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CENTRAL BANK BALANCE SHEETS AMIDST RECENT GLOBAL CRISIS: ISSUES IN FUTURE MONETARY MANAGEMENT

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CENTRAL BANK BALANCE SHEETS AMIDST RECENT GLOBAL CRISIS: ISSUES IN FUTURE MONETARY MANAGEMENT

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With intense market stress impeding the normal transmission mechanism, and pushed to a situation of 'interest rate conundrum', central banks in several countries responded aggressively by using their balance sheets in many unconventional ways to extinguish the bonfire of global crisis. As an upshot, central banks' balance sheets witnessed unprecedented expansion, besides significant change in the composition, posing several challenges and risks for future monetary management. In this milieu, it is imperative that central banks develop a credible and coherent exit strategy to roll back crisis time interventions, while providing signals to markets on achieving medium-term policy goals amidst forestalling the risk of a premature withdrawal. In the Indian context, with the RBI unleashing ample rupee and forex liquidity, normalcy and orderly conditions were restored in the markets, without compromising either on the asset quality of its balance sheet or on the eligible counterparties. Unlike other countries, RBI's balance sheet did not witness any unusual expansion, since two important measures of liquidity injection, viz., reduction in CRR and unwinding of MSS, actually led to contraction in the balance sheet, while the policy induced change in the money multiplier through the CRR allowed desired quantitative expansion in the broad money.

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(I) Prologue

1. The movements in central bank balance sheets received an unprecedented focus in the analysis of policy response of central banks to the global crisis. As the nominal policy rates tended to hit the “zero lower bound” in advanced economies and transmission mechanism weakened significantly due to severe market stress, reliance on quantitative easing, through both conventional and unconventional measures increased considerably. This was manifested in large expansion in the balance sheets of central banks, with significant compositional shifts on both asset and liability sides.

2. As the crisis began to unfold, the authorities- national Governments and central banks, particularly in the advanced countries recognised at an early stage that they needed to respond swiftly and act aggressively. The central banks embarked upon an unprecedented wave of both conventional and unconventional policy responses to make available ample liquidity at lower cost and thereby help in shoring up the confidence in the financial system and arresting the economic slowdown that followed. Policy responses, which began initially in terms of conventional monetary easing, turned out to be more innovative overtime.

3. Notwithstanding the swift and sizeable easing of policy rates, the limitations of interest rate as a policy instrument soon came to surface in many countries, with transmission mechanism getting significantly hampered. With policy rates in many countries tending to touch historically low levels, the zero lower bound emerged as a binding constraint, making it impossible to depend only on conventional policy measures. To contain the crisis of confidence and ease the financial conditions, central banks ventured aggressively by using their balance sheets in unconventional ways. As a corollary, the dramatic expansion in balance sheets of central banks became a key manifestation of the response of central banks to the financial crisis.

4. Although the forceful and coordinated policy actions were successful in extinguishing the initial damages and averting a global financial collapse, the

unconventional measures entail several challenges and risks in terms of management of assets and liabilities in the balance sheets of central banks, highlighting the importance of designing an appropriate exit policy. In this context, this paper endeavors to examine the impact of policy actions taken during the crisis on the balance sheets of central banks, besides outlining the future challenges and lessons in the management of assets and liabilities in the balance sheets of central banks during the course of exit.

5. Against this backdrop, Section II presents the key policy actions and developments in the central bank balance sheets in respect of major advanced countries, which were in the forefront of the battle against the global crisis and examines their impact and future implications for their balance sheets. Section III sets out the key policy actions of the central banks in emerging market economies (EMEs) and explores the impact, if any, on their balance sheets. The likely challenges in the management of assets and liabilities of central banks and the exit policy options from the unprecedented accommodative policy are discussed in Section IV. Section V outlines in brief, the Indian context, narrating particularly as to how it was different from the trends in central banks of advanced countries. The last Section sets out the concluding remarks.

SECTION-II

Advanced Economy Central Banks:

Policy Interventions and their Impact on Balance Sheets

(1) Balance Sheet as a Tool of Monetary Policy: Few Stylised Facts from the Literature

6. In theoretical literature, unconventional monetary policy is said to be implemented by combining the two elements of the central bank balance sheet, *viz.*, size and composition. The size corresponds to expanding balance sheet, while keeping its composition unchanged (narrowly defined as quantitative easing). The composition pertains to changing the composition of balance sheet,

while keeping its size unchanged by replacing conventional assets with unconventional assets (narrowly defined as credit easing) (Shiratsuka, 2009).

7. Bernanke (2009a) first called the Federal Reserve's (Fed) approach to supporting credit market as credit easing. In the literature, the unconventional monetary policy is referred to in the context of providing an empirical evidence on monetary policy strategies, when short-term interest rates are very low or even zero (Bernanke and Reinhart, 2004). Bernanke and Reinhart examined the effects of changing the composition and size of the central bank balance sheet, in addition to altering market expectations about the future course of short-term interest rates. They focused primarily on the portfolio rebalancing effect stemming from the changes in the composition and size of the central bank balance sheet. By shifting the composition of asset holdings from shorter to longer-dated government securities, a central bank may influence term premiums and an overall yield curve, if investors treat them as imperfect substitutes. Similarly, by increasing the monetary base, a central bank may also influence prices and yields of non-money assets, if the monetary base is an imperfect substitute for other financial assets (Shiratsuka, 2009).

8. In a financial and economic crisis, both sides of the central bank balance sheet play an important role in countering the adverse effects stemming from the financial system. The asset side works as a substitute for private financial intermediation, for instance, through the outright purchase of credit products. The liability side, especially expanded excess reserves, functions as a buffer for funding liquidity risk in the money markets. In addition, the two sides interact closely, since malfunctions in financial intermediation are closely tied to funding liquidity risk at financial institutions, resulting in the increased demand for excess reserves.

9. In practice, given the constraints on policy implementation, central banks combined the two elements of their balance sheet, *i.e.*, size and composition, to enhance the overall effects of unconventional policy measures during the recent

crisis. In that respect, quantitative easing, often used in a vague manner, better fits as a package of unconventional policy measures making use of both the asset and liability sides of the central bank balance sheet, designed to absorb the shocks to the economy.

(2) Central Bank Policy Interventions

10. As the crisis in global financial markets deepened in mid-September 2008, triggered by the collapse of Lehman Brothers, the pressure on financial markets mounted, the credit spreads widened to record levels and equity prices crashed to historic lows, leading to widespread volatility across markets. The turmoil transcended from credit and money markets to the global financial system more broadly. Amidst the deteriorating global financial environment, monetary authorities in the industrial world were the first to act with aggressive monetary easing, so much so that policy rates reached to record lows. On October 8, 2008, six major central banks undertook the first ever round of coordinated action in policy rate cuts. A similar swift action was followed from other central banks subsequently (Table 1). As could be seen, the interest rate option was used to the maximum possible extent during September 2008 to March 2009.

Country/ Region	Key Policy Rate	Policy Rate (As on July 9, 2009)		Change in Policy Rates (Basis points)	
				Sept 2008 - March 2009	Since end- March 2009
1	2	3		4	5
Australia	Cash Rate	3.00	(Apr. 8, 2009)	(-) 400	0
Canada	Overnight Rate	0.25	(Apr. 21, 2009)	(-) 250	(-) 25
Euro area	Interest Rate on Main Refinancing Operations	1.00	(May 13, 2009)	(-) 275	(-) 50
Japan	Uncollateralised Overnight Call Rate	0.10	(Dec.19, 2008)	(-) 40	0
UK	Official Bank Rate	0.50	(Mar. 5, 2009)	(-) 450	0
US	Federal Funds Rate	0.00 to 0.25	(Dec.16, 2008)	(-) 200	0

Source: International Monetary Fund, websites of respective central banks and The Economist.

Why Balance Sheet Emerged as a Tool of Monetary Policy in the Recent Crisis?

11. Although central banks responded aggressively by the swift and sizeable easing in policy rates, given the exceptional nature of the crisis, the conventional wisdom about interest rate as an all weather effective policy instrument in a market economy received a setback. With persisting strains in the financial markets and the rise in credit and liquidity risk premia, the transmission mechanism was greatly hampered. Illustratively, despite sharp declines in policy rates, yields on corporate bonds hardened. Though banks generally passed on the reductions in their funding costs to their customers, they tightened credit standards substantially, offsetting the impact of rate cuts on overall financial conditions. With policy rates in many countries reaching historically low levels, the zero lower bound became a real constraint, rendering it hard to follow conventional policy options.

12. With conventional monetary policy having reached its limit, any further policy stimulus required a different set of tools (Bernanke, 2009). Amidst the complex and challenging environment, central banks were forced to look beyond the interest rate channel and explore all possible ways- both conventional and unconventional- to restore the functioning of credit markets and ease the financial conditions. This is how balance sheet emerged as the main instrument and in turn, became the key manifestation of central banks' response to the global crisis. In fact, the degree of balance sheet expansion served as a barometer of financial market distress (Sheard, 2009).

Forceful Liquidity Easing

13. Several liquidity easing measures were initiated, basically focusing on reducing term interbank market spreads, seen as an indicator of tensions in the key market segment. This was circumvented in two ways. First, by directly providing more term funding, so as to offset some of the shortfall in market supply. Second, by indirectly addressing impediments to the smooth distribution of reserves in the system and ensuring access to funding from the central bank (Table 2).

Table 2: Select Central Banks Policy Actions

Category	Objective	No.	Measure adopted	FED	ECB	BoE	BoJ	BoC	RBA	SNB
1	2	3	4	5	6	7	8	9	10	11
I	Achieve the official stance of Monetary Policy	A.	Exceptional fine-tuning operations	√	√ ¹	√	√	√	√	√
		B.	Change in reserve requirements		√ ²					
		C.	Narrower corridor on overnight rate	√ ³	√	√				
		D.	Payment of interest on reserves	√			√ ⁴			
		E.	Increased treasury deposit	√				√		
		F.	Short-term deposit or central bank bill			√	√	√		√
II	Influence wholesale inter-bank market conditions	A.	Modification of discount window facility.	√ ⁵		√				
		B.	Exceptional long-term operations	√	√ ⁶	√	√	√	√	√
		C.	Broadening the range of eligible collaterals	√	√	√	√	√	√	√
		D.	Broadening of eligible counterparties	√		√	√	√	√	
		E.	Inter-central bank FX swap lines	√	√	√	√	√	√	√
		F.	Introducing or easing conditions for securities lending	√		√	√	√		
III	Influence credit market and broader financial conditions	A.	CP funding/purchase/ collateral eligibility	√ ⁷		√ ⁸	√ ⁹	√ ¹⁰	√ ¹¹	
		B.	ABS funding/ purchase/collateral eligibility	√ ¹²	√ ¹³	√ ⁸			√ ¹¹	
		C.	Corporate bond funding/purchase /collateral eligibility			√ ⁸	√ ¹⁴	√ ¹⁰		
		D.	Purchase of public sector securities	√ ¹⁵		√ ⁸	√ ¹⁶			
		E.	Purchase of other non-public sector securities					√ ¹⁷		√ ¹⁸

Note: √: Indicates Yes

Blank Space: No

FED : Federal Reserve; ECB : European Central Bank; BoE : Bank of England; BoJ : Bank of Japan; BoC : Bank of Canada; RBA : Reserve Bank of Australia; SNB: Swiss National Bank.

1: Including front loading of reserves in maintenance period; 2: Expand range over which reserves are remunerated; 3: Lower the discount rate relative to the target Federal Funds Rate; 4: Pay interest on excess reserve balance; 5: Reduce rate and expand term on discount facility: allow participation of primary dealers (Primary Dealer Credit Facility); 6: Including fixed rate full allotment operations; 7: Finance purchase of short-term CD, CP and asset- backed CP (ABCP); 8: Asset purchase facility; 9: Increase frequency and size of CP repo operations & introduce outright CP purchases; 10: Term Purchase & Resale Agreement Facility for private sector instruments; 11: Acceptance of residential mortgage backed securities & ABCP as collateral in repo operations; 12: Finance purchase of asset backed securities, collateralised by student, credit, auto & other guaranteed loans; 13: Purchase of covered bonds; 14: Expand range of corporate debt as eligible collateral & introduce loan facility against corporate debt collateral; 15: Purchase treasury debt as well as direct obligations of and MBS backed by housing related government sponsored enterprises; 16: Purchase of Japanese Government bonds to facilitate smooth money market operations; 17: Purchase equity held by financial institutions; 18: Purchase foreign currency securities.

Source: Adopted from BIS Annual Report, 2008-09.

14. Many advanced country central banks extended conventional liquidity easing measures, such as easing the terms and availability of existing central bank facilities, like standing lending windows. Second, the access to central bank lending was enhanced thereafter by extending the tenor of financing and widening the range of counterparty financial institutions. Third, several central banks introduced or eased conditions for lending out highly liquid securities – typically sovereign bonds – against less liquid market securities in order to improve funding conditions in the money market. Fourth, stipulations on the provision of reserves were eased substantially by expanding the list of eligible collateral and counterparty coverage, and lengthening the maturity of refinancing operations¹. Fifth, several central banks also undertook foreign exchange swaps or loans with other central banks to alleviate severe shortages of foreign exchange.

15. Though these liquidity easing measures were mostly in line with the standard central bank lender-of-last-resort function, their range and magnitude were well above the traditional levels². Shortage of US Dollar led to Federal Reserve using inter-central bank swap lines. With the intensification and spread of US dollar shortages in mid-September, swap lines with the Federal Reserve grew in number, time zone and geographical coverage and size. The use of the swap lines came to be seen as a significant driver of balance sheet expansions for major central banks during this period (BIS, 2008).

1 For instance, in the US, collateral normally available only at the discount window was made available for open market operations. In the UK, additional securities, including some well-rated asset-backed securities and covered bonds were accepted in the three-month repo operation.

2 In some cases, they stepped in to provide direct lending to distressed institutions and took other exceptional measures to improve funding conditions in credit markets. For instance, the Fed lengthened the maturity of its refinancing operations. In addition, an increasing share of the latter was lent to primary dealers against a wide range of less liquid securities to help improve their balance sheets *via* the Fed's Term Securities Lending Facility. Similarly, the BoE allowed banks to swap less liquid securities against more liquid ones under its Special Liquidity Scheme. The BoE, ECB and SNB substituted longer-term open market operations (OMOs) for shorter-term operations. More auctions were also conducted at a fixed rate with full allotment.

Move to Aggressive Credit and Quantitative Easing

16. As the crisis deepened, interest rate channel became ineffective due to policy rates at zero or near-zero level in the advanced countries. The central banks in these countries were, thus, forced to go for quantitative easing. This response was focused directly on alleviating tightening credit conditions in the non-bank sector and easing of broader financial conditions. There were two approaches to this quantitative easing. First, funds were provided to non-banks to improve liquidity and reduce risk spreads in specific markets, such as commercial papers (CPs), asset-backed securities and corporate bonds. Direct purchase of public sector securities was also made to influence benchmark yields more generally. Second, central banks purchased government or government-guaranteed securities from banks or other institutions in order to improve their access to credit and ease liquidity conditions. The quantitative easing involving government securities tended to be more important in bank-centered systems (Japan and the UK). Credit easing with private securities generally played a larger role in market-centered systems (the US) (BIS, 2009).

17. The Federal Reserve focused heavily on non-bank credit markets as well as operations involving private sector securities, such as the Commercial Paper Funding Facility and the Term Asset-Backed Securities Loan Facility. The European Central Bank (ECB) focused on banking system liquidity by conducting fixed rate full-allotment refinancing operations with maturities of up to 12 months and by purchasing covered bonds. In the case of Bank of Japan (BoJ), substantial efforts were directed at improving funding conditions for firms through various measures pertaining to CPs and corporate bonds. In a few cases, central banks directly provided financing to corporate borrowers. Irrespective of the approach adopted, the quantitative easing led to manifold expansion in the balance sheets of central banks.

18. The usage levels of various unconventional central bank market operations could be seen from the Table 3.

Table 3: Major Crisis Interventions of Central Banks

No.	Central Bank Interventions	Maximum Amount	Amount used as at end-June 2009
I	US Federal Reserve (in billion US dollars)		
	1. <i>Short-term liquidity provision</i>		
	TAF	**	282
	CPFF	***	114
	2. <i>Long-term liquidity provision</i>		
	TALF	1,000	25
	3. <i>Outright purchases of assets</i>		
	Agency mortgage backed securities	1,250	462
	Agency debt	200	97
	Treasury securities	300	184
II	Bank of England (in billion pounds)		
	1. <i>Outright purchases of assets</i>		
	Asset Purchase Facility#	175	105
III.	European Central Bank (in billion euros)		
	1. <i>Short-term liquidity provision</i>		
	Long-term refinance operations@	Unlimited	728
	2. <i>Outright purchases of assets</i>		
	Covered bonds	60	0
IV	Bank of Japan (in billions of Yen)		
	1. <i>Short-term liquidity provision</i>		
	SFSOFCF^	Unlimited	7,467
	2. <i>Outright purchases of assets</i>		
	Commercial paper	3,000	197
	Corporate bonds	1,000	174
<p>Note: TAF =Term Auction Facility; CPFF = Commercial Paper Funding Facility; TALF = Term Asset-Backed Securities Loan Facility; SFSOFCF = Special Funds-Supplying Operations to Facilitate Corporate Financing.</p> <p>** : The amount is determined at each auction. ***: There is a limit per issuer.</p> <p>#: Purchasing commercial paper, corporate bonds, and gilts.</p> <p>@: Providing liquidity at a fixed rate, full allotment basis up to one year.</p> <p>^: Providing liquidity against collateral of private credit instruments at a fixed rate, allotment basis up to 3 months.</p> <p>Source: Global Financial Stability Report, October, 2009.</p>			

(3) Impact of Policy Actions on Central Bank Balance Sheets

19. The use of different monetary policy instruments has differing impacts on balance sheets. In the context of central banks using wide array of monetary policy tools during the recent financial crisis, the effect that different instruments can have on the typical balance sheet is presented in Table 4.

Table 4: A Synoptic View of Balance Sheet Movements under Different Monetary Policy Instruments						
Monetary Policy Instrument	Operation	Central Bank Balance Sheet Movements				
		Monetary Base	Bank Reserves	NDA	NFA	
(i) Standing Facilities	Higher loans through refinancing facility	↑	↑	↑	Constant	
	Higher deposits through deposit facility	↓	↓	↓	Constant	
(ii) Open Market Operations	Outright purchase of securities or repos	↑	↑	↑	Constant	
	Outright sales of securities or reverse repos	↓	↓	↓	Constant	
(iii) Open Market-Type Operations	Positive net issuance of central bank or govt. papers	↓	↓	↓	Constant	
	Negative net issuance of central bank or govt. papers	↑	↑	↑	Constant	
(iv) Credit and Deposit Auctions	Auctioning of credit	↑	↑	↑	Constant	
	Auctioning of deposits	↓	↓	↓	Constant	
(v) Foreign Exchange Operations	Purchase of foreign Currency	↑	↑	Constant	↑	
	Foreign exchange swap	↑	↑	Constant	↑	
(vi) Shift of Public Sector Deposits	To the banking system	↑	↑	↑	Constant	
	From the banking system to the central bank	↓	↓	↓	Constant	
(vii) Reserve Requirements	Increase in reserve ratios:					
	Short-term	↑	↑	↑	Constant	
	Medium-term	?	?	?	Constant	
	Reduction in reserve ratios:					
Short-term	↓	↓	↓	Constant		
Medium-term	?	?	?	Constant		

Adopted from Schaechter (2001).

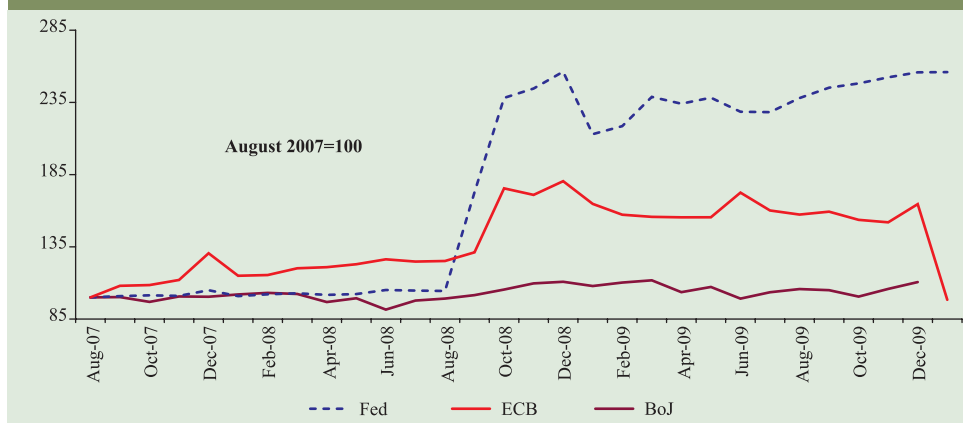
Analytics of Key Developments in the Central Bank Balance Sheets

20. The changes in the balance sheets emerged as the key manifestation of central banks' response to the global financial market turmoil, as central banks used their existing tools in innovative ways, besides introducing new ones, in order to relieve the liquidity shortages and ensure the smooth functioning of the markets. In the aftermath of bankruptcy of Lehman and Brothers in September 2008, as central banks stepped up their intermediation role in money markets and extended crucial support to other credit markets, the size and complexity of their balance sheets increased significantly (ECB, 2009). However, it needs to be noted that making cross-national comparisons of central bank balance sheets is fraught with difficulty as each central bank differs in terms of operational procedures, accounting and disclosure conventions. With this limitation, this paper attempts to analyse the key developments in respect of balance sheets of major central banks, viz., Fed, ECB and BoJ during the recent crisis.

(A) Overall Size of the Balance Sheet

- Until September 2008, the size of the central banks' balance sheets had not changed significantly. Liquidity injections were offset through the sale of central bank assets or downward adjustments to the size of the refinancing operations, in order to ensure that no excess liquidity remained in the banking system (Chart 1).
- As the financial turmoil intensified during the fourth quarter of 2008, the Fed introduced a credit easing programme and the ECB initiated a number of enhanced credit support measures, both of which triggered a significant expansion in their respective balance sheets. Subsequent improvements in money market conditions during the first half of 2009 led to a reduction in the total assets of the ECB and the Fed.
- High demand for the one-year refinancing operation, conducted in June 2009, however, triggered a second round of increase in the size of the ECB's balance sheet.

Chart 1: Central Bank Balance Sheets in Advanced Economies (Assets/Liabilities)



- Due to the high level of outstanding banknotes, the BoJ's balance sheet was relatively already large before the start of the financial market turmoil, with the result that its increase in size was smaller (ECB, 2009).
- Before the onset of financial market turmoil, the balance sheets of three central banks differed in size relative to GDP and banknotes in circulation. The Fed had the smallest balance sheet relative to the size of both GDP and banknotes in circulation, while the ECB and the BoJ had the largest in terms of banknotes in circulation and relative to GDP, respectively (Table 5).

Table 5: Total Assets Relative to GDP and Bank Notes in Circulation

	ECB	Fed	BoJ
<i>Relative to GDP (%)</i>			
Jun-2007	10	6	16
Peak	19	15	23
Peak Reference Date	02-01-2009	17-12-2008	31-03-2009
Aug-2009	16	14	22
<i>Relative to Bank Notes in Circulation (%)</i>			
Jun-2007	144	109	111
Peak	231	266	144
Peak Reference Date	02-01-2009	17-12-2008	31-03-2009
Aug-2009	194	232	139

Adopted from ECB Monthly Bulletin, October, 2009.

- These differences could be explained, at least in part, by various factors, such as different financial market structures, monetary policy implementation frameworks and economic conditions.
- With expansion in central bank assets since October 2008, the Fed's balance sheet became the largest relative to banknotes, even if it remained the smallest in terms of GDP.

Key Drivers of Balance Sheets Expansion

21. The following are the factors that contributed to the expansion of central bank assets.

(B) Impact of Liquidity Injection Operations (Assets Side)

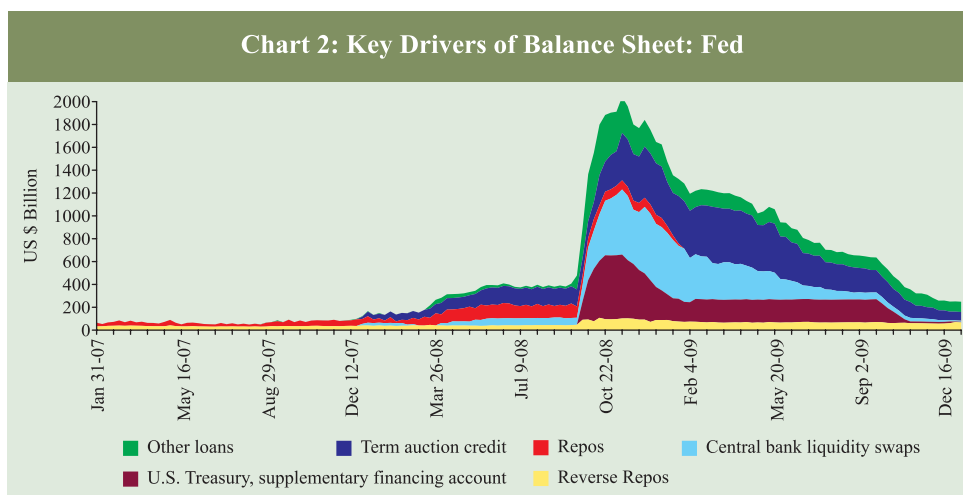
Federal Reserve

22. The size of the Fed's balance sheet had not seen any significant expansion between June 2007 and September 2008, because the excess liquidity provided through the new lending facilities was absorbed through the sale and redemption of Treasury securities, which raised the amount of one category of assets and reduced the amount of another. Since the beginning of the financial market turmoil in August 2007, however, the balance sheet of Fed grew in size and changed in composition. Fed's policy reactions put more emphasis on the asset side of the central bank balance sheet, an approach referred to as credit easing. As a result, the total assets of the Fed increased significantly from \$869 billion on August 8, 2007, to well over \$2 trillion to date. In fact, the Fed's policy assets expanded by approximately 4,000 per cent since 2006 (Stella, 2009). The specific drivers of these balance sheet changes are set out below.

- (i) The Fed launched a one-month term repo programme in early 2008, which resulted in significant expansion in the outstanding amount of repos from an average of US\$ 30 billion during the first half of 2007 to US\$ 130 billion in May 2008. However, with the introduction of lending programmes following the bankruptcy of Lehman Brothers, there was a large increase

in the excess reserve balances, with the result that the Fed discontinued its regular repos in January 2009 (Chart 2).

- (ii) In order to provide term funding, the Fed launched the Term Auction Facility (TAF) in December 2007. As a corollary, the outstanding amount under TAF peaked at almost US\$ 500 billion in March 2009, before reverting back to around US\$ 76 billion as on January 6, 2010.
- (iii) In addition to the regular repos and the TAF, changes in the outright portfolio also affected the size and composition of the Fed's balance sheet during the financial crisis. Initially, in order to compensate for the liquidity injected through the TAF and the other new lending programmes, the Fed sold Treasury securities of around US\$ 300 billion between June 2007 and September 2008.
- (iv) In view of its credit easing policy, however, the Fed began to purchase federal agency debt securities in September 2008 and federal agency mortgage-backed securities in January 2009. This portfolio amounted to US\$ 740 billion in August 2009. Moreover, in April 2009, the Fed resumed its purchases of Treasury securities and, thus, had increased its portfolio by US\$ 270 billion by the end of August 2009.

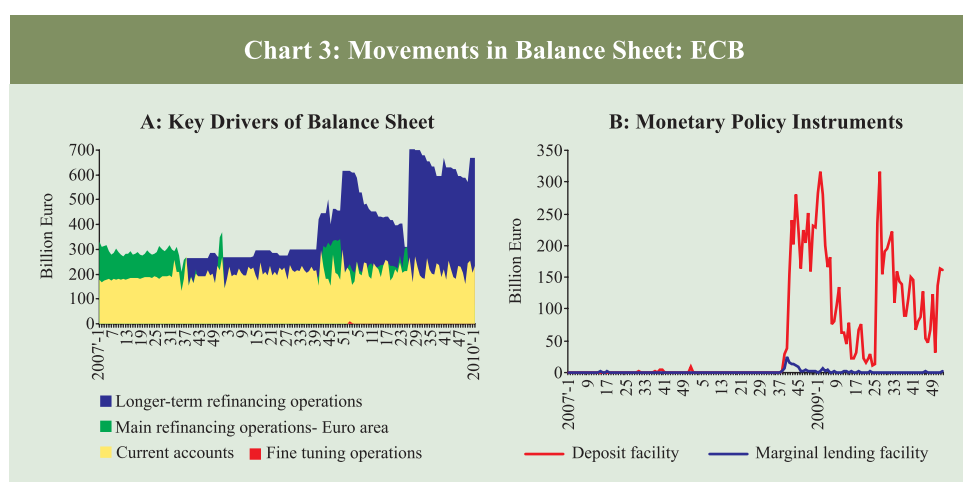


- (v) Another item that contributed to the strong expansion in the Fed's balance sheet was 'other lending'. This includes the discount window, *i.e.*, standing lending facility available to depository institutions. With the Fed reducing the spread between the discount window rate and its target for the federal funds rate (100 to 50 basis points in August 2007 and to 25 basis points in March 2008) and extending the maturity of discount window lending (overnight to 30 days and 90 days, respectively), the use of the discount window increased from an average of US\$ 200 million in June 2007 to almost US\$ 100 billion in October 2008.
- (vi) Besides, the primary dealers (counterparties of the Fed for OMOs) were given access to a similar overnight standing lending facility- the Primary Dealer Credit Facility in March 2008.
- (vii) Furthermore, several credit easing measures introduced (under 'other lending') after September 2008 also contributed to the expansion of Fed's balance sheet. These are (a) Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility to finance credit institutions' purchases of asset-backed commercial paper from money market mutual funds, (b) Commercial Paper Funding Facility (October 2008) to enhance the liquidity in the CP market and Money Market Investor Funding Facility to provide liquidity to money market investors and (c) Term Asset-backed Securities Loan Facility (March 2009) to support the issuance of asset-backed securities collateralised by consumer and small business loans.
- (viii) These new lending programmes, the increased use of the discount window, the funding provided in the context of the merger between Bear Stearns and JPMorgan Chase and the restructuring of AIG increased 'other lending' from US\$ 190 million at the end June 2007 to a peak of US\$ 600 billion at the end of 2008. The improvement in financial market conditions, however, led to a decrease in demand for the new lending facilities to US\$ 220 billion by the end of August 2009 (Stella, 2009 and ECB, 2009).

European Central Bank

23. ECB launched a series of enhanced credit support measures in October 2008, which were supplemented by several additional tools in May 2009. First, the ECB began conducting all refinancing operations at a fixed rate while allotting all bids received from counterparties. Second, this operational change was coupled with enhanced credit support by expanding the already long list of collaterals eligible for OMOs. Third, the number and frequency of long-term refinancing operations (LTROs) with maturities ranging from one to six months were raised. These measures resulted in a significant increase in the size of the ECB's balance sheet, as may be seen below.

- (i) The outstanding amount of LTROs increased from €150 billion in June 2007 to over €600 billion at the end of 2008, almost doubling the total amount of outstanding refinancing, which peaked at €850 billion during the first week of January 2009.
- (ii) The outstanding amount of main refinancing operations (MROs) also increased from an average of €190 billion during the first phase of the financial turmoil to €340 billion at the beginning of December 2008, which however, recorded a decline thereafter (Chart 3A and B).

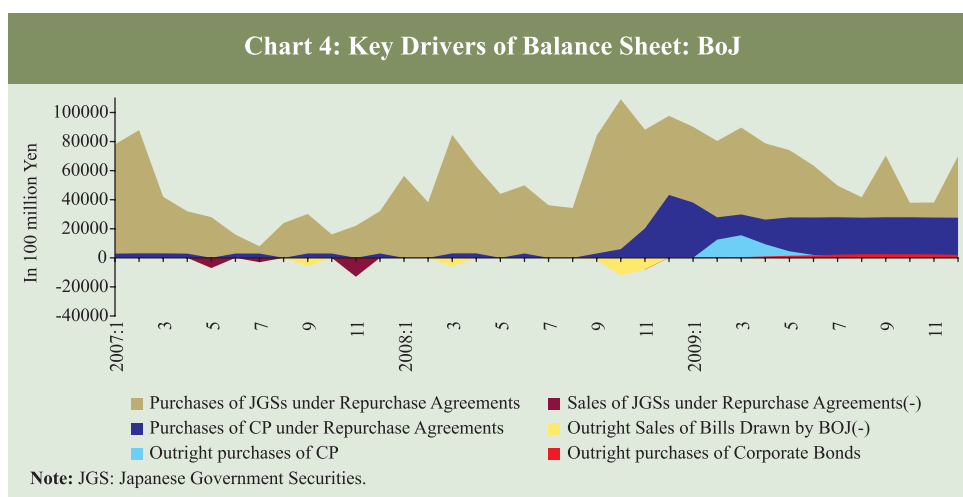


- (iii) With the easing of money market conditions during the first half of 2009, demand for LTROs declined gradually. However, with the carrying out of first one-year LTRO in June 2009, counterparties' interest in the operation increased, resulting yet again in a significant increase in the size of the ECB's balance sheet. The total amount of outstanding refinancing reached €900 billion at the end of June 2009.
- (iv) As a part of credit support programme, ECB introduced outright purchase of covered bonds in July 2009. A portfolio worth €9 billion was purchased during the first two months alone (ECB, 2009).

Bank of Japan

24. BoJ introduced various measures to facilitate corporate financing, including fixed rate full allotment liquidity provisions against eligible corporate debts. It also resumed the purchase of stocks held by financial institutions and introduced a scheme to provide subordinated loans to them (Shiratsuka, 2009). As a result, BoJ also witnessed expansion in the balance sheet and change in its composition, *albeit*, on a lower scale (ECB, 2009).

- (i) First, since June 2007, it increased the level of its repo operations by around JPY 19 trillion (Chart 4).
- (ii) Second, the BoJ's holdings of Japanese government bonds declined in 2007 and 2008, mainly because purchases of Japanese government bonds were lower than those of redemptions.
- (iii) Third, to support credit markets, the BoJ began purchasing CPs in February 2009 and corporate bonds in March 2009, the total amounts of which reached to JPY 100 billion and JPY 250 billion, respectively, in August 2009.



- (iv) Finally, in order to facilitate corporate financing, the BoJ introduced special fund-supplying operations with a fixed rate, for an unlimited amount and backed by corporate debt in January 2009. Due to these operations, the item ‘other lending’ reached JPY 7.5 trillion in March 2009.

(C) Impact of Inter-Central Bank Swap Lines

25. The ECB and several other central banks undertook a joint action with the Federal Reserve allowing access to US dollar liquidity against domestic collateral to their domestic counterparties through swap arrangements. As a result, there was a qualitative change in the composition of the central banks’ balance sheets. The total amount of central bank liquidity swaps of the Fed peaked to US\$ 583 billion, almost a quarter of its total assets, in mid-December 2008. In the same month, almost half of the US\$ 600 billion in central bank liquidity swaps (equivalent to €200 billion) were on the liability side of the ECB’s balance sheets, while the corresponding figure for the BoJ was one-fifth (equivalent to JPY 11 trillion) (ECB, 2009). The international demand for US dollar refinancing declined gradually to reach US\$ 10 billion on the Fed’s balance sheet by the first week of January 2010.

(D) Impact of Liquidity Absorbing Operations (Liabilities Side)

26. In view of massive liquidity injections, the three central banks had to absorb excess liquidity by way of different instruments. The Fed reached an agreement with the Treasury, according to which, it would issue securities and deposit the proceeds in a supplementary account with the Fed. As a result, the Fed absorbed more than US\$ 500 billion by October and November 2008, after which the outstanding amount gradually fell to US\$ 5 billion by the first week of January 2010. The supplementary finance programme (which provided for sterilisation of the liquidity injection by the Fed) is remarkable in the sense that it is rare for central banks to obtain liquidity management assistance to this extent and with such an alacrity (Stella, 2009).

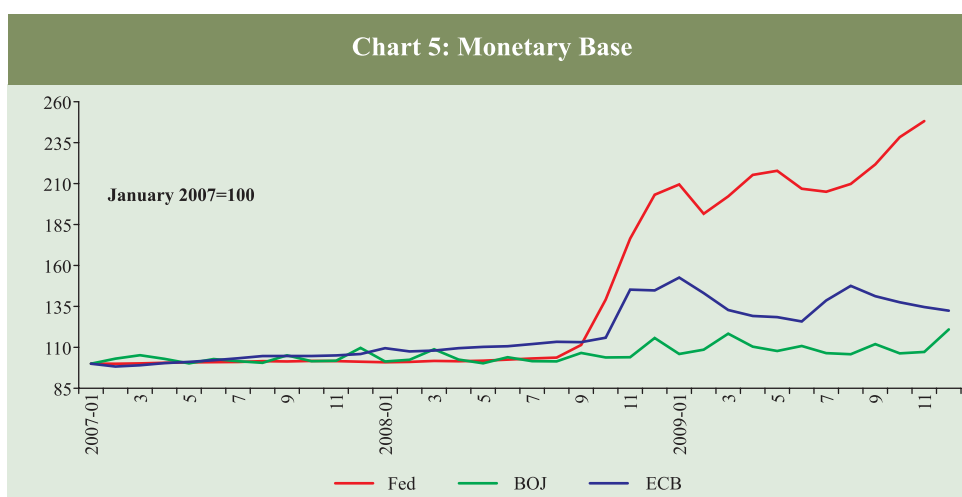
27. In respect of ECB, the liability item that witnessed the largest increase was the deposit facility, which rose from around €1 billion at the end of June 2007 to over €300 billion by the beginning of 2009. Subsequently, the average amount placed in the deposit facility declined gradually to less than €20 billion by June 2009, but rose again to around €300 billion during July 2009, before reaching €160 billion by the first week of January 2010. The ECB also absorbed liquidity through fine-tuning operations in the course of the maintenance period on several occasions.

28. The minimum reserve requirements with the central banks also played an important role in absorbing the excess liquidity in the system. The current account balances with the Fed and BoJ covering minimum reserve requirements and excess reserves increased significantly since October 2008, owing to the introduction of the remuneration of excess reserves, which enabled banks to hold excess reserves at no cost. The current account balances with the Fed increased from less than US\$ 20 billion in June 2007 to US\$ 860 billion in August 2009 and from less than JPY 10 trillion to JPY 12 trillion in the case of BoJ.

29. Thus, the massive increases in liquidity provision on the asset side of the balance sheet and liquidity absorption on the liability side show the important role that the central banks played as intermediaries, particularly during the period following the collapse of Lehman Brothers in September 2008.

(E) Developments in Autonomous Factors

30. During the financial crisis, the liability side of the balance sheets of the three central banks also grew as a result of the increase in autonomous liquidity factors, in particular euro banknotes, euro area government deposits and US Treasury deposits. The financial crisis affected the demand for banknotes (Chart 5). In addition to the long-term upward trend and the seasonal increases in the quantity of banknotes in circulation, there was a significant rise in the demand for euro banknotes and US dollar banknotes at the end of September 2008. In the first half of October 2008, the demand for euro banknotes was approximately €35 billion, approximately two-thirds of which was for €500 banknotes. Since high-denomination banknotes are usually used as a store of value (*i.e.*, as a substitute for bank deposits) and not for transaction purposes, the high demand may be related to a lack of confidence in the banking system at that time. The extraordinary demand for euro banknotes tapered off at the end of October 2008, after



governments had announced extraordinary measures to support the banking sector (ECB, 2009). The growth in the Federal Reserve's banknotes outstanding, which had been decelerating since 2003, rose in May 2008.

31. Thus, in response to the financial turmoil, the Fed, ECB and BoJ introduced significant measures to support the continued access of financial institutions to liquidity and to reduce the tensions in credit markets. These measures led to considerable increase in the size and complexity of their balance sheets.

(F) Implications of Changes in Central Bank Balance Sheets

32. There are several implications that emerge from the recent changes in the central bank balance sheets.

- First, with change in the composition, the risk profile of central bank balance sheets also seems to have undergone a change. The central banks purchase of assets, such as MBSs and CPs has increased their credit and valuation risks. The broadening of the set of eligible securities that central banks accept as collateral for extending credit through new facilities and to a number of eligible counterparties has also raised the counterparty risk.
- Second, there could be some interest rate risks. For instance, for the Fed, the excess reserves have an overnight maturity. Against these short-term liabilities, longer-term and illiquid assets have been created. In principle, if short-term interest rates were to move up very sharply, the cost of funding on the liabilities side could eventually exceed the return on the Fed's assets. Moreover, excess reserves may decline with economic recovery but corresponding reduction in certain assets could be difficult, unless the market for these assets improve. The bigger the balance sheet, the greater would be the amount of interest-rate risks (Dudley, 2009).
- Third, the income position of central banks has also undergone a change. While low returns on central bank assets have reduced revenue, liquidity

injections have increased the amount of reserves over which interest is received³, thereby increasing the central bank profits (Stella 2009 and GFSR, 2009).

- Fourth, a massive expansion of the central bank balance sheet is the corollary of public intervention in private financial transactions, potentially distorting incentives and resource allocation in the private sector. In particular, such side-effects become more obvious as the duration of quantitative easing prolongs (Shiratsuka, 2009). The moral hazard would affect the future risk taking tendencies in the market.
- Fifth, the large excess reserves might result in rapid credit expansion, fuelling inflationary pressures. After all, inflation is driven mainly by two variables – inflation expectations and the degree of pressure on resources. But the lack of marketability of certain types of assets in the central bank balance sheet may not be useful in normal open market operations. This could hinder liquidity management operations and, thus, would dilute the ability of monetary policy as inflationary pressures re-emerge.
- Sixth, the Treasury purchase program in the US created the perception that the Fed was providing the fiscal authorities with the means to fund a more stimulative fiscal policy than they would otherwise have been able to finance. It has been viewed that this could undermine credibility of the central bank and trigger a damaging rise in inflation expectations.
- Seventh, the changes in balance sheets have also raised the apprehensions about the financial situation that could jeopardize operational and financial independence of central bank (Stella, 2009).
- Lastly, going forward, an exit strategy may require phased reduction in excess reserves of banks as abrupt unwinding of reserves could disrupt

³ With the payment of interest on excess balances, market participants will have little incentive for arranging federal funds transactions at rates below the rate paid on excess reserves. By helping set a floor on market rates in this way, payment of interest on excess balances will enhance the Fed's ability to keep the federal funds rate around the target for the federal funds rate.

financial markets. Concomitantly, if inflation expectations firm up, central banks may need to increase the remuneration rate they pay on excess reserves as a means to ensure the targeted policy rate. This in turn would entail additional cost for central banks, which to some extent though would be offset by the extra income resulting from expanded balance sheets, they face substantial income risk (GFSR, October 2009).

SECTION-III

Emerging Economy Central Banks: Policy Actions and their Impact on Balance Sheets

33. In the aftermath of September 2008, as the contagion spilled over to the emerging markets, their central banks also resorted to several unconventional measures in response to the sudden tightening of global liquidity conditions. EMEs undertook various liquidity easing and foreign exchange measures, although the magnitude of their use of credit easing and quantitative easing was much more limited (Table 6).

(1) Policy Response by EMEs

34. In EMEs, as exchange rates came under pressure with the intensification of stress in the global dollar markets and net capital inflows began to reverse, central banks in these countries initiated foreign exchange liquidity easing measures. It is only in the beginning of November 2008, the policy interest rates were reduced in many EMEs, indicating that conventional domestic monetary policy easing lagged the unconventional measures (Ishi, *et al*, 2009). Central banks in many EMEs resorted to liquidity injections and frequent cuts in policy rates, *albeit*, from much higher levels (Chart 6).

Liquidity Easing

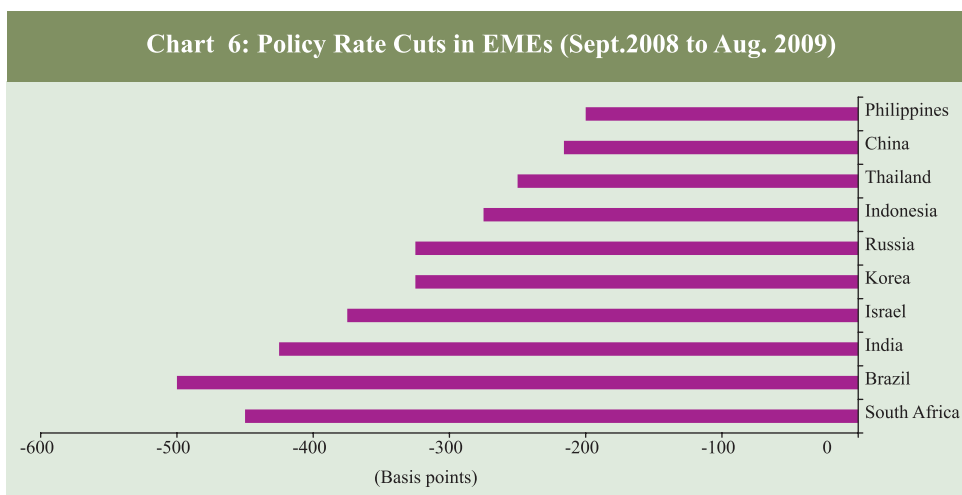
35. Central banks in several EMEs resorted to cuts in reserve requirement ratios, introduction of reserve averaging and hike in exemption thresholds with

Table 6: Select Unconventional Measures by the EME Central Banks

	Type	Country	Measure
1	2	3	4
I Domestic Liquidity Easing			
1.	<i>Direct money market instruments</i>	China Hungary Nigeria	Reduction in reserve requirements.
2.	<i>Systemic domestic liquidity arrangements</i>	Philippines Israel Chile	Expansion in the eligible collateral for standing repo facility to include foreign currency denominated sovereign debt securities. Central bank's announcement to transact OMOs with govt. debt of different types and maturities. Broadening the list of eligible collateral for monetary operations to include CPs.
II. Foreign Exchange Easing			
1.	<i>Foreign Exchange Liquidity Injection</i>	Brazil Philippines Turkey India Indonesia Serbia	Central bank's announcement to sell 1-month dollar liquidity lines. Central bank's approval to open dollar repo facility. Introduction of daily dollar selling auctions. Allowing banks to borrow funds from their overseas branches up to a prescribed limit. Reduction in the foreign exchange reserve requirement for commercial banks. Reduction in the required reserves against foreign assets.
2.	<i>Cross Central Bank Currency Swap Arrangements</i>	Brazil Mexico Korea Singapore	Temporary reciprocal swap lines with the Federal Reserve by the Banco central do Brazil, the Banco de Mexico, the Bank of Korea and the Monetary Authority of Singapore.
III Credit and Quantitative Easing			
		Korea Israel	Announcement of central bank financing (up to a limit) to a bond fund to purchase CPs. Central bank announcement to purchase govt. bonds.
Adopted from Ishi, <i>et al.</i> , (2009).			

a view to ease the domestic liquidity shortages. Most of them also eased the terms of existing standing and market-based liquidity providing facilities, *viz.*, extension of maturities, easing the collateral requirements, increasing the

Chart 6: Policy Rate Cuts in EMEs (Sept.2008 to Aug. 2009)



frequency of auctions, *etc.* Several central banks provided domestic liquidity to targeted institutions for on-lending to the market entities (Table 7).

Table 7: Number of Measures Implemented in Select EMEs (September 2008-May 2009)

Country	Liquidity Easing Measures	Foreign Exchange Easing Measures	
		Foreign Exchange Liquidity Injections	Cross-Central Bank Currency Swaps
1	2	3	4
Brazil	12	9	2
Mexico	1	1	2
China	4	1	
Hong Kong SAR	3	1	1
India	5	7	1
Indonesia	11	4	
Korea	5	4	5
Malaysia	3	-	-
Philippines	3	4	-
Singapore	-	-	2

Adopted from Ishi, *et al.*, (2009).

Foreign Exchange Easing

36. Central banks in EMEs eased the terms of existing foreign exchange facilities, *i.e.*, extending maturities, broadening the collateral, *etc.*, and also put in place new foreign exchange facilities such as dollar repo and swap facilities⁴. The list of counterparties was widened to include non-banking financial institutions and key non-financial institutions (*e.g.* exporters or energy importers). The foreign exchange liquidity limits were also relaxed, covering removal of ceilings on bank purchases of offshore foreign exchange and easing of capital inflow limits. In addition, some central banks lowered the required reserve ratio for bank foreign currency liabilities and shifted the currency structure of required reserves away from foreign exchange. In order to ease the foreign exchange liquidity conditions, central banks in countries like Brazil, Korea, Mexico and Singapore had dollar swap arrangements with the Federal Reserve (BIS, 2008).

Credit and Quantitative Easing

37. In respect of EMEs, the use of credit and quantitative easing measures were limited. Illustratively, the Bank of Korea purchased corporate debt and CPs, while the Bank of Israel undertook quantitative easing between March and August 2009.

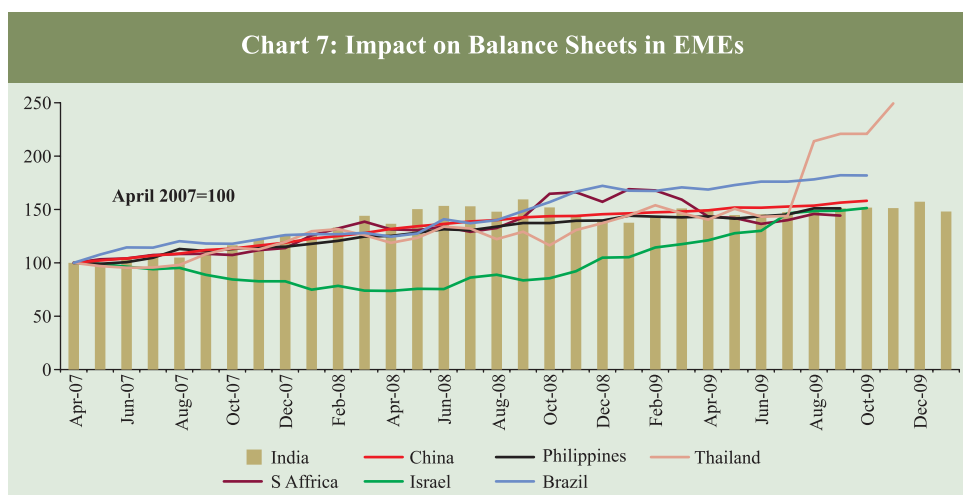
38. The policy response by EMEs probably reflected the tighter constraints on liquidity easing measures faced by them, including external vulnerability, shallower financial markets, conflicts between macroeconomic and systemic stability objectives. Many of the EMEs also avoided a financial crisis and had to deal with only the risk of slowdown in growth. As a result, they did not have

4 Most major emerging market central banks conducted outright sales of foreign exchange reserves to help meet the local market's demand for foreign currency funding and to relieve pressure on the exchange rate. In addition, some central banks sought to offer foreign exchange reserves to counterparties under repurchase agreements (Brazil and the Philippines). Some central banks announced modifications (widening of counterparty eligibility, extension of term) to their existing FX swap facilities to make the distribution of foreign currency more efficient and flexible (Korea and Indonesia). Some others set up new swap facilities (Brazil, Chile and Poland) or announced their readiness to conduct swaps with counterparties as needed (Hong Kong SAR).

to take measures similar to that of advanced economies. Most EMEs maintained positive interest rates to avoid the risk of exchange rate depreciation and capital outflows. The quantitative easing measures were also of limited magnitude, thereby limiting the extent of increase in the size of central bank balance sheets.

(2) Impact of Policy Actions on Central Bank Balance Sheets

39. Beginning in September 2008, although many EMEs began to take measures to ease foreign exchange and domestic currency liquidity conditions, unconventional measures did not play much role for them as in the advanced countries. The liquidity easing measures reinforced in some cases by foreign exchange liquidity provided by reserve currency central banks seemed to have had some success in alleviating short-term liquidity pressures. However, the size of emerging market central bank balance sheets did not increase by the same magnitude as those of their advanced country counterparts (GFSR, October 2009). Although there was not much of an expansion in the emerging market central banks' balance sheets, the trends show a co-movement among these countries. It is noteworthy that the trends in RBI's balance sheet were in tandem with those of other emerging market central banks (Chart 7).

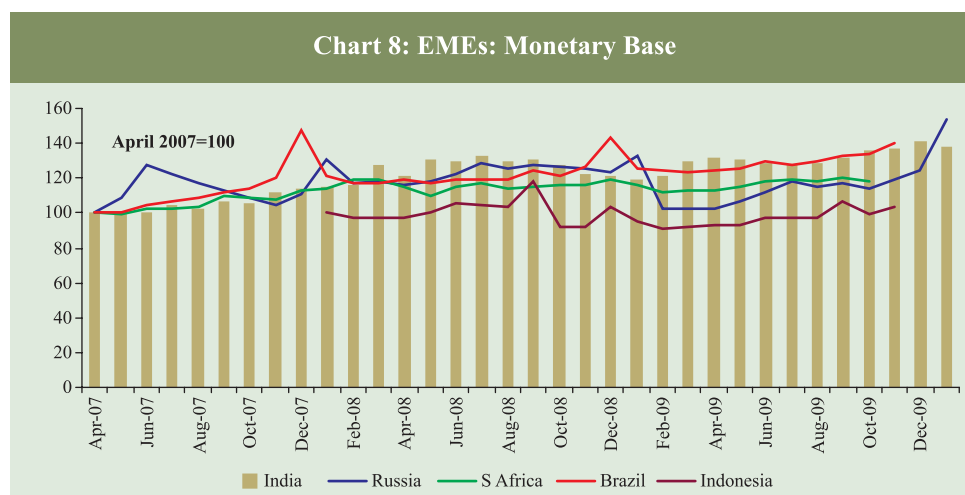


40. The size of central bank balance sheets in EMEs increased much less due to the depletion of international reserves in many cases, due to capital outflows (Ishi, *et al*, 2009) (Chart 8).

(3) Key Difference between Central Banks of Advanced Economies and EMEs

41. While central banks of both the developed countries and emerging markets resorted to unconventional monetary measures, there were differences in terms of timing, nature and magnitude of the actions.

- In the advanced economies, the switchover was from conventional monetary tools to unconventional measures due to policy rates reaching zero or nearing zero. In contrast, in many EMEs, the unconventional foreign exchange easing measures such as currency swap preceded domestic liquidity easing measures due to sudden tightening of global liquidity conditions. Thereafter, the conventional measures of loosening policy rates followed.
- To ease liquidity, central banks in EMEs relied mostly on direct instruments such as reserve requirements. Central banks in advanced countries, on the



other hand, resorted to measures such as widening the list of counterparties and extending the maturity of liquidity providing operations.

- Central banks in advanced countries also eased liquidity through securities liquidity provision, *i.e.*, swap of illiquid private sector securities for liquid government securities. Central banks in EMEs hardly resorted to such measures. Furthermore, the central banks in advanced countries extensively used credit and quantitative easing measures, while they were barely used in the EMEs.
- In view of the extensive use of the credit and quantitative easing, the enlargement in the balance sheets of central banks in the advanced countries was far larger than those in the EMEs (Ishi, *et al*, 2009).

SECTION- IV

Exit Policy and Challenges in Management of Assets and Liabilities

42. The debate about the exit from the unconventional monetary policy began in early 2008. The question initially was “how”, but gradually, with signs of improvement in the real and financial spheres, the question “when” came to the fore. The exit or the reversal would be a multi-faceted process and would unfold differently, depending on prospects for growth, inflation and the financial system in each country (Baudchon, 2009).

Why Exit ?

43. A strong central bank balance sheet is essential for the quality of currency and the stability of financial system (Bagus, 2009). The financial crisis witnessed substantial changes in the balance sheets of the world’s major central banks. From a monetarist’s point of view, according to which inflation is a monetary phenomenon, the question of the exit strategy takes the centre stage.

44. The policies during the crisis, which hugely expanded the monetary base, are considered potentially inflationary, with the inflation risk arising from three sources: over-stimulation by adoption of hyper-accommodative monetary policy, excess liquidity in the banking system and potential deanchoring of inflation expectations (linked to excess liquidity). To prevent runaway inflation, the central banks need to withdraw in a timely manner the monetary policy stimulus injected into the system. Second, it is possible that large increases in excess reserves could conceivably diminish the willingness of banks to lend. (Dudley, 2009). Moreover the abundant liquidity, if not withdrawn quickly, could pose risks inducing the same excesses and imbalances that transpired as a run-up to the recent crisis. The exit from unconventional policy measures becomes all the more important in view of several challenges and risk they pose for authorities.

Risks and Challenges from Unconventional Policy Measures

45. The unconventional measures of liquidity, credit and quantitative easing introduced by central banks during the crisis pose several challenges and risks (IMF, 2009).

- Unconventional measures may inadvertently allocate credit to inefficient markets at the expense of efficient markets, constraining financial sector restructuring in the short run, and impairing future economic growth.
- The gradual replacement of high-quality and liquid assets with illiquid claims on central bank balance sheets reduces operational flexibility and thereby constrains future monetary management.
- The quasi-fiscal nature of some unconventional measures blurs the distinction between monetary and fiscal policies and together with the pressure to continue to provide financing, could potentially compromise central bank independence.

- Though these unconventional monetary policy instruments may be effective in boosting the economy, when price stability is at stake, they have their limits with broader implications.
- The expansion in reserve money amidst announcements of unconventional measures by central banks leads to inflation expectations.
- As the effects of such policies are not well-known, the conduct of monetary policy is bound to be surrounded by much more uncertainty than is normally the case.
- Most importantly, liquidity injections need not be greatly effective when financial intermediaries continue to remain unhealthy.
- There is a risk of introducing distortions in financial prices without a careful design of the measures.
- Unconventional measures may have a more direct redistributive impact on specific sectors of the economy or categories in society than normal monetary policy actions.
- Thus, a high degree of common understanding and cooperation between fiscal and monetary authorities is required with a clear definition of respective responsibilities and fields of action (IMF, 2009).

46. For the EMEs, prolonged and sizable liquidity easing could be counterproductive as they are prone to large and potentially destabilising capital inflows. As the tradeoffs between price, fiscal and financial stability objectives are sharper in the EMEs, the case for credit easing by central banks was weaker. Quantitative easing was also less appropriate for EMEs than advanced countries. Firstly, while the financial crisis was less severe and inflation was higher, policy rates were far from being zero. Secondly, vulnerability of EMEs to volatile capital flows would require keeping the policy rate higher to compensate currency holder for exchange risk. Otherwise, quantitative easing could lead to capital outflows in these countries (Ishi, *et al*, 2009).

Constraints in Exit

47. As monetary stimulus was injected by using unconventional means, central banks may lack the tools needed to undo their previous actions. Quantitative tightening would decrease inter-bank and overall liquidity and could lead to a stronger, deflationary credit tightening. The financial crisis could become aggravated with destabilising effects. In fact the financial crisis was caused by solvency problems that led to liquidity constraint. Central banks tried to fight this by increasing the provision of liquidity and buying or loaning against the bad assets that caused the solvency problems. If central banks reverse their actions, the solvency problems could reemerge with earlier liquidity problems.

48. While early withdrawal of monetary accommodation may derail the recovery process, delayed actions may build up inflationary expectations. Therefore, balancing growth and inflation remains a major challenge for central banks. In short, the key issues facing monetary policymakers in advanced countries are when to start tightening and how to unwind large central bank balance sheets.

Designing an Appropriate Exit Strategy

49. It becomes imperative for policymakers to consider and articulate the exit strategy as to how and in what sequence policies may be unwound. It is essential to develop a credible and coherent exit strategy to roll back crisis interventions when market conditions permit and the economic outlook is on a firm recovery path. Successful disengagement would require coherent sequencing and clear communications from the central banks. Specific unwinding plans need to be calibrated while providing signals to markets on achieving medium-term policy goals, while avoiding the risk of a premature withdrawal of support when conditions are still fragile (GFSR, October 2009).

50. Central banks could devise plans to unwind unconventional measures to ensure a smooth return to market-based financial intermediation and to address

concerns that excessive liquidity could eventually drive a resurgence of inflation. With some markets getting stabilised, some liquidity support measures have already started to unwind naturally. Nevertheless, central banks would need to ensure that they have the necessary tools to reverse the accommodative policy stance, while recognising that they may have to keep some illiquid assets on their balance sheets for some time.

51. In the recent discussions in the literature, several plausible options have been proposed for exit policy (Box I).

Asset Side Management

52. The central banks, particularly in advanced countries, have to consider when and how to withdraw from the segments of the markets in which they had

Box I: Exit Strategy: Plausible Options

Several options have been suggested in the recent literature, some of which are presented below.

- Letting programs to purchase securities expire, or stopping them beforehand.
- Selling purchased assets directly into the market, or under reverse repos (without selling them outright). Selling directly would probably be a last-resort solution, as central banks traditionally prefer to avoid creating a “market-event”.
- Selling “legacy” assets, particularly public securities acquired before the crisis, at lower prices without the risk of incurring losses on those assets.
- Imposing more severe conditions for access to the various funding facilities.
- Terminating the funding facilities.
- Raising the interest rate on reserve balances- an incentive for banks to leave reserves with the Fed, in order to contain the supply of credit and thus, the risk of inflation. The ability to vary the interest paid on reserves also decouples management of the Fed’s balance sheet from interest rate decisions, which could be useful given the state of excess reserves, in that it does not prevent increases in the Fed funds rate.
- Reactivating the US Treasury’s Supplementary Financing Program (SPF), a special Fed measure⁵. The main drawback of this option is that it could convey the impression of the Fed relinquishing independence relative to the Treasury (Baudchon, 2009).

5 Under the program, the Treasury issues special bills, with the proceeds added to the liabilities side of the Fed’s balance sheet. When buyers pay, the Treasury’s account at the Fed is credited and excess reserves are reduced by the same amount.

intervened (asset side). The objective is to return to the use of the interest rate as the monetary policy instrument, aiming at price stability, while sustaining the growth recovery. This could be achieved even in the face of high excess reserves, although the magnitude of reserve accumulation has been large and poses a challenge (GFSR, October 2009).

53. In terms of the *modus-operandi*, when the central bank holds short-term assets, it can easily mop up excess reserves by simply letting these assets mature. If the liquidity facilities are demand-driven, unwinding takes place automatically when funding markets improve and banks reduce their demand for precautionary excess liquidity. This unwinding process could be encouraged further if borrowing from the central bank is provided at a rate that would restore normal market incentives.

54. In respect of central banks whose increase in reserves is larger than the increase in short-term instruments, retiring short-term instruments might not be sufficient to mop up excess reserves entirely. When the central bank extends liquidity by purchasing long-term instruments, such as government and corporate bonds or a variety of impaired structured credit products, it would need to sell or exchange them in order to unwind excess liquidity.

55. Asset sales can proceed if a market for the assets exists, which is not necessarily the case for some central bank holdings. Sales of relatively illiquid instruments or large quantities should proceed with caution as selling could destabilise fragile markets. Furthermore, when central banks hold large portfolios of government debt, the government should avoid the temptation to influence their disposal and recognise the independence of the central bank (GFSR, October 2009).

Liability Side Management

56. On the liabilities side, the central bank could use additional instruments of market operations, such as liquidity-absorbing repo operations and central bank bills to absorb excess reserves (GFSR, October 2009 and BIS, 2009) (Table 8). For instance, it is argued that the Fed would be able to reduce its balance sheet

Table 8: Supplementary Operations for Managing the Central Bank Balance Sheet

Options	Fed	ECB	BOE	BOJ
Issuance of Central Bank Bills (Debt Certificates)	Not available (Supplementary Finance Program used instead)	Not used	√	√
Reverse Repos	√	Not used (Deposit actions would be used instead)	Not regularly used	√
Remuneration on Excess Reserves	√ (Recent)	Deposit facility for surplus reserves	√ (Recent)	√ (Recent)

Source: GFSR, October, 2009.

in a smooth manner with interest payments on reserves, combined with steps to reduce excess reserves, such as large-scale repurchasing agreements, term deposits to financial institutions, and the outright sale of its holdings of long-term securities (Bernanke 2009).

57. In addition, by remunerating excess reserves, the central bank could determine the policy rate by setting a floor on the overnight rate. These operations could prove to be highly costly for a central bank, as they would also channel interest income from the central bank to banks. One of the concerns is whether the technical modalities of the withdrawal of excess liquidity would impair the ability of central banks to control interest rates, their main monetary policy tool, and whether the impact of high level of liquidity on credit growth could become inflationary.

58. The experience since the fall of 2008 as well as Japan's experience earlier in the past decade suggests that the existence of excess reserves in itself does not necessarily have an inflationary effect when the financial system is seriously impaired. However, the timing of unwinding excess liquidity and, hence, the extent to which the central bank can rely fully on remuneration to deal with excess reserves, depends critically on the condition of the financial system.

59. Timing is complicated by the fact that some policies may be effective even if their usage is limited, as they may be bolstering confidence or acting as a backstop to a class of institutions or investors. In general, a facility can be phased out by raising its costs or gradually decreasing its availability. Expensive policies or those where costs are not commensurate with the benefits should be considered first for withdrawal, as also the policies that significantly distort financial markets.

60. Importantly, given the global nature of the crisis and the types of unconventional policies used, attention must be paid to the cross-border impact of unwinding, and coordination may be helpful, notably with regard to the withdrawal of guarantees for bank debt across countries where potential arbitrage opportunities can arise. Given that this is uncharted territory for policymakers, some experimentation may be appropriate to test market conditions. If warranted, reinstatement of some facilities should not be viewed as a setback (GFSR, October 2009).

61. The right mix of interventions and timing of their withdrawal are critical to restore the financial system to health. An appropriate future exit strategy should focus on achieving the right balance between exiting too early- at the cost of causing credit spreads to jump abruptly and risking a loss of confidence- and prolonging stimulus, thereby providing excess liquidity, re-initiating asset price inflation, and funding leveraged and carry-trade activities. The choice is between tightening too early or too fast (undermining the fragile base of the recovery), and tightening too late (which could raise inflation risks).

62. Communicating about the exit strategy is an integral part of the exit strategy. Central bank credibility is linked to anchoring expectations (regarding inflation or rates). An exit strategy that is clearly identified and understood strengthens monetary policy effectiveness because it reassures that inflation and the entire yield curve will remain under control, once growth resumes. For central banks, that are engaged in both kinds of policies, withdrawing credit

easing (the measures intended to loosen credit conditions) should pose less of a problem than withdrawing quantitative easing (purchasing long-term government securities or similar instruments to ease interest rate and credit spreads), because the former will be to a large extent endogenous, without requiring any special intervention by the central bank.

63. The improvement in the economic and financial landscape would automatically reduce banks' need for central bank money. This type of passive automatic adjustment strategy is already at work. Illustratively, ECB's unconventional policy measures were devised with exit consideration in mind, and hence, some of the measures would phase out naturally (Trichet, 2009).

SECTION-V

Indian Context: Policy Response by the Reserve Bank and Impact on its Balance sheet

(1) India's Monetary Policy Response to the Financial Crisis

64. There are several unique aspects, which enabled India to withstand the impact of the global crisis in a non-disruptive manner. Although financial markets in India came under pressure temporarily, owing to the spillover of illiquidity and volatility from the markets of advanced economies, all markets - starting from money to credit market - functioned normally throughout, and the excessive volatility in the markets was contained within two months by the Reserve Bank, ensuring ample rupee and forex liquidity in the system.

65. With the intensification of financial crisis after the collapse of Lehman and Brothers in September 2008 and in view of the reduction in capital inflows and consequent pressures in the foreign exchange market, the Reserve Bank sold foreign exchange in the market, consistent with its policy objective of maintaining orderly conditions in the foreign exchange market. While foreign exchange sales attenuated the mismatch in the foreign exchange market, these operations drained liquidity from the rupee market and accentuated pressures on the rupee liquidity. As a response, the Reserve Bank

embarked upon pro-actively managing liquidity since mid-September 2008 to assuage the liquidity pressures through a variety of measures. These measures, *inter-alia*, included, (i) reduction in the repo rate by 425 basis points to 4.75 per cent, (ii) reduction in the reverse repo rate by 275 basis points to 3.25 per cent, (iii) cut in the cash reserve ratio (CRR) by a cumulative 400 basis points to 5.0 per cent.

66. Fresh issuances under the Market Stabilisation Scheme (MSS) was withheld and buyback of existing MSS securities was also undertaken to inject liquidity into the system. Buybacks were aligned with government market borrowing programme. Following the amendment to the Memorandum of Agreement on the MSS, Rs.12,000 crore was transferred to the Government cash account from the MSS cash account. Reflecting the various operations, MSS balances declined from Rs.1,75,362 crore at end-May 2008 to around Rs.88,000 crore by end-March 2009. The Reserve Bank also came to respond to the global financial crisis with the initiation of other measures such as cut in the statutory liquidity ratio (SLR), opening of new refinancing windows, refinance to SIDBI and EXIM Banks, and clawing back of prudential norms with regard to provisioning and risk weights. The measures to improve forex liquidity included, increase in interest rate ceilings on non-resident deposits, easing of restrictions on external commercial borrowings and on short-term trade credits (Annex).

67. The experience with MSS requires a special mention in the context of assessment of RBI's balance sheet, because it has shown that it operates symmetrically, acting as a store of liquidity during surges in capital inflows and ensuring domestic liquidity management at the time of capital outflows. Moreover, in view of the government market borrowing programme, the Reserve Bank undertakes purchases of government securities under its open market operations as warranted by the evolving monetary and financial market conditions. The various monetary and liquidity measures initiated since mid-September 2008 released actual/potential liquidity amounting to Rs.5,61,700 crore (Table 9).

**Table 9: Actual/ Potential Release of Primary Liquidity
(Since Mid-September 2008)**

Measure/Facility	Amount (Rs.crore)
Monetary Policy Operations (1 to 3)	
1. Cash Reserve Ratio (CRR) Reduction	1,60,000
2. Open Market Operations (purchases)	80,080
3. MSS Unwinding/Buyback/De-sequestering	1,55,544
Extension of Liquidity Facilities (4 to 8)	
4. Term Repo Facility	60,000
5. Increase in Export Credit Refinance	26,576
6. Special Refinance Facility for SCBs (Non-RRBs)	38,500
7. Refinance Facility for SIDBI/NHB/EXIM Bank	16,000
8. Liquidity Facility for NBFCs through SPV	25,000
Total (1 to 8)	5,61,700
Memo:	
Statutory Liquidity Ratio (SLR) Reduction	40,000
Source: First Quarter Review of Statement on Monetary Policy for the Year 2009-10.	

Why and How Indian Situation was Different from the Central Banks of Advanced Economies?

68. There were several key differences between the policy response by the Reserve Bank and the central banks in many advanced countries, which could be seen below:

- i) In the first place, India did not experience a financial crisis; its financial system remained largely insulated, as it was not exposed to the toxic assets and failing institutions in the advanced economies.
- ii) India, however, was impacted by the global recession, and the policy stimulus in India aimed primarily at containing the pace and duration of economic slowdown.
- iii) Unlike several export-dependent and external capital dependent countries, India's growth process was driven by domestic savings and domestic demand, which clearly contributed to limit the impact of global recession on India.

- iv) Unlike the advanced economies, thus, India did not have to use large-scale policy stimulus to bailout failing institutions and freezing markets. No stimulus for recapitalising banks, buying back illiquid assets or guaranteeing the liabilities of banks was necessary.
- v) Despite significant pressures on India's balance of payments in the second half of 2008-09 when both exports started to decline and capital inflows reversed, the comfortable foreign exchange reserves facilitated Reserve Bank's operations in the foreign exchange market to preserve orderly conditions.
- vi) There was no dilution of collateral standards, which were largely government securities, unlike the mortgage securities and CPs in the advanced economies.
- vii) In the process of liquidity injection, the counter-parties involved were banks; even liquidity measures for mutual funds, NBFCs and housing finance companies were largely channeled through the banks.
- viii) Availability and deployment of multiple instruments facilitated better sequencing of monetary and liquidity measures.
- ix) The gradual and sequential approach to liberalisation of the capital account also prevented leveraging of the Indian financial system for taking positions in troubled assets in the advanced economies.
- x) Adequate regulatory precautions ensured that complex structures like synthetic securitisations did not contaminate the Indian markets and prudential measures were also designed to discourage excessive exposure of the banking system to sensitive sectors and asset price bubbles (Thorat, 2009).
- xi) The experience in the use of procyclical provisioning norms and counter-cyclical regulations ahead of the global crisis helped to manage financial conditions in a non-disruptive manner.

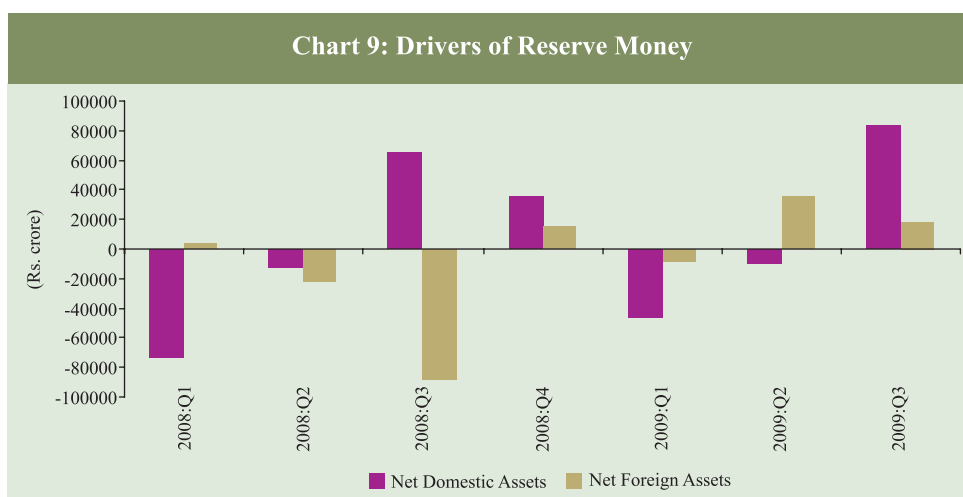
xii) Despite large liquidity injection, the Reserve Bank's balance sheet did not show unusual increase, unlike the global trend, because of release of earlier sterilised liquidity (Mohanty, 2009).

69. With the prompt and timely conduct of liquidity management operations along with those of exchange rate management and internal debt management in a synchronized manner, the Reserve Bank ensured that there was no dearth of liquidity in the system. The combined policy response of the Reserve Bank was aimed at sustaining the domestic growth, consistent with price and financial stability (Mohanty, 2009).

(2) Delineation of Key Developments in the Reserve Bank's Balance Sheet

70. As the crisis deepened and global macro economic conditions deteriorated, EMEs were confronted with reversal in the capital flows. As a result of capital outflows, the balance of payments position of India came under pressure during the third quarter of 2008-09. As a corollary, the Reserve Bank was required to draw down the reserves to make up for the shortfall in order to ensure orderly conditions in the foreign exchange market. The drawdown of reserves led to corresponding contraction in the base (reserve) money. Concomitantly, the Reserve Bank had to ensure the required expansion in net domestic assets (NDA) by resorting to conventional policy measures. First through the open market operations (OMO) involving outright purchases of government securities in the secondary market and secondly, through the provision of liquidity through repos under its daily liquidity adjustment facility (LAF) (Chart 9).

71. A large part of the NDA that explains the trends in reserve money was in the form of net RBI credit to the Government, which comprises the combined effects of OMO operations, LAF operations (repo and reverse repo), MSS balances and the Governments balance with the Reserve Bank. While the lower CRR and unwinding of MSS were the primary instruments for expanding liquidity, much of the surplus liquidity came back to the Reserve Bank through reverse repo under the LAF and high surplus balances of the Government with the Reserve Bank by the end of 2009.



72. The MSS was another instrument that came handy for the Reserve Bank to expand liquidity in the system by unwinding of the securities held under MSS⁶. The amount sterilised through MSS remained immobilised in the Central Government's account with the Reserve Bank. As at end-September 2008, MSS amount stood over Rs. 1.7 trillion. The unwinding of MSS balances gave adequate space for the Reserve Bank to embark on necessary liquidity expansion without resorting to expansion in its balance sheet in any significant measure. Nevertheless, the timing of the unwinding was also modulated in such a way that the large borrowing programme of the government was managed smoothly, without exerting undue pressure on the market. Besides, the reduction in CRR of banks from 9 per cent to 5 per cent released Rs.1.6 trillion of primary liquidity to the banking system.

73. The CRR measure changed the monetary conditions in two ways. On the components side, the reduction in reserve requirement by 4 percentage points and the associated decline in bankers' deposits with the RBI led to a reduction in the growth of reserve money. The balance sheet of the RBI also contracted but the CRR measure helped money multiplier to deliver the quantitative easing impact. The average money multiplier rose from 4.3 in March 2008 to 4.8 in

⁶ MSS securities are essentially short-term government securities, introduced in April 2004, as an instrument of sterilisation to partly neutralise the expansionary effects of surges in capital inflows.

March 2009, reaching further to 5.1 per cent at end-December 2009, reflecting the impact of lowering of CRR. An increase in money multiplier resulted in higher increase in broad money (Chart 10).

74. On the sources side, the decline in net foreign assets of the Reserve Bank, driven by capital outflows was more than offset by expansion in net domestic assets, however, the impact was not adequate to give rise to a large increase in the balance sheet size or reserve money. A decomposition of net RBI credit to the Centre (which is the major component of Reserve Bank net domestic assets) shows that the Government deposits with the Reserve Bank fell considerably on account of unwinding of MSS, which contributed to contraction in the Reserve Bank’s balance sheet on the liabilities side along with the reduction in bankers’ deposits with the Reserve Bank. On the asset side, marketable securities held by the Reserve Bank (which include both OMOs and LAF) did not increase significantly (Chart 11). In fact, during the period following November 2008, the liquidity released through relatively sharp unwinding of the MSS was ploughed back by the banks into reverse repos (despite a 2.75 percentage points reduction in reverse repo rate), indicating lower credit off-take and surplus liquidity in the banking system.

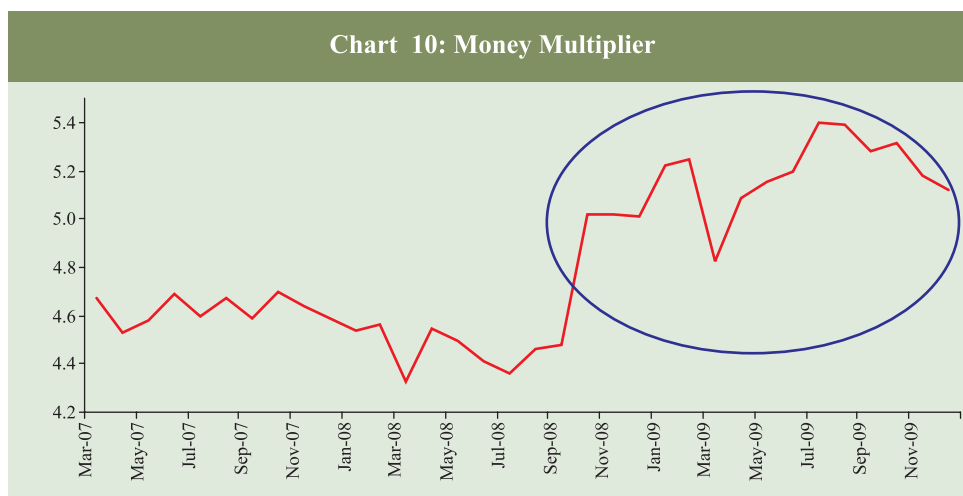
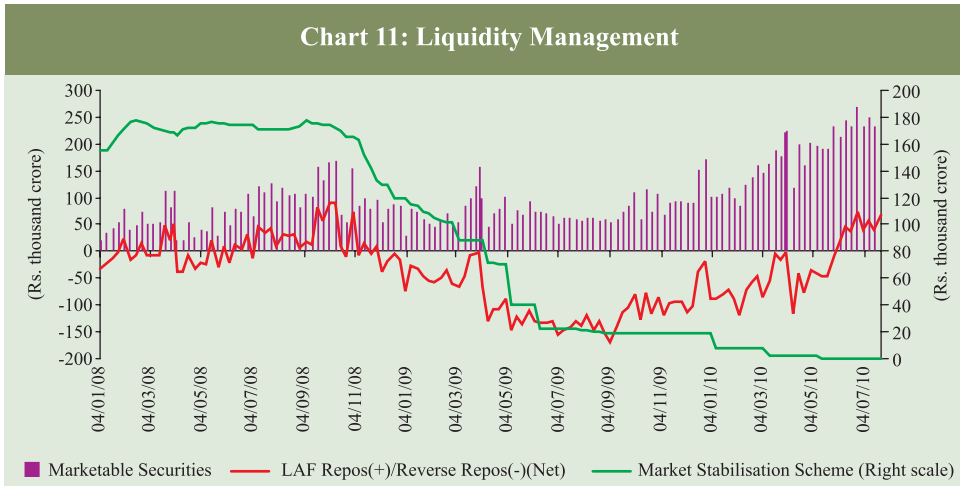
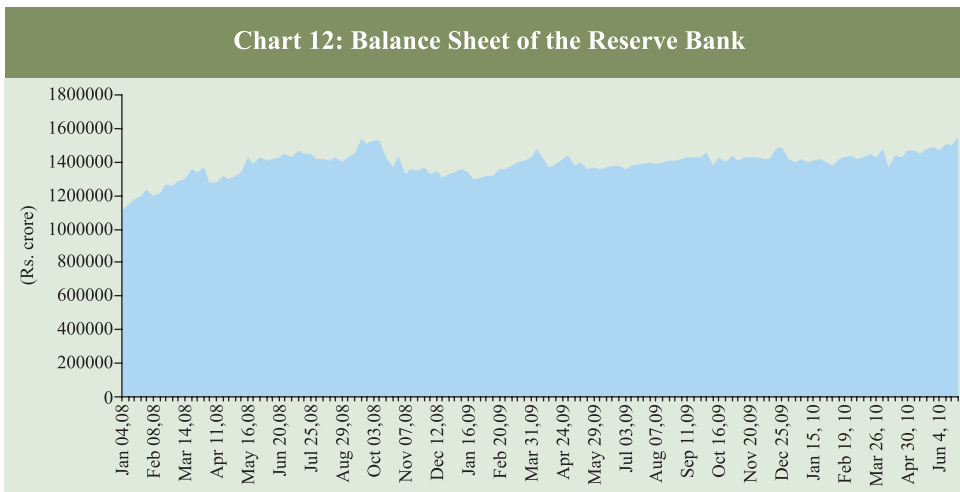


Chart 11: Liquidity Management



75. In India, thus, the provision of adequate liquidity, despite being large, was achieved without compromising either on the asset quality in the Reserve Bank’s balance sheet or on the eligible counterparties. The liquidity requirements of non-bank financial entities were catered to indirectly by extending liquidity support to the designated counterparties, like commercial banks and primary dealers. The liquidity expansion achieved through unwinding of MSS and reduction in reserve requirement ensured that the Reserve Bank’s balance sheet did not expand significantly, unlike in several other central banks (Chart 12).

Chart 12: Balance Sheet of the Reserve Bank



SECTION VI

Concluding Remarks

76. The exceptional nature of financial crisis tested the ability of central banks to act as lender of the last resort (LOLR). Since the global financial crisis started because of illiquidity of the assets, rather than run on banks by the depositors, the liquidity management response of the central banks had to go beyond the conventional LOLR function, which was reflected in the sheer size and composition of the central bank balance sheets. A key issue that emerged was the need for an adequate array of policy tools to contain the stress in the financial markets. The policy responses during the crisis were remarkable in terms of their scale, intensity and exceptional coordination across the countries. Advanced countries, which initially began with conventional policy rate cuts, later turned to unconventional policy measures while using their balance sheets in unusual ways, as transmission mechanism was impaired and modulation in interest rate became ineffective. As an outcome of the unprecedented actions involving quantitative easing, central bank balance sheets expanded considerably, with significant change in their composition as well.

77. The assets of the Fed and the BoE more than doubled, that too in a matter of weeks, while that of the ECB grew by more than 30 per cent. In the Fed's case, this reflected direct lending to banks and dealers through existing and new lending facilities; indirect lending to money market funds; purchases of commercial papers (CPs) through special purpose vehicles (SPVs) and drawings by foreign central banks on dollar swap lines. In Europe, the key drivers of ECB balance sheet covered enhanced credit support measures along with standing facilities, which involved increasing the number, frequency of operations and the list of eligible collaterals. Balance sheet changes in respect of BoJ were mainly driven by introduction of measures to facilitate corporate financing, along with the purchase of CPs and corporate bonds.

78. The central banks in emerging markets also responded to the contagion that spilled over to their economies through the confidence, trade and capital

movement channels. Their responses mainly covered foreign exchange and liquidity easing measures, though the extent of their use of credit and quantitative easing measures was limited. As a result, the increase in the central bank balance sheets of these countries was nowhere near the change that occurred in respect of advanced country central banks. It is notable that the trends in respect of RBI's balance sheet were in tune with the changes in central banks' balance sheets of EMEs, but with specific unique features because of its dependence on CRR and MSS unwinding, both of which entailed contraction in the RBI balance sheet.

79. With the significant changes in the size of central bank balance sheets, several challenges have come to the fore, *viz.*, change in the risk profile of balance sheets with rise in credit, valuation and counter-party risks besides interest rate risks; change in the income position of central banks; excess reserves limiting the willingness of banks to lend; questions over marketability of certain types of assets and illiquid claims impeding the operational flexibility and constraining future monetary management. The unconventional measures have also several other implications in terms of their adverse impact on resource allocation, price discovery mechanism and potential inflation expectations.

80. In view of the above challenges, it is imperative on the part of central banks to develop a credible and coherent exit strategy to roll back crisis time interventions when market conditions permit and the economies return to a firmer recovery path. While early withdrawal of monetary accommodation may derail the recovery process, delayed actions may build up inflationary expectations. Therefore, balancing recovery and inflation remains a major challenge for central banks, even though the inflation risk in advanced economies remain largely contained, supporting thereby the need to delay exit till recovery becomes stronger and more durable. Successful disengagement would require coherent sequencing and clear communications from the central banks. Specific unwinding plans will need to be calibrated while providing signals to markets on achieving medium-term policy goals, while avoiding the risk of a premature withdrawal of support as conditions look still fragile. Attention must be paid to the cross-

border impact of unwinding and coordination may be helpful. The exit or the reversal would be a multi-faceted process and would unfold differently, depending on prospects for growth, inflation and the financial system in each country

81. India, avoided a financial crisis at home, but was affected by the knock on effects of global recession. The temporary pressure on financial markets in terms of increased volatility was contained by the Reserve Bank with its prompt and careful conduct of the liquidity management operations. The MSS instrument provided Reserve Bank the much needed flexibility to carry out its market operations. The reduction in CRR, while raising the money multiplier, enabled adequate liquidity injection to the system. As a consequence, the balance sheet of RBI did not see any notable change during the phase of crisis. With the beginning of exit announced in the October 2009 Policy Statement, the remaining measures to be reversed fall in the domain of conventional monetary policy, which will happen in response to the growth and inflation outlook over time. Thus, for the Reserve Bank, there are no balance sheet related concerns, unlike in the advanced economies.

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Annex: Policy Response of the Reserve Bank During Recent Crisis	
Item	Key Measures
1	2
Monetary Measures	<ul style="list-style-type: none"> • Cut in the repo rate under the LAF by a cumulative 425 basis points from 9.0 to 4.75 per cent between October 2008 to April 2009. • Cut in the reverse repo rate by a cumulative 275 basis points from 6.0 to 3.25 per cent during the above period.
Rupee Liquidity/ Credit Delivery	<ul style="list-style-type: none"> • Cut in the CRR by a cumulative 400 basis points of NDTL from 9.0 per cent to 5.0 per cent between October 2008 to April 2009. • Introduction of a special refinance facility under Section 17(3B) of the Reserve Bank of India Act, 1934 under which all SCBs (excluding RRBs) were provided refinance from the Reserve Bank equivalent to up to 1.0 per cent of each bank's NDTL as on October 24, 2008 at the LAF repo rate up to a maximum period of 90 days. Banks were encouraged to use this facility for the purpose of extending finance to micro and small enterprises. The facility was to available to upto September 30, 2009. • Institution of a term repo facility for an amount of Rs.60,000 crore under the LAF to enable banks to ease liquidity stress faced by mutual funds, NBFCs and housing finance companies (HFCs) with associated SLR exemption of 1.5 per cent of NDTL. This facility was to available up to September 30, 2009. • Reduction in statutory liquidity ratio (SLR) by one percentage points from 25 to 24 per cent of NDTL with effect from the fortnight beginning November 8, 2008 (reversed in October 2009). • Introduction of a mechanism to buy back dated securities issued under the MSS so as to provide another avenue for injecting liquidity of a more durable nature into the system. • Extension of the period of entitlement of the first slab of pre-shipment and post-shipment rupee export credit, by 90 days each, with effect from November 15, 2008 and December 1, 2008, respectively. • Increase in the eligible limit of the ECR facility for scheduled banks (excluding RRBs) from 15 per cent to 50 per cent of the outstanding export credit eligible for refinance at the prevailing repo rate under the LAF. • To allocate amounts, in advance, from SCBs for contribution to the SIDBI and the NHB to the extent of Rs.2,000 crore and Rs.1,000 crore, respectively, against banks' estimated shortfall in priority sector lending in March 2009. • Reduction in the provisioning requirements for all types of standard assets (for residential housing loan beyond Rs.20 lakh, standard advances in the commercial real estate sector, personal loans including outstanding credit card receivables, loans and advances qualifying as capital market exposure and non-deposit taking systemically important NBFCs) to a uniform level of 0.40 per cent except in case of direct advances to agricultural and SME sector, which could continue to attract provisioning of 0.25 per cent, as hitherto.

Annex: Policy Response of the Reserve Bank During Recent Crisis

Item	Key Measures
1	2
	<ul style="list-style-type: none"> • Downward revision of risk weights on banks' exposures to certain sectors, which had been increased counter-cyclically earlier. All unrated claims on corporates and claims secured by commercial real estate would attract a uniform risk weight of 100 per cent as against the risk weight of 150 per cent prescribed earlier. Claims on rated as well as unrated non-deposit taking systemically important non-banking financial companies (NBFC-ND-SI) were uniformly risk weighted at 100 per cent. As regards the claims on asset financing companies (AFCs), there was no change in the risk weights, which continue to be governed by the credit rating of the AFCs, except the claims that attracted a risk weight of 150 per cent under the new capital adequacy framework, was reduced to a level of 100 per cent. • In order to provide liquidity support to housing, export and MSE sectors, the Reserve Bank provided a refinance facility of Rs.4,000 crore to the NHB, Rs. 5,000 crore to the EXIM Bank and Rs. 7,000 core to the SIDBI up to March 2010. • For more effective liquidity management, the Reserve Bank widened the scope of OMOs by including purchases of Government securities through an auction-based mechanism in addition to operations through NDS-OM.
Foreign Exchange Liquidity	<ul style="list-style-type: none"> • Continuation of selling foreign exchange (US dollars) through agent banks to augment supply in the domestic foreign exchange market or intervene directly to meet any demand-supply gaps. • To institute special market operations to meet the foreign exchange requirements of public sector oil marketing companies against oil bonds when they become available. • The ceiling rate on export credit in foreign currency was increased to LIBOR plus 350 basis points subject to banks not levying any other charges. • Authorised Dealer (AD) category - I banks were allowed to borrow funds from their head office, overseas branches and correspondents and overdrafts in nostro accounts up to a limit of 50 per cent of their unimpaired Tier 1 capital as at the close of the previous quarter or US\$ 10 million, whichever was higher, as against the earlier limit of 25 per cent. • As a temporary measure, HFCs registered with the NHB were allowed to raise short-term foreign currency borrowings under the approval route, subject to compliance with prudential norms laid down by the NHB. • A forex swap facility with tenure up to three months to Indian public and private sector banks having overseas operations in order to provide them flexibility in managing their short term funding requirements at their overseas offices. The facility was to available up to March 31, 2010.

Annex: Policy Response of the Reserve Bank During Recent Crisis

Item	Key Measures
1	2
	<ul style="list-style-type: none"> • Cumulative increase in the interest rate ceilings on FCNR (B) and NR(E) RA term deposits by 175 basis points each since September 16, 2008. • Proposals from Indian companies to prematurely buyback their FCCBs was to be considered under the approval or automatic route, depending on the extent of discount of the FCCBs and the source of funds, subject to compliance with certain stipulated conditions. (The buyback should be financed by the company's foreign currency resources held in India or abroad and/or out of fresh external commercial borrowing (ECB) raised in conformity with the current norms for ECBs). Extension of FCCBs was also to be permitted at the current all-in-cost for the relative maturity.
ECB Norms	<ul style="list-style-type: none"> • The all-in-cost ceiling for ECBs of average maturity period of three to five years and of maturity period over five years was enhanced to 300 basis points above LIBOR and 500 basis points above LIBOR, respectively. The all-in-cost ceiling for trade credit less than three years was enhanced to 6-month LIBOR plus 200 basis points. • ECBs up to US\$ 500 million per borrower per financial year were permitted for rupee/foreign currency expenditure for permissible end-uses under the automatic route. • The definition of infrastructure sector for availing ECB was expanded to include mining, exploration and refinery sectors. Payment for obtaining license/permit for 3G spectrum by telecom companies was classified as eligible end-use for the purpose of ECB. • The requirement of minimum average maturity period of 7 years for ECB of more than US\$ 100 million for rupee capital expenditure by the borrowers in infrastructure sector was dispensed with. • Borrowers were granted the flexibility to keep their ECB proceeds offshore or keep it with the overseas branches/subsidiaries of Indian banks abroad or to remit these funds to India for credit to their rupee accounts with AD category-I banks in India, pending utilisation for permissible end-uses. • NBFCs exclusively involved in financing of the infrastructure sector were permitted to avail of ECBs under the approval route from multilateral/regional financial institutions and Government- owned development financial institutions for on-lending to the borrowers in the infrastructure sector, subject to compliance with certain conditions.

