might be able to use market power in their lending to their non-bank wholesale customers.

effect of moving rates on the earlier days towards the rate expected for the final day of the maintenance period. But this mechanism does not determine the *level* of rates that banks expect to prevail on the final day.

48 The special arrangements for the final day are, therefore, designed to determine the level of rates then. To ensure that the reserves banks collectively can be as close as possible to their reserves targets, a fine-tuning OMO is undertaken to supply or drain the estimated residual amount of reserves; and, in addition, the system of ranges around reserves targets means that an individual bank's reserves can be remunerated at Bank Rate even if it has not achieved its point target exactly. Even so, if unanticipated large sterling flows were to occur between the Bank and the banking system after the fine-tune OMO, the market as a whole might be short or long of reserves. Since the introduction of the current framework, banks have been offered Standing Facilities to bring them into line with their targets in such circumstances. The Standing Facility rates on the final day of the monthly maintenance period have therefore been set at ± 25 basis points relative to Bank Rate, forming a narrow, symmetric corridor around Bank Rate. The fine-tune, the reserves target range and the narrow interest rate corridor are all designed to keep market rates and expected market rates close to Bank Rate on the final day.

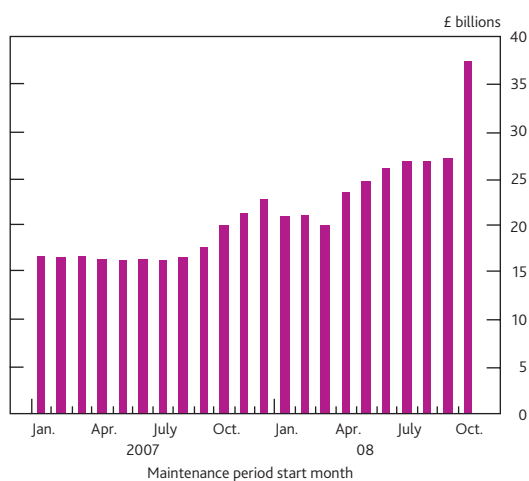
Voluntary reserves

49 The Bank is sometimes asked why the UK reserves scheme is voluntary. Not all banks have to belong to the scheme; and scheme members are free to choose their own reserves targets (subject to a maximum). This is in contrast to the arrangements in some other countries where banks are required to hold specified amounts of reserves, typically related to the size of their deposit liabilities. In the past such schemes could be and were used to implement monetary policy in a way that focused on monetary quantities rather than prices (interest rates). In brief, the central bank would directly control the amount of reserves held by the commercial banks. Because the commercial banks were obliged to hold a certain proportion of their deposit liabilities in the form of reserves at the central bank, that gave the central bank a tool for controlling, indirectly, the quantity of commercial bank deposits and hence broad money. But most major central banks now set monetary policy in terms of a short-term interest rate. Although some have retained the machinery of reserves requirements, the Bank of England does not believe that to be necessary to implement the MPC's policy. In introducing its new framework in 2006, the Bank wanted to make it clear that, in the UK monetary system, the MPC sets the interest rate and the commercial banks decide the quantity of reserves they wish to hold.

50 In choosing their reserves targets, individual banks are essentially deciding the level of precautionary balances they need to hold with the Bank, in the light of their view of

possible shocks to payment flows and their capacity to manage their need for intraday and overnight liquidity by controlling the pattern of in-payments and out-payments. Following the onset of stress last summer, banks in aggregate have progressively raised their targets, as they concluded that they needed larger precautionary balances given the heightened probability of liquidity shocks (**Chart 1**). The increase in the demand for reserves during the period of stress has been accommodated within the normal operation of the Bank's system, helping to maintain overnight money market rates broadly in line with Bank Rate (see below).

Chart 1 Aggregate reserves targets



The role of OMOs: getting the supply of reserves right

51 The Bank uses its Open Market Operations (OMOs) to ensure that banks, in aggregate, can hold the reserves they need to meet their targets. Mostly, the Bank employs OMOs to lend money (against security). In making the loan it pays money into the reserves account of a bank (either that of the counterparty itself, or of their bank). That bank may pass on the money, for example via a money market transaction or a payments flow, and so into another bank's reserves account. Crucially, for as long as the Bank's loan is outstanding, the reserves will remain somewhere in the system. The Bank also buys securities outright via OMOs, in which case the reserves remain in the system until the security matures. Exceptionally, there can be a surplus of reserves in the overnight money market, due for example to the Bank lending large amounts at longer maturities. The Bank may then need to use OMOs to drain reserves in order to bring its net supply back into line with demand. It can do so by repoing out bonds or by selling short-term Bank of England bills. In this case the bonds or bills are paid for by drawing down one or more reserves accounts, which are replenished when the repos or the bills mature.

52 When, as is normally the case, the Bank's OMOs are for lending to the banking system, the Bank takes collateral to protect its own financial position. In legal terms its lending operations take the form of repos — temporary purchases of

eligible securities with an undertaking to sell them back to the borrower at the maturity of the transaction. So long as the securities eligible as collateral are in sufficiently plentiful supply, the precise range of assets eligible to be used in these operations does not affect the relative prices at which different securities trade in private markets. Hence, given the need to protect the integrity of its balance sheet, the Bank has traditionally restricted the collateral eligible in its OMOs to the highest-quality sovereign securities.

53 The Bank undertakes OMOs at a number of different maturities. Routinely, once a month it lends for periods of three, six, nine and twelve months. Once a week it lends or borrows for a period of one week. And, as described above, on the final day of every monthly maintenance period the Bank undertakes a 'fine-tuning' OMO lending or borrowing for an overnight maturity to ensure that the supply of reserves in the maintenance period as a whole can be brought as close as possible to the banks' reserves targets. (Fine-tuning operations can take the form of borrowing by the Bank if otherwise the banking system would be oversupplied with reserves.)

Autonomous factors and operations to drain reserves

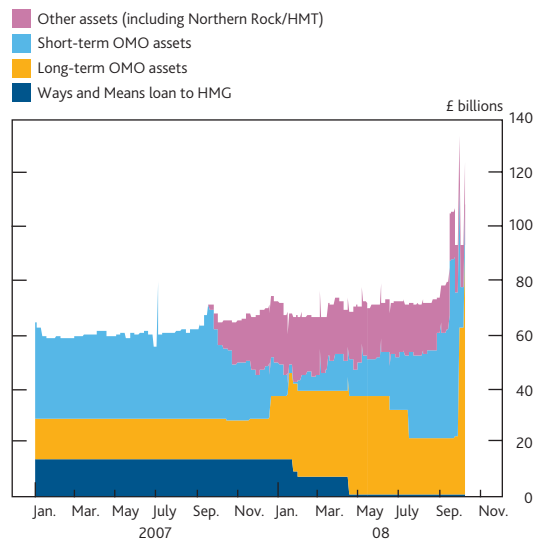
54 By operating at a variety of maturities, the Bank gives itself the flexibility to adjust the supply of reserves as needed without unnecessary 'churn' in its short-term operations. The Bank needs that flexibility because OMOs are not the only factor affecting the quantity of reserves in the system. Any transaction by the Bank in sterling will affect the stock of reserves. For example, the note issue tends to rise around holiday periods. Banks pay for the extra notes by running down their reserves balances with the Bank, and so the Bank needs to restore the level of reserves by lending more in its OMOs. Movements in the note issue are generally quite predictable, but the level of reserves can also be affected in less predictable ways. If the Bank lends outside the Sterling Monetary Framework, for example if it provides emergency liquidity assistance as part of a support operation under the authority of the Chancellor of the Exchequer,⁽¹⁾ such lending also adds to the quantity of reserves in the banking system while it is outstanding. The Bank then needs to lend less than otherwise in its OMOs. This was apparent during 2007 when the Bank lent to Northern Rock. By financing a particular bank, the Bank was also injecting reserves into the system as a whole. In order to sterilise the potential monetary effect, the Bank reduced the size of its short-term OMO assets. The outstanding stock was very low in early 2008 (Chart 2.a).

55 The Bank has also increased the size of (and widened the collateral eligible in) its monthly long-term repo (LTR) OMO for a three-month maturity. The objective has been to help alleviate the stress in the banking system by financing what have become illiquid mortgage and other asset-backed securities. But the expanded operations also injected extra reserves. Initially, the Bank again sterilised the monetary

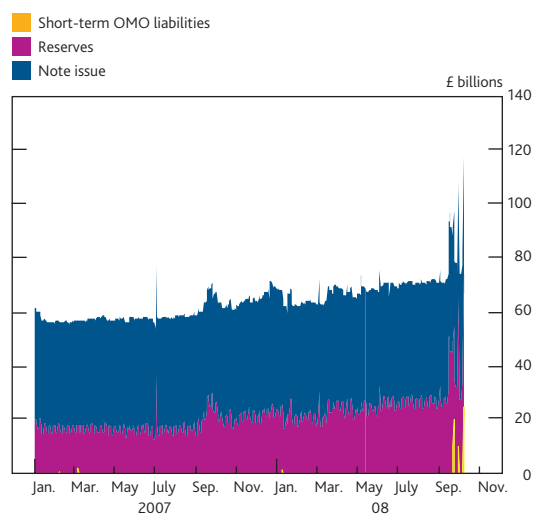
effect by reducing the size of its weekly short-term OMO assets. But clearly the outstanding stock of one-week lending cannot be reduced below zero. And so when recently the scale of long-term repo lending was expanded further, the Bank's weekly OMOs became draining operations in which one-week Bank of England bills were sold (Chart 2.b).

Chart 2 Bank of England sterling transactions

2.a Assets



2.b Liabilities



56 Because of their frequency, weekly and fine-tuning OMOs offer the greatest flexibility for adjusting the Bank's *net* supply of reserves. They are, therefore, a main buffer for absorbing swings in the so-called 'autonomous factors' (such as the note issue and emergency lending) and changes in the provision of longer-term financing via LTRs and bond-purchase OMOs. The

(1) Under the Memorandum of Understanding (MoU) that sets out the framework for co-operation between HM Treasury, the Bank and the FSA, the ultimate responsibility for authorisation of support operations rests with the Chancellor of the Exchequer. The MoU is available at www.bankofengland.co.uk/about/legislation/mou.pdf.

Bank's framework makes provision for short-term 'draining' operations as part of getting the net supply of reserves right.

Standing Facilities

57 The 2006 operational framework introduced Standing Facilities for banks to borrow from and deposit with the Bank in unlimited amounts throughout the day, every day. As described above, on the final day of the monthly maintenance period, the Facilities are priced at 25 basis points above and below Bank Rate respectively. On all other days, they have been priced at ± 100 basis points. The difference reflects the fact that the Facilities have been serving two purposes. The first is to stabilise expectations, throughout the maintenance period, of the overnight rate prevailing on the final day in line with Bank Rate. A narrow corridor makes that more likely. The second, but related, purpose was to give banks a source of insurance against payments shocks that could otherwise take their reserves accounts either below zero or to a level where they would otherwise be unremunerated. Since banks are in the business of providing payment services to households and corporate customers, they cannot absolutely rule out a day's out-payments exceeding in-payments, and *vice versa*. Among other reasons, that could reflect unexpected 'frictional' payment shocks as well as episodes of wider idiosyncratic or systemic stress. Frictional payment shocks can arise from banks being unable to square their books in thin markets; technical problems in banks' own systems or in the market-wide payments and settlements infrastructure; or an Open Market Operation being less than fully covered so that the Bank had supplied the system as a whole with less reserves than intended.

58 When any of those things happens, a bank will look to the market to make good the gap in its funding. But if the payments imbalance occurs late in the banking day or if money market liquidity is thin for some reason, a bank may be unable to square its book without bidding up the rate for funds if it is short, or accepting a low rate if long. Ultimately, and partly because the payments system has to remain open for settlement after the markets for same-day money have closed, banks can square their sterling books only with the Bank. The loan and deposit Standing Facilities were made available throughout the maintenance period for that reason. The Bank's provision of such a facility is a precondition for being able to stabilise overnight rates in line with Bank Rate.

59 Under the framework introduced in 2006, the Bank has disclosed aggregate use of the facilities with a one-day lag. It has done so because Standing Facility deposits with, or loans from, the Bank withdraw or inject reserves into the system, and so affect the net supply of reserves relative to the aggregate target. Particularly given the initial novelty of reserves averaging for the sterling money markets, the transparency was designed to maximise information about the system's aggregate reserves balance.

60 The loan/deposit facilities were priced at a material premium/discount to Bank Rate in order to incentivise banks to manage their day-to-day payments flows and liquidity carefully. The price on most days was set at 100 basis points, higher than the final day's 25 basis points, because of the possibility that banks would use the Standing Facilities not just to square their books in the face of frictional payments imbalances but also as a source of wider liquidity insurance in stressed conditions arising from individual or collective mismanagement.

61 That latter possibility resulted in the lending facility becoming stigmatised during the turmoil of the past year. The Bank's disclosure of aggregate Standing Facility use revealed that borrowing had occurred but not its cause, triggering what amounted to a witch hunt for the borrowers. The effect was to render redundant the insurance provided by the Bank against frictional and technical payments imbalances, and so to remove the effective ceiling on wholesale market overnight rates and part of the arbitrage mechanism for establishing Bank Rate in the markets. Similar problems occurred with other central banks' standing facilities.⁽¹⁾ In the United Kingdom, other elements of the framework were temporarily recalibrated to help overcome that potential problem, as described below. The Bank's proposals for reform, set out in the next Section, reflect that experience.

Experience of implementing monetary policy since the 2006 reforms

62 The turmoil that hit the money markets in Summer 2007 and the strains that have persisted since then have, until recently, affected primarily the longer end of the money markets and credit markets more generally, which the Bank's monetary policy operations do not aim to influence directly. At the very short end, market rates have generally been kept in line with Bank Rate over that period, as discussed in Box C.

63 That has reflected the normal operation of the 2006 framework together with the Bank activating some of the contingency measures set out in the *Red Book*, see Box D.

64 Since August 2007 UK banks' demand for reserves has risen. Because the UK reserves scheme is voluntary, banks have been able to increase their reserves targets, and the Bank has automatically used its OMOs to supply the increased amount demanded. In recognition of increased demand, the Bank has also more than doubled the maximum reserves targets that banks are allowed to set currently. For the reserves maintenance period beginning 8 October 2008,

(1) In an international context, problems that emerged with standing facilities are described in Section 4.1 of the Committee on the Global Financial System's July 2008 report entitled *Central bank operations in response to the financial market turmoil*. See www.bis.org/publ/cgfs31.pdf?noframes=1.

aggregate targets for banks in the scheme were more than twice as high as in August 2007. The system of voluntarily chosen reserves targets has enabled the Bank to meet the banking system's increased demand for reserves as precautionary balances.

65 In addition, under the pressure of events, demand for reserves has also sometimes increased within a maintenance period for which reserves targets had already been set. That can happen if, after the beginning of a maintenance period, the market environment or the circumstances of individual banks alter so as to raise a bank's perceptions of the probability of large payments shocks or changes in their access to liquidity. Other things being equal, in that event banks need to hold larger precautionary reserves balances. The Sterling Monetary Framework, as set out in the *Red Book*, allows for such a contingency. It establishes a range of routes for the Bank to create more reserves, via Open Market Operations, in order to meet an abrupt shift in demand. In four maintenance periods (September 2007, and March, September and October 2008) the Bank has drawn on these contingency measures, choosing to inject additional reserves relative to target, and to widen the ranges around targets in order to allow scope for the additional reserves to be remunerated at Bank Rate. Before September 2007 target ranges were set at $\pm 1\%$. Since then they have varied between $\pm 60\%$ and $\pm 20\%$.

66 Wider target ranges, of at least $\pm 20\%$, were maintained not just during the particular months in which the Bank injected above-target reserves but throughout the period. That was because the stigma attached to the standing lending facility meant that banks were more tightly constrained than previously in the management of their day-to-day liquidity. Wide ranges have given banks additional flexibility in managing their liquidity, and helped to dampen volatility in market overnight rates at a time of increased uncertainty about payment flows and the availability of liquidity.

67 As described above, an efficiently working money market is essential for the implementation of monetary policy. Extreme strain in the market, which accelerated following the closure of Lehman Brothers in mid-September and later rescues of individual European banks, has at times caused volatility in overnight rates. Credit and liquidity concerns led to wide dispersion in the rates paid by different banks in the overnight money markets. Until the measures taken by the United Kingdom and other governments over the past week, banks generally were anxious to conserve their own liquidity day-by-day, and so less willing to make use of the averaging provisions of the Bank's reserves scheme to arbitrage between days within the maintenance period. Because banks were concerned to square their positions on each and every day, sharp variations in the demand for liquidity led to considerable variation from day to day in average overnight market rates. The *Red Book* provides for exceptional fine-tuning open market

operations in such a contingency (paragraph 147), and the Bank made use of that provision. Although overnight rates were volatile in this turbulent period, expected overnight risk-free rates within the maintenance period, as reflected in gilt repo and OIS swap rates at maturities of one and two weeks, on average remained close to Bank Rate (Box A).

Summary

68 In summary, the 2006 framework of voluntary reserves averaging has generally worked well in steering overnight interest rates. The experience of the past year has, though, highlighted the following issues with the operation of the Bank's system for providing reserves in stressed conditions:

- The stigma attaching to the Standing Lending Facility.
- The level of disclosure about use of the Bank's facilities.
- What should be the width of the range around reserves targets in steady state.
- The need for the Bank to be able to drain large quantities of surplus reserves in some circumstances.

69 Plans to address those, and some more technical issues, are set out in the next Section.

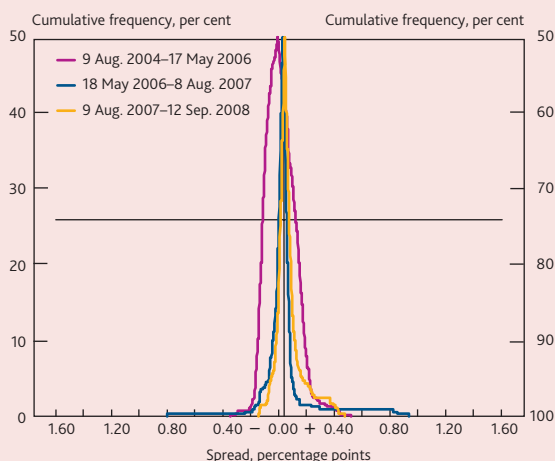
Box C: Overnight rates

Charts 1.a and 1.b represent the spreads between policy rates and daily readings of sterling secured overnight interest rates. They show the distribution of these spreads and are constructed in such a way that the peak of the distribution shows the average (median) spread; the median indicates the mid-point of the distribution, in the sense that equal numbers of days in any period have spreads above the median and below the median. The area under each curve is a measure of dispersion around the median.

Chart 1.a shows this distribution for three periods — a period of nearly two years before the current Sterling Monetary Framework was introduced (red): from the introduction of the

Chart 1 Folded cumulative distribution^(a) of spread of sterling secured overnight interest rate (trade weighted) to Bank Rate

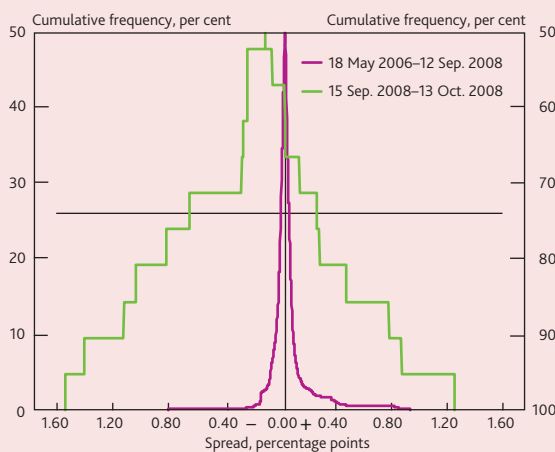
1.a(a)



Sources: ICAP and Bank calculations.

(a) Distribution of the spreads between overnight secured interest rates and policy rate at end-of-day. The distributions are folded at the median so that cumulative probabilities for values above (below) the median are indicated by the right-hand (left-hand) scale.

1.b(a)



Sources: ICAP and Bank calculations.

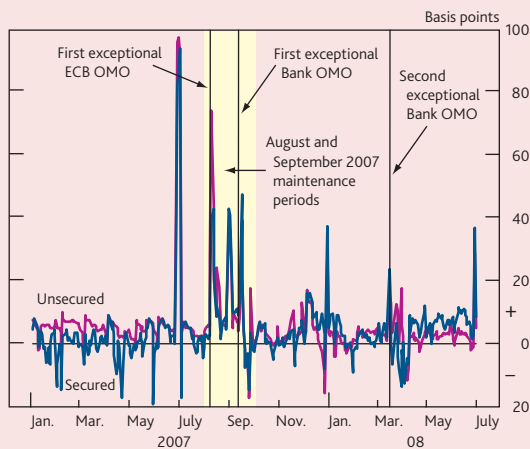
(a) See footnote (a) of Chart 1.a.

framework on 16 May 2006 to August 2007 when current strains began (blue); and from then until 15 September 2008, the onset of acute systemic stress in global markets and financial systems (orange). The chart shows that the reforms introduced in 2006 had the intended effect of generally keeping the market rate much closer to the policy rate. It also indicates that the behaviour of the overnight rate relative to Bank Rate was, in general, little changed after the onset of stressed money market conditions in August 2007. **Chart 1.b** shows two distributions — the whole period from the reforms of 2006 until the onset of heightened tension in September 2008, and the period since then. In that most recent period, the rates at which individual institutions could borrow (even in the secured market) varied widely and daily averages of traded rates were also highly variable as reflected in the very wide (green) distribution shown.

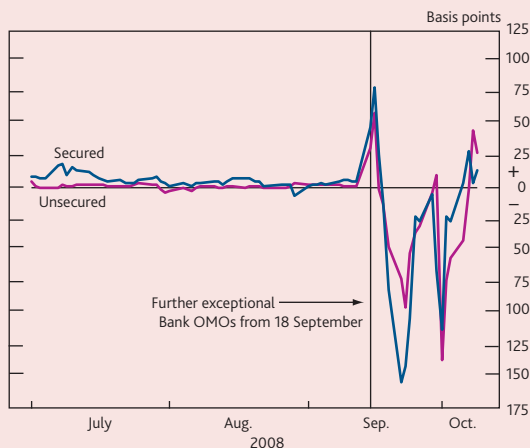
Charts 2.a and 2.b show times series of the sterling overnight secured rate. During the August 2007 maintenance period sterling rates were somewhat volatile as banks were keen to conserve liquidity and so reluctant to lend into the market

Chart 2 Spread to Bank Rate of sterling overnight interest rates

2.a 1 January 2007–31 August 2008



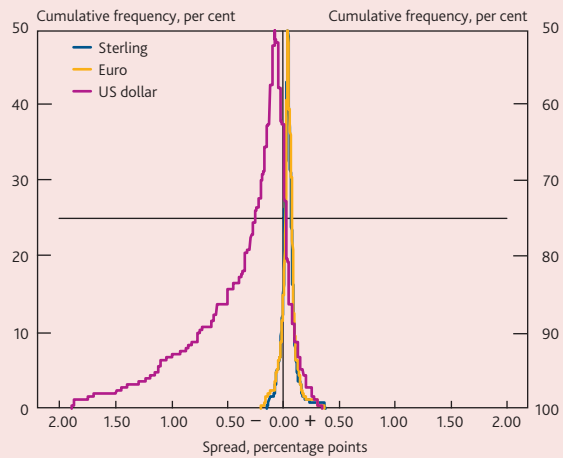
2.b 1 July 2008–9 October 2008



notwithstanding elevated market rates. The start of the September 2007 period provided banks with an opportunity to increase their target holding of reserves, which they did by 6%. Via its Open Market Operations (OMOs), the Bank both provided those extra reserves; and, given the period of elevated overnight rates, offered above-target reserves in order to underline its commitment to its *Red Book* objectives. A further shock hit sterling money markets in mid-September following the announcement of a liquidity support facility to Northern Rock. In terms of its management of overnight money market conditions, the Bank responded by offering, on 19 September 2007, additional reserves via an exceptional fine-tuning OMO. **Chart 2.a** shows that after 19 September 2007, sterling overnight rates were generally close to Bank Rate, as together these actions underpinned the credibility of the Bank's commitment to maintain overnight rates in line with Bank Rate. But **Chart 2.b** shows that from 15 September 2008, after the failure of Lehman Brothers, trading in the money markets was severely impaired, with great volatility in average market rates, despite active use by the Bank of fine-tuning OMOs to adjust the aggregate supply of reserves.

Charts 3 and **4** present some comparisons of experience in the sterling, US dollar and euro overnight markets, secured and unsecured, between September 2007 and September 2008. They indicate broadly similar experience in the different monetary areas. In the period since then, the dispersion of rates has been very much greater in all three currency areas.

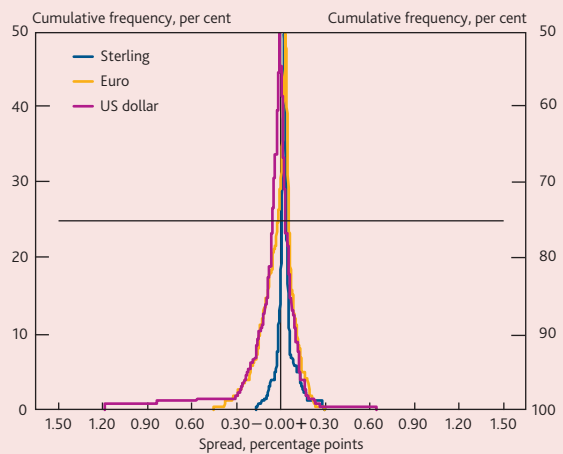
Chart 3 Folded cumulative distribution^(a) of spread of international secured overnight interest rates to official interest rates^(b)



Sources: ICAP and Bank calculations.

- (a) Distribution of the spread between overnight secured interest rates and policy rates at end-of-day. The distributions are folded at the median so that cumulative probabilities for values above (below) the median are indicated by the right-hand (left-hand) scale.
 (b) Chart shows the distribution for period 19 September 2007–12 September 2008.

Chart 4 Folded cumulative distribution^(a) of spread of international unsecured overnight interest rates to official interest rates^(b)



Sources: Wholesale Market Brokers' Association and Bank calculations.

- (a) Distribution of the spread between overnight unsecured interest rates and policy rates at end-of-day. The distributions are folded at the median so that cumulative probabilities for values above (below) the median are indicated by the right-hand (left-hand) scale.
 (b) Chart shows the distribution for period 19 September 2007–12 September 2008.

Box D: Contingency plans: reserves demand and distribution

The *Red Book* currently makes explicit provision for the following broad types of contingency:⁽¹⁾

- a bank finding itself temporarily short of reserves at the end of the banking day;
- a widespread, or common, shock to the demand for reserves; and
- a pronounced shift in the degree to which banks need to manage their reserves directly with the Bank rather than via the money markets.

As described in the main text, the standing lending facility was designed to enable a bank that finds itself temporarily short of reserves at the end of the banking day to access reserves from the Bank against very high-quality collateral.

In the event of a widespread increase in the demand for reserves, individual banks are able routinely to vary their own reserves targets from one maintenance period to the next, constrained only by the ceilings on reserve targets. The Bank can also add extra reserves *within* a maintenance period, accompanying that with an increase in either reserves targets or the range around targets. That has been utilised and worked well over the past year.

Those two types of contingency do not involve interruption to the functioning of the money markets and its supporting infrastructure. But such interruptions can occur. The 2006 *Red Book* framework therefore also enables the Bank to address a pronounced shift in the degree to which banks need to manage their reserves directly across the Bank's balance sheet in the absence of fully functioning money markets. There are various circumstances in which that could occur: the operational breakdown of the high-value payment or securities settlement systems (CHAPS and CREST); the breakdown of the internal systems of one or more major settlement banks so that they were unable to process payments and/or securities transfers; major operational disruptions to the wider market, for example as a result of terrorist attack, pandemic, or extreme weather; or concerns about banks that were sufficient to interrupt the flow of funds in the very short-term sterling money markets and payment systems more generally. In such circumstances, the Bank may need itself to facilitate directly the distribution of liquidity around the banking system, while keeping control of overnight rates, which should stay in line with the official Bank Rate. The Bank would be able to achieve that by narrowing the interest rate 'corridor' between its overnight Standing Facilities,

keeping it centred on Bank Rate. If necessary, the Bank could offer both its Standing Lending and Deposit Facilities at Bank Rate, via what would be a zero-width corridor. That would bring about, temporarily, a very substantial increase in the degree of intermediation undertaken across the Bank's balance sheet.

(1) The Bank's Sterling Monetary Framework contains a number of contingency measures that can be used in the event of operational or financial disruption. These are set out in paragraphs 102–05, 149 and 166–67 of the January 2008 version of the *Red Book* available on the Bank's website.

IV Planned reforms to the framework for stabilising the overnight rate

70 As described in Section III, the contingency measures built into the Bank's Sterling Monetary Framework have generally worked well over the past year in delivering stable overnight and other very short-term rates in line with Bank Rate during the period of stress. UK banks' additional demand for reserves has been accommodated both across and within maintenance periods. But one major issue concerns the operation, and therefore design, of the Standing Facilities. The Bank is introducing major reforms in this area. In addition, it is proposing some more technical reforms given recent experience and in the light of its plans, described in Sections V–VII below, to introduce new facilities explicitly designed to help alleviate financial system stress.

Standing Facilities

71 As described above, Standing Facilities are intended to be an essential element of the rate-setting process, providing an arbitrage in normal market conditions to prevent money market rates moving far away from Bank Rate. As an adjunct and means to their rate-setting function, the existing Standing Facilities have offered liquidity insurance against a very wide range of circumstances, including not only frictional payment shocks but also, in principle, wider idiosyncratic or systemic stress.

72 If banks are unwilling to use the Standing Lending Facility, it cannot be relied upon to set a ceiling on market rates. Associated with that, other things being equal, day-to-day volatility in market interest rates would tend to be increased by the incidence of frictional disturbances to the payments system (the overnight money markets and their supporting infrastructure). While, over recent months, wider ranges around banks' reserves targets have ameliorated the effect on overnight rates from the stigma on using the facilities, they cannot insulate the system entirely from material technical shocks to the payments system. The Bank therefore plans to introduce major reforms to the Standing Facilities.

73 Specifically, the Bank is replacing the current Standing Facilities with two facilities:

- **purely frictional Operational Standing Facilities, the principal aim of which is rate-setting and so absorbing essentially technical frictions in the overnight money markets; and**
- **a Discount Window Facility, the principal function of which is to provide liquidity insurance in the event of**

stress. (The Discount Window Facility is described in Sections V and VI below.)

74 For the Operational Standing Facilities, the maturity will remain overnight and the rate will on all days be ± 25 basis points relative to Bank Rate. For the lending facility, the eligible collateral will remain those instruments that are eligible in the Bank's short-term repo OMOs, ie very high-quality industrialised-country sovereign bonds. The Bank will reserve the right to verify that the facility is being used for purely technical, frictional reasons. Taken together, these features are designed to ensure that using the lending facility — borrowing overnight against gilts (or equivalent) at an extra cost of 25 basis points — is understood for what it is: recourse to the Bank due to technical payments frictions. That should help the Bank to steer overnight rates in line with Bank Rate.

Disclosure of Standing Facility use

75 As described above, banks' reluctance to utilise the previous lending facility reflected, to a considerable degree, adverse public commentary. The Bank will therefore be introducing amendments to its disclosure of the use of Standing Facilities.

76 Up to now, each day the Bank has published the aggregate use on the previous day of each of the Lending Facility and the Deposit Facility. In its immediate launch of the Operational Standing Facilities, the Bank will cease doing so, in order to help to remove the possibility of adverse commentary following any large use due, for example, to technical problems in the payment system.

77 Instead, the Bank could publish nothing, or it could publish some information periodically. Options include publishing average use of the facilities over periods of, say, a week, a monthly maintenance period or a quarter. The Bank is minded to move to disclosure of average usage after the end of the relevant maintenance period. That approach will be adopted on introduction of the new Operational Standing Facilities on Monday 20 October.

78 Adopting that course requires adjustments to the previous system of publishing daily the system's reserves holdings and the amount of reserves needed over the remainder of a maintenance period for the aggregate reserves target to be achieved. If the Bank did not reduce those disclosures, which are summarised in Box E, the market could seek to infer

utilisation of the Operational Standing Facilities from the publication of daily reserves data.

79 With disclosure reduced, reserves-scheme members will have less information available to them to assess the quantity of reserves held in aggregate in the maintenance period thus far; or the likely size of the next scheduled short-term OMO. As a practical matter, however, such information may not be needed, so long as banks expect — as they should — that the Bank will supply whatever quantity of reserves is needed for targets in aggregate to be met, with overnight rates broadly in line with Bank Rate. The Bank will return to this issue after it and the market have gained experience from operating the new facility.

80 Do participants consider that periodic publication of average usage of the Bank's Operational Standing Facilities will help to avoid stigma in using the facilities?

- Would daily publication deter use? How great a delay would be optimal?
- Now that banks have experience of reserves averaging, will reduced disclosures of information relating to aggregate reserves balances materially affect the management of their own reserves or their participation in Open Market Operations?

Collateral in short-term repos and the Operational Standing Facility

81 At present, the securities eligible in the Bank's short-term repo OMOs and in the standing lending facility are high-quality sovereign bonds issued by a range of industrialised countries. The Bank plans to make one technical change in this area.

82 Up to now, US Treasury bonds have been eligible only in those contingencies, such as a serious infrastructure breakdown, requiring the Bank to use collateral settled in a later time zone than London. The Bank is minded to make such instruments routinely eligible every day.

83 As already announced, the Bank has planned to extend the range of sovereign securities eligible in its regular short-term reserves operations when, in due course, it begins to undertake OMOs to purchase outright very high-quality foreign sovereign bonds.⁽¹⁾

84 In summary, collateral eligible in the Bank's short-term repo OMOs and standing lending facility will, broadly, comprise gilts, and bonds rated at least Aa3 issued by the countries of the European Economic Area, Canada, Japan, Switzerland and the United States. The planned extension may be introduced before the launch of asset-swap OMOs described in the previous paragraph.

Ranges around reserves targets

85 As described above, and reflecting the stigma attached to use of the Bank's previous Standing Lending Facility, the Bank has in recent months maintained wider ranges around banks' reserves targets. The Bank believes that a narrower range would be appropriate when market conditions eventually normalise, as that would encourage reserves banks to choose the target level of balances they do, in fact, need from month to month; and because much wider ranges should be reserved for contingencies. Given the planned reforms, described above, to destigmatise the standing facilities, the Bank is minded to set the range around reserves targets in steady state at $\pm 5\%$.

86 Separately, the Bank has recently introduced higher maximum limits on reserve targets: the higher of £2.5 billion and 5% of each bank's Eligible Liabilities (as calculated for the Cash Ratio Deposit scheme), rather than, as previously, the higher of £1 billion and 2% of each bank's Eligible Liabilities. The Bank plans to maintain that higher ceiling as the norm in its permanent framework, while keeping it under review in the light of changing circumstances.

87 The Bank would welcome comments on the proposal to set the range around reserves targets in normal circumstances, when resumed, at $\pm 5\%$.

- In particular, what effect might it have on banks' decisions on reserves targets in normal conditions, and in stressed conditions?
- Is there support for the Bank's plan to maintain the recently increased maximum limits on reserves targets at the higher of £2.5 billion and 5% of Eligible Liabilities?

88 In order to accommodate an unexpected rise in the demand for reserves, the Bank can choose to use OMOs, either scheduled or *ad hoc*, to inject reserves over and above the level that would be consistent with the aggregate target chosen by the banks for the particular maintenance period. In those circumstances, the Bank would, in future, again probably widen the range around reserves targets in which reserves are remunerated at Bank Rate. That would be designed to maintain market interest rates in line with Bank Rate, avoiding the risk of soft market rates that could otherwise result if reserves banks had to use the Operational Standing Deposit Facility in order to avoid holding reserves above the top of an unchanged target range. That was the course that the Bank

(1) Complementing its OMO-purchases of gilts and with the same purpose of injecting reserves into the banking system on a long-term basis, the Bank intends to conduct OMOs to purchase domestic-currency bonds issued by AAA-rated sovereign borrowers, swapped into sterling, subject to minimum size criteria related to individual bonds and to the total of eligible bonds of each issuer. Because the Bank sets higher credit thresholds for bonds held outright than for bonds held as collateral, the bonds of all issuers eligible for outright purchase will also be eligible for use as collateral in OMO repo and swap transactions. That was announced in a Market Notice in November 2006. See www.bankofengland.co.uk/markets/money/documentation/061124.pdf.

Box E: Reserves balances: disclosure

The Bank currently discloses on each working day a good deal of information about reserves balances and use of the standing lending and deposit facilities:

- (i) That day's forecast holdings of aggregate reserves.
- (ii) The previous day's aggregate actual holdings of reserves.
- (iii) The previous day's error in the Bank's forecast of aggregate reserves.
- (iv) Average of reserves held thus far in maintenance period.
- (v) Residual average reserves requirement for the maintenance period as a whole.
- (vi) The previous day's use of the standing lending facility, in aggregate.
- (vii) The previous day's use of the standing deposit facility, in aggregate.

In addition the size of the Bank's open market operations (OMOs) has to be announced when they are undertaken. And on the first four working days of the final week of each maintenance period the Bank publishes the expected size of the fine-tuning OMO scheduled for the final day.

Changes in reserves balances from day to day are driven by a number of factors. Two of them are the change in the Bank's stock of sterling assets acquired in Open Market Operations and use of the standing lending facility by a bank. Even if the Bank did not publish up-to-date daily information on use of the lending facility, it is possible that any large-scale use would be visible in the difference between the change in reserves and the change in the Bank's holding of OMO assets on any particular day.

It is for this reason that upon the launch of the Operational Standing Facilities the Bank is reducing and delaying publication of information on (aggregate) reserves balances, and is consulting on whether that would affect banks' management of their own reserves balances or their participation in OMOs.

adopted in September 2007 and March, September and October 2008 — see Section III above. Alternatively, reserves targets could be raised *within* a maintenance period.⁽¹⁾ That could be achieved by the Bank itself stipulating new reserves targets for each reserves bank (for example, increasing them across the board by a specific percentage); or by the Bank inviting reserves banks to submit revised targets for the maintenance period. In the latter case, the Bank could ask reserves banks to set a target for the *remainder* of the relevant maintenance period or a new target for the maintenance period *as a whole*. The Bank believes the second approach would probably be better, as the first approach would amount to splitting a maintenance period into two parts.

89 Do reserves banks agree that, in the event of their being invited to submit revised reserves targets during a maintenance period, it would be easier to do so for the maintenance period as a whole rather than for the remainder of the maintenance period?

Short-term OMOs: auction design

90 The Bank is considering whether or not to change the format of its short-term (one-week and fine-tuning) open market operations, whether repo-lending or draining. For some years, including before the 2006 reforms, the Bank's short-term OMOs have been conducted at a fixed rate. The Bank has therefore offered a fixed amount of reserves at a fixed price (Bank Rate) or, recently, offered to drain a fixed amount of reserves at the same fixed price. The amount is endogenously determined by the reserves targets chosen by banks, in the light of their expectations of the Bank's success in stabilising overnight rates in line with Bank Rate. Given autonomous factors and the take-up in previous OMOs in each maintenance period, those reserves targets determine the amount of reserves that the Bank needs to offer to inject (or drain) in each OMO to bring supply into line with demand. In that sense, taking each maintenance period as a whole, the Bank is not determining both the quantity and price in its short-term OMOs.

91 The current fixed-rate format has one potentially undesirable consequence. In an OMO to supply reserves, counterparties bid for a quantity (at Bank Rate). Given the amount of reserves each counterparty actually desires, the size of their bid is determined by their expectation (or guess) as to how much other counterparties will bid for. That can set up a dynamic where, from week to week, the extent to which a short-term repo OMO is covered is on a rising or falling trend. If, for example, a counterparty thinks its peers will bid for much more than they in fact desire, then it too must do the same in order to be allotted roughly what it actually wants. If the cover ratio is on a declining dynamic, that can potentially lead eventually to an uncovered OMO (as happened in June 2007, before the turmoil), which means that reserves are undersupplied. In that event, the shortfall in the Bank's supply

of reserves is made up later in the maintenance period, without a big effect on overnight rates if the standing facilities and reserves averaging are fully used and the arbitrage mechanism works efficiently.

92 The reason the Bank has maintained fixed-rate auctions for OMOs maturing before the next MPC policy-rate decision is that, in the past, when short-term OMOs were conducted at variable rates, the market tried to read policy signals into the Bank's OMOs. The Bank has been concerned that if variable-rate auctions were again employed, the market would mistakenly seek to infer signals according to whether the OMO was allotted at, above or below the prevailing level of Bank Rate. In stressed conditions, the divergence from Bank Rate could potentially be substantial.

93 Also, weighing against variable-rate auctions, the Bank would need to consider whether it would be a sensible format for operations to drain reserves, since it could result in one-week Bank of England bills yielding more or less than reserves, whereas both are liabilities of the Bank.

94 What impact would moving to variable-rate auctions have on counterparties' likely participation in short-term repo OMOs?

- What impact would there be on participation in short-term OMOs if any such variable-rate auctions were conducted at a uniform price, rather than on a pay-your-bid basis?
- Would signals be read into short-term OMO results?

Operations to drain reserves

95 Over recent weeks the Bank has needed to drain surplus reserves from the overnight money market, due to the expansion and increased frequency of longer-term repo lending, designed to help finance the banking system during the current exceptional period of acute stress. The Bank has done so by conducting OMOs to sell one-week or shorter Bank of England bills.

96 The Bank will codify this in its permanent (*Red Book*) framework by extending the provisions for Open Market Operations in which, if necessary, it can borrow to reduce the quantity of reserves in the system. As with the existing fine-tuning operations, any weekly draining operations would be the mirror image of weekly lending operations. Instead of lending each week, at a one-week maturity, the Bank would borrow cash and would in exchange give bond collateral or if necessary, in exceptional circumstances, very short-term Bank of England bills.

(1) Paragraph 104 of the *Red Book*.

V Alleviating financial system stress: design principles and high-level architecture

97 As set out in Section II, the Bank's framework is designed to maintain money market overnight interest rates in line with Bank Rate and to reduce the costs of disruptions to the banking system's provision of liquidity and payments services, not only in normal conditions but also in stressed or otherwise extraordinary conditions. Section III reviewed the measures in the current *Red Book* for addressing contingencies affecting the management and distribution of the supply of reserves. All of those measures were designed to ensure that events changing the demand for reserves, or affecting the efficient distribution of reserves, would not compromise the Bank's ability to maintain very short-term market interest rates in line with Bank Rate. They thus contribute to underpinning the Bank's management of the banking system's day-to-day liquidity *in the course of implementing monetary policy*. As such, those elements of the 2006 system also contribute to, and indeed are a necessary condition for, the maintenance of financial stability. But they do not exhaust the range of market operations available to central banks to reduce the economic costs of disruptions to the banking system, as evidenced by the various actions taken by central banks, including the Bank of England, over the past year. The Bank has decided to be more transparent about that menu of additional operational interventions. This section outlines the design principles guiding the high-level architecture of the new, broader liquidity-insurance facilities that the Bank is introducing into its permanent framework.

Design principles for two new liquidity-insurance facilities

98 Given the Bank's Objectives set out in Section II, the following considerations have guided the Bank's plans for two new permanent facilities designed explicitly to provide liquidity insurance in order to reduce the costs of disruptions to the liquidity and payments services supplied by commercial banks.

Counterparties

99 The Bank can provide liquidity to the banking system via two broad mechanisms:

- *Bilateral liquidity insurance*: available on demand, so that the amount borrowed is determined by the counterparty but at prices and on conditions determined *ex ante* by the Bank; and
- *Open Market Operations*: liquidity is offered to all relevant counterparties simultaneously in an open auction, where the frequency of the operation is determined by the Bank and, typically, the aggregate amount available is also set by the Bank.

100 The Bank's Open Market Operations, discussed in Section III above, are designed to ensure that the banking system as a whole is provided with the right amount of reserves to achieve the aggregate reserves target, as a necessary precondition for maintaining market overnight rates broadly in line with Bank Rate. The Bank therefore supplies a fixed quantity of funds for which firms bid. OMO counterparties that are reserves banks may bid for liquidity for their own use, but they cannot be sure that their bids will be accepted, in which case they have to acquire the reserves needed to meet their targets in the money markets. OMO counterparties may also act as intermediaries, on-lending reserves to clients and in the markets. As described above, in the Bank's framework, the efficient distribution of reserves around the banking system is a necessary condition for implementing monetary policy effectively. Therefore, regulated firms other than banks are eligible to apply to become counterparties in the Bank's OMOs provided that they are active intermediaries in the sterling money markets.

101 By contrast, the Bank's bilateral liquidity-insurance facilities will continue to be offered only to commercial banks (including building societies). This is because they should be available only to those institutions which, by virtue of their liabilities being money, themselves provide liquidity insurance to households and firms, and so lie at the core of the economy's payments system. Other types of firm act as intermediaries in the financial markets, but they rely on intraday and overnight liquidity from their bankers in order to do so. Currently, all banks and building societies placing Cash Ratio Deposits at the Bank are eligible to have access to the Bank's liquidity-insurance facilities.

Maturity

102 As described in the existing *Red Book*,⁽¹⁾ the Bank generally chooses the maturity of the assets acquired in its monetary operations according to the expected maturity of its monetary liabilities (notes and bankers' reserves). For example, the underlying growth of the banknote issue has been steady for many years, and so much of the necessary financing for banknotes could have been provided via the acquisition of longer-maturity assets in long-term repos and outright purchases of (high-quality) bonds. (That is being achieved via the bond-purchase OMOs described above.)

103 In stressed circumstances, the maturity at which the Bank provides liquidity via its operations should be determined by the circumstances of the financial system (counterparties and markets), not solely by the expected maturity of the Bank's monetary liabilities. By providing liquidity insurance, the central bank effectively provides time for banks and others to address the problems created by the stress; and for the authorities to develop remedial plans. Such insurance is not and cannot be a source of longer-term funding to the banking system. The Bank's proposed new facilities are designed explicitly to provide liquidity insurance to help alleviate stress.

Outright purchase of assets vs secured lending

104 Outright purchases are permanent transactions and as such transfer financial risk to the Bank. Given the Bank's aims of protecting the integrity of its balance sheet and, in normal conditions, of having broadly neutral effects on relative asset prices, its liquidity-insurance operations will routinely comprise loans (repo and swaps) rather than outright purchases.⁽²⁾ Via appropriate valuations, haircuts and remargining, using repos (and swaps) will enable the Bank to leave financial risk with its counterparties. Consistent with its role as central bank, the Bank will be aiming to unbundle liquidity risk from credit and valuation risk.

Collateral, haircuts and pricing

105 Consistent with preserving the integrity of the Bank's balance sheet, in those of its operations designed purely to manage the supply of reserves, the Bank will continue to confine eligible instruments to very high credit-quality, liquid sovereign and supranational securities.

106 When acting to alleviate financial stress, central banks have traditionally been prepared to lend to commercial banks against a wider population of good-quality collateral. The Bank has decided that it can be more transparent about the collateral it is prepared to take in its new permanent public facilities, on terms designed to be consistent with avoiding creating incentives for commercial banks to take greater risks in future and with protecting the Bank itself against risk.

107 Unsecured bank debt will continue to be excluded from the Bank's facilities because, if eligible, it would entail the Bank

extending credit to the banking system secured by a claim on the banking system. In highly stressed conditions, that may well not provide the Bank with adequate protection against loss in the event of a counterparty default. Also, such a system would have the perverse effect of inducing banks to hold each other's debt as a form of a liquid asset; at the level of the system as a whole, such liquidity could prove illusory.

108 For the population of securities that is eligible in the new facilities, a distinction will be made between those that are and those that are not also eligible in the Bank's short-term repos (STRs), notably in the terms on which liquidity is available. The Bank believes that the incentives for commercial banks to hold on their balance sheet a liquidity buffer of sovereign securities of the very highest credit-quality would be eroded if the Bank were to accept other securities in the new facilities on equal terms.

109 For securities to be admitted as eligible, the Bank will need to be able to value them and to manage the risks in the event of counterparty default. The Bank will develop detailed eligibility criteria reflecting its risk tolerance and experience gained from managing assets and collateral, including as part of the Special Liquidity Scheme and the current extended-collateral long-term repos. In particular, for securitised assets, the Bank plans in due course to establish criteria for both the structure of the securitisation and the composition of the underlying portfolios. For example, the Bank is considering, and will discuss with interested market participants and commentators, whether or not:

- to exclude asset-backed securities based on dynamic rather than static portfolios, on the grounds that dynamic portfolios can deteriorate through a process of adverse selection that persists after inception and which is difficult to track;
- to exclude certain types of higher risk loans (eg mortgages without full documentation); and
- to place maxima on the loan to value ratios and arrears performance of loans included in portfolios.

110 Haircuts will vary across different types of security, taking account of, among other things, the underlying credit and market risk, the degree of diversification in portfolios, and the liquidity of the markets in which they can be sold. Remargining will take place on a daily basis.

(1) See paragraphs 35 and 36 of the *Red Book*.

(2) For the purpose of backing a proportion of the note issue, the Bank does purchase outright some securities of the highest credit quality that are traded in liquid markets. In these outright purchases, valuations should be highly robust and the Bank's risk should be minimised. Beyond that, in the face of deflation, when interest rates would be close to the zero bound, outright purchases of a broader range of instruments might be appropriate, as the Bank might then wish to set aside its normal considerations about minimising the effect of its monetary operations on relative asset prices. Implementing monetary policy at or close to the zero bound is beyond the scope of this consultative paper.

111 Where the collateral delivered by a counterparty comprises securitisations or covered bonds of portfolios of loans it originated itself (or with which it has close financial links), higher haircuts and fees will apply. That is because of the likely correlation between the quality of the portfolios (and hence the Bank's collateral) and the probability of the counterparty defaulting. And the Bank would plan not to lend, via its new permanent facilities, against collateral which it judged had been created for the express purpose of rediscounting with the Bank.

112 The Bank will keep haircuts under review, and will reserve the right to alter them, including on outstanding transactions. In reviewing haircuts, the Bank will take into account structural and cyclical changes in financial conditions. In the future the Bank may, for example, increase haircuts if secondary market liquidity became impaired; or if the Bank concluded that, as a credit cycle developed, risk was plausibly underpriced and so not properly reflected in the valuations of instruments used as collateral.

113 But the Bank does not believe that haircuts could be relied upon on their own to produce the appropriate incentives for banks' liquidity management. The Bank will, therefore, be adopting a fee structure that increases as banks borrowing increases and/or is made against riskier collateral. Consistent principles will be applied to the pricing structures for the two new permanent facilities described in Sections VI and VII below.

High-level architecture of new liquidity-insurance facilities

114 In summary, the Bank's design of permanent public facilities explicitly intended to help to alleviate episodes of financial system stress, by underpinning banking system liquidity, is informed by the following principles:

- The Bank may lend against wide collateral provided that the Bank is capable of valuing it and managing it in the event of a counterparty default.
- The terms of any such facilities should balance the costs of creating incentives for commercial banks to take more liquidity risk in the future.
- Such lending against wider collateral should be for term maturities.
- Liquidity should be provided via secured loans (repo or swaps) rather than outright purchases; and terms (eg collateral margins) should control the risk to the Bank.

- Facilities providing bilateral liquidity insurance should be made available only to commercial banks, whose liabilities are money.
- Facilities should not be available to banks where in the judgement of the Bank there were serious question-marks over their viability or solvency.

115 In the light of those design principles, the Bank plans permanently to add to its Framework two new instruments explicitly designed to help contain financial system stress by providing financing against securities that may become illiquid in stressed conditions:

- *A Discount Window Facility making available to commercial banks collateral swaps in which the Bank lends UK government securities in exchange for a wide range of eligible collateral.* The fee for borrowing the gilts will vary both by collateral type and by the total amount borrowed.
- *Long-term repos (LTRs) against collateral that comprises a range of high-quality securities beyond the sovereign securities routinely eligible in the Bank's short-term repo operations.* The auction structure will be designed to allot differing amounts at different prices for different collateral types, reflecting the pattern of demand revealed in the bids, and given the degree of financial stress in the system.

116 The following Sections discuss each of these facilities in greater detail.

VI The Discount Window Facility

117 The Bank is introducing a Discount Window Facility to provide liquidity insurance to the banking system. A Market Notice setting out the details will be published on Monday 20 October 2008.

118 Loans from the Discount Window Facility (DWF) will usually take the form of a collateral swap in which the Bank lends UK government debt (gilts) against eligible collateral. A transaction of this form will have no impact on the Bank's net supply of reserves, and so will not necessitate any offsetting adjustment in the Bank's other monetary operations. It will, of course, be open to banks to use any gilts borrowed from the DWF in the Bank's regular OMOs, or in the market, as a way of raising cash.

Counterparties and drawings

119 All banks and building societies placing Cash Ratio Deposits at the Bank will be eligible to access the Discount Window Facility, subject to signing the necessary documentation.

120 Counterparties will be able to apply to use the Discount Window Facility at any time. Drawings will be at the Bank's discretion, and will not be permitted for banks with fundamental solvency problems or otherwise where the bank has issues that should be addressed via the planned Special Resolution Regime.⁽¹⁾

121 Because the DWF is designed to make financing available in, and so to help contain, stressed conditions, drawings will in normal circumstances be for a 30-day term maturity. Banks will have the option to repay at any time. It will be open to banks to apply to roll DWF borrowing, which will be at the discretion of the Bank.

122 Banks borrowing gilts from the DWF will not be permitted to use them in the Operational Standing Facility (OSF). That is because, as described in Section IV above, the purpose of the OSF will be to resolve short-term frictional problems in the payment systems and overnight money markets.

Gilts loaned by the Bank

123 The gilts made available via the DWF will comprise bundles of individual securities.

124 The Bank would welcome views on the details of the bundles of gilts it would lend via the Discount Window Facility.

Collateral

125 The population of eligible collateral will be broad. Counterparties will be able to bring to the DWF any collateral from a well-defined list. A first list will be published shortly, and it will be developed over time, drawing on detailed consultations with market participants and commentators. As underlined in Section V, the Bank will include on the list only assets that it should be able to value and whose risks it should be able to manage in the event of a counterparty defaulting.

126 In view of the Bank's planned pricing structure (see below), instruments eligible in the DWF will be classified into four groups (or Levels), broadly defined as follows:

- Level A: high-quality sovereign and supranational bonds.
- Level B: other quality debt that is tradable in liquid markets.
- Level C: debt, and other transferable instruments, that are not tradable in liquid markets.
- Level D: 'own name' instruments, ie where a bank borrowing from the DWF itself originated (or has some other close financial link to) the assets comprising the collateral.

127 Level A instruments will be those eligible in the Bank's short-term repo OMOs (and so in the Operational Standing Facility described in Section IV above, and intraday in the sterling wholesale payments system).⁽²⁾

128 Level B will include, for example, highly rated mortgage bonds, securitisations of corporate lending and portfolios of corporate bonds, provided that they are trading in liquid markets.

(1) HMG plans to introduce a Special Resolution Regime to extend the range of tools available to the authorities to deal with situations where a bank failure has become imminent. Proposals for the regime have been published for consultation. See www.hm-treasury.gov.uk/media/E/1/consult_depositorprotection010708.pdf.

(2) During the day, the Bank provides intraday liquidity to facilitate the functioning of the wholesale payments systems. This intraday liquidity is provided against the same list of collateral that is eligible for the Bank's routine short-term OMOs. See paragraph 45 of the *Red Book* for more detail.

129 Level C will include, for example, high-quality transferable securitised loans, including highly rated mortgage bonds that are not trading in liquid markets, or which have been privately placed; together with certain diversified equity portfolios. Where a market becomes illiquid, eligible instruments may be moved from Level B to Level C.

130 Level D will include, for example, 'own name' securitisations and covered bonds, and possibly underlying loans. Borrowing against these instruments will, accordingly, be subject to higher haircuts and fees. That is for two reasons. First, if the collateral pledged by a bank comprises portfolios of loans it originated itself, whether or not in securitised form, there probably is not a market for them. Second, the Bank's exposure to risk would be greater than otherwise due to the correlation between the value of a bank's asset portfolio and the probability of its defaulting.

131 Among other things, the following will definitely be excluded from Levels B, C and D: unsecured bank debt of any kind; asset-backed debt securities formed from synthetic portfolios; securities with complex leverage or embedded options; commodities; and real estate. Nor, in its permanent facilities, will the Bank take securitised instruments containing eligible assets that had been created for the express purpose of rediscounting with the Bank.

132 As recorded in Section V, for instruments included in Levels B, C and D, the Bank plans over time to define the permanent eligibility criteria in some detail. The Bank will reserve the right to change the list of collateral eligible in the DWF at any time, including switching instruments from one Level to another for purposes of haircuts or the fee charged on drawings.

133 Haircuts may vary for instruments within each of Levels A, B, C and D, according to the general policies set out in Section V. They will be set recognising that the Bank may need to realise risky collateral in stressed circumstances; and taking account of diversification within portfolios that should prove robust in such stressed conditions.

Pricing

134 The fee for borrowing gilts in the Discount Window Facility will vary according to:

- The broad type (Level) of collateral used.
- The total outstanding amount a bank or building society has borrowed from the DWF, scaled relative to the size of its sterling balance sheet.

135 As a measure of sterling balance sheet size, the Bank plans to use Eligible Liabilities (ELs).⁽¹⁾ The fee will depend on

whether a bank's total drawing is in the range 0%–10% of ELs; 10%–20% of ELs; or 20%–30% of ELs. For drawings beyond 30% of an institution's ELs, the fee will be at the Bank's discretion, if access is permitted.

136 The fee charged for progressively larger drawings of riskier collateral will increase to a greater extent than the fee for progressively larger drawings of better-quality collateral. This will give banks an incentive to hold good-quality collateral assets in the future.

137 The Bank's pricing matrix is, therefore, as follows:

Table A

Fee in basis points				
Collateral type (% ELs)	Level A	Level B	Level C	Level D
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			

138 In implementing the above fee structure, the Bank will assume that for mixed buckets of collateral (for example where total drawings are against collateral from both Level B and Level C) the collateral from the less risky Level is used 'first'.⁽²⁾

139 Charging fees on the basis of the stock of DWF borrowing will entail rates on existing transactions being reset as other transactions mature. That will incentivise prudent liquidity management.

140 **The Bank seeks comment on this new Discount Window Facility:**

- **What is likely to be the pattern of demand for use of the Discount Window Facility, in both routine and stressed circumstances?**
- **Are there any specific operational issues that the Bank should address?**

(1) Sterling eligible liabilities broadly comprise sterling deposits (deducting deposits placed with other banks and building societies) and are intended to measure the size of a bank's sterling balance sheet after netting out interbank deposits. Further detail on eligible liabilities can be found at www.bankofengland.co.uk/statistics/about/faq_crds.htm.

(2) For example: suppose a bank has 100 of ELs, and borrows 25 (so borrowing 10 in each of the first two size tranches and 5 in the third tranche), with an underlying collateral mix of 5 of Level A collateral, 12 of Level B and 8 of Level C. Using the principle of 'good-quality collateral being used first' and the pricing matrix outlined above, 5 would be borrowed vs Level A at 50 basis points, 5 borrowed vs Level B at 75 basis points, 7 borrowed vs Level B at 125 basis points, 3 borrowed vs Level C debt at 200 basis points, and 5 borrowed vs Level C at 275 basis points. This gives an average cost of 139 basis points.

Disclosures

141 The Bank is planning for a low level of disclosure of drawings from the DWF, in order to avoid speculation of the kind that could bring about the very kind of systemic problem that the DWF is being introduced as a permanent facility to help avert. Specifically, the Bank plans to publish average use of the facility over each quarter at the end of the subsequent quarter; so any use, for example, over the period January–March would be published at the end of June.

142 **Do counterparties, or other market participants, have comments on the planned disclosure arrangements?**

Contingencies

143 The Bank will retain discretion in two areas: to extend the maturity of Discount Window borrowing beyond 30 days; and to lend cash rather than gilts, which might prove necessary in very rare circumstances where, as recently, the government bond repo markets failed to function properly during a period of acute stress. The exercise of those discretions will depend on the Bank's assessment of financial conditions. If ever the term of DWF borrowing were temporarily extended, the disclosure arrangements summarised above would be adapted accordingly.

VII Long-term repurchase operations against extended collateral: possible new auction structure

144 As part of its existing *Red Book* framework, the Bank has for some years conducted long-term repo operations each month, lending at three, six, nine and twelve-month maturities. Since December 2007, and especially since September 2008, the Bank has increased the amount and frequency of its three-month lending and has expanded the range of collateral eligible in those operations to include, among other things, some asset-backed securities and covered bonds. The Bank now proposes to widen permanently the range of collateral eligible in its routine monthly long-term repo operations. But in order to meet its objectives, the Bank intends also to modify their operational design in due course. This Section outlines how long-term repos can contribute to both of the Bank's main Objectives, sets out the principles guiding the possible reformed design of these operations, and describes the related questions on which the Bank is consulting.

The role of long-term OMOs in both normal and stressed conditions

145 As described in Section III, Open Market Operations (OMOs) in which the Bank lends cash against collateral are the main way in which it ensures that the banking system as a whole is provided with sufficient reserves, in aggregate, to allow reserves-scheme members to achieve their reserves targets. This is a precondition for meeting the Bank's objective of maintaining overnight risk-free interest rates broadly in line with Bank Rate.

146 In normal conditions the Bank's long-term repo operations have in the past been conducted with the same counterparties and against the same collateral as its short-term OMOs. Only the maturity and frequency of the operations have differed.⁽¹⁾ In determining the relative scale of its short and long-term OMOs, the Bank's approach has been that (a) short-term borrowing from the Bank entails uncertainty in the liquidity management of its counterparties; (b) the larger the size of short-term OMOs, the greater the volume of transactions and so the operational risk entailed; (c) the Bank's banknote liabilities can to a large extent be backed by assets acquired in longer-term OMOs, as the growth of banknotes has been steady for many years; but (d) the Bank

may nevertheless at times need to reduce its total OMO assets, which puts a limit on the proportion that should be held at long-term maturities.

147 As has been demonstrated over the past year, the Bank's long-term repo operations can also contribute to its second objective of reducing the economic costs of disruptions to the commercial banking system's provision of liquidity and payments services. Starting in December 2007, and as part of co-ordinated action by a number of central banks, the Bank increased the size of its long-term repos; and, from September 2008, also their frequency. By shifting the composition of its open market lending away from the one-week maturity and towards the three-month maturity, the Bank has helped to provide time for banks, and the authorities, to address the problems underlying market stress. And by extending the range of collateral eligible in its three-month repos, the Bank has assisted commercial banks in financing assets that had suddenly become illiquid. Looking ahead, the Bank expects eventually to reduce the size of its long-term repos when stability is re-established in financial markets. But drawing on the experience of the past year, the Bank plans to adapt its published framework by permanently expanding the collateral eligible in its long-term repos.

Permanent extension of collateral for long-term repo auctions

148 In its routine lending operations, including its long-term lending, the Bank's approach in the past has been to accept as collateral only very high-quality sovereign and supranational securities. But as described in Section V above, in order to support the banking system's provision of liquidity services to the economy, the Bank is planning to make a wider population of good-quality collateral permanently eligible in its long-term repo auctions. The wider collateral will comprise certain types of high-quality (non-sovereign) securities.

149 The list of collateral for the new long-term repos will probably not be as wide as that proposed for Level B of the Discount Window Facility described in Section VI. That is

⁽¹⁾ For details see paragraphs 37 and 127–31 of the *Red Book* at www.bankofengland.co.uk/markets/money/publications/redbookjan08.pdf.

because it would be impractical to auction funds against *many* different types of collateral in a way that is consistent with the Bank's goal of making the auction results, in its reformed permanent framework, sensitive to the types of collateral offered.

150 The Bank would, however, be prepared to contemplate making the same wider list eligible in its auctions for repo-lending at six, nine and twelve-month maturities as in those for three months, if there were demand for that. The Bank would, however, need to be satisfied that making wider collateral eligible at more maturities would not dilute the incentives of banks to manage their balance sheets and liquidity prudently in future.

151 **Is there demand for a wider range of collateral to be eligible in six, nine and twelve-month repos, as well as in three-month repos?**

- How would that affect banks' behaviour?

Counterparties

152 In common with the Bank's short-term OMOs, the counterparties in the long-term repos can include both reserves banks and regulated firms that are active intermediaries in the sterling money markets. The Bank is not planning to change these arrangements, because long-term repos play an important role in injecting reserves, relying on the market to distribute them to where they are needed.

Design principles for long-term repos against an extended collateral range

153 In permanently extending the range of securities eligible as collateral in its long-term repos, the Bank will want to ensure that that does not dilute banks' incentives to manage their liquidity prudently. Reflecting the Objectives set out in Section II and the high-level design principles for the permanent new facilities set out in Section V, the Bank is minded to reform the auction structure for its long-term repo operations with a view to delivering the following:

- Counterparties bidding to borrow against wider collateral should face incentives to bid, and pay, higher interest rates than those borrowing against the high-quality sovereign securities eligible in short-term repos (STRs).
- As the spread between the rates bid to borrow against the different groups of collateral increases, possibly reflecting stress in the financial system, the auctions should offer greater access to borrowing against the wider collateral.

Bidding against different 'Sets' of collateral

154 The Bank is minded, therefore, to introduce an auction mechanism under which counterparties would be asked to bid separately to borrow against different types of collateral. Initially there would be two such 'Sets'. The first Set would comprise securities eligible in the Bank's routine short-term repo operations and in the Operational Standing Lending Facility, ie high-quality sovereign and supranational securities. The second Set would comprise a wider class of collateral. In the light of experience of operating such auctions, the Bank would not rule out adding one or more additional Sets of collateral for long-term repos over time. As with the Discount Window Facility, the Bank might amend the composition of the Sets in the light of wider market trends.

155 With two Sets of collateral, the Bank would, in effect, be holding two simultaneous, parallel auctions for lending at each maturity for which the wider collateral was eligible. For each collateral Set, bids would be allotted from the highest interest rate downwards until, reaching the 'stop-out rate', either all bids were allotted or the funds allocated to lending against that collateral Set were exhausted. Through the lifetime of a repo, substitution of collateral would be permitted only within Sets, or where upgrading to the higher-quality Set.

156 Against that background, the Bank is considering, and would welcome comments on, two alternative ways of allocating lending between different Sets of collateral.

(a) Proportions lent against different collateral Sets determined in advance of each auction

157 In the first allocation method, the Bank would announce in advance the amount it was prepared to lend against each collateral Set separately; and the auctions of funds against the two Sets would, similarly, be separate. The bids against each type of collateral would affect the Bank's choice of how much to offer to lend against the two Sets in *subsequent* monthly operations (alongside other considerations, including market conditions).

158 This approach might, however, not always deliver results consistent with the Bank's Objectives in individual months, because the allocation between collateral Sets would not be influenced by the pattern of bids in the auction. If the stop-out rate for bids against private collateral turned out to be lower than the Bank had expected when it chose the relative size of the two parallel auctions, the pre-announced share of lending against that collateral Set might be greater than would be consistent with the Bank's objective of encouraging prudent banking system liquidity management. On other occasions, the stop-out rate in the non-sovereign auction might be higher than had been expected, indicating stress in the system, so that a higher allocation to borrowing against the private-collateral Set would have been consistent with the goal of helping to alleviate such stress.

(b) Proportions lent against different collateral Sets determined by the pattern of bids

159 The second option is accordingly defined by making the amount of lending against each collateral Set dependent on the spread between the two 'stop-out' rates. The Bank is minded to adopt this approach. For each repo maturity, the Bank would announce the total amount of funds available in the auction but would not specify in advance how much it would lend against each collateral Set. Instead, that would be determined in the auction.

160 Counterparties would bid for funds specifying which collateral Set they wanted to borrow against (as now, multiple bids would be permitted). For any pattern of bids within the overall auction, there would usually be many possible ways of splitting the auction between the two collateral Sets. The Bank would make the split using a predefined schedule relating the proportion of funds allocated against each collateral Set to the difference in the stop-out rates for each Set. The Bank would expect to lend routinely some funds against both types of collateral. But as conditions in financial markets varied, the auctions would be designed to shift the balance of long-term repo lending between each collateral Set.

161 More specifically, as the interest rates bid to borrow against private securities rose relative to those bid to borrow against sovereign securities — as summarised by the spreads between the possible 'stop-out' rates — proportionately more of the total funds available would be lent against private securities. And as the interest rates bid to borrow against private securities fell back, the balance would revert towards lending against sovereign collateral. To encourage prudent liquidity management, a large proportion would be allocated to bids to borrow against private collateral *only* when the spread reached a level broadly in line with the fee for accessing the Bank's new Discount Window Facility against similar tradable securities (probably Level B DWF collateral). The resulting relationship between the Bank's division of its lending and the spread between stop-out rates in each group of bids amounts to the Bank's 'supply schedule', which is described in more detail in Box F. A simple example of how the Bank would allocate an auction is outlined in Box G.

162 If the Bank pursues this approach to its long-term repo auctions then, depending on the responses to this consultation paper, it would in principle be prepared to contemplate publishing how it would determine the split in the allocations against the different collateral types. That would amount to revealing the 'supply schedule' described in Box F. The Bank would reserve the right to change the 'supply schedule' over time.

163 **How would participants bid in an auction where the division between lending against different collateral types was dependent on the bids received?**

- **Would participation be greater or less than in an auction with fixed amounts for each type of collateral?**

What successful bidders pay: discriminatory or uniform-price auctions?

164 Whichever mechanism the Bank adopts for allocating lending between different Sets of collateral, there is a separate design choice to be made on the pricing format to be used. This choice would be between a so-called uniform-price format (in which every successful bidder would pay the same rate — the stop-out rate for borrowing against the relevant type of collateral); and a format in which successful bidders would each pay the rate they bid. In its existing long-term repos, the Bank has employed the pay-your-bid (or discriminatory price) format, but these operations have routinely been against high-quality sovereign collateral. For long-term repos with two Sets of collateral, the Bank is considering the alternative of a uniform-price format.

165 A pay-your-bid format ensures that counterparties bidding the highest rates also pay the highest rates, so banks in most need of liquidity would tend to pay higher rates than those who valued access to central bank liquidity insurance less highly. A uniform-rate format would not ensure that those banks placing the highest value on central bank liquidity would pay the highest rates, potentially diluting the incentives for banks to manage their liquidity prudently.

166 There is, however, an opposing consideration. Under a pay-your-bid format, bidders may face incentives to submit bids that are below the interest rate that they would actually be prepared to pay given their circumstances. Given that, if allotted, they pay the rate they bid, they face incentives to submit bids close to where they think the stop-out rate will be for the auction as a whole, and so taking into account their expectations of bids by other counterparties. With repeated monthly auctions, it is possible that bidders operating in a pay-your-bid format would learn about likely stop-out rates and adjust their bids over time. These incentives might be most powerful in unstressed conditions, when success in the auction might depend on bidders' skill in predicting the stop-out rate. But in stressed conditions a risk-averse bank would probably be more willing to bid above its expectation of the stop-out rate if it had a strong demand for financing via the auction. In contrast, a uniform-rate format, in which the rate paid is not affected by the rate bid, encourages bidders to submit bids close to the value they truly attach to central bank liquidity. But if the aggregate demand of the banks most willing to pay high rates were smaller than the size of the auction, the stop-out rate, and so the rate paid by those banks, would be determined by the demand of banks willing to bid only relatively low rates.

167 The Bank invites views from OMO counterparties, and from commentators more widely, on how bidding behaviour in long-term repos against wider collateral might be affected if the Bank were to adopt a uniform-price format.

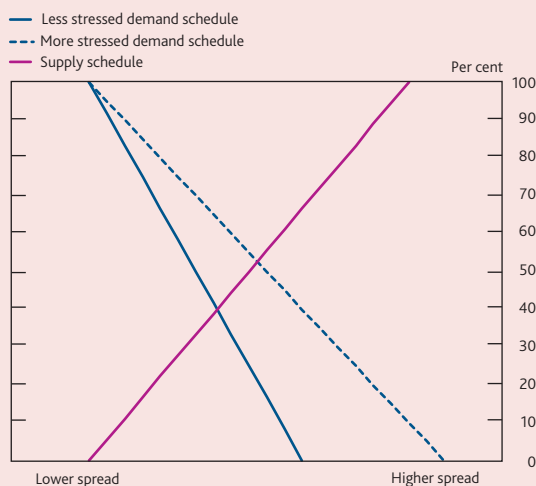
Box F: The Bank's supply schedule when bids are grouped by collateral

As described in the main text, the Bank is considering holding long-term repo auctions in which a given amount of money would be available at each maturity but counterparties would enter separate bids to borrow against different classes of collateral. The Bank would then choose the proportion of the amount of money on offer to be allocated to borrowing against one form of collateral or the other. Starting with the highest bids for each type of collateral, the Bank would accept successively lower bids until the chosen proportion of the auction had been allocated. The lowest accepted bid for each type of collateral would be the stop-out rate for that type of collateral.

As demonstrated in Box G, there would normally be a number of different ways in which borrowing in the auction could be allocated between types of collateral. Each possible allocation would have a different pair of stop-out rates. These possibilities are illustrated schematically in the 'demand schedules' in the chart. They show how the spread between the stop-out rates might vary (measured on the horizontal axis) as the Bank chose to allocate different proportions of the auction to wider collateral (measured on the vertical axis). The demand schedules slope downward to the right because counterparties would be very willing to borrow against wider collateral if the cost was low relative to borrowing against usual collateral (gilts and other high-quality sovereign bonds). But bids to borrow against wider collateral at a high spread would be more sparse. The chart shows two demand schedules. In stressed conditions, when wider collateral was less usable in the market, bidders might be more prepared to bid up to borrow against it in auctions at the Bank. So the 'more stressed demand schedule' slopes down less steeply to the right.

The 'demand schedules' represent the choices open to the Bank. Given the bids in the auction, the auction would be fully allocated at each point on the line. The 'supply schedule' illustrates the way in which the Bank would exercise its choice. And the allocation in the auction is represented by the point at which demand and supply schedules cross one another. The supply schedule slopes upward to the right because, in accordance with the objectives and principles underlying the planned framework for the Bank's market operations, as conditions became more stressed the Bank would wish to allocate more of the auction to wider collateral. But it would do so at a higher spread. A horizontal supply schedule by contrast would imply that the Bank placed little weight on reducing the costs of financial stress. The split of lending between the two collateral types would be fixed and banks would not be able to finance more assets in the wider class of collateral. By contrast, a steeply rising supply schedule would imply that the Bank placed little weight on encouraging prudent liquidity management by commercial banks. As assets in the wider collateral class became more difficult to finance and bids increased, the Bank would allot a much larger share of the auctions to that collateral with very little increase in the spread and so in the price charged.

Chart 1 Illustrative demand and supply schedules: percentage share of auction allocated to wider collateral



Box G: An example auction allocation

This example illustrates how the Bank might divide a notional tender of £1 billion between two groups of bids, against sovereign collateral and against non-sovereign collateral. To simplify, each bid is assumed to be for £100 million, a tenth of the total tender. There are nine bids in each group. **Table 1** shows the bids grouped and ranked in order of interest rate. The numbers are invented and assume, for illustration, that the risk-free rate at the relevant maturity is 5%.

Table 1 Interest rates bid (basis points)

Bid	Sovereign collateral	Non-sovereign collateral
1	515	561
2	512	554
3	509	547
4	506	540
5	503	533
6	500	526
7	500	519
8	500	512
9	500	505

Table 2 shows all possible divisions of £1 billion between the two groups of bids and the stop-out rates that would result for each group.

Table 2 Possible outcomes

Possible divisions (£mn)		Interest rates (bp)		Spread between stop-out rates (bp)	
Sovereign	Non-sovereign	Stop-out in sovereign group	Stop-out in non-sovereign group	From the auction	Bank target
100	900	515	505	-10	50
200	800	512	512	0	45
300	700	509	519	10	30
400	600	506	526	20	35
500	500	503	533	30	30
600	400	500	540	40	25
700	300	500	547	47	20
800	200	500	554	54	15
900	100	500	561	61	10

For example, in the third row the three highest bids against sovereign collateral are accepted, along with the seven highest bids against non-sovereign collateral. The stop-out rate in the sovereign collateral group would be 509 basis points and that in the non-sovereign collateral group would be 519 basis points — a spread of 10 basis points.

The final column of **Table 2** shows an example (again purely illustrative) of how the Bank might allocate lending between sovereign and non-sovereign collateral dependent on the

spread between the stop-out rates. It shows, for each possible division of the money on offer, the spread at which the Bank would be willing to make that allocation. To allocate 90% of the tender to the non-sovereign collateral group, the Bank would have required a spread of 50 basis points but to allocate only 10% it would have needed a spread of just 10 basis points. In this example, the allocation to the non-sovereign group at which the Bank hits its target spread is £500 million (50% of the tender).

VIII Summary of questions and next steps

168 The Bank is seeking views from interested parties on the following issues:

- 1 (Para 80) Do participants consider that periodic publication of average usage of the Bank's Operational Standing Facilities will help to avoid stigma in using the facilities?
 - (i) Would daily publication deter use? How great a delay would be optimal?
 - (ii) Now that banks have experience of reserves averaging, will reduced disclosures of information relating to aggregate reserves balances materially affect the management of their own reserves or their participation in Open Market Operations?
- 2 (Para 87) The Bank would welcome comments on the proposal to set the range around reserves targets in normal circumstances, when resumed, at $\pm 5\%$.
 - (i) In particular, what effect might it have on banks' decisions on reserves targets in normal conditions, and in stressed conditions?
 - (ii) Is there support for the Bank's plan to maintain the recently increased maximum limits on reserves targets at the higher of £2.5 billion and 5% of Eligible Liabilities?
- 3 (Para 89) Do reserves banks agree that, in the event of their being invited to submit revised reserves targets *during* a maintenance period, it would be easier to do so for the maintenance period as a whole rather than for the remainder of the maintenance period?
- 4 (Para 94) What impact would moving to variable-rate auctions have on counterparties' likely participation in short-term repo OMOs?
 - (i) What impact would there be on participation in short-term OMOs if any such variable-rate auctions were conducted at a uniform price, rather than on a pay-your-bid basis?
 - (ii) Would signals be read into short-term OMO results?
- 5 (Para 124) The Bank would welcome views on the details of the bundles of gilts it would lend via the Discount Window Facility.

6 (Para 140) The Bank seeks comment on this new Discount Window Facility:

- (i) What is likely to be the pattern of demand for use of the Discount Window Facility, in both routine and stressed circumstances?
 - (ii) Are there any specific operational issues that the Bank should address?
- 7 (Para 142) Do counterparties, or other market participants, have comments on the planned disclosure arrangements?
 - 8 (Para 151) Is there demand for a wider range of collateral to be eligible in six, nine and twelve-month repos, as well as in three-month repos?
 - (i) How would that affect banks' behaviour?
 - 9 (Para 163) How would participants bid in an auction where the division between lending against different collateral types was dependent on the bids received?
 - (i) Would participation be greater or less than in an auction with fixed amounts for each type of collateral?
 - 10 (Para 167) The Bank invites views from OMO counterparties, and from commentators more widely, on how bidding behaviour in long-term repo against wider collateral might be affected if the Bank were to adopt a uniform-price format.

169 The Bank will issue a Market Notice on Monday 20 October launching the new Operational Standing Facilities and the Discount Window Facility.

170 The Bank would be glad to discuss the issues raised in this paper with interested parties. Comments are invited and should be sent to the Head of Sterling Markets Division, Bank of England, Threadneedle Street, London EC2R 8AH, or by email to marketoperationsdevelopment@bankofengland.co.uk by 27 November 2008.

171 In the light of comments received and following further consultation if necessary, the Bank will finalise its proposals for the development of the Bank's market operations. It will in due course incorporate those changes into a revised Framework for the Bank of England's Operations in Sterling Money Markets (the 'Red Book').