

**FOR  
AGENDA**

SM/10/21

January 27, 2010

To: Members of the Executive Board

From: The Secretary

Subject: **Exiting from Monetary Crisis Intervention Measures—Background Paper**

Attached for consideration by the Executive Directors is a background paper on exiting from monetary crisis intervention measures, which is tentatively scheduled for discussion on **Monday, February 8, 2010**.

The staff proposes the publication of this paper after the Executive Board completes its discussion, together with a PIN summarizing the Executive Board's discussion.

Questions may be referred to Mr. Stone (ext. 36532), Mr. Fujita (ext. 37858), and Mr. Kotaro (ext. 38034) in MCM.

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INTERNATIONAL MONETARY FUND

**Exiting from Monetary Crisis Intervention Measures—Background Paper**

Prepared by the Monetary and Capital Markets Department<sup>1</sup>

Approved by Christopher Towe

January 25, 2010

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<sup>1</sup> This paper was prepared by Kenji Fujita, Kotaro Ishi, and Mark Stone, with research assistance from Simon Townsend. Data reported in this paper were helpfully provided by Fund area departments.

## EXECUTIVE SUMMARY

**This paper documents the crisis intervention measures implemented by central banks during the crisis of 2007-09 and discusses selected issues raised by exiting from them.**

Advanced economy central banks introduced a wide range of intervention measures including not just substantial interest rate cuts but also “balance sheet policies.” Indeed, changes in the size, composition and duration of central bank balance sheets took on a leading policy role.

Emerging market economy central bank generally did not ease monetary conditions by as much, or as broadly, as their advanced economy counterparts.

**Many advanced economy central banks have begun to exit from the crisis intervention measures.** Large scale systemic liquidity operations have been mostly rolled back, while foreign exchange liquidity provision has virtually ceased. The amount of central bank holdings of private securities has declined. However, a few central banks continue to hold a large amount of public securities which correspond to high levels of bank reserves.

**Central banks in advanced economies have the means to exit from crisis intervention measures and need to make a number of decisions on whether, when, and how to unwind.** Central banks should return to a market-based implementation framework based on single rate, but several operational changes made during the crisis may warrant retention. Absorbing excess bank reserves should not pose major challenges, although dealing with the legacy of large-scale purchases of long-term securities may require a different set of a policy tools. Central banks that hold a large amount of long-term securities will need to decide when to wind down purchases, how to manage the outstanding stock on their balance sheet, and on possibly selling these holdings.

**Emerging market economy central banks crisis measures were generally implemented later, were of a smaller magnitude, and focused relatively more on foreign exchange liquidity.** They started taking intervention measures only after the sudden tightening of global liquidity conditions in September 2008. Overall, emerging market economy central banks lowered policy interest rates but by less than did advanced economy central banks. Crisis intervention measures addressed both foreign and domestic liquidity conditions. To date, several emerging economy central banks have unwound large portions of crisis intervention measures, partly reflecting improved external liquidity conditions and economic recovery.

## I. INTRODUCTION

**1. This paper elaborates the discussion in the Board paper “Exiting from Crisis Intervention Policies” on the crisis intervention measures implemented by central banks.**

The financial crisis that began in the summer of 2007 compelled central banks to employ a wide range of measures. Central banks have started withdrawing some of those measures as market conditions have improved, but the timeline and modalities for exiting are uncertain. Thus, whether, when, and how to exit from crisis interventions remains an important issue for many central banks. This paper documents the crisis intervention measures taken by central banks and provides a more detailed and technical discussion than in “Exiting from Crisis Intervention Policies” of selected aspects of exiting from them. A number of important monetary issues addressed in the main paper are not covered here to avoid duplication.<sup>2</sup>

**2. This paper confirms that central banks have available the means to exit from crisis intervention measures.** On a technical level, terminating crisis intervention measures and reversing them when warranted should not present major challenges. As documented below, the crisis intervention measures have varied considerably across countries, and thus so will the specific steps needed to unwind them. Section II of this paper addresses the crisis intervention measures taken by advanced economies (AEs). Since emerging market economies’ (EMEs) crisis interventions were generally more limited and with somewhat different aims, their measures are addressed separately in Section III. A short appendix summarizes the central bank balance sheet crisis intervention data.

## II. CRISIS INTERVENTION MEASURES OF ADVANCED ECONOMIES

**3. Before the crisis, most AE central banks implemented monetary policy by guiding a single short-term interest rate.** Changes in the policy interest rate were implemented using money market instruments and were transmitted to the economy mainly by the yield curve and changes in private sector balance sheets.<sup>3</sup> Central bank communication and expectations also played a key role. With expectations firmly anchored and market conditions broadly stable, changes in the monetary policy stance had little or no impact on the central bank balance sheet.<sup>4</sup>

**4. The events of September 2008 necessitated new and innovative monetary policy measures** (Table 1). The transmission channels of monetary policy were already weakened beginning in the summer of 2007 by stress in money and other financial markets (IMF, 2008 and

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<sup>2</sup> This paper also covers medium and large advanced and emerging market economies.

<sup>3</sup> Kuttner and Mosser (2002) provide a comprehensive review of monetary policy transmission channels for large AEs.

<sup>4</sup> See Disyatat (2008) and Stella (2009). On occasion, AE central banks have purchased or sold foreign reserves to influence the exchange rate; these transactions do impact the composition and—if unsterilized—the size of the balance sheet.

Cihák, 2009). The failure of Lehman and intervention of AIG led to the hoarding of liquidity by financial and nonfinancial companies and further constrained private sector balance sheet monetary policy transmission channels. Central banks immediately began to inject large amounts of domestic and foreign exchange liquidity. Early in 2009, the pace of reduction of policy interest rates was accelerated as the speed and magnitude of the global economic contraction became clear.

5. **AE central banks cut policy interest rates to historical lows and several committed to maintaining them at these levels for prolonged periods.** Most AE central banks reduced their policy rates to the effective lower-bound (Figure 1). Several central banks committed to keeping interest rates at very low levels for a period beyond the interval between monetary policy announcements. For example, in April 2009, the Bank of Canada (BoC) committed to keep overnight rates at 0.5 percent, conditional on inflation developments, until the end of the second quarter of 2010 to influence rates at longer maturities. The Federal Reserve Bank (Fed) also committed to maintaining a low policy interest rate for an extended period.

6. **Most AE central banks, especially those constrained by the lower policy interest rate bound, shifted their focus to “balance sheet policies.”** These were necessitated by severely impaired transmission of interest rate changes and the dire states of the financial sector and the economy at large. Changes in the size, composition and duration of central bank balance sheets took on a leading policy role and evolved and grew as the economic situation worsened.<sup>5</sup> The main such policies are:<sup>6</sup>

- *Systemic liquidity easing*—These are measures that generally boost liquidity and are aimed at alleviating systemically important liquidity shortfalls in key funding markets and for the financial system as a whole. They are implemented generally by easing access to standard central bank liquidity providing instruments and increase the level and somewhat lengthen the duration of central bank assets. Bank reserves rise in tandem.
- *Purchase of long-term public sector securities*—These purchases are principally intended to lower longer-term interest rates and also alleviate stress in longer-term credit markets. They boost long-term assets of the central bank and, in practice, have been unsterilized, so that bank reserves rise as well.

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<sup>5</sup> Some balance sheet policies are commonly referred to as “unconventional measures,” examples of which include quantitative easing and credit easing (Bernanke, 2009; Bini Smaghi, 2009). However, these terms have been subject to varying uses and interpretations and thus complicate cross-country comparisons, and are not used here.

<sup>6</sup> A few AE central banks provided lender of last resort support during the crisis; these operations are not a focus of this paper. Unsterilized purchases of foreign exchange are also not considered here.

**Table 1. Advanced Economy G-20 Central Banks: Crisis Measures and Current Status of Exit**  
(As of end-December, 2009)

	Policy rate			Number of Policy Measures (latest/maximum)						Balance Sheet Impacts (latest/maximum, % of GDP) 1/			
	Latest peak (last date)	Latest bottom (last date)	Last policy rate change (date)	Systemic Liquidity Easing Measures	Purchases of Private Securities	Purchases of Public Securities 1/	FX liquidity easing	(FX swap arrangements)	Emergency Liquidity Assistance	Bank Reserves 2/	Purchases of Private Securities	Purchases of Public Securities 1/	FX liquidity easing
Australia	7.25 (Sep.2, 08)	3.00 (Oct. 6, 09)	3.75 (Dec. 2, 09)	0/2	-	-	1/1	1/1	-	0.1/0.7	-	-	0.0/3.5
Canada 3/	4.5 (Dec.3, 07)	0.25 (Current)	0.25 (Apr.21, 09)	4/6	-	-	-	1/1	-	0.9/1.8	-	-	-
Euro area 4/	4.25 (Oct.7, 08)	1.00 (Current)	1.00 (May 7, 09)	6/7	0/1	-	3/5	3/3	-	1.9/3.4	0.3/0.3	-	0.1/4.3
Japan	0.50 (Oct.30, 08)	0.10 (Current)	0.10 (Dec.19, 08)	8/9	0/2	-	1/1	2/2	-	2.3/2.7	0.0/0.3	-	0.0/2.4
South Korea	5.25 (Oct. 8, 2008)	2.00 (Current)	2.00 (Jan. 9, 09)	1/3	1/1	-	3/3	3/3	-	0.2/1.2			0.0/2.3
United Kingdom	5.75 (Dec.5, 07)	0.50 (Current)	0.50 (Mar.5, 09)	5/5	2/2	1/1	1/1	1/1	0/3	9.0/10.2	0.1/0.2	13.3/13.3	0.0/5.1
United States	5.25 (Sep.17, 07)	0.0-0.25 (Current)	0.0-0.25 (Dec.16, 08)	8/9	3/4	2/3	-	1/1	2/2	7.1/8.1	0.4/2.5	9.2/9.2	-

Sources: Central bank websites; IMF International Financial Statistics; Bloomberg; and Haver Analytics.

1/ Cumulative changes from end-August 2008. Items included in each policy measure are spelled out in the data appendix. Figures for South Korea is those at end-November 2009.

2/ Purchases conducted solely for liquidity provision purposes are included in Liquidity Easing Measures. .

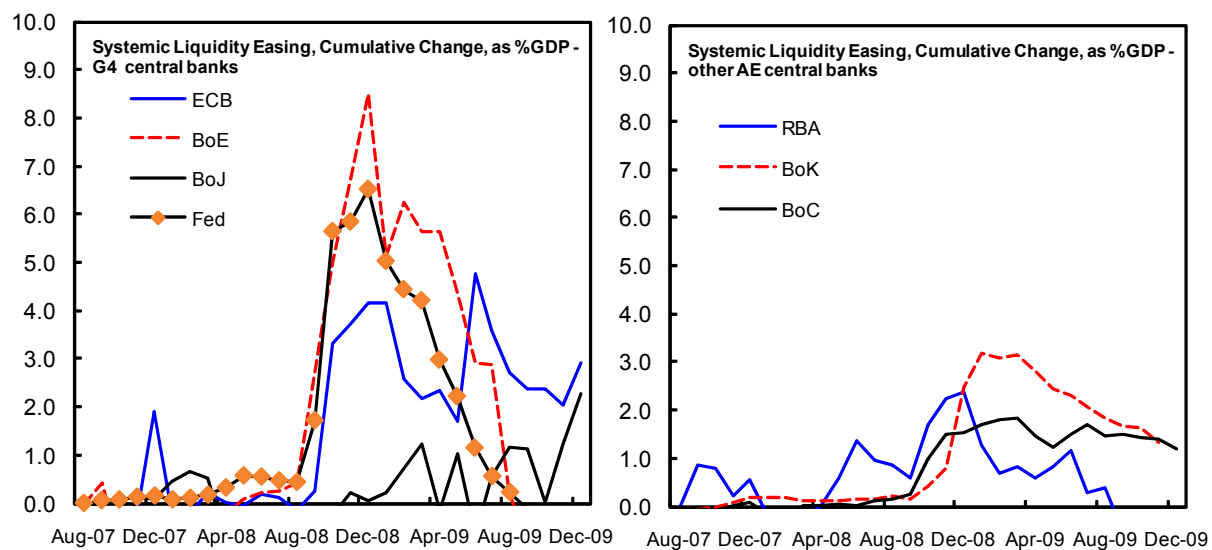
3/ Bank reserves for Canada include deposits by government.

4/ Bank reserves for Euro Area include deposit facility.

- *Purchase of private sector securities*—These are intended to boost credit in key markets for mainly macroeconomic objectives. In practice, these purchases are also not sterilized and thus they contribute to the expansion of bank reserves.
- *Foreign exchange liquidity provision*—Severe foreign exchange liquidity shortfalls can be addressed by the injection of foreign exchange liquidity, which can be in the form of sales of foreign reserves or foreign exchange swaps or other derivatives. These measures are not primarily aimed at influencing the exchange rate. Foreign reserve sales reduce the size of the balance sheet, unless sterilized by domestic liquidity injection. In addition, a number of currency swap facilities between central banks were established to transfer foreign currency. These arrangements increased both sides of central bank balance sheets.

***The large systemic liquidity operations have been mostly rolled back***

7. **Liquidity conditions in AEs tightened calamitously in September 2008.** Already, central banks had taken some liquidity providing measures beginning in late 2007. The ratcheting up of financial stress in September 2008 made financial institutions extremely reluctant to lend out funds in money markets owing to a loss of confidence in counterparties and a perceived need to hoard liquidity. Money markets froze, especially for term transactions. Key funding market interest rates rose sharply, reserve demand shot up, and confidence deteriorated.



Sources: Central bank websites, Haver Analytics.

8. **In response, AE central banks introduced a number of measures to boost liquidity on a systemic basis.** All AE central banks increased the volume of liquidity provided (text chart and Figure 1). The duration of fund-supplying operations was extended by many AE central



banks.<sup>7</sup> During 2009, the European Central Bank (ECB) provided substantial liquidity at a one-year maturity. Central banks also enhanced access to standing facilities, increased the number of counterparties, and expanded eligible collateral. Although the primary effect of liquidity easing has come from higher levels of bank reserves, the other changes in operational procedures also served to enhance the availability of liquidity and improve confidence.

9. **Differences in the magnitude and modalities of liquidity injection across AEs follow from varied market structures and financial stress.** The Fed, Bank of England (BoE), and ECB provided the most liquidity in relation to GDP, reflecting the relatively high degrees of stress in their financial systems. The Fed employed the largest array of measures probably due to the complexity of U.S. financial markets. Other AE central banks provided ample liquidity but on a smaller scale.

10. **Most central banks have started to roll back liquidity easing measures in line with improving conditions in key funding markets.**<sup>8</sup> The Reserve Bank of Australia (RBA) has pared back bank reserves to well below the levels that prevailed before the crisis. The ECB and the BoC recently decided to gradually shorten the maturity of fund-supplying operations. The outstanding amount of short-term operations by the Fed and BoE has decreased substantially. In December 2009, the Fed reaffirmed that several liquidity easing facilities would expire on February 2010, as scheduled. In contrast, the BoJ introduced in December 2009 a new fund-supplying operation to encourage a further decline in longer-term interest rates in an effort to support the recovery. In the United States and United Kingdom, bank reserves remain very high, but this is due to purchases of long-term securities.

***Foreign exchange liquidity provision has virtually ceased***

11. **AE central banks provided a considerable amount of foreign exchange liquidity mostly in U.S. dollars** (text chart). These amounted to an injection of dollars into the global financial system. In December 2007, the ECB started conducting dollar supplying operations. As tensions in global funding markets surged after the collapse of Lehman, AE central banks took prompt action to provide dollars to their local markets (Baba and others, 2009). The amount of dollars provided by other central banks sharply increased toward the end-2008 and temporarily accounted for large shares of AE central bank balance sheets.

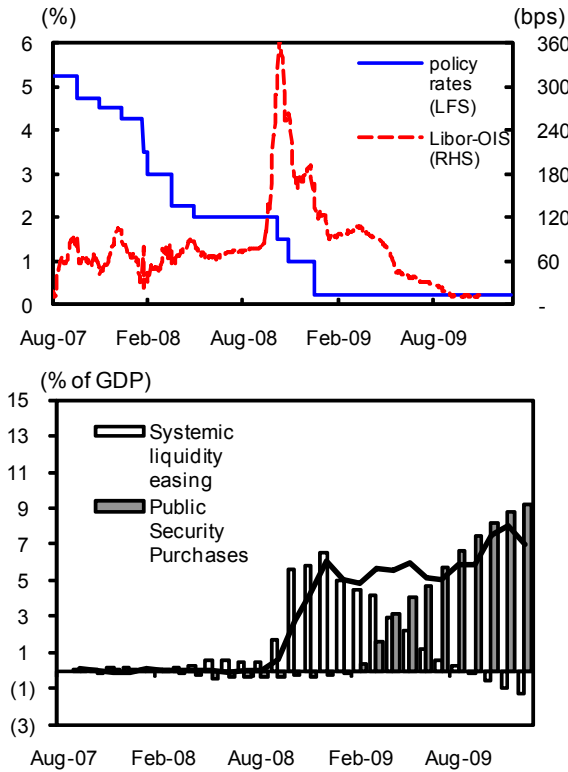
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<sup>7</sup> In some cases, corporate securities were made eligible for collateral for central bank liquidity access, indirectly increasing the demand for such securities and thus easing credit conditions for corporations.

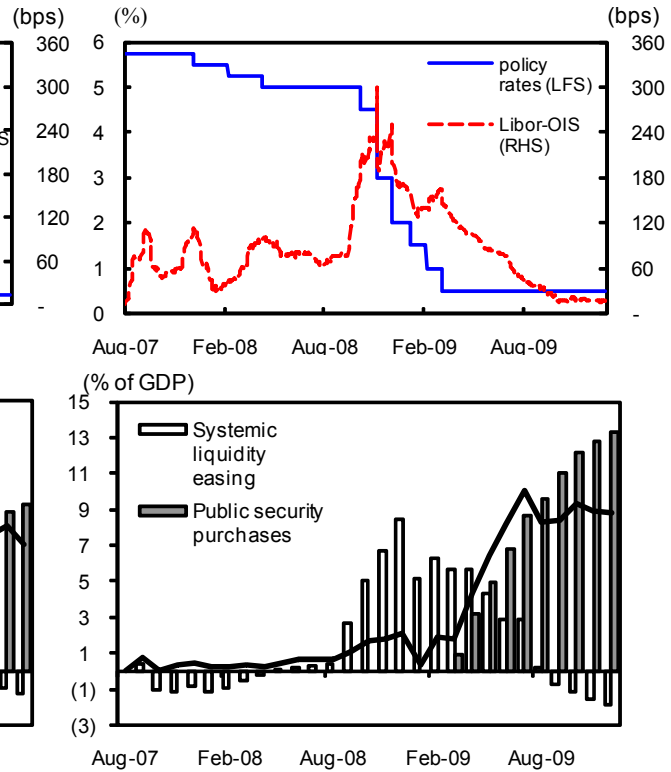
<sup>8</sup> The companion background paper “The Role of Indicators in Guiding the Exit from Monetary and Financial Crisis Intervention Measures” discusses indicators of funding market stress.

Figure 1. Advanced Economies, Key Monetary Crisis Measure Indicators, 2007–09

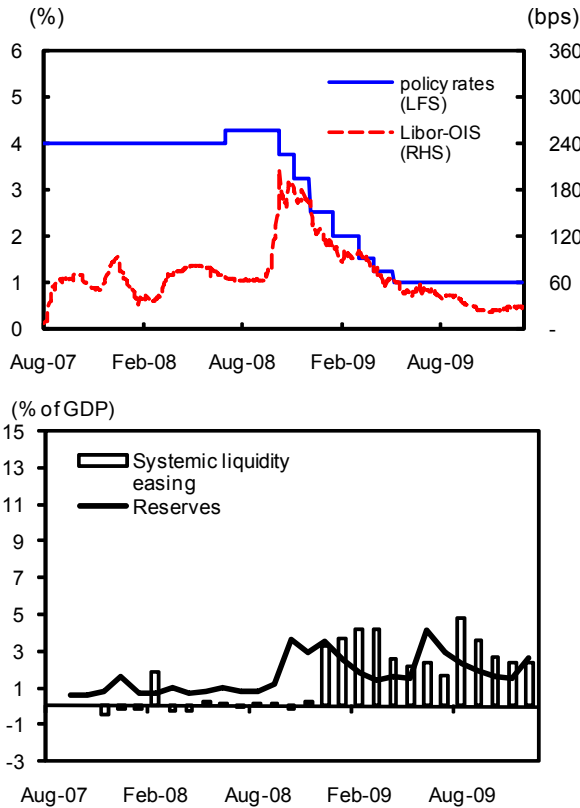
(1) Fed



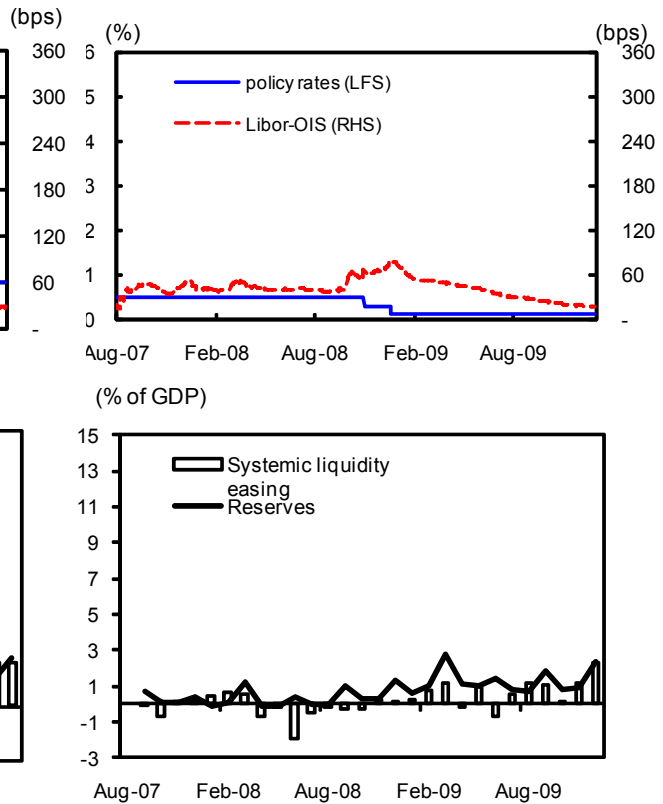
(2) BOE



(3) ECB



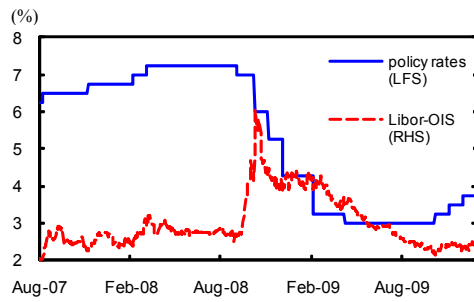
(4) BOJ



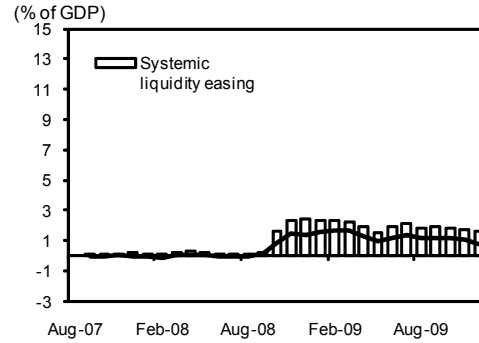
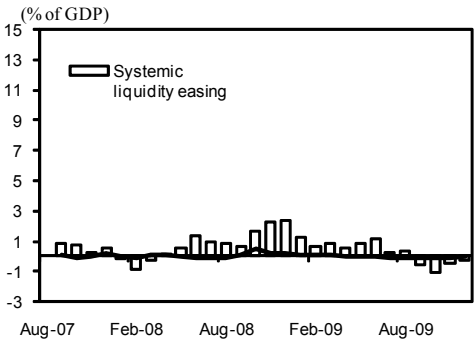
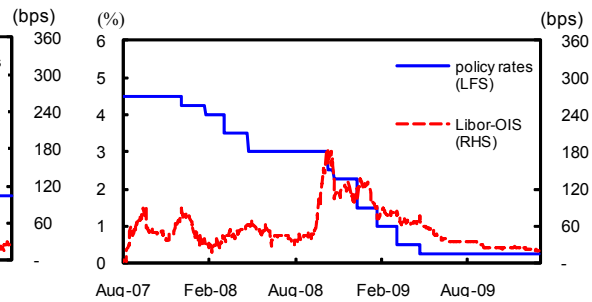
Sources: Bloomberg, Central bank websites, Havor Analytics.

Figure 1. Advanced Economies, Key Monetary Crisis Measure Indicators, 2007-09  
(continued)

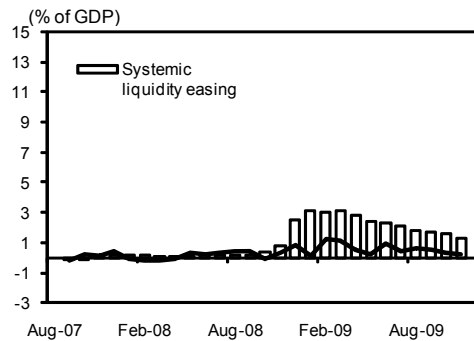
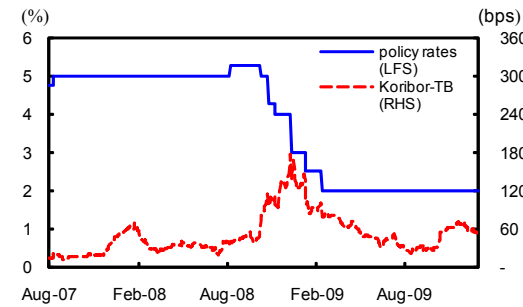
(5) RBA



(6) BOC

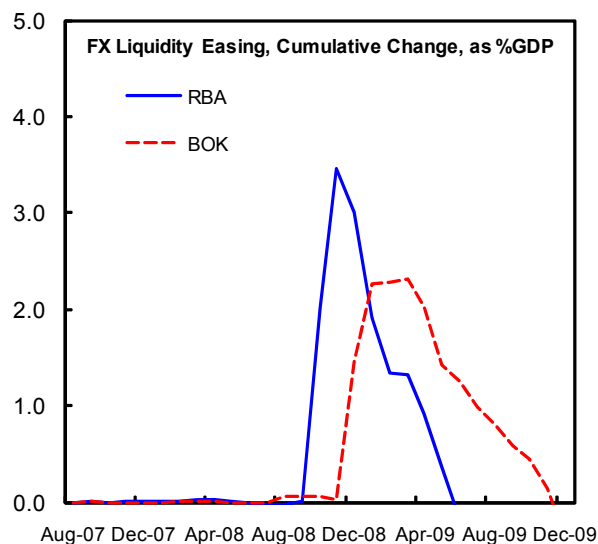
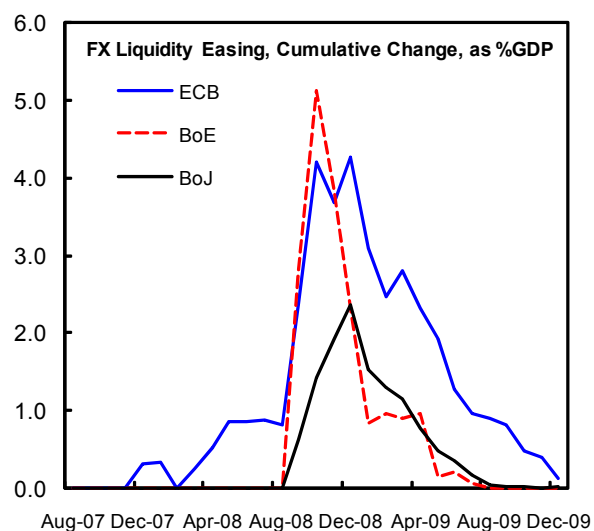


(7) BOK



Sources: Bloomberg, Central bank websites, Haver Analytics.

12. **Foreign exchange liquidity provision was facilitated by a number of central bank swap facilities.** These are bilateral (or in a few cases multilateral) agreements between central banks that in essence involve the provision of liquidity from a central bank whose currency was in demand to another central bank for distribution by the latter to local institutions. These measures are different from the others in that they involve more than one central bank, with one central bank effectively providing liquidity. The Fed established dollar swap arrangements with fourteen central banks and the ECB and the Swiss National Bank also supplied liquidity in their currencies.

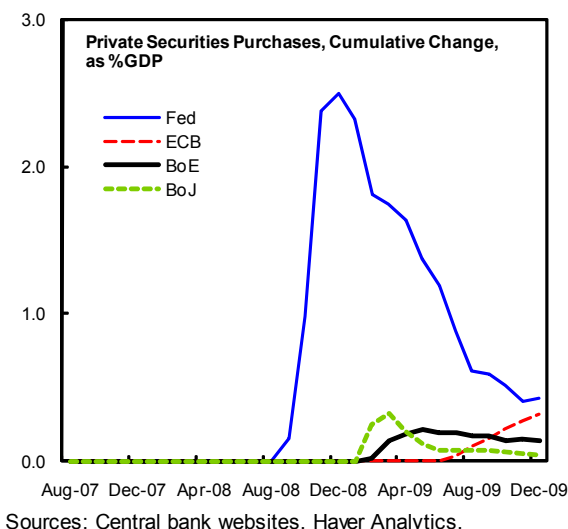


Sources: Haver Analytics, Central bank websites

13. **As tensions in dollar funding markets abated, the amount of dollar provision by foreign central banks has declined** (text chart). As of end-October 2009, only US\$33 billion was provided by central banks utilizing swap agreements with the Fed. The RBA and the Bank of Korea (BoK) have stopped offering dollar providing operations, though explicit announcements of the termination have not been made. Other AE central banks continue offering foreign exchange providing operations, but with a limited frequency and maturity. Currency swap arrangements between Fed and other central banks are scheduled to expire on February 1, 2010.

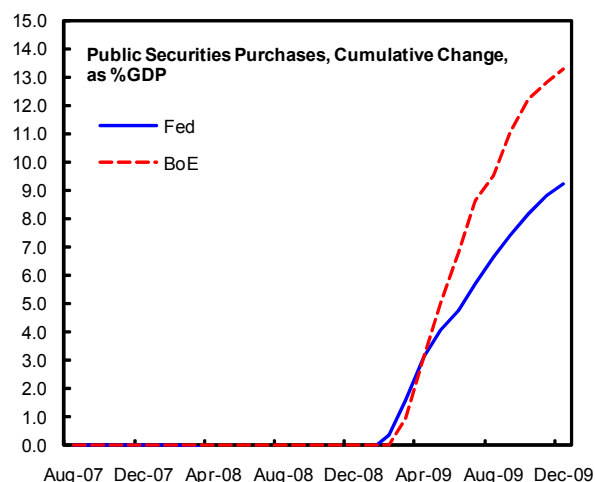
*Only a few central banks purchased private securities; these holdings are now small*

14. **The Fed, ECB, BoE and BoJ introduced facilities for the direct and indirect purchase of private securities mainly to shore up stressed credit markets** (text chart). Among them, only the Fed purchased a large amount, mostly via the Commercial Paper Funding Facility (CPFF). The outstanding amount of private securities has decreased to a relatively low level for all these central banks. The BoJ terminated its facility to purchase commercial paper and corporate bonds at end-December 2009 and the Fed recently reaffirmed the scheduled expiration date for the CPFF.



*Holdings of public securities are large and still growing for a few central banks*

15. **The Fed and BoE started purchases of targeted amounts of public sector securities after their policy interest rates hit the lower bound** (text chart). These purchases were intended to lower long-term interest rates, primarily for the purchased securities, but also were aimed at improving overall credit conditions. Purchases by the Fed of mortgage-backed securities guaranteed by government sponsored agencies are also counted here as public sector securities, even though they are formally claims of the Fed on the private sector. The BoE also emphasized the effects of the increased bank reserves that mirror the purchases of government securities.



16. **The amount of purchases by the Fed and the BoE are sizable.** In some cases, they account for significant shares of the outstanding securities, and they make up a large share of those central banks' balance sheets (Figure 1 and Table 2). The Fed continues to purchase agency-guaranteed mortgage-backed securities and agency debt. The BoE recently expanded the targeted size of asset purchases by GBP 25 billion to GBP 200 billion.

**Table 2. Asset Purchases by Central Banks and Market Size**  
(Billions of national currency otherwise noted)

	Target / maximum amount	Expiration date	Amount purchased by central banks (C) 3/	Amount outstanding (at end-2008) (A) 4/	Total issuance (during 2008) (B)	(C)/(A) (in percent)	(C)/(B) (in percent)
<b>United States</b>							
Commercial Paper Funding Facility		Feb 1, 2010	350	1,659	-	21.1	-
Term ABS Loan Facility	200	Mar 31, 2010 2/	48	1,506	N.A.	3.2	N.A.
Purchase of Agency MBS	1250	Mar 31, 2010	910	5,075	1,299	17.9	70.0
Purchase of US Treasury	300	Oct 30, 2009	300	3,913	1,037	7.7	28.9
<b>United Kingdom</b>							
Asset Purchase Facility (Commercial Papers)1/	50	No date	0	N.A.	N.A.	N.A.	N.A.
Asset Purchase Facility (Corporate Bonds)1/	50	No date	2	N.A.	108	N.A.	1.4
Asset Purchase Facility (Gilts)1/	200	No date	188	479	147	39.3	128.4
<b>Euro Area</b>							
Outright Purchase of Covered Bonds	60	Jun 30, 2010	29	1,667	388	1.7	7.3
<b>Japan</b>							
Outright Purchase of Commercial Paper	3,000	Dec 31, 2009	1,557	19,442	-	8.0	-
Outright Purchase of Corporate Bonds	1,000	Dec 31, 2009	-	54,792	8,843	0.0	0.0

Sources: SIFMA, Bloomberg, Haver Analytics, and central bank websites.

1/The maximum amount of total security holdings by Asset Purchase Facility is GBP 200 billion. Up to GBP 50 billion can be allotted to purchase of private securities.

2/ Expected expiration date for purchases of new-issue CMBS is June 30, 2010.

3/ Figures for end-December 2009 except for commercial papers. Figures for commercial papers are the peak amount.

4/ The figure for Term ABS Loan Facility is the sum of consumer ABS and CMBS.

***Balance sheet policies likely helped stabilize conditions but they also have costs***

17. **Balance sheet policies seemed to have helped improve confidence although their effectiveness is hard to measure.** The necessarily tentative and preliminary empirical literature on the effectiveness of balance sheet measures for advanced economies has yielded mixed results. Aït-Sahalia and others (2009) concluded that the liquidity provision measures of the Fed did not reduce Libor-OIS spreads for the financial system as a whole. Artuç and Demiralp (2009) found that the easing of liquidity conditions by the Fed via the Primary Credit Facility did improve money market conditions. Klyuev and others (2009) suggest that the measures reduced tail risks. The central bank foreign exchange swaps seem to have been viewed as a positive signal about the credibility of the liquidity receiving country (Obstfeld and others, 2009; Stone and others, 2009).

18. **Balance sheet policies also have costs and risks:**

- *Central banks may face pressure in the future to maintain the expanded policy role that they took on during the crisis.* During the 1970s and 1980s, central banks, in particular those of EMEs, undertook a variety of quasi-fiscal roles, including implementing direct credit policies (Fry, 1993 and Mackenzie and Stella, 1996). These roles were seen as compromising central bank independence and monetary policy objectives.
- *Balance sheet policies also pose financial risks to central bank balance sheets.* These risks, once materialized, may require budgetary support. If the losses are large enough to threaten the financial soundness of central banks, their policy independence could be compromised.
- *Balance sheet policies could distort the relative prices of credit instruments.* Under ordinary circumstances, central banks strive to ensure that their operations do not favor specific markets or institutions. Targeted treatment of specific market instruments could create an unlevel playing field and cause resource misallocation. The costs of these effects may be outweighed by the crisis-mitigating benefits in a time of market stress, but as markets recover the balance will tilt the other way.
- *Large-scale systemic liquidity provision could crowd out money markets with adverse long-term consequences.* Excess bank reserves and easy access to central bank liquidity leave institutions with little incentive to turn to funding markets. The supplanting of money markets by the central bank can, over time, shrink the infrastructure needed to support these markets, as well as lead banks to cut back on their own market-based liquidity management, as was the case in Japan. Once markets do recover, the fixed costs of rebuilding these capabilities would have to be repaid.

### III. SELECTED EXITING ISSUES FOR ADVANCED ECONOMY CENTRAL BANKS

19. **Exiting from the crisis measures poses some novel technical challenges.**<sup>9</sup> Some systemic liquidity and foreign exchange liquidity easing measures are naturally waning as demand for such policies diminishes, but others, particularly those of purchases of long-run securities, will require decisions on whether, when, and how to unwind them.

*Some operational changes made during the crisis may be worth retaining*

20. **Before developing an exit strategy, central banks need to consider what to exit to.** Once financial and economic conditions recover, there seems to be no reason why central banks should not return to the pre-crisis operational framework based on a target for a single short-term interest rate.

21. **Several operational changes implemented during the crisis may warrant retention, because these would facilitate the availability of liquidity in different circumstances:**

- *Measures to reduce “market stigma”*—During the crisis, some central banks found that standing lending facilities were not tapped due to market stigma, i.e., a bank being unwilling to borrow from the central bank because it feared that this would send a signal to the markets that it was uncreditworthy (Chailloux and others, 2008). Thus, several central banks took actions to reduce “market stigma.” The BoE did not disclose daily use of standing facilities. The Fed introduced auction-based lending operations with undisclosed borrowing for those counterparties with access to its standing lending facility. Modifications along these lines could facilitate monetary policy implementation in a time of stress.
- *Expansion of high-quality collateral*—New liquidity regulations will require financial institutions to hold higher levels of liquidity and possibly compel them to manage liquidity more actively. Broadening the eligibility of collateral for central bank liquidity provision, particularly high-quality collateral, would facilitate liquidity management under the new regulatory regime, especially if markets are less active than before the crisis. This does not suggest, however, that the easing in collateral frameworks during the crisis period should be retained.
- *Expansion of counterparties of OMO*—Pre-crisis, many central banks conducted open market operations with fewer counterparties than standing facilities. As market transactions among counterparties stopped during the crisis, these central banks started conducting open market operations with a wider range of counterparties. Maintaining a

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<sup>9</sup> The broad policy context for exiting from monetary crisis measures is discussed in “Unwinding Crisis Intervention Measures.”



larger number of eligible counterparties, with due consideration of administrative costs, may increase efficiency in money market transactions, especially during times of stress.

***Absorbing excess bank reserves should not pose major challenges***

22. **AE central banks can be expected to absorb excess reserves when money and financial market conditions have normalized.** Excess reserves are unlikely to pose an immediate threat to price stability and therefore there is little reason to absorb them for policy purposes in the short run.<sup>10</sup> Nevertheless, maintaining a high level of excess reserves on a large scale can over time lead to a loss of market infrastructure, as noted earlier. Accordingly, once financial stability is attained, excess reserves should be absorbed. The timing of liquidity absorption measures should be carefully judged and based on a wide range of indicators.

23. **Central banks have an array of options available to absorb reserves.** Some liquidity facilities are unwinding on their own as instruments mature. Central banks can also tighten the parameters of existing facilities, by, for example, shortening the maturity of central bank liquidity provision, or reducing the frequency of liquidity providing operations.

24. **Absorbing excess reserves injected by large-scale purchases of long-term securities may require a different set of operational tools.** Selling a large amount of long-term securities into the secondary market could disrupt the market. In these circumstances, central banks could issue reverse repos, issue their own securities, or accept term deposits, all of which have their pros and cons. Absorption of liquidity by reverse repos is subject to the size and depth of the repo market. Central bank securities are less liquid than government and private sector securities and compete with them. Central bank term deposits are also relatively illiquid and might not be allowed for non-bank counterparties to the central bank. Central banks should be able to ensure the stability of short-term market interest rates around a new higher policy rate by raising reserve remuneration at the same time. However, this approach should be only transitional, since excess reserves on the central bank balance sheet would continue to crowd out short-term money markets.<sup>11</sup>

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<sup>10</sup> Excess reserves could be a concern when central banks' main operational target was the quantity of money. Today, interest rates are the main operational tool, and as long as central banks can control interest rates consistent with their policy objectives, excess reserves in and of themselves should not pose an immediate threat to price stability. Further, money multipliers have dropped sharply since the crisis began.

<sup>11</sup> Raising reserve requirements is another possible option; however, such direct measures are no longer used by AEs because they lead to disintermediation of bank finance. Moreover, for some central banks the use of reserve ratios for policy purposes would require changes to the legal framework.

### *The management and selling of long-term securities*

25. **Central banks holding large amounts of long-term securities will need to decide how to manage and possibly sell them.** Treatment of these securities is challenging because they involve a number of conflicting objectives and institutional coordination issues.

26. **Approaching treatment of the securities from the angle of balance sheet management can provide a helpful perspective.** Central banks usually take the following into account when managing their balance sheets:<sup>12</sup>

- *Policy objectives*—Balance sheet management must follow from the central bank’s policy objectives of price stability, financial stability, and maintaining payment systems.
- *Risk management*—Risks of financial losses should be properly controlled to maintain financial soundness of the central bank.
- *Transparency*—Appropriate disclosure of financial positions and risk assessment enhances the credibility of central bank governance.<sup>13</sup>

27. **Private security holdings pose potential policy conflicts and balance sheet risks for central banks.** The support of specific credit markets is not a standard central bank objective but, rather, is of a quasi-fiscal nature. Indeed, central banks strive to not affect credit allocation among market segments as well as individual private debtors. Private security holdings also pose credit and prepayment risks. Therefore, these securities should be shifted to the government’s balance sheet and dealt with transparently. The timing of sales, should of course take account of market conditions. If the central bank dominates the market, sales could be disruptive. Market indicators to guide the selling strategy include price, volatility, and turnover.<sup>14</sup>

28. **More broadly, the risks of these securities should be assumed by the government.** Several central banks introduced loss-sharing rules with governments when taking credit risks. The U.S. Treasury will take up the first US\$20 billion in losses incurred by the Fed’s Term Asset Backed Security Loan Facility and the Troubled Asset Relief Program. The BoE will be

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<sup>12</sup> BIS (2009) documents the practices of central banks and discusses principles; there is no standard or code on central bank balance sheet management. Many central banks do actively manage foreign reserves (this is addressed in the *Guidelines for Foreign Exchange Reserve Management*, <http://www.imf.org/external/np/mae/ferm/eng/index.htm#1>) and in some cases their own domestic portfolio, often using a close portfolio management, risk/return approach.

<sup>13</sup> Transparency of financial reporting is addressed explicitly in the *Code of Good Practices on Transparency in Monetary and Financial Policies* (<http://www.imf.org/external/np/mae/mft/index.htm>).

<sup>14</sup> See the companion background paper “The Role of Indicators in Guiding the Exit from Monetary and Financial Crisis Intervention Measures.”

indemnified by the government from “any losses arising out of or in connection with” the Asset Purchase Facility which was used to purchase gilts, corporate bonds and commercial paper.

29. **From a policy perspective, central banks will need to exercise careful judgment when considering selling public securities.** Large-scale sales of these securities could raise the government bond yield curve and possibly widen private security spreads and increase household and business financing costs. A wide array of market, sectoral, and economic information would need to be taken into account. The potential for sales to disrupt markets could be minimized by selling holdings on a regular pre-announced basis. These securities expose central banks to interest rate risk, which could impact the financial position of the central bank.<sup>15</sup>

#### IV. CRISIS INTERVENTION MEASURES OF EMERGING MARKET ECONOMY CENTRAL BANKS<sup>16</sup>

30. **EME central bank crisis measures differed from those of AEs in timing, type, and magnitude** (Table 3). They started taking intervention measures at a much later stage and, overall, they eased monetary policy conditions less than did AE central banks. EME central banks focused largely on foreign exchange liquidity measures, as well as using both interest rates and direct instruments (e.g., adjustments in a reserve requirement framework) to ease conditions.

31. **The varied crisis response measures of EME and AE central banks reflected different financial systems and the response to the global crisis.** First, EME domestic financial sectors generally experienced less stress compared to those of AE countries. Second, EMEs, along with some AEs, faced acute shortages of foreign liquidity, mainly in U.S. dollars. Third, some EME central banks utilize direct instruments as a matter of course, and they relied on these during the crisis much more than did AE central banks.

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<sup>15</sup> The impact on capital depends on the accounting principle adhered to by the central bank. The Fed and BoJ value long-term securities on a cost basis. Gilts acquired by the BoE through normal market operations, are evaluated at fair value. See Stella (2008) for a discussion of central bank losses, capital and policy effectiveness.

<sup>16</sup> This section draws on Ishi and others (2009).

**Table 3. Emerging Market Economy G-20 Central Banks: Crisis Measures and Current Status of Exit**

(As of end-December, 2009)

	Policy rate			Number of Policy Measures (latest/maximum)							Bank Reserves (latest/maximum, % of GDP) 3/
	Latest peak (last date)	Latest bottom (last date)	Last policy rate change (date)	Systemic Liquidity Easing Measures	Purchases of Private Securities	Purchases of Public Securities 2/	FX liquidity easing	(FX swap arrangements)	Emergency Liquidity Assistance		
Argentina 4/	13.0 (Oct.6, 07)	10.25 (Mar. 08)	11.5 (Oct. 21, 09)	5/6	-	1/1	2/2	1/1	-	-0.1/0.5	
Brazil	13.75 (Jan.20, 09)	8.75 (Current)	8.75 Jul. 21, 2009)	1/1	-	-	2/2	1/1	-	-1.2/1.0	
China	4.68 (Nov. 26, 08)	3.33 (Current)	3.33 (Dec.22, 08)	0/1	-	-	-	-	-	12.4/13.4	
India	9.0 (Oct. 20, 08)	4.75 (Current)	4.75 (Apr. 21, 09)	3/9	-	-	4/5	-	-	0.3/2.0	
Indonesia	9.5 (Dec. 9, 08)	6.5 (Current)	6.5 (Aug. 5, 09)	8/9	-	-	4/4	2/2	-	-0.8/0.9	
Mexico 4/	8.25 (Jan. 15, 09)	4.50 (Current)	4.50 (Jul. 17, 09)	1/1	-	0/1	2/2	1/1	-	0.2/0.6	
Russia	13.0 (Apr. 23, 09)	8.75 (Current)	8.75 (Dec. 28, 09)	4/5	-	-	0/1	-	-	-0.1/2.0	
Saudi Arabia	5.5 (2008/4Q)	2.00 (Current)	2.00 (2009/1Q)	3/3	-	-	0/1	-	-	1.5/2.5	
South Africa	12.0 (Dec. 10, 08)	7.0 (Current)	7.0 (Aug. 13, 09)	-	-	-	-	-	-	1.7/1.8	
Turkey	16.75 (Nov. 19, 08)	6.50 (Current)	6.50 (Nov. 19, 09)	2/2	-	-	6/8	-	-	0.6/0.7	

Sources: Central bank websites; IMF International Financial Statistics; Bloomberg; and Haver Analytics.

1/ Bank reserves are those at the latest available.

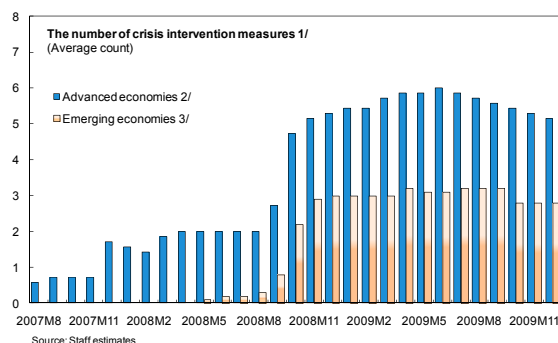
2/ Purchases conducted solely for liquidity provision purposes are included in liquidity easing measures.

3/ A shaded item indicates that required reserve ratios were reduced. An underline indicates that required reserve ratios are raised from their latest bottom.

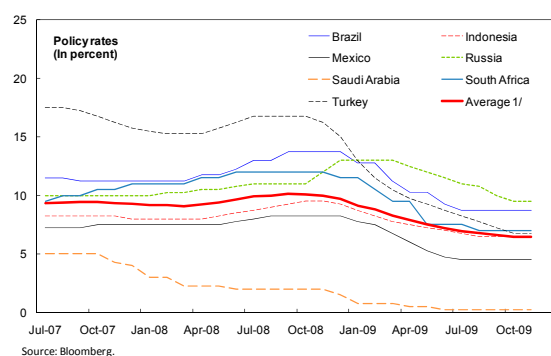
4/ Purchases of public securities for Argentina and Mexico are interest swap operations.

***Emerging market economies' central banks implemented crisis measures generally later than advanced economies central banks***

32. **EME central banks began crisis intervention measures only after September 2008 in response to the sudden tightening of global liquidity conditions.** Indeed, previously, EMEs were grappling with capital inflows and inflationary pressures.<sup>17</sup> Initially, EME central banks' focused on providing foreign currency liquidity as local foreign exchange markets dried up, exchange rates came under pressure, and net capital inflows began to reverse. Non-financial institutions not only had trouble obtaining dollars to make debt payments but were also virtually cut off from trade and working capital financing. Some EMEs also introduced domestic easing measures, but at somewhat later stages. Policy rate reductions began only in late 2008, as inflation risks diminished and economic growth began to slow (text chart).



1/ The crisis intervention measures are defined in Section II.  
2/ Australia, Canada, Euro area, Japan, Korea, U.S., and U.S.  
3/ Argentina, Brazil, China, India, Indonesia, Mexico, Russia, Saudi Arabia, South Africa, and Turkey.



1/ The average of Argentina, Brazil, China, India, Indonesia, Mexico, Russia, Saudi Arabia, South Africa, and Turkey.

***Emerging market economies' central banks provided both foreign and domestic liquidity***

33. **EME central banks eased the terms of existing foreign exchange liquidity facilities and introduced new facilities.** They extended maturities of foreign exchange swaps or introduced new facilities providing foreign exchange repos, loans, or swaps. Counterparties were widened to include nonbank financial institutions and key non-financial institutions. Many EME central banks opened foreign exchange selling auctions and relaxed foreign exchange liquidity or borrowing limits. Furthermore, some central banks lowered the required reserve ratio for bank foreign currency liabilities.

34. **To support those foreign liquidity operations, a number of central banks entered into currency swap arrangements with reserve currency central banks.** The Fed established dollar swap arrangements with four EME central banks, while the European Central Bank and

<sup>17</sup> See Habermeier and others (2009).

the Swiss National Bank each provided euro liquidity to Hungary and Poland. These arrangements facilitated the implementation of foreign exchange easing measures in emerging economies, as the liquidity receiving central banks distributed the foreign exchange to local counterparties in need.

35. **Many EME central banks also implemented domestic liquidity easing measures.** These included cuts in reserve requirement and the expansion of eligible reserve assets. Some central banks also widened the list of eligible collateral for monetary operations, broadened counterparties, and extended the maturity of liquidity providing operations.

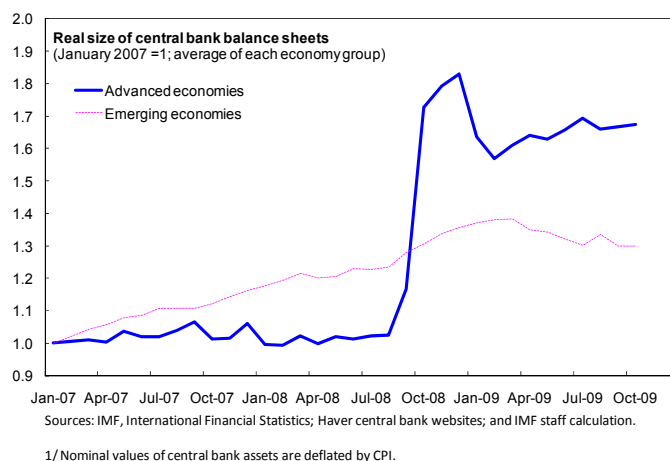
36. **Some EME central banks acted indirectly to alleviate credit strains.** In a few cases, central banks guided banks to use the liquidity freed by lower reserve requirements for lending to the private sector. Several introduced a special refinancing facility to support bank lending to particular economic sectors.

*Emerging market economies' crisis measures were of a smaller order of magnitude compared to those of advanced economies*

37. **EME central banks reduced policy interest rates but to well above the lower bound in most cases.** Countries with exchange rates fixed to the U.S. dollar generally reduced interest rates to lower levels than other countries.

38. **Balance sheet policies appear to have been used less in many EMEs.** An exception is the Bank of Israel, which purchased long-term public securities for a relatively brief period (March to August 2009). The limited use of balance sheet measures by EME central banks can be attributed to: (i) policy rates not reaching the lower bound; (ii) capital markets playing a less critical role in monetary transmission compared to the banking sector; and (iii) in some economies (e.g., Brazil and Mexico) quasi-fiscal activities undertaken by state-owned banks, rather than by the central bank.

39. **Thus, central bank balance sheets in EMEs have not increased by as much as those of AE central banks (text chart).** The expansion of AE central bank balance sheets was generally driven by both increases in reserve money from balance sheet measures and central bank foreign exchange swaps. EME central bank balance sheets have increased by much less owing to the near absence of public



and private security purchases, and the rundown in international reserves in some cases.<sup>18</sup>

***Emerging market economies' central banks face fewer challenges in exiting from their crisis measures compared to advanced economies' central banks***

40. **Exiting from crisis interventions in EMEs appear to be technically less demanding.** Most EME central banks have implemented a more limited set of measures without reducing the policy rates to the zero bound and sharply expanding their balance sheets. For example, foreign exchange liquidity easing measures have naturally unwound as capital inflows increase, and use of domestic liquidity easing measures has diminished as market conditions improved. Most EME central banks have unwound large portions of crisis intervention measures (Table 3).

41. **Some EME central banks are already beginning to tighten monetary policy.** With the domestic economy gaining strength, the Reserve Bank of India and Bank Indonesia have taken steps to unwind domestic liquidity easing measures, such as hikes in statutory liquidity or reserve requirement ratios. In January 2010, the People's Bank of China took steps to guide market rates upward, together with an increase in required reserve ratios for the first time since September 2008.

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<sup>18</sup> This said, in some other cases (e.g., China), the size of the central bank balance sheet continues to gradually rise owing to an increase in foreign assets.

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## APPENDIX I. DESCRIPTION OF BALANCE SHEET DATA

40. **The detailed components of balance sheet policy measures are as described below.** All the data are from central bank websites.

### **Federal Reserve System**

- *Systemic liquidity easing* consist of repurchase agreements, term auction credit, discount window lending (including Primary Dealer Credit Facility or PDCF), and central bank liquidity swap.
- *Purchases of private securities* consist of term ABS loan facility (TALF), net portfolio holdings of Commercial Paper Funding Facility (CPFF), and Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF).
- *Purchases of public sector securities* consist of U.S. Treasury securities, Federal agency debt securities, and Mortgage-backed securities.

### **European Central Bank**

- *Systemic liquidity easing* consist of longer-term refinancing operations (LTRO), main refinancing operations (MRO), fine-tuning reverse operations, and discount window lending.
- *Purchases of private securities* are holdings of covered bonds for monetary policy purposes.
- The amount outstanding of *foreign liquidity easing* operations is computed from results of foreign currency (U.S. dollar and Swiss Franc) providing operations.

### **Bank of England**

- *Systemic liquidity easing* consists of short-term open market operations, longer-term sterling reverse repo, and Standing facility assets.
- *Purchases of private securities* consist of holdings of corporate bonds and commercial papers by Asset Purchase Facility (APF).
- Purchases of public sector securities are holdings of Gilts by APF.
- The amount outstanding of *foreign liquidity easing* operations is computed from results of U.S. dollar providing operations.

**Bank of Japan**

- *Systemic liquidity easing* consists of repurchase operations, loans and discounts, and holdings of government securities.
- *Purchases of private securities* consist of holdings of corporate bonds and commercial papers; the latter excludes those with repurchase agreements.
- The amount outstanding of *foreign liquidity easing operations* are estimated from changes in “other deposits” which include deposits the BoJ accepts from the Fed when the BoJ draws down the currency swap against the Fed.

**Other advanced economies’ central banks**

- *Systemic liquidity easing* of the BoC, BoK, and RBA consist of repurchase operations and discount window lending.
- The amount outstanding of *foreign liquidity easing operations* of the RBA and BoK are estimated from changes in “deposits of overseas institutions” (RBA) and “non-residents deposits” (BoK), which includes deposits each bank accepts from the Fed when the BoK draws down the currency swap against the Fed.