

## Dietrich Domanski

Head of the Secretariat of the Committee on the Global Financial System (CGFS)  
Bank for International Settlements (BIS)



# Exit from Unconventional Monetary Policy Measures and the Future of Central Bank Operational Frameworks<sup>1</sup>

The global financial crisis that started in 2007 has raised fundamental questions about the character of central bank market operations. Central bank operations have evolved from an ancillary tool – used to ensure that the interest rate target is met – to a set of measures directly targeting broader financial and monetary conditions.<sup>2</sup> In the early phases of the crisis, central banks expanded their operations especially to address liquidity hoarding and banks’ reluctance to lend to each other.<sup>3</sup> After September 2008, amid the deepening financial crisis and rapidly deteriorating macroeconomic conditions, central banks increasingly replaced interbank money and credit markets. And as policy rates in major advanced economies approached near-zero levels, central banks embarked on large-scale purchases of private sector credit assets and government bonds to provide additional stimulus. The term “unconventional policies” has become commonly used for this wide array of measures.<sup>4</sup>

Against the backdrop of stabilising and improving market and macroeconomic conditions over the course of 2009, central banks began to wind down unconventional measures. Timely exit from unconventional policies is important to contain adverse effects on market functioning.<sup>5</sup> However, mounting liquidity pressures in European

bank funding markets in early May 2010 led the Eurosystem to expand the range of unconventional policies, and the Federal Reserve to re-establish US dollar swap lines with the Eurosystem and other advanced economy central banks.

The need to re-introduce some unconventional measures highlights two questions. First, what are the near-term issues that central banks face in the transition towards policy normalisation? This broader question includes issues such as the timing and sequencing of exit and the management of large central bank balance sheets. Second, which elements of unconventional policies, if any, should be retained in post-crisis operational frameworks?

This note discusses these questions. Focusing on measures taken by the Bank of England, the Eurosystem and the Federal Reserve, the paper is organised as follows. Section 1 reviews the progress in exiting unconventional policies. Section 2 sets out some the near-term issues in exiting unconventional policies and discusses challenges for the design of central bank operational frameworks. Section 3 concludes.

## 1 Progress and Experiences in Exiting Unconventional Policies

Unconventional central bank policies fall into three broad categories (table

<sup>1</sup> *The views expressed here are my own and do not necessarily reflect those of the BIS or the CGFS. I would like to thank Bilyana Bogdanova, Michael Davies, Corrinne Ho, Tim Ng and Philip Turner for useful comments and contributions. The paper also draws on background work done for meetings at the BIS.*

<sup>2</sup> *See Caruana (2009).*

<sup>3</sup> *For a discussion of central bank operations until May 2008, see CGFS (2008).*

<sup>4</sup> *There is no agreed definition of unconventional central bank policies. In particular, some authors also consider the pre-commitment to keep policy rates low for an extended period as unconventional policy (see e.g. Meier, 2009).*

<sup>5</sup> *See BIS (2009) for a discussion of the adverse effects of unconventional policies on market functioning.*

Table 1

### Unconventional Operations and Facilities Introduced during the Crisis

	BoC	ECB	BoJ	SNB	BoE	Fed
<i>Information as of 2 August 2010</i>						
(a) Provision of liquidity to banks						
Term funds, domestic currency	○	●	*	○	⊙	○
Foreign currency funds		●	●	●	●	
Term securities lending					⊙	○
(b) Intervention in credit markets						
Corporate bonds/CP			⊙		●	○
Asset-backed securities						○
Covered bonds		○				
Government bonds		●				
(c) Large/open-ended purchases						
Government bonds			●		⊙	⊙
Other securities				⊙		⊙
Foreign exchange				⊙		

● = in use; ⊙ = partially wound down (for securities lending, includes the case where new lending has ceased but existing transactions can still be rolled over; for asset purchases, includes the case where purchases have ceased but outstanding holdings are still exceptionally large); ○ = terminated/no longer active; ● = reactivated.

\* There are longer-term funds supplying operations, but they tend to be designed to facilitate corporate financing or enhance monetary easing, not to alleviate interbank market pressures per se.

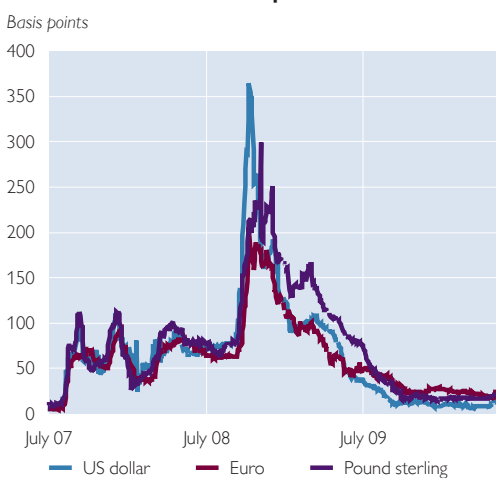
1): (a) lending to the banking sector on extraordinary terms – including at longer maturities and/or against a wider range of collateral – in domestic and foreign currency; (b) intervention in

credit markets to support secondary markets for specific instruments; and (c) outright asset purchases aimed at easing monetary conditions beyond what could be achieved by policy rate cuts.

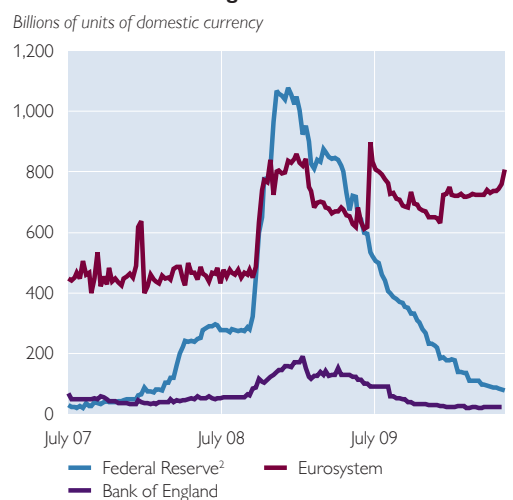
Chart 1

### Money Market Rates and the Use of Central Bank Refinancing Facilities

#### Three-Month Libor-OIS Spreads



#### Central Bank Lending Facilities<sup>1</sup>



Source: Central banks; Bloomberg.

<sup>1</sup> Repurchase agreements in domestic currencies.

<sup>2</sup> Includes repos, term auction credit, other loans and Commercial Paper Funding Facility.

## 1.1 Supplying Liquidity to the Banking System

The phasing out of facilities to provide liquidity to banks is the most advanced. Banks became less reliant on *domestic currency* liquidity as interbank markets recovered. Interbank market conditions improved substantially over time (chart 1). Since March 2009, many money market indicators have come back to the levels last seen before the beginning of the crisis in August 2007.

As markets gradually resumed functioning, demand for central bank funding declined. This allowed the Federal Reserve and the Bank of England to scale back, or end, the provision of term funding.<sup>6</sup> The Eurosystem has discontinued its special longer-term refinancing operation, but the stock of

long-term transactions outstanding remains sizeable owing to the large 12-month refinancing operation due in July 2010.<sup>7</sup>

The exit from liquidity operations in *foreign currencies* was essentially completed before the May 2010 crisis (chart 2). The Federal Reserve's currency swap arrangements with 14 central banks formally expired on 1 February 2010, though some partner central banks had already discontinued some or all of their US dollar auctions well before then. Dollar swap lines were re-established with some central banks in May, but to date only a relatively small amount of dollar funding has been provided through these facilities.

One key element supporting a relatively quick exit from unconventional

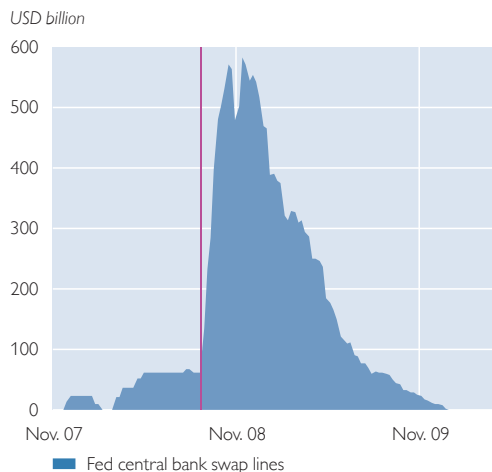
Chart 2

### Central Bank Swap Lines and US Dollar Swap Spread<sup>1</sup>

#### FX Swap Spread<sup>2</sup>



#### Federal Reserve Central Bank Swap Lines<sup>3</sup>



Source: Central banks; Bloomberg.

<sup>1</sup> The first vertical line indicates the first expansion of the Federal Reserve's temporary reciprocal currency arrangements (18 September 2008), the second indicates the reactivation of the Fed swap lines (9 May 2010).

<sup>2</sup> Spread between the three-month FX swap implied dollar rate and the three month USD Libor, in basis points; the FX swap implied rate is the implied cost of raising US dollars via FX swap using the funding currency.

<sup>3</sup> Outstanding amounts.

<sup>6</sup> The Bank of England (BoE) has scaled back the frequency and size of its expanded three-month pound sterling repo operations against a wider range of collateral. The Federal Reserve has ended its Term Auction Facility (TAF), which supplied term funds to banks via competitive auctions against discount window collateral, and its Term Securities Lending Facility (TSLF) for primary dealers.

<sup>7</sup> In early May, the ECB conducted a six-month funding operation.

bank lending facilities was the pricing of such operations. Many central bank facilities were priced as backstops, attractive only under stressed market conditions. This provides for a built-in exit mechanism.

However, the rapid deterioration in early May 2010 demonstrated that funding market conditions remain fragile. Unsurprisingly, emergency liquidity provision has not resolved the underlying bank balance sheet mismatches, including a considerable dollar funding gap of European banks,<sup>8</sup> or concerns about counterparty risk.

## 1.2 Supporting Dysfunctional Credit Markets

Central banks have also partially exited from measures to *directly support specific credit markets*.<sup>9</sup> On 1 February, the Federal Reserve terminated four extraordinary facilities, including the Asset-Backed Commercial Paper (ABCP) facility, the Asset-Backed Commercial Paper Money Market Fund Liquidity Facility (AMLF) and the Commercial Paper Funding Facility (CPFF).<sup>10</sup> The Term Asset-Backed Securities Loan Facility (TALF) was closed on 30 June 2010. The Bank of England's purchase of corporate securities, financed by treasury bill issuance and Debt Management Office cash management operations, also continues, though on a modest scale. The Eurosystem's Covered Bond Purchase Programme (CBPP) was completed on 30 June 2010.

In most cases, central banks pre-announced an expiration date for credit market programmes. This was seen as an important means to limit distortions to market functioning when introducing unconventional measures. Pre-announcement of exit may also explain why market conditions around expiration dates have generally been calm – which contrasts with significant price movements after the announcement of credit market facilities (chart 3).

However, it is difficult to assess whether the targeted markets have resumed normal functioning. One key issue is to identify the drivers of credit spread movements. Disentangling liquidity risk premiums in spreads from the price of credit risk is not straightforward and can complicate central bank communication. This is a challenge that the Eurosystem may face in implementing the Securities Markets Programme (SMP).

A related issue concerns the sustainability of improved market conditions. Narrower or more stable spreads may be supported only by thin trading activity. Moreover, the willingness to take positions may reflect a perception that central banks would intervene if market conditions were to deteriorate again.

## 1.3 Providing Additional Monetary Stimulus

Central banks' *large-scale outright asset purchases* have mostly ceased. The Federal Reserve and the Bank of England

<sup>8</sup> See Fender and McGuire (2010) for the evolution of the dollar funding gap, and Domanski and Turner (2010) for an overview of the liquidity management issues confronting international banks.

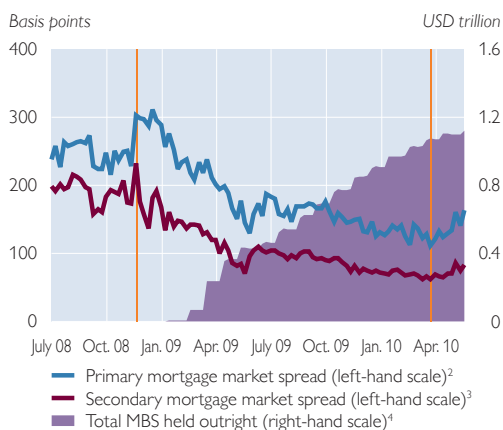
<sup>9</sup> Other measures supported credit markets indirectly. In particular, the eligibility of ABS originated by the pledging bank as collateral in Eurosystem refinancing operations supported ABS issuance in the euro area. The annual average share of ABS pledged with the Eurosystem rose from 6% in 2004 to 28% during 2008 (Cheun, von Köppen-Mertes and Weller, 2009).

<sup>10</sup> The other two extraordinary facilities are the TSLF and the Primary Dealer Credit Facility (PDCF). The Money Market Investing Funding Facility (MMIFF), introduced post-Lehman along with the AMLF and the CPFF, was withdrawn in late October 2009 owing to a lack of demand.

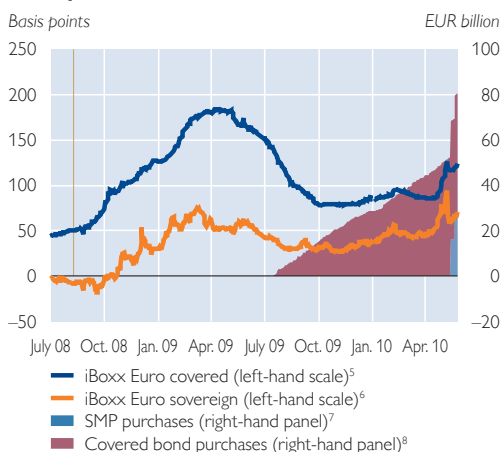
Chart 3

## Central Bank Intermediation in Credit Markets<sup>1</sup>

### Federal Reserve: MBS Purchases



### Eurosystem: Covered Bond and SPP Purchases



Sources: Central banks, Bloomberg, Freddie Mac, Markit.

<sup>1</sup> The first vertical line indicates the announcement of the programme, the second indicates its termination. For the ECB, the announcement of the covered bond purchase programme.

<sup>2</sup> Spread between 30-year fixed mortgage rate provided by Freddie Mac's Primary Mortgage Market Survey and 10-year Treasury yields, weekly data, in basis points.

<sup>3</sup> Spread between Fannie Mae's 30-year current-coupon MBS and 10-year treasury yields, in basis points.

<sup>4</sup> In trillions of US dollars; settled transactions only.

<sup>5</sup> Spread between the yield on a basket of euro-denominated covered bonds and interest rate swaps with a similar maturity, in basis points.

<sup>6</sup> Spread between the yield on a basket of euro-denominated government bonds and interest rate swaps with a similar maturity, in basis points.

<sup>7</sup> Purchases under the Securities Markets Programme announced on 9 May 2010; in billions of euros; settled transactions only.

<sup>8</sup> In billions of euros; settled transactions only.

reached their targets for government bond purchases in late October 2009 and late January 2010, respectively. The Federal Reserve completed its agency debt and agency mortgage-backed securities (MBS) purchases in March; maturing securities and prepayments are not being replaced in this case. The Bank of England completed gilt purchases in late January 2010.

However, it is not clear whether, and to what extent, ending asset purchases actually constitutes an exit from the provision of additional monetary stimulus. Through government bond purchases, the central bank seeks to alter benchmark yields and affect economy-wide credit conditions and, ultimately, aggregate demand. But views differ on the relative effectiveness of large-scale asset purchases (i.e. flow ef-

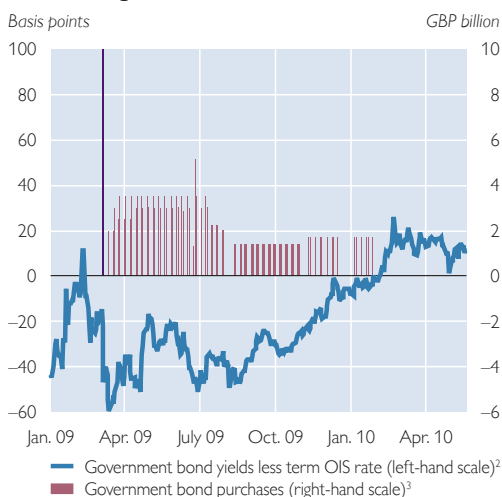
fects) and portfolio composition (i.e. stock effects) in achieving these effects. A casual comparison of changes in the spread of government bonds over OIS rates suggests that the *purchase* of assets has influenced spreads, consistent with empirical work documenting the impact of Treasury issuance on long-term interest rates (chart 4).<sup>11</sup>

Moreover, the role of bank reserves in the monetary transmission process is subject to debate. Reserves held with the Federal Reserve and the Bank of England grew more or less in lockstep with asset purchases. Similarly, full allotments at fixed rate auctions have created large excess reserves in the Eurosystem. Some authors argue that such an expansion can prevent a self-fulfilling deflationary spiral from developing, citing the experience in Japan in the

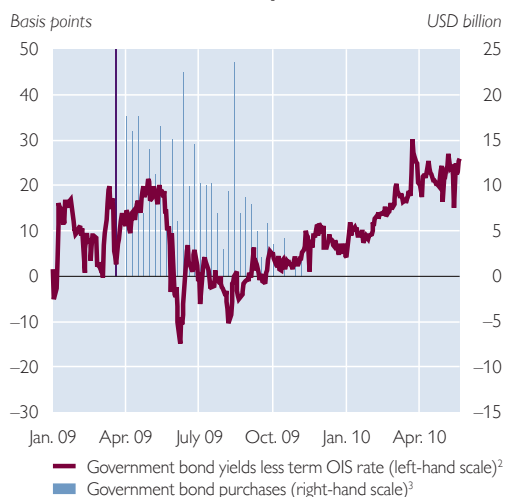
<sup>11</sup> See Gagnon (2009).

## Central Banks' Outright Purchases of Government Bonds

### Bank of England: Gilt Purchases<sup>1</sup>



### Federal Reserve: Treasury Purchases<sup>1</sup>



Sources: Central banks, Bloomberg.

<sup>1</sup> For the Bank of England, the vertical line indicates the announcement of the GBP 75 billion asset purchase programme by issuance of central bank reserves (5 March 2009). For the Federal Reserve, the vertical line indicates the announcement of the USD 300 billion Treasury purchase programme (18 March 2009).

<sup>2</sup> Spread between 10-years government bond yields and the 10-year OIS rate, in basis points.

<sup>3</sup> In billions of units of domestic currency. For the Bank of England, daily data, gross amounts purchased; for the Federal Reserve, weekly change in nominal Treasuries held outright, face value.

early 2000s.<sup>12</sup> Others maintain that an expansion of reserves only changes the composition of liquid assets in the banking system, but not their level.<sup>13</sup> A key question is how the liquidity of banks influences their decision to lend. Overall, uncertainty about the impact of unconventional policies increases as measures become less targeted.

## 2 Challenges Ahead

### 2.1 Managing Large Central Bank Balance Sheets

The balance sheets of major central banks are now much larger than before the crisis (chart 5). Those of the Federal Reserve and the Bank of England have more than doubled in size, and the Eurosystem's balance sheet has increased by about two thirds. However, the drivers of balance sheet expansion

differ. Assets purchased in extraordinary actions now dominate the asset side of the Federal Reserve's and the Bank of England's balance sheets. Correspondingly, the duration of central bank assets has increased substantially. The Eurosystem's balance sheet has mainly grown because of the extension of longer-term refinancing operations. Outright securities purchases have been relatively small, but may become more important with the SMP.

Central banks need to be able to manage large balance sheets actively. Letting assets roll off passively at maturity could take a long time. For instance, only about 10% of the Federal Reserve's holdings of Treasury securities have a remaining maturity of one year or less, while essentially all of the agency MBS held have a remaining ma-

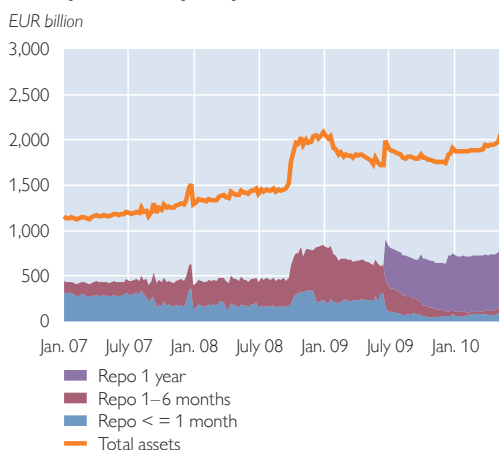
<sup>12</sup> See Wieland (2009).

<sup>13</sup> Borio and Disyatat (2009).

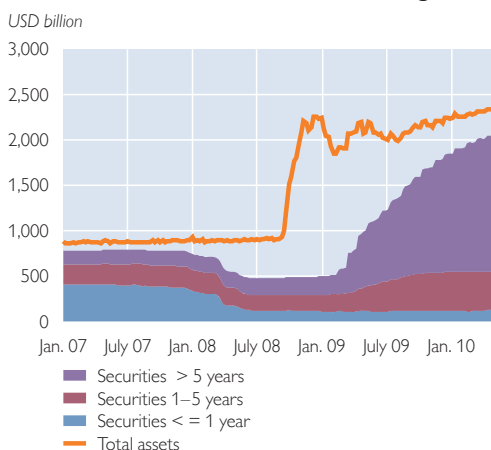
Chart 5

## Central Bank Balance Sheet Size and Asset Duration<sup>1</sup>

### Eurosystem – Repo Operations



### Federal Reserve – Securities Held Outright<sup>2</sup>



Sources: Central banks.

<sup>1</sup> In billions of units of domestic currency. For the Eurosystem, breakdown of outstanding repo operations refers to original maturity; for the Federal Reserve, breakdown of securities held outright refers to remaining maturity.

<sup>2</sup> Includes mortgage-backed securities, US treasuries and agency debt securities held outright.

turity of over 10 years, with prepayment unlikely to accelerate unless there is a substantial decline in long-term interest rates. The Bank of England's gilt purchases include bonds maturing no earlier than 2013 and as late as 2060.<sup>14</sup>

Technically, shrinking the balance sheet is not a necessary condition for raising policy rates. In principle, a central bank can set the policy rate independently from the size of its balance sheet.<sup>15</sup> Central banks can establish a floor on money market rates through remuneration of reserves or reduce the amount of “free” reserves through reverse repo operations, issuance of central bank paper or term deposits, and transfer of government deposits from the banking system to the central bank.<sup>16</sup> However, raising policy rates in an environment of large excess reserves

may complicate the communication of the stance of monetary policy if the level of excess reserves is seen as indicator of the policy stance.

Different approaches to normalising the size of the central bank balance sheet may have different implications for the path of policy rate increases and yield curves. Holding assets to maturity should contain upward pressure on long-term interest rates. As a result, any need to tighten monetary conditions may require larger or faster policy rate hikes at the short end. By contrast, asset sales will tend to exert upward pressure on longer-term interest rates. As a consequence, the policy rate may not need to rise as fast or as much. However, a large gap between the policy rate and long-term rates may raise questions about central bank credibility

<sup>14</sup> The Eurosystem's balance sheet could shrink faster as long-term refinancing operations mature. However, the SMP could entail a significant extension of asset duration.

<sup>15</sup> See Bech and Klee (2009) for a discussion of the increase in bank reserves on the federal funds market.

<sup>16</sup> These tools are not new: many Asian central banks have long been using them to maintain control over short-term interest rates in the context of a structural liquidity surplus resulting from foreign exchange purchases.



– and encourage too much short-term borrowing.<sup>17</sup>

Finally, a large balance sheet gives rise to other challenges. One is greater exposure to changes in market valuations of assets and hence possible volatility in central bank profits and/or capital. Another issue is delineating monetary and fiscal policy. Central bank purchases of sovereign bonds affect government funding costs. Conflicts could arise, for instance, if the central bank wished to reduce large holdings of government bonds at a time of increasing government financing requirements.

## 2.2 Designing Post-Crisis Operational Frameworks

Deciding on an appropriate exit strategy requires an understanding of whether any of the unconventional instruments should become part of a central bank's post-crisis operational framework. Adverse effects on market functioning and the need to reduce the size of central bank balance sheets call for an unwinding of unconventional measures. However, there may be a case for retaining elements of the measures introduced during the crisis.

The crisis has demonstrated that both *broad* and *narrow* operational frameworks have advantages and disadvantages. On the one hand, the Eurosystem's framework, featuring a broad range of counterparties and pool of eligible collateral in regular operations, allowed emerging tensions in interbank markets to be addressed swiftly and without larger modifications to operating procedures. However, the option to pledge a broad range of assets with the

central bank may weaken risk management by financial institutions and expose the central bank to credit risk. On the other hand, the Federal Reserve, starting from a narrow framework, was able to innovate new facilities relatively quickly. But developing and implementing new tools entails operational risk. Moreover, facilities that are not regularly used, such as the Federal Reserve's discount window prior to the crisis, may be stigmatised, raising issues for the distribution of liquidity within the banking system.

Against this backdrop, three principles could guide future modifications to both *broad* and *narrow* frameworks:

1. Central banks should retain, and strengthen, measures that can mitigate immediate stress in interbank markets arising from a typical liquidity shock. These include:
  - *Standing lending facilities that are free of stigma.* Standing facilities can serve as a safety valve in case of an unexpected liquidity shortage in the banking system if they are not subject to stigma. Addressing stigma may call for regular, possibly mandatory, use of such facilities by a broader range of counterparties.<sup>18</sup>
  - *Regular provision of term funding.* In a liquidity crisis, central banks may have to provide term funding to prevent banks from becoming overly reliant on overnight funding.<sup>19</sup> Regular term funding operations with a broad range of counterparties, such as the Long-Term Refinancing Operations conducted by the Eurosystem prior to

<sup>17</sup> These effects can be expected to be larger if markets are segmented, for instance because of liquidity preferences of investors.

<sup>18</sup> See Goodhart (2009) and Tucker (2009) for a discussion of possible approaches to dealing with stigma.

<sup>19</sup> See Turner (2009) for a more detailed discussion.

the crisis, can enhance the effectiveness of such operations during crisis.

- *Accepting a wider range of collateral in certain operations.* The central bank may wish to limit the pool of eligible collateral to high-quality assets. However, such a policy may be time-inconsistent: under stressed conditions, the central bank may be forced to accept lower-quality collateral. One approach could be to accept a wider range of collateral in operations that are likely to be of particular importance in stress situations, e.g. term funding operations.<sup>20</sup>

2. Central banks should phase out instruments that were introduced to deal with shocks to specific markets or types of counterparties:

- *Credit market support facilities.* The impact of liquidity problems on individual markets may crucially depend on the nature of the shock and be different for each crisis. Central banks were able to (re-)establish these facilities relatively quickly and unwind them relatively smoothly, suggesting that it may be sufficient for central banks to have the operational capacity to run such facilities. This would be consistent with the notion that central banks should be prepared to act as market maker of last resort to counter a systemic liquidity shock.<sup>21</sup>

3. Central banks need adequate instruments for managing their balance sheets:

- *Enhanced risk management capacities.* It is likely that central banks have to accept a wide range of collateral during a crisis. More generally, deteriorating sovereign credit

quality may affect the availability of highly liquid, credit risk-free collateral going forward. Hence, central bank haircut practices and collateral risk management capacities become more important.

- *Instruments to manage the liability side of central bank balance sheets.* Uncertainty about banks' de-



mands and a desire to avoid shortages may result in an accidental excess supply of liquidity during crises. In order to avoid an unintended decline in the overnight rate, central banks should have the capacity to issue liquidity-absorbing paper and/or to remunerate reserves.

An open question is whether, and how, central banks should have mechanisms in place providing liquidity in foreign currency as part of their regular operations. On the one hand, one can argue that cross-currency funding needs are an integral part of international banking and that this should also be reflected in regular central bank liquidity operations. On the other hand, recent experience shows that when circumstances warrant, the central bank swap arrangements can be put in place

<sup>20</sup> See Tucker (2009).

<sup>21</sup> See the principles for central bank operations in crisis periods set out in CGFS (2008).

quickly and on a scale commensurate with the circumstances.<sup>22</sup> Central bank swap or repo lines are one obvious candidate solution for systemic liquidity problems such as the global US dollar liquidity shortage observed in the recent crisis. At the same time, they are no panacea.<sup>23</sup>

### 3 Conclusion

Unconventional central bank measures adopted during the crisis have contributed to the stabilisation of the financial system in a major way, even when taking into account the difficulties in as-



sessing the impact of policies aimed at influencing broader financial conditions. Moreover, to date the exit from measures to provide liquidity support

to the banking system and specific credit markets has worked reasonably smoothly. Policies aimed at providing additional monetary stimulus through large-scale asset purchases – especially government bonds – have arguably raised bigger issues. Their effectiveness is more difficult to assess than that of targeted measures, they are more difficult to unwind and they may ultimately distort markets.

But the unprecedented use of unconventional policies has placed a heavy burden on central banks. Balance sheets are very large, may remain bloated for some time and expose central banks to risks that are more naturally the domain of governments. Communication has become more difficult. And perhaps most importantly, it is questionable whether it will be possible to design central bank liquidity provision in a way that contains moral hazard. The scale and scope of the unconventional measures taken during the crisis may make it difficult for central banks to credibly commit to limiting emergency liquidity assistance in the next crisis. All this calls for more emphasis on crisis prevention – policies aimed at strengthening the resilience of the financial system and preventing the build-up of systemic liquidity risk.<sup>24</sup>

### References

- Bank for International Settlements. 2009.** 79<sup>th</sup> Annual Report.
- Bech, M. L. and E. Klee. 2009.** The Mechanics of a Grateful Exit: Interest on Reserves and Segmentation in the Federal Funds Market. FRBNY Staff Reports 416.
- Borio, C. and P. Disyata. 2009.** Unconventional Policies: an Appraisal. BIS Working Papers.
- Cheun, S., I. von Köppen-Mertes and B. Weller. 2009.** The Collateral Frameworks of the Eurosystem, the Federal Reserve System and the Bank of England and the Financial Market Turmoil. ECB Occasional Papers 107. December.

<sup>22</sup> For a discussion of the implementation details, see CGFS (2010a).

<sup>23</sup> See CGFS (2010a).

<sup>24</sup> For a discussion of the need for a macroprudential framework, see the contribution by Gerlach (2010) prepared for this conference.

- Caruana, J. 2009.** Unconventional Monetary Policies in Time of Crisis. SUERF Annual Lecture. Brussels. 16 November.
- Committee on the Global Financial System. 2008.** Central Bank Operations in Response to the Financial Turmoil. CGFS Papers 31. July.
- Committee on the Global Financial System. 2010a.** The Functioning and Resilience of Cross-Border Funding Markets. CGFS Papers 37. March.
- Committee on the Global Financial System. 2010b.** Funding Patterns and Liquidity Management of Internationally Active Banks. CGFS Papers 39. May.
- Domanski, D. and P. Turner. 2010.** The Great Liquidity Freeze: What Does It Mean for International Banking? Paper prepared for the ADBI-IMF-CBRC conference on Banking Regulation and Financial Stability in Asian Emerging Markets. 26 May 2010.
- Fender, I. and P. McGuire. 2010.** European Banks' US Dollar Funding Pressures. BIS Quarterly Review. June.
- Gagnon, J. E. 2009.** The World Needs further Monetary Ease, Not an Early Exit. Peterson Institute for International Economics Policy Brief. December.
- Gerlach, S. 2010.** Are the Golden Years of Central Banking Over? Monetary Policy after the Crisis. Paper presented at the 38<sup>th</sup> Economics Conference of the Oesterreichische Nationalbank.
- Goodhart, C. 2009.** The Regulatory Response to the Financial Crisis. Edward Elgar Publishing.
- Meier, A. 2009.** Panacea, Curse or Non-Event? Unconventional Monetary Policy in the United Kingdom. IMF Working Paper WP/09/163.
- Tucker, P. 2009.** The Repertoire of Official Sector Interventions in the Financial System: Last Resort Lending, Market-Making and Capital. Presentation at the Bank's of Japan 2009 International Conference: Financial System and Monetary Policy Implementation.
- Turner, P. 2009.** Central Banks, Liquidity and the Banking Crisis. In: Griffith-Jones S., J. Ocampo and J. E. Stiglitz (eds.). Time for a Visible Hand. Oxford University Press.
- Wieland, V. 2009.** Quantitative Easing: A Rationale and Some Evidence from Japan. NBER Working Papers 15565.