



UNITED KINGDOM

FINANCIAL SECTOR ASSESSMENT PROGRAM

June 2016

REVIEW OF THE BANK OF ENGLAND'S LIQUIDITY PROVISION FRAMEWORK—TECHNICAL NOTE

This Technical Note on Review of the Bank of England's Liquidity Provision Framework on the United Kingdom was prepared by a staff team of the International Monetary Fund. It is based on the information available at the time it was completed in March 2016.

Copies of this report are available to the public from

International Monetary Fund • Publication Services
PO Box 92780 • Washington, D.C. 20090
Telephone: (202) 623-7430 • Fax: (202) 623-7201
E-mail: publications@imf.org Web: <http://www.imf.org>
Price: \$18.00 per printed copy

International Monetary Fund
Washington, D.C.



INTERNATIONAL MONETARY FUND

UNITED KINGDOM

FINANCIAL SECTOR ASSESSMENT PROGRAM

March 2016

TECHNICAL NOTE

REVIEW OF THE BANK OF ENGLAND'S LIQUIDITY
PROVISION FRAMEWORK

Prepared By
**Monetary and Capital Markets
Department**

This Technical Note was prepared in the context of an IMF Financial Sector Assessment Program (FSAP) in the United Kingdom in November 2015 and February 2016 led by Dimitri Demekas. It contains technical analysis and detailed information underpinning the FSAP findings and recommendations. Further information on the FSAP program can be found at <http://www.imf.org/external/np/fsap/fssa.aspx>

CONTENTS

Glossary	3
EXECUTIVE SUMMARY	4
OVERVIEW OF THE LIQUIDITY PROVISION FRAMEWORK AND RECENT DEVELOPMENTS	6
A. The Pre-GFC Framework and the Impact of the GFC	6
B. The Current Sterling Monetary Framework	8
ISSUES OF RELEVANCE TO FINANCIAL STABILITY	9
A. The Scope of Liquidity Insurance and the Adequacy of Safeguards	9
B. How Well-Quantified and Managed is the Bank’s Exposure to Liquidity Insurance?	10
C. Incentives for SMF Participants to Self-insure Against Liquidity Risk	11
D. Foreign Exchange Liquidity Insurance	13
E. Is the ELA Framework Robust to Future Needs?	13
F. Is the MMLR Framework Adequate?	14
G. Will the Future Monetary Policy Implementation Model Function Adequately with the Liquidity Insurance Framework?	14
H. Have the BoE’s Facilities been Sufficiently De-stigmatized for Them to Function Effectively?	15
BOX	
1. The Bank of England’s Capital Adequacy Framework	12
FIGURES	
1. ELA Operations During the Crisis Period	18
2. Results of ILTR Operations 2014–16	20
TABLES	
1. United Kingdom: Main Recommendations on the Liquidity Provision Framework	6
2. Overview of the Bank’s Sterling Monetary Framework	8
3. Operational Features of the Current BoE Liquidity Provision Framework	19
4. Eligible Collateral	21
5. Counterparty Access to SMF Facilities	22
APPENDICES	
I. Challenges from the GFC and Subsequent	17
II. The Current Sterling Monetary Framework (SMF)	19
III. The ELA Framework	23

Glossary

BoE	Bank of England
DWF	Discount Window Facility
Bank Rate	Bank of England Target Rate
CTRF	Contingent Term Repo Facility
ELA	Emergency Liquidity Assistance
GFC	Global Financial Crisis
ILTR	Indexed Long Term Repo operation
LOLR	Lender of Last Resort
QE	Quantitative Easing
RMBS	Residential Mortgage Backed Securities
RONIA	Repo Overnight Interest Rate Average
SLS	Special Liquidity Scheme
SMF	Sterling Monetary Framework
SONIA	Sterling Overnight Interest Rate Average

EXECUTIVE SUMMARY

The U.K. is a leading financial center with diverse liquidity needs. These needs came to the fore during the global financial crisis (GFC), when the authorities were forced to scale up liquidity provision and redesign their liquidity insurance framework. Since then, the authorities have reviewed their experience and formalized a broader, less discretionary, and more accessible framework, aimed at extending the reach of liquidity provision and reducing the stigma that made the previous framework less effective. Operational readiness and governance arrangements have been improved to make liquidity provision more “fit for purpose”.

The Bank of England’s (BoE’s) Sterling Monetary Framework (SMF) is the mechanism used in the U.K. to direct liquidity provision. This includes the tools required to implement monetary policy; those required to backstop sterling liquidity needs of individual institutions and the overall system (termed “liquidity insurance”); and the tools required to support the proper functioning of markets—Market Maker of Last Resort (MMLR). This technical note reviews all aspects of the SMF, given that the components of the SMF are heavily interconnected. It also reviews the Bank’s approach to Emergency Liquidity Assistance (ELA), a broad, largely unpublished framework for bilateral idiosyncratic liquidity support that lies outside the SMF and encompasses all other liquidity provision activities, including lending in foreign exchange.

The BoE’s relatively wide-ranging and accessible liquidity insurance framework raises three key questions and four other issues relevant to financial stability. The key questions are: (i) what are the contingent implications for the BoE balance sheet; (ii) what safeguards are in place against excessive use (for example, through global liquidity arbitrage); and (iii) to what extent the framework weakens incentives for financial institutions to self-insure against liquidity risk. In addition, the adequacy of the Emergency Liquidity Assistance (ELA) framework, the BoE’s capacity to provide FX ELA, the adequacy of the Market Maker of Last Resort (MMLR) framework and the degree to which the Bank’s facilities continue to be stigmatized are all relevant to the maintenance of financial stability.

The quantification of the implications of the liquidity framework for the BoE Balance sheet is still work in progress. A new Division dedicated to enterprise-wide financial risk assessment has been tasked with the job of developing a deeper and more forward-looking capacity to evaluate the impact of a range of scenarios on the Bank’s balance sheet. A relevant scenario would be to consider a large financial sector shock, perhaps in conjunction with a macroeconomic shock, involving SMF counterparties such as central counterparties (CCPs) and their largest members, who are also likely to be SMF participants. That analysis could be used to examine interconnections between different aspects of SMF facilities.

Safeguards are generally sufficient, although the BoE should ensure that the lower level of supervisory scrutiny directed at small- and medium-sized firms does not adversely impact its horizon-scanning for firms at risk of requiring liquidity support. The safeguards in place in general appear adequate to protect the BoE’s balance sheet. The BoE retains sufficient discretion in

providing liquidity, it assesses the creditworthiness of its counterparties as part of SMF risk management, the cost of liquidity increases with demand, and the BoE supervises entities eligible for liquidity insurance and has close ties to foreign regulators for foreign SMF participants. Although the supervisory activity of the PRA is just part of the risk management and horizon scanning processes, the BoE should ensure that enough supervisory attention is provided to adequately support those functions. This is particularly in view of the fact that the Bank's risk-based approach means that second-tier or smaller institutions receive less supervisory attention than the largest firms.

Opening access for CCPs to the Sterling Monetary Framework may, in time, change the incentives for CCPs to self-insure. The BoE has allowed CCPs to apply for access to the SMF since 2014. Whilst there is no evidence that CCPs have changed their own liquidity self-insurance arrangements, or the way in which they meet the relevant regulatory requirements, there is a risk that access to central bank facilities could reduce their incentives to self-insure. The Bank should continuously assess the incentives created for CCPs in managing their liquidity risk, and ensure—via both their supervision of CCPs and management of the SMF—that appropriate arrangements and incentives are in place.

The Bank's ELA framework is well-organized and operationally ready. The BoE's horizon scanning function is functioning to help proactively identify ELA needs and appears adequate. The Bank has made good efforts to retain the capacity to conduct covert ELA and probably has done what it can, recognizing that for very large or long-lived ELA episodes it will be difficult for ELA to remain covert. The IMF recognizes that the option to have the capacity for covert intervention is valuable in some circumstances.

The BoE has built capacity to implement foreign exchange (FX) ELA. The availability of FX from multiple sources means that these arrangements and associated operational procedures seem adequate for the provision of liquidity support in the future.

The Bank has a well-designed and appropriately flexible MMLR framework. The BoE could consider whether it would benefit from having access to further instruments, such as non-recourse repos for future MMLR operations as these have been used successfully elsewhere in the past. A key challenge for future MMLR situations is how Asset Managers (a relatively important part of the sterling money and fixed income markets) could benefit from MMLR given they are not SMF participants and there are operational challenges in the BoE dealing with them.

Efforts to de-stigmatize liquidity insurance have thus far had mixed results, according to market participants. On one hand, the ILTR seems popular with SMF participants and has little stigma in normal market conditions. On the other, the DWF does not form part of SMF participants' normal liquidity planning, and participants would be reluctant to use the facility except in more extreme situations.

Table 1. United Kingdom: Main Recommendations on the Liquidity Provision Framework

Recommendations	Timing	Authorities
Assess the incentives created for CCPs in managing their liquidity risk and ensure, both via supervision of CCPs and management of the SMF, that appropriate arrangements and incentives are in place.	Short term	BoE
Ensure that the level of PRA supervisory scrutiny over small and medium-size firms does not have an adverse impact on SMF risk management and ELA horizon scanning.	Short term	BoE
Complete a broad financial sector stress scenario to assess the aggregate exposure to liquidity insurance across the full range of SMF facilities.	Short term	BoE

OVERVIEW OF THE LIQUIDITY PROVISION FRAMEWORK AND RECENT DEVELOPMENTS¹

A. The Pre-GFC Framework and the Impact of the GFC

1. Prior to the GFC the BoE operated a conventional, narrowly focused liquidity provision regime. Historically, the liquidity framework was heavily focused on monetary policy implementation within a traditional mid-corridor system. Banks held a relatively low level of reserves that they determined themselves in each reserves maintenance period within the BoE's contractual reserves system. Liquidity was only provided to meet marginal liquidity needs, with the aim of stabilizing market rates close to the BoE base rate (Bank Rate). This system was very successful at stabilizing interest rates with only a modest operational input from the Bank.

2. Liquidity insurance was provided as a last-resort tool aimed at commercial banks. Banks were the main participants in the BoE's SMF, and liquidity was provided against a relatively narrow range of very high quality collateral including U.K. Gilts. ELA was the only liquidity insurance tool in place. The BoE put a strong emphasis on managing/minimizing moral hazard—encouraging banks to fund in the market if at all possible.

¹ The Technical Note was prepared by Kelly Eckhold, Senior Financial Sector Expert from the IMF Monetary and Capital Markets department, for the 2016 U.K. FSAP. His analysis was based on publicly available information, background documentation provided by the BoE, as well as discussions with the BoE, and a range of financial market participants.

3. ELA was available but “constructive ambiguity” applied. The BoE took an approach of “constructive ambiguity” towards ELA, which meant that while the Bank acknowledged having an ELA role, few details were available publicly. Such ambiguity was designed to prevent moral hazard and increase incentives for self insurance.

4. The GFC overwhelmed the SMF resulting in a temporary widening of its scope. Key actions included a broadening of the range of eligible collateral and the introduction of the Discount Window Facility (DWF), a lengthening and increase in frequency of liquidity provision operations, the introduction of MMLR operations in corporate bonds and commercial paper, the introduction of Quantitative Easing (QE) and, related to the latter, a move to a “floor” monetary policy implementation system where all reserves are remunerated at the Bank rate to accommodate the large increase in reserves that occurred. Appendix I describes in more detail these actions and the subsequent reviews of the GFC experience performed by the BoE.

5. The Bank reviewed its GFC experience and moved quickly on the review recommendations. Reviews of the liquidity provision and ELA frameworks resulted in permanent adjustments to ELA processes and the “Red Book” describing the SMF.² The key changes made permanent were:

- **Governance arrangements.** Concordats were created between the Bank’s executive and the MPC³ and FPC⁴ respectively that transparently allocated responsibilities to the MPC (for monetary policy tools and decisions) and set out the framework for engagement for the FPC with regard to the SMF.⁵
- **New tools.** The Indexed Long Term Repo (ILTR) and Contingent Term Repo Facility (CTRF) facilities were introduced to provide an avenue to provide term financing on terms close to market rates; the DWF was significantly reformed and made transparent in terms of pricing and volumes of liquidity on offer. Pricing was reduced and put on a sliding scale according to volume borrowed, and the range of eligible collateral was significantly widened.
- **Eligible collateral.** The wider collateral pool approved during the crisis was permanently approved and consolidated into three categories.

² See the Winters review (<http://www.bankofengland.co.U.K./publications/Documents/news/2012/cr2winters.pdf>) and the Plenderleith review (<http://www.bankofengland.co.U.K./publications/Documents/news/2012/cr1plenderleith.pdf>) for details.

³ <http://www.bankofengland.co.U.K./about/Documents/legislation/mpcconcordat.pdf>.

⁴ <http://www.bankofengland.co.U.K./about/Documents/legislation/fpcconcordat.pdf>.

⁵ The legal basis for the Bank’s liquidity insurance model is provided via the BoE Act (1998), the Financial Services and Markets Act (2000), the Banking Act (2009) and the Financial Services Act (2012). This legislation is supported with a system of MOU’s and Concordats and the exchange of letters between the Chancellor and the Governor of the Bank (See <http://www.bankofengland.co.U.K./about/Documents/mous/moufincrisis.pdf> for MOU governing ELA provision in a crisis). The governors in consultation with the Court decide on LOLR/ELA and associated monitoring arrangements and the Chancellor and HMT are closely involved through the indemnification process and via representation on the FPC.

- **Eligible counterparties.** The list was widened to include broker dealers, building societies and CCPs reflecting the recommendations of the Winters review.

B. The Current Sterling Monetary Framework

6. The SMF is the omnibus operational framework covering all published sterling market operations. The SMF comprises the operations required to implement monetary policy, as well as those for liquidity insurance—i.e., tools and facilities for the sterling liquidity support of the system or individual firms. Finally, the SMF includes tools for the support of market functioning—i.e., MMLR. ELA is a separate set of largely unpublished policies and tools, and comprises any sterling lending that doesn't fit within the SMF, as well as any FX lending. Appendices B and C describe the various elements of the SMF and ELA frameworks in more detail.

Table 2. United Kingdom: Overview of the Bank's Sterling Monetary Framework

	Monetary Policy Implementation	Liquidity Insurance
Objective	Implement MPC decisions to meet inflation target	Reduce cost of disruption to key financial and payment services to the U.K. economy
Governance	MPC	Bank
Guiding principle	Maintain risk-free interest rates in line with MPC target	The market should be the first/prime source of liquidity
Tools	Level of Bank Rate Remunerate reserves at Bank Rate Operational Standing Facilities (OSF) Asset Purchase Facility (APF) FX Intervention	<u>Liquidity to the system:</u> ILTR CTRF <u>Liquidity to individual entities:</u> DWF <u>Support of market functioning:</u> MMLR

Source: Bank of England and IMF.

ISSUES OF RELEVANCE TO FINANCIAL STABILITY

7. London’s status as a leading financial center, combined with the BoE’s relatively transparent and broad liquidity provision framework, raises several relevant issues. The BoE’s “Open for business” philosophy, combined with the diverse and significant liquidity needs of the London markets, naturally raises a number of questions about potential risks and how they are managed. These include:

- Are adequate safeguards in place to protect the BoE balance sheet against excessive use of its facilities?
- Has the BoE adequately quantified and managed its contingent exposure to future liquidity insurance needs?
- Does the SMF unduly undermine incentives for SMF participants to self-insure against liquidity risk?
- Does the BoE have sufficient capacity to provide FX ELA?
- Is the ELA framework robust to future needs?
- Is the Market Maker of Last Resort framework adequate?
- Will the future monetary policy implementation model function adequately with the liquidity insurance framework?
- Have the BoE’s facilities been sufficiently de-stigmatized for them to function effectively?

A. The Scope of Liquidity Insurance and the Adequacy of Safeguards

8. The Bank has adopted a very wide-ranging liquidity provision model compared to its peers. No other central bank provides regular term liquidity to markets outside of the operations required to implement monetary policy (open market operations and QE operations) or has the terms of its DWF as transparently laid out as the BoE. Few central banks offer liquidity to nonbanks or broker-dealers unless they have a banking operation in the country. The BoE is one of the first central banks to open the DWF to CCPs.⁶

9. The risks of global “liquidity arbitrage” seem adequately managed. The discretion retained by the Bank to deny DWF draw-downs or participation in liquidity insurance operations if they feel the drawdown of liquidity is for an inappropriate purpose is an adequate safeguard. The Bank has relationships with foreign regulators that would help it assess the degree of global liquidity

⁶ The other current example is the Reserve Bank of Australia.

arbitrage taking place. The ILTR operation has an upward sloping pricing curve as demand increases providing another level of comfort.

10. The Bank should ensure adequate effort is directed at monitoring a wide range of SMF participants. A key mitigating factor that manages the risk of such a broadly accessible liquidity insurance framework is that the Bank itself supervises SMF participants. The Bank's risk department conducts an independent risk assessment before admitting counterparties to the SMF, drawing on supervisory input and other information. These are then reviewed regularly thereafter, with site visits for counterparties where more detailed review is required. However, smaller and mid-size institutions receive a much lower level of supervisory attention by the PRA which, other things being equal, raises the risks to the SMF from these entities. The Bank should ensure that its risk-based approach to supervision of SMF participants does not allow risks to creep in and that the horizon scanning process (which builds on supervisory relationships) remains effective.

B. How Well-Quantified and Managed is the Bank's Exposure to Liquidity Insurance?

11. The Bank has a wide-ranging balance sheet exposure that is inevitably difficult to quantify. The strongly interconnected nature of the SMF counterparties (notably CCPs and their largest customers) mean that demand for liquidity could be strongly correlated across the full range of the Bank's facilities and counterparties in times of significant financial stress.

12. The BoE has gone some way to address the risks through creation of a new Financial Risk and Resilience Division dedicated to forward-looking assessment and challenge of enterprise-wide financial risk. In its first months of operation, the Division has completed impact analysis of a number of initial scenarios including a U.K. housing market shock, the default of an FX ELA recipient and the risks associated with providing a bridge loan to an institution in resolution. Substantial further work is planned to add to the BoE's assessment of the balance sheet implications of their facilities and operations. Box 1 discusses potential implications for its capital adequacy framework.

13. The outcome of these risk scenarios is to provide an assessment of the quantum and form of financial backing required, together with monitoring thresholds. The BoE has modest upfront capital on balance sheet. Hence larger risks have historically needed to be supported by a Crown Indemnity. The scenarios provide estimates of "monitoring thresholds" that provide management indicators of when upfront capital risks becoming depleted.

14. The overall risk assessment is still work in progress. As acknowledged by BoE staff, the specific scenarios examined so far do not yet quantify the aggregate demand for liquidity across all facilities in a serious financial sector shock. Expanding the range of scenarios is on the agenda for the immediate future.

15. The BoE should explore a broad-based financial sector shock scenario, so as to assess its contingent exposure across the full range of its operations. This work would provide useful

information to refine liquidity provision policy so as to manage the risks. An example of an interesting policy question is whether liquidity should be provided to CCPs directly through the DWF or indirectly through banks (who are customers of CCPs).

C. Incentives for SMF Participants to Self-insure Against Liquidity Risk

16. The structure of the DWF might raise questions about the incentives for market participants to self-insure against liquidity shortfalls. On the other hand, the Bank retains discretion for draw-downs that limits over-reliance, and the reluctance of firms to use the facility except in extreme circumstances means low moral hazard in practice for most SMF participants. Liquidity regulation has been tightened, with the advent of Basel III helping boost the degree of self-insurance among SMF participants. The feedback from SMF participants was that, by design, the DWF was not seen as a “business as usual” funding option but one for use in a near-resolution situation, when no other options are available and the business is being wound down.

17. However, this balance merits re-examination in the case of CCPs. CCPs generally have little or no need for funding from either the central bank or the markets, as their business model tends to leave them in a liquidity-rich position in the normal course of business. CCPs are required to have in place a liquidity contingency plan that shows how they would deal with a liquidity shortfall should two of their largest customers fail to settle on their obligations. This plan should not (and in practice does not) depend on central bank liquidity access. Although there is no evidence that CCPs have changed their liquidity self-insurance arrangements as a result of access to the DWF, there is a risk that access to central bank facilities could reduce their incentives to self-insure, whether through committed lines or other arrangements. The Bank should continuously assess the incentives created for CCPs in managing their liquidity risk and ensure—both via their supervision of CCPs and management of the SMF—that appropriate arrangements and incentives remain in place.⁷

⁷ The Bank notes that all CCP participants in the SMF need to pay an annual fee of GBP 50000 for membership. However, this is modest relative to the cost of a risk-based commitment fee and is not related to the risk being managed.

Box 1. The Bank of England's Capital Adequacy Framework

Central banks typically need some level of capital—but for different reasons than corporations. Central banks can become balance sheet-insolvent but they cannot be wound up. However, some level of capital is required to support the central bank's capacity to independently and credibly carry out its policy functions.¹ There is no universal capital benchmark level, as this is a function of the central bank's policy mandate, the risks it faces, and the operational environment.^{2,3}

Of greater importance for a central bank is policy solvency, where realized revenues exceed realized costs in the long run.⁴ Policy solvency allows the central bank to undertake its functions without recourse to the Treasury for funding. If realized net losses accrue (e.g., due to exceptional operations or market conditions) they should be covered by capital, thus preserving credibility and independence. Some central banks have successfully continued to operate with negative capital, but in these cases, these central banks had sound prospects of being policy solvent either at the time or within a reasonable term.⁵

A driver of policy solvency for many central banks is usually their seigniorage revenue. The steady income stream arising from the investment of the proceeds of issuing currency (seigniorage) usually covers operating and policy costs. This, along with accumulated reserves and capital buffers against realized operational losses or one-off events (e.g., credit losses), is necessary to allow the central bank to operate independently of its primary shareholder, the government.

The Bank of England does not retain its seigniorage revenue, but also has a lower risk profile relative to many central banks. The U.K.'s foreign reserves are not held on the Bank's balance sheet, and the monetary policy framework did not previously require a very large or risky balance sheet. Moreover, many crisis-related operations of recent years, including Quantitative Easing (QE), were indemnified by the Crown reducing the need for capital.

The Bank of England's policy and operational environment is changing. As the Bank exits from QE, the Crown indemnities that supported the expansion of the Bank's risk profile since the global financial crisis (GFC) will wind down. However, the financial system will likely have significant ongoing liquidity needs, implying that the part of the Bank's balance sheet devoted to monetary policy implementation may continue to be large, potentially implying a larger ongoing risk profile. Similarly, the liquidity insurance framework may imply significant contingent balance sheet risks.

The Bank's operational and capital frameworks need to assure future policy solvency. The design of the future operational framework should ensure policy solvency, be capital efficient,⁶ provide the Bank of England sufficient capital buffers to cover a reasonable range of the risks faced in fulfilling its policy objectives and allow for additional capital to be supplied expeditiously. Risks that arise from implementing policies for which the Bank has independence should be covered by in the first instance by prudent risk management practices, and in the second instance by capital, up to some reasonable level of potential losses. Other risks arising from certain extraordinary operations may not need capital but could be backed with Crown indemnities, as the Treasury ultimately assures the Bank's capital adequacy.

¹ "Does Central Bank Capital Matter for Monetary Policy?" IMF Working Paper Western Hemisphere Department Prepared by Gustavo Adler, Pedro Castro, and Camilo E. Tovar, February 2012.

² "The Role of Central Bank Capital Revisited", ECB Working Paper Series No. 392 / September 2004; by Ulrich Bindseil, Andres Manzanares, and Benedict Weller.

³ "Central bank finances" BIS Papers No 71 by David Archer and Paul Moser-BoEhm Monetary and Economic Department, April 2013.

⁴ "Issues in Central Bank Finance and Independence"; IMF Working Paper Series No. 37, 2008; Peter Stella and Åke Lönnberg.

^{5,6} "Issues in the Governance of Central Banks"; BIS; A report from the Central Bank Governance Group; Chair: Guillermo Ortiz, Governor of the Bank of Mexico.

D. Foreign Exchange Liquidity Insurance

18. There are two forms of foreign currency liquidity insurance, market-wide and idiosyncratic. Market-wide foreign currency insurance is usually relevant in the event of a systemic FX shortage and would typically be offered via an auction. Idiosyncratic foreign currency insurance is usually relevant in the event of a firm specific foreign currency liquidity shortage and would typically be offered in the form of ELA.

19. All forms of FX liquidity insurance are naturally constrained by the availability of FX. The Bank's first choice source of foreign currency liquidity insurance would be central bank FX swap lines.

20. The use of such swap lines would require the approval of both central banks at the time. Such approval is generally more likely to be granted where the need for liquidity is driven by systemic concerns than where a particular firm is suffering an idiosyncratic stress. Protocols for using the FX swap lines are in place. This adds to the capacity to fund FX ELA-especially if the ELA involves CCPs or is a function of a global liquidity problem.

21. If for some reason swap lines are unavailable, the Bank would look to use alternative available sources of foreign currency liquidity. This would include market sources, with questions of capacity and operational efficiency driving choices between these and other options. The Bank has done some detailed preparatory work here.

22. In sum, the authorities appear to have done what they can to prepare for provision of foreign currency liquidity in stress scenarios. Extensive work has been undertaken to maximize the potential to use swap lines and consider other alternatives. Capacity seems adequate, and protocols and procedures for raising FX are in place.

E. Is the ELA Framework Robust to Future Needs?

23. The Bank's ELA framework is well-organized and operationally ready. The BoE's horizon-scanning function is helping to proactively identify ELA needs and seems adequate.⁸ The Bank has made good efforts to retain the capacity to conduct covert ELA. It actively monitors and seeks to mitigate a range of disclosure risks while seeking to strike a balance with the benefits of increased market transparency. The Bank recognizes, however, that it will not always be possible (or even desirable) to keep ELA covert. This is particularly the case where ELA is provided in a very large amount or for an extended period of time. The IMF nevertheless welcomes the steps which the Bank has taken in this regard.

⁸ "Horizon Scanning" refers to the process used to proactively identify potential candidates for ELA ahead of an actual request to allow for planning.

F. Is the MMLR Framework Adequate?

24. The Bank has a well-designed and appropriately flexible MMLR framework. The Bank gained significant experience through the GFC period with implementing MMLR. Clear and appropriate objectives and principles are in place and the Bank retains a flexible approach as it's not clear what the next crisis might look like.

25. Non-recourse repo operations might be of use in some MMLR applications. The U.S. Federal Reserve used non-recourse repos to help support the CP/ABS markets in the GFC. This was helpful as such repos limits the downside of investors making it easier for them to participate-consistent with encouraging market solutions to liquidity problems

26. There is an open question around how Asset Managers might interact with future MMLR operations. Asset managers do not have SMF access but are an important part of the sterling market. However, there are significant policy, legal, and operational challenges in dealing with such entities, given they are not necessarily domiciled in the U.K., and do not own the assets themselves but manage them on an agency basis for investors, who can be located anywhere. Market participants suggested that commercial banks might have more limited capacity to channel liquidity to asset managers in a stress situation which might blunt the effectiveness of future MMLR operations if there were liquidity problems at asset managers.

G. Will the Future Monetary Policy Implementation Model Function Adequately with the Liquidity Insurance Framework?

27. The future monetary policy framework needs to be consistent with the BoE's liquidity insurance framework. The Bank will need an implementation framework that works well with its relatively active and wide liquidity insurance role, so that it can continue to control short-term interest rates even when the demand for liquidity insurance varies. Also, the monetary policy framework should not confound the liquidity insurance or ELA framework in any way (for example by making covert ELA more obvious through offsetting sterilization operations). Finally, the monetary policy implementation framework should be robust and efficient in the face of liquidity shocks that might emanate from an active accommodating liquidity insurance framework.

28. The Winters' review recommended considering an ultimate return to a mid-corridor system but did not see this as critical. Winters considered the existing floor system as also a viable option, while noting the BoE's bias towards returning to its traditional corridor system.

29. A floor system is likely inevitable during the initial stages of the exit from Quantitative Easing. The APF is quite large and will only run off over time—even with significant asset sales or BoE sterilization operations. Hence market interest rates will lie close to the Bank Rate floor for some time to come. While Bank staff speculated that post QE demand for reserves may be close to current

levels, market participants did not think so.⁹ Rather, most anticipate that as exit proceeds, the structure of bank liquidity portfolios will shift from holding cash to other liquid assets.

30. Even after QE exit, the floor system would not be incompatible with the current liquidity insurance framework. The demand for liquidity is likely to continue to be more variable than it was in 2006, when the contractual reserves system was first developed. The market's demand for liquidity varies regularly with fluctuations in the risk environment (driving the precautionary demand for liquidity) and the relative cost of cash reserves versus other liquid asset alternatives (Gilts, etc). This variability in demand is routinely reflected in market indicators of liquidity premia (e.g., Treasury bill and repo to overnight indexed swaps spreads, the TED spread in the U.S. markets etc). In the past, market needed to meet fluctuations in its demand for cash in the market, as the central bank participants generally would not step in unless short term interest rates threatened to move away from those levels consistent with the desired monetary policy stance. Under the BoE's current liquidity insurance framework, the Bank will accommodate at least some of these swings in demand through operations such as its ILTR, resulting in larger swings in reserves availability, possibly requiring sterilization operations in a mid-corridor framework. A floor system is robust to these types of liquidity swings.

31. At the same time, the benefit of a corridor system for increased interbank trading may not necessarily be realized. One important argument underlying the case for returning to a corridor system is that it would better incentivize interbank markets to operate. However, market participants were more skeptical that these benefits will accrue. They believed that money market turnover is being structurally constrained by tighter regulatory changes in Basel III, which reduce incentives and capacity for financial institutions to trade in short-term markets. Furthermore, a reserve averaging system with more built-in flexibility also reduces the incentives for active liquidity management on behalf of market participants.

H. Have the BoE's Facilities been Sufficiently De-stigmatized to Function Effectively?

32. The overarching objective is to limit contagion through liquidity in a crisis by attempting to overcome stigma. If central bank facilities are excessively stigmatized then they will be used relatively late in a stress situation, increasing the chance of contagion and a larger more unmanageable problem. Hence the Winters/Plenderleith reviews suggested that reducing stigma should be an important goal through increasing the accessibility of the BoE's facilities, increasing the regularity of ILTR operations, reducing disclosure requirements on DWF usage, and reducing the discretion required to access DWF funding.

⁹ Staff interpreted the recent higher demand in ILTR operations reflected a demand for reserve balances whereas market participants did not think that ILTR demand would have increased if ILTR repos were of a shorter duration and suggested that ILTR demand rather reflected demand for term funding.

33. Liquidity is now available on more accommodating terms, reflecting the fact that firm-level moral hazard is now more effectively managed through a well-specified micro-prudential liquidity regime than through the terms of the Bank's lending facilities.

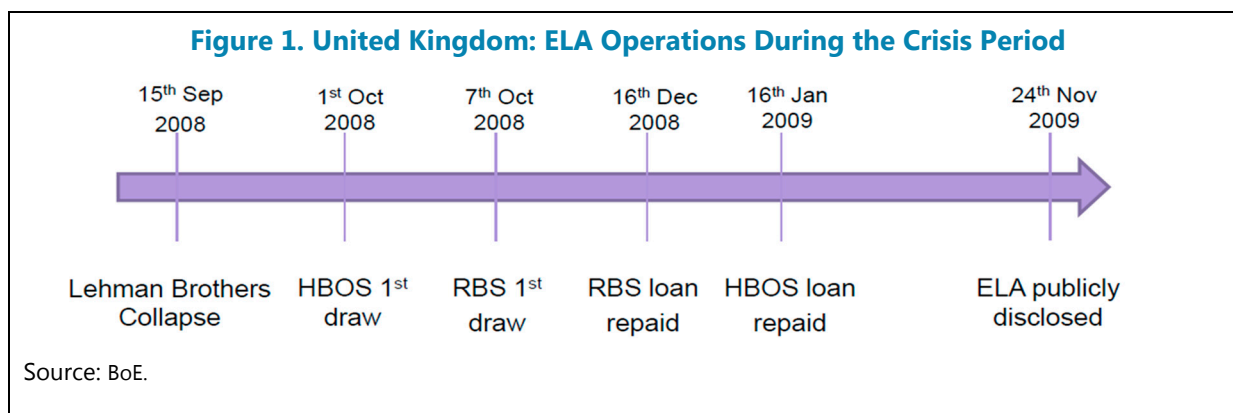
34. The Bank's focus on de-stigmatization seems broadly appropriate given their central regulatory and supervisory role. An increased focus on "horizon scanning" and use of the supervisory capacity that has come from integration of the PRA into the Bank is seen as being key to managing the moral hazard risks that might emanate from the otherwise encompassing liquidity insurance framework. This seems sensible given the "full service central bank" model in the U.K. The U.K. has advantages in this area compared to some of its peers (e.g., the U.S.).

35. However efforts at de-stigmatizing the Bank's liquidity insurance facilities have had mixed results. On one hand, the ILTR seems popular with SMF participants and has little stigma in normal market conditions (albeit untested in a period of significant market stress).¹⁰ On the other, the DWF does not form part of SMF participants' normal liquidity planning, and would be reluctant to use the facility except in more extreme situations.

¹⁰ Market participants report that the longer term nature of the ILTR is helpful as there is limited liquidity in the repo markets beyond the three months, even for Gilt collateral.

Appendix I. Challenges from the GFC and Subsequent Reviews

1. **The GFC seriously challenged the liquidity provision framework on many fronts.** The U.K. as a financial center was close to the epicenter of the crisis. Market functioning was severely damaged, the macro environment weakened sharply, and precautionary liquidity demand surged. A significant easing in monetary policy was required both in terms of lower interest rates and increased liquidity provision and QE. The narrowly focused SMF was inadequate to meet these challenges.
2. **Liquidity demand surged and overwhelmed the SMF.** Precautionary demand increased across the board and many institutions struggled to raise market funding resulting in a dramatic increase in demand for funding from the Bank. The Special Liquidity Scheme (SLS) was introduced initially to help meet the demand for liquidity via a long term asset swap of Residential Mortgage Backed Securities (RMBS) for Treasury bills. Extended long-term repos were also introduced to lend cash against the same widened range of collateral. The increase in liquidity demand significantly expanded reserves in the system that was unevenly distributed in segmented markets.
3. **With the introduction of QE, a new monetary policy implementation framework was developed that was robust to the liquidity overhang created.** A “floor” system where all reserves are remunerated at the Bank rate was introduced and reserves averaging and contractual reserves were suspended.
4. **Significant ELA was required in both sterling and FX.** Two large banks, Royal Bank of Scotland and Halifax Bank of Scotland, required significant volumes of ELA in Sterling (RBS, HBOS) and FX (RBS). Initially this was provided by the Bank at its own risk and was not government-guaranteed, as new protocols needed to be established to govern indemnified ELA. After a short period, this ELA was covered by a new Crown indemnity. ELA was covertly provided to banks via collateral swaps priced at a penal rate (200 basis points over Bank rate). Collateral swaps were used in an effort to minimize risk of early disclosure of ELA, to not disturb total bank reserves and monetary policy, as well as increasing the supply of high-quality liquid assets to the wider market. The volume of ELA peaked at an equivalent of GBP 61.5 billion.



5. Other market support operations occurred which were part of the Asset Purchase Facility. The Bank activated its MMLR role to purchase commercial paper in the primary market at spreads wider than normal levels but on better terms than were available at the time. Additionally two way auctions of corporate bonds were held to facilitate price discovery and the Bank investigated moving into other financing markets.¹ The Bank also participated in concerted USD liquidity providing operations with other central banks.

The Winters and Plenderleith reviews

6. In 2012, two significant reviews of the BoE's GFC activities were convened. The Winters review focused on the SMF while the Plenderleith review focused on the Bank's ELA role.

7. The Winters review concluded that by and large, the SMF was fit for purpose, although some enhancements to liquidity provision could be considered. The monetary policy framework was judged to be robust and a return to the mid-corridor reserves averaging system could be considered after exit from QE. It was recommended that liquidity insurance facilities should be revised to decrease stigma and increase accessibility/scalability in a future crisis. It was suggested that governance arrangements could be improved to clarify roles of the FPC and MPC, to ensure adequate information flows between the FPC and MPC and to widen the group of senior staff involved in ELA decisions.

The Plenderleith review suggested improvements to the ELA framework to improve operational readiness and to improve horizon-scanning for firms at risk of requiring liquidity support. Key recommendations included: developing early warning indicators and "horizon scanning" to allow the Bank to act proactively; developing protocols for providing LOLR (legal arrangements, collateral/risk management capacity, monitoring arrangements, etc.); extending the net to include ELA to non banks (CCP's and NBFIs); and developing capacity to provide ELA in FX. The Bank appears to have successfully implemented the review's recommendations.

¹ See <http://www.bankofengland.co.U.K./archive/Documents/historicpubs/speeches/2009/speech390.pdf> for more details of the Bank of England's MMLR operations during the GFC period.

Appendix II. The Current Sterling Monetary Framework

Monetary policy implementation

1. Before the GFC, the Bank operated a traditional mid-corridor implementation system.

The key policy lever was normally the level of the Bank Rate and the remuneration of reserves supported by operational standing facilities to constrain market interest rates. A system of contractual reserves (where SMF participants determined their demand for reserves and are remunerated at the Bank rate on that amount) combined with reserves averaging provided some stability for the demand for reserves aiding interest rate control.

2. The current period of QE means that the size of the APF is an important monetary policy lever. All reserves are currently remunerated at Bank rate and the contractual reserves system is suspended reflecting the flooding of the system with reserves due to the acquisition of long term assets in the APF. The APF has remained stable at around GBP 375 billion since 2012/13.

Table 3. United Kingdom: Operational Features of the Current BoE Liquidity Provision Framework

	Reserve Accounts	Operational Standing Facilities	ILTR	CTRF	DWF
Method	Standing facility	Repo vs. cash	Repo vs. cash		Collateral swap (cash for CCP's)
Frequency		Daily	Monthly	As reqd	Daily
Pricing	Bank rate ¹	Bank rate + 25 bps	Sliding scale based on collateral and level of borrowing		Sliding scale based on collateral and level of borrowing ²
Maturity	O/N	O/N	6 months	Flexible	30 days ³
Eligible collateral	N/A	Level A	Levels A, B & C		

Source: BoE.

¹ Reserve accounts for CCP's are unremunerated beyond an individually allocated maximum.

² The pricing charge is the basis point fee for the liquidity upgrade of swapping less liquid collateral for liquid U.K. government security collateral. Starting points for the upgrade fee are 25 bp, 50 bp and 75 bp for Level A, B and C collateral respectively.

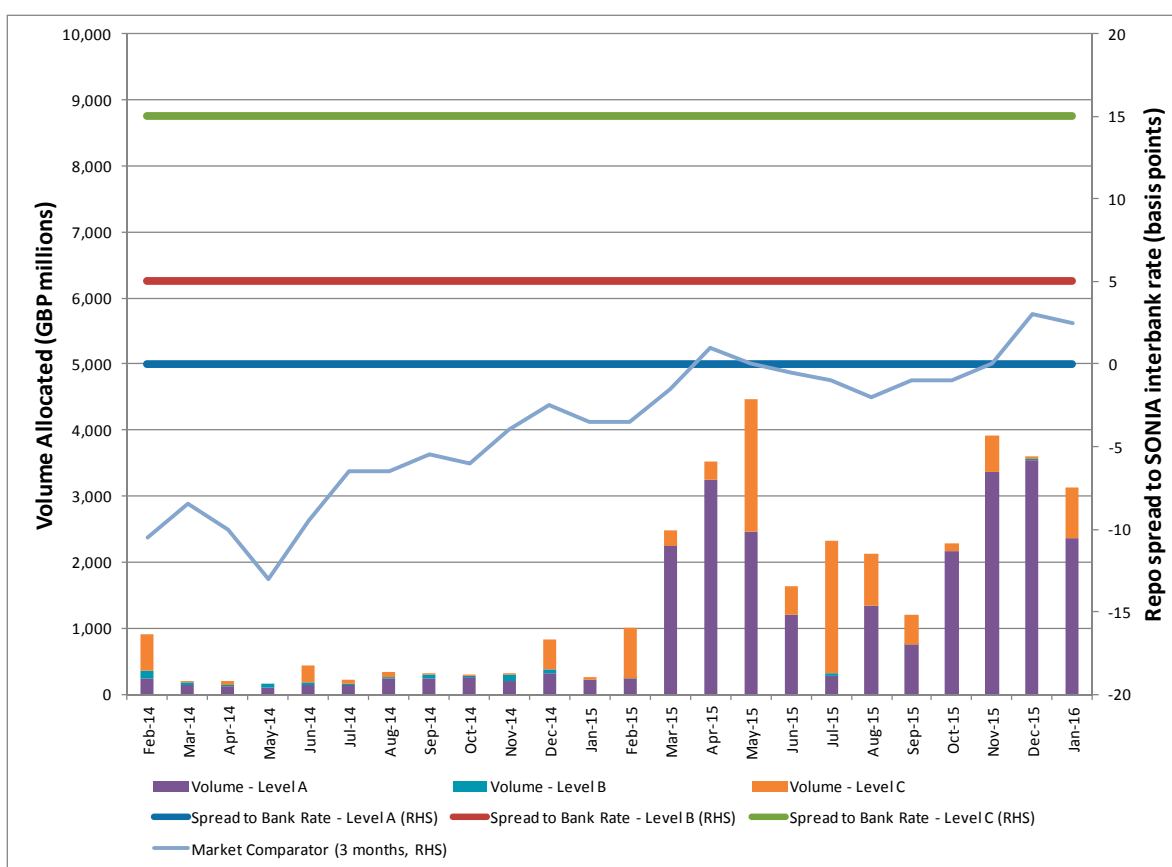
³ DWF loans may only be for a maturity of a maximum of seven days.

3. **FX intervention is also available to the MPC.** While available in principle FX intervention has never used for this purpose.

Liquidity insurance

4. **Systemic demand for term liquidity demand can be met through two broad based and flexible operations.** These are a regular monthly ILTR operation that provides term (six month) liquidity against a wide collateral pool and the CTRF which is a more flexible repo operation, which can be tailored in terms of frequency, maturity and volume in response to unusual systemic liquidity demand.

Figure 2. United Kingdom: Results of ILTR Operations 2014–16



Source: Bank of England and IMF Staff estimates.

5. **The DWF is available to meet idiosyncratic liquidity needs.** Short-term (30-day) sterling liquidity is available in the form of a collateral swap which may be rolled over at the discretion of the borrower, with the Bank’s agreement. The cost of liquidity is on a sliding scale dependent on the amount borrowed and the nature of the collateral. A viability test is required at time of borrowing-the Bank does such analysis on an ongoing basis through its risk management department, working closely with supervisors. The Bank also requires counterparties to be solvent to

receive DWF funding. DWF access for CCPs is provided on a slightly different basis reflecting the business needs of CCPs. 5 day funds in cash as opposed to collateral are provided. Loans may be rolled over at the Bank's discretion.

MMLR

6. Market liquidity support is available in the form of Market Maker of Last Resort. The criteria governing MMLR operations are that MMLR must be catalytic in nature and that terms should be unattractive in normal market conditions. Operations can occur in both primary and secondary markets depending on the nature of the market (e.g., CP versus corporate bond markets). The focus is on promoting the provision of funding to markets as opposed to pricing per-se-there has been no focus on supporting derivatives markets for this reason.¹

Eligible collateral

7. A wide collateral pool is available to support the SMF. SMF participants can use three broad categories of collateral to borrow liquidity from the Bank. The table below summarizes the collateral categories.

Table 4. United Kingdom: Eligible Collateral

A	B	C
Gilts U.K. Treasury Bills U.K. Government FX debt BoE securities Sovereign and central bank debt in GBP, EUR, CAD and USD of Canada, France, Germany, the Netherlands and the U.S.	Other high quality sovereign debt International Financial Institutions RMBS and Covered Bonds U.S. Agency securities HMT SU.K.U.K. and debt issued in currencies outside Cat A ABS Some non U.K. government guaranteed bank debt Non financial corporate bonds and CP	Other securities excluded from Cat A and B Raw loans and loan pools Retained RMBS and covered bonds

Source: BoE.

¹ The legal framework covering MMLR operations is contained in the 2009 MOU on crisis management between the BoE, PRA and HMT pursuant to Section 65 of the Financial Services Act 2012.

8. A wide range of counterparties have access to liquidity insurance. In addition to commercial banks, building societies, broker dealers² and CCP's³ have access to various elements of the liquidity insurance framework.

Table 5. United Kingdom: Counterparty Access to SMF Facilities

	Short Term Repo	Reserve Accounts	Operational Standing Facilities	ILTR	DWF	CTRF
Banks and building societies	Yes	Yes	Yes	Yes	Yes	Yes
Broker Dealers	Yes	Yes	Yes	Yes	Yes	Yes
CCP's		Yes	Yes		Yes	

Source: BoE.

² Eligible broker dealers are those the PRA designates as "investment firms".

³ Eligible CCP's are those operating in the U.K. markets that are either authorized under EMIR by a competent authority, or recognized under EMIR by ESMA (i.e., regulated to an equivalent standard), and meets the other operational/legal criteria applied to other SMF Participants (see Eligibility Criteria).

Appendix III. The ELA Framework

1. **ELA occurs outside of the published SMF “Red Book” framework.** ELA is considered to be all liquidity insurance provided outside of the published SMF.
2. **The legal basis for ELA procedures is provided via a MOU that describes how agencies will cooperate to manage a crisis situation.** The Financial Services Act (2012) sets out that the authorities must cooperate during a crisis, and the MOU operationalizes this.¹
3. **ELA must be approved by the Chancellor and the Bank’s Court of Directors.** Where the latter is not practical, a decision can be taken by the Governor in consultation with a sub-committee of Court (the Transactions Committee, which consists of three nonexecutive directors, one of whom must be the Chair of Court or his designate).
4. **ELA terms are flexible and can be advanced in Sterling or foreign exchange.** The Bank uses its horizon scanning framework to identify potential ELA needs in advance, and it anticipates having sufficient time to prepare a bespoke response dependent on the situation at hand. The Bank has in place clear procedures that are sufficiently flexible to be adapted to specific circumstances. Similarly, ELA pricing is flexible but a starting point would be that applied to the DWF plus a margin, to reflect the increased risk to the Bank and the scale of lending. ELA can be provided in foreign exchange using a number of sources of foreign currency, including FX swap lines with other central banks and other market sources. Haircuts on FX ELA would be higher, to reflect the FX risk on such lending.
5. **ELA recipients would likely be financial institutions that should be solvent but do not have to be systemically important.** ELA may be provided to any entity—although the expectation is that financial institutions would be the main recipients of ELA. Counterparties must be solvent (on a balance sheet basis) although under the terms of the Memorandum of Understanding the Chancellor may direct the Bank to provide ELA to an insolvent firm. Firms are expected to provide collateral. A going concern assessment would also be performed to ensure the ability to repay ELA—this would be done in conjunction with the Bank’s Resolution Directorate, in case the special resolution regime needs to be used. There is no statutory requirement for ELA recipients to be systemically important, although the Governor and Chancellor would be advised on the level of systemic importance when a case is made for ELA.
6. **ELA is expected to be collateralized.** Although the range of assets accepted as collateral for ELA may be broader than those routinely accepted in SMF operations. This might include equities, a wider range of foreign government and corporate securities, non-SMF conforming loans,

¹ <http://www.bankofengland.co.U.K./about/Documents/mous/moufincrisis.pdf>.

loans contracted under foreign law and ultimately a floating charge over the residual assets of an ELA recipient.

7. A Crown indemnity might be sought for ELA and any ELA should be approved by the Chancellor. The MOU on crisis management lays out the framework to be applied. ELA in any amount is considered a use of Crown funds and should require government approval. The decision to request an indemnity would reflect the riskiness of the ELA and its size. In general, the Bank would prefer to not require an indemnity. The principle is that the Bank as regulator and ELA provider should try to manage ELA risks on its own.