
Bank lending channel of monetary policy transmission: India and the global financial crisis

M. Shahidul Islam

Institute of South Asian Studies,
469A Bukit Timah Road,
#07-01 Tower Block,
259770 Singapore
E-mail: isasmsi@nus.edu.sg

Ramkishan S. Rajan*

School of Public Policy,
George Mason University,
3401 N. Fairfax Drive,
Arlington, VA 22201, USA
E-mail: rrajan1@gmu.edu
*Corresponding author

Abstract: This paper examines the role of bank lending channel of monetary policy in India during the global financial crisis, especially following the collapse of Lehman Brothers in late 2008. Contrary to popular perceptions, and in contrast to the USA, this paper shows that following the Reserve Bank of India's aggressive monetary easing measures, bank credit growth in India maintained robust growth even in the midst of severe global financial crisis. However, there is a clear distinction between the private and public sector bank's lending behaviour. The crisis has clearly shown that banks will remain an important channel of monetary transmission in India.

Keywords: bank lending channel; Federal Reserve; global financial crisis; India; RBI; Reserve Bank of India; USA.

Reference to this paper should be made as follows: Islam, M.S. and Rajan, R.S. (2011) 'Bank lending channel of monetary policy transmission: India and the global financial crisis', *Int. J. Economics and Business Research*, Vol. 3, No. 5, pp.557–575.

Biographical notes: M. Shahidul Islam is a Research Associate at the Institute of South Asia Studies (ISAS) in the National University of Singapore (NUS). Prior to joining ISAS, he worked as a Research Associate with Policy Consultancy Associates from September 2005 to March 2007. He also worked as a Research Associate at the Institute of Southeast Asian Studies (ISEAS) from September 2004 to August 2005 where he was the Assistant Editor of ASEAN Economic Bulletin (AEB), ISEAS' in-house research journal. His research interest includes financial liberalisation, global financial imbalances, economic catch-up and demography and development.

Ramkishan S. Rajan is an Associate Professor in the School of Public Policy at George Mason University (GMU), a position he has held since January 2006. He is also Co-director of the Center for Emerging Markets Policy (CEMP) at

GMU. He is also a Visiting Senior Research Fellow and joint coordinator of the Regional Economic Studies Program at the Institute of Southeast Asian Studies (ISEAS) in Singapore. Previously, he was on the Faculty of the School of Economics at the University of Adelaide for five years and continues to be a Visiting Faculty there. He has held shorter visiting positions at the Asian Development Bank Institute (ADBI), Hong Kong Institute of Monetary Research (HKIMR) Institute of South Asian Studies (ISAS), National University of Singapore (NUS), Institute of Policy Studies (IPS), Singapore and other institutes in Asia.

1 Introduction

The ongoing global financial crisis has reignited a number of debates pertaining to financial regulation, capital account openness, as well as the effectiveness of fiscal and monetary policies. With regard to monetary policy specifically, the crisis has highlighted the need to revisit the monetary policy transmission mechanism, and in particular, the role of banking system in this process. In a nutshell, the monetary policy transmission mechanism refers to the channels via which monetary policy actions feed through the system and ultimately impact the real economy.¹ The conventional channels of monetary policy concentrate on the impact via various asset markets. Firstly, lower policy interest rates decrease the cost of capital, thus stimulating investment demand and demand for consumer durables. Secondly, lower policy interest rates lead to a flow of funds to other assets, such as equities, causing a rise in asset prices and this stimulates consumption demand (through the wealth effect) and investment demand (through the so-called Tobin's q effect).² Finally, other things equal, lower interest rates tend to cause the currency to depreciate, hence stimulating net exports.

However, in the presence of market information asymmetries and other market inefficiencies in financial markets, the conventional channels of monetary policy may not always operate effectively.³ This in turn has led to focus on the 'credit view' of monetary transmission which places central attention on the role of banks. There are different channels within the broad rubric of the credit view. In this paper, we limit our analysis to the bank lending channel of monetary policy transmission, an important but oft-neglected channel.⁴ Financial reforms may have led to a decrease in the relative importance of the bank lending over the years in the USA and elsewhere in much of the developed world. However, it remains a crucial channel in many developing economies, including India, where many companies especially small- and medium-sized enterprises (SMEs) are highly dependent on bank loans with no close substitutes when it comes to financing. Indeed, a recent empirical study by Pandit et al. (2006) confirms the significance of bank lending channel in India.⁵ The bank lending channel, which ordinarily works quite effectively during normal circumstances, can breakdown during times of financial stress, as appears to have been the case in the ongoing global financial crisis. This paper examines the role of banks in the transmission of monetary policy in India during the crisis period.

2 The bank lending channel and credit crunch: a simple exposition

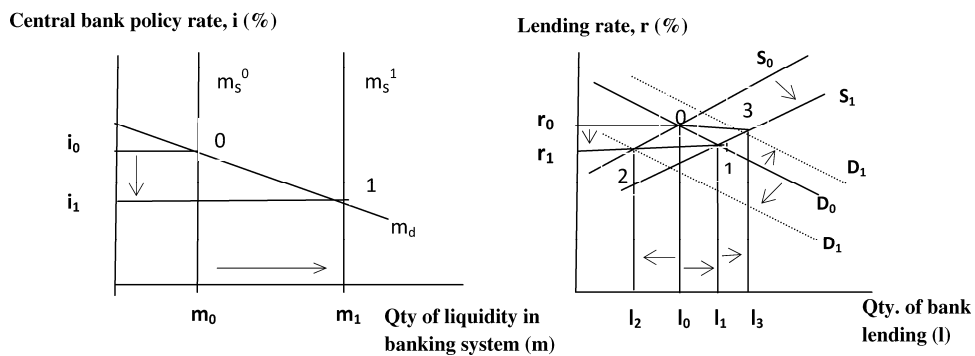
The bank lending channel places central emphasis on the role of banks in the financial system as these types of financial institutions are considered to be well-suited to solve the information problems/asymmetries that are prevalent in the credit markets. In the presence of information frictions, publicly issued bonds and bank intermediated loans are not very close substitutes. As a result, a large number of firms depend on commercial banks for funding, particularly SMEs. The basic idea behind the bank lending channel is as follows: an expansionary monetary policy raises the excess reserves of banks, leading to lower bank lending rates, hence increasing bank lending and economic activity.

In the case of India, the major monetary policy instruments used by the Reserve Bank of India (RBI) include:

- 1 the repo rate which is the rate at which RBI injects rupee liquidity in the banking system
- 2 the reverse repo rate which is the rate at which RBI sucks excess rupee liquidity from the market
- 3 the cash reserve ratio (CRR) which is the minimum reserves each bank must hold to customer deposits and notes
- 4 the statutory liquidity ratio (SLR) which is the ratio of total demand and time liability that a bank has to maintain in form of cash, gold or other approved securities with the RBI.⁶

At a broad conceptual level the basic bank lending channel in India operates as follows. A reduction in RBI's policy rate (repo rate) or downward adjustment of CRR and SLR infuses liquidity into the banking system. This greater liquidity from the central bank at lower costs in turn increases the supply of bank credit (from S_0 to S_1), leading to a fall in bank lending rates (from r_0 to r_1) and a consequent rise in the quantity of bank lending (from l_0 to l_1) (Figure 1).

Figure 1 A simple illustration of the bank lending channel



Source: Authors.

However, during a situation of bank distress, infusions of liquidity into the banking system may not readily translate into a rise in bank lending as banks become highly risk averse – especially in the face of growing non-performing loans (NPLs) and eroding capital bases (‘capital crunch’) – and choose instead to hoard funds. In the context of Figure 1, this implies that there is little or no shift in the supply of bank lending curve despite the increase in liquidity to the banking system by the central bank. This in turn implies no change in bank lending rates or the quantity of bank lending.

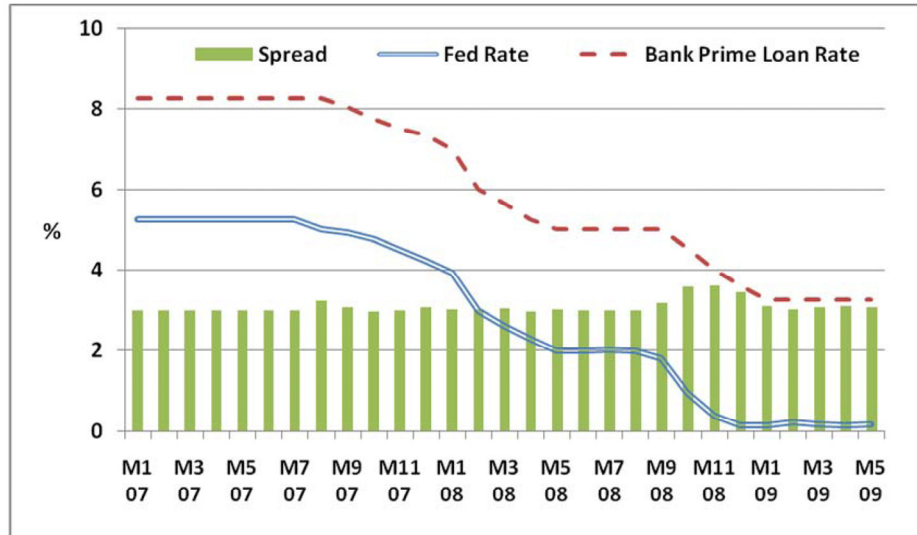
It is, of course, possible that due to moral suasion from the central bank or for some other reason, banks may feel obliged to lower lending rates (r_1). However, if this is the case, they could still choose to restrict lending (to l_2). While some might interpret this situation as one of disequilibrium, i.e. mandated ceiling interest rate, causing an excess demand over supply, from a bank’s perspective, they may view effective demand as having declined as there are fewer creditworthy customers who would qualify for bank loans (i.e. from the bank’s perspective, demand has shifted from D_0 to D_1). This is a situation where monetary policy transmission breaks-down in the sense that central bank-infused liquidity into the banking system does not find its way to the rest of the economy; credit is clogged up in the banks. This is the classic credit crunch where the problem is not so much the *cost of funds* but the *availability of funds* and there is an endless debate about whether the lack of credit creation is because banks are not lending or there are not enough ‘credit-worthy’ customers as perceived by the banks.⁷ The relevant point here, however, is that increases in reserve money without any corresponding expansion of broad money will show up as a decline in broad money multiplier – the ratio of broad money to base money.

2.1 *Bank lending story in the USA*

For instance, in the case of the USA, as part of the monetary easing programme in response to the crisis, the Fed funds rate were cut to its lower bound (setting a target between 0% and 0.25%) and the bank prime loan rate in the USA subsequently declined in line with the Fed rate cut (see Figure 2). However, there was a sharp rise in the LIBOR-OIS spread (a measure of the degree of risk aversion of banks) in September–October 2008⁸ (Figure 3). Given this risk aversion, banks were not extending credit to the public, choosing instead to hoard reserves or place them in government securities, consequently leading to a drop in the money multiplier (Figure 4).⁹

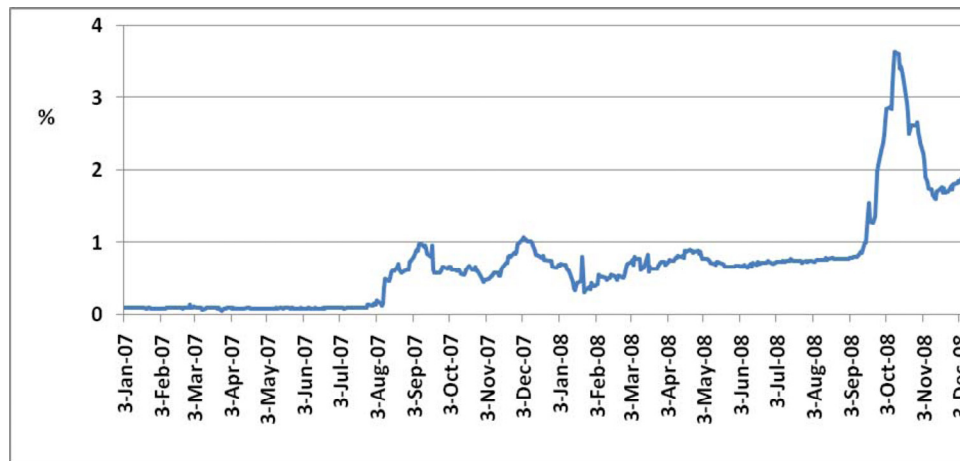
More precisely, thanks to a massive credit easing programme the monetary base (M0) in the USA more than doubled from US\$843 billion in August 2008 to US\$1.75 trillion in May 2009.¹⁰ However, broad money growth did not increase at the same pace.¹¹ As a result, the money multiplier collapsed from 9.1 in August 2008 to 4.7 in April 2009. In other words, the gigantic increase in Fed balance sheet did not translated into credit growth as banks chose to hold the excess reserves rather than make loans to the private sector.¹²

Figure 2 The spread between Fed funds rate and the US bank prime loan rate, M1:2007–M5:2009 (see online version for colours)



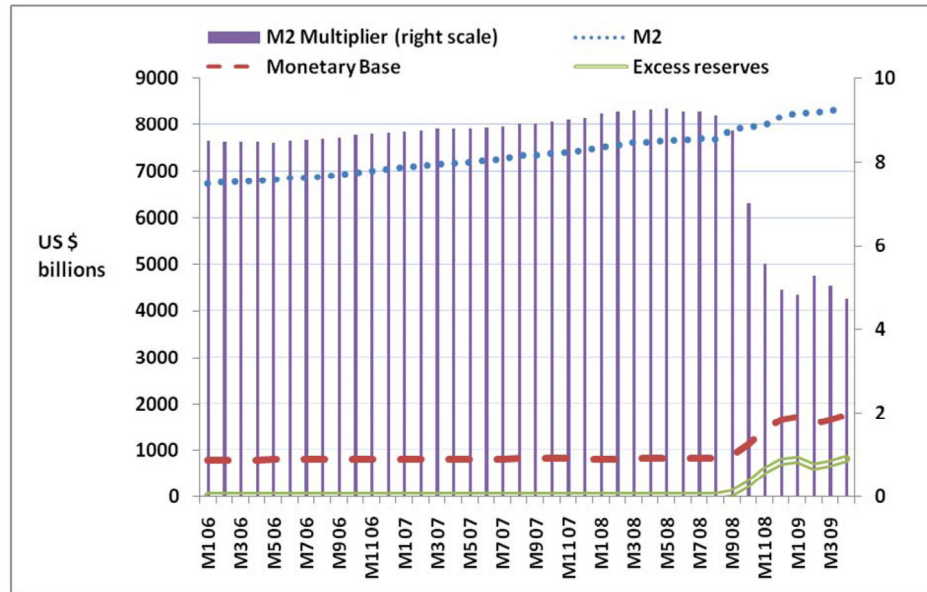
Source: Based on the Federal Reserve Bank of St. Louis, Available at: <http://stlouisfed.org>, USA.

Figure 3 LIBOR-OIS spread on daily basis, M1:2007–M12:2008 (see online version for colours)



Source: Based on the Federal Reserve, Saint Louis, <http://stlouisfed.org> and the British Banker’s Association, Available at: <http://www.bba.org.uk>.

Figure 4 Trends in monetary base, broad money, excess reserves and M2 multiplier in the USA, M1:2006–M4:2009 (see online version for colours)



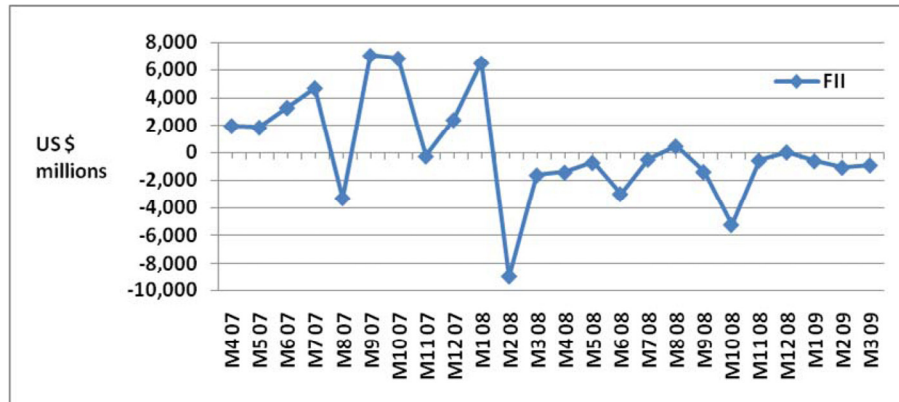
Source: Based on the Federal Reserve Bank of St. Louis, Available at: <http://stlouisfed.org>, USA.

3 Monetary policy actions and bank lending in India during the crisis

The global financial crisis hit India initially via the financial channels, particularly following the collapse of the Lehman Brothers in September 2008 and consequent global deleveraging.¹³ Owing largely to massive outflows of foreign institutional investors (FIIs) funds from Indian equity market, the BSE Sensex, India's flagship equity index, witnessed a free fall from early 2008 and the Indian Rupee experienced a rapid depreciation *vis-à-vis* the US dollar (see Figures 5 and 6).

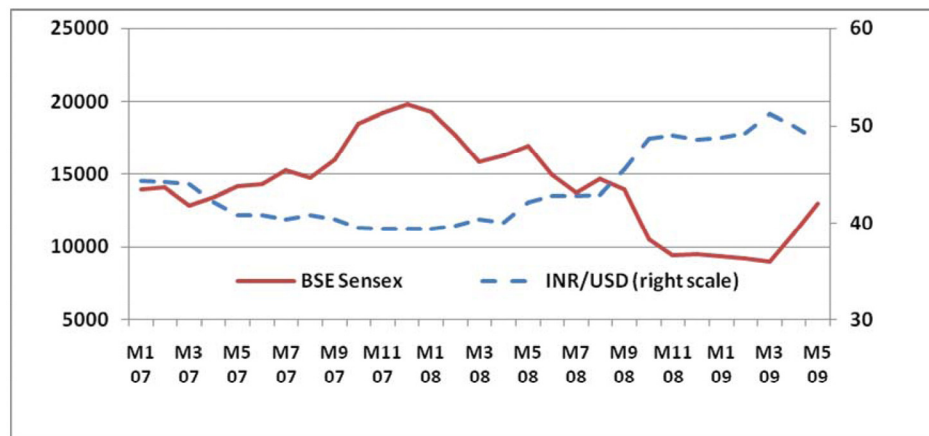
In addition, banks and corporates that had depended on global wholesale markets for 'cheap' foreign currency funding suddenly found themselves facing a major liquidity crisis as credit dried up as concern about counterparty risks sky-rocketed.¹⁴ As these entities turned to domestic banks and non-banks (such as mutual fund withdrawals) to refinance so as to remain liquid, there were huge pressures on domestic sources of liquidity. In the case of the banking sector these pressures were reflected most obviously in the sharp rise in volatilities in the Indian call money market. As apparent from Figure 7, the overnight interest rate (including CBLO) stayed above the ceiling of the RBI's liquidity adjustment facility (LAF) rate corridor in September–October 2008.¹⁵

Figure 5 Trends in FII flows in India, M4:2007–M3:2009 (see online version for colours)



Source: Based on Reserve Bank of India, Available at: www.rbi.org.in.

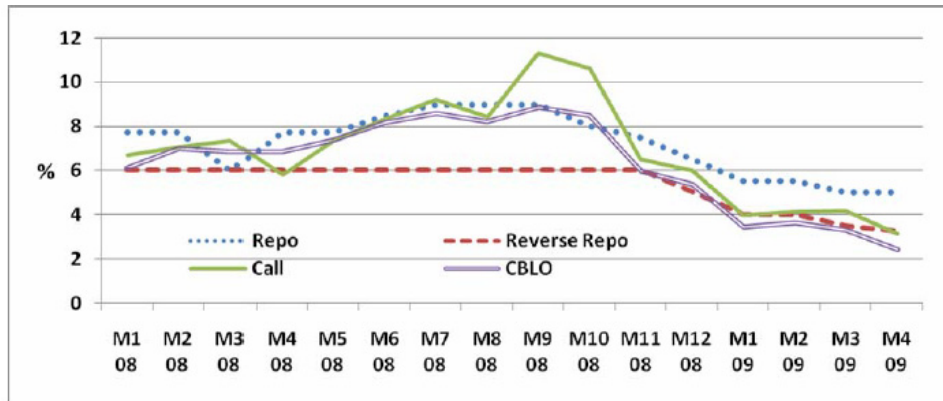
Figure 6 Trends in BSE sensex and rupee/USD exchange rate, M1:2007–M5:2009 (see online version for colours)



Source: Based on Reserve Bank of India, www.rbi.org.in and Bombay Stock Exchange Ltd., Available at: www.bseindia.com.

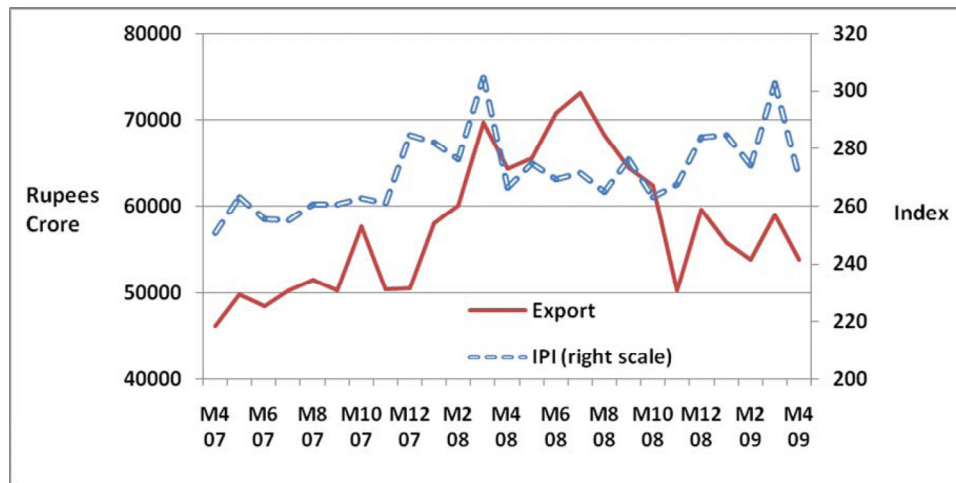
The wealth destruction in India and globally due to asset price declines as well as the increased cost of credit inevitably caused the country’s export growth to plunge and industrial production to decelerate in August–November 2008 (Figure 8).

Figure 7 Trends in repo, reverse repo, call money and CBLO rate, M1:2008–M4:2009 (see online version for colours)



Source: Based on the Reserve Bank of India, www.rbi.org.in and the Clearing Corporation of India Ltd., Available at: www.ccilindia.com.

Figure 8 Trends in export and industrial production index, M4:2007–M4:2009 (see online version for colours)



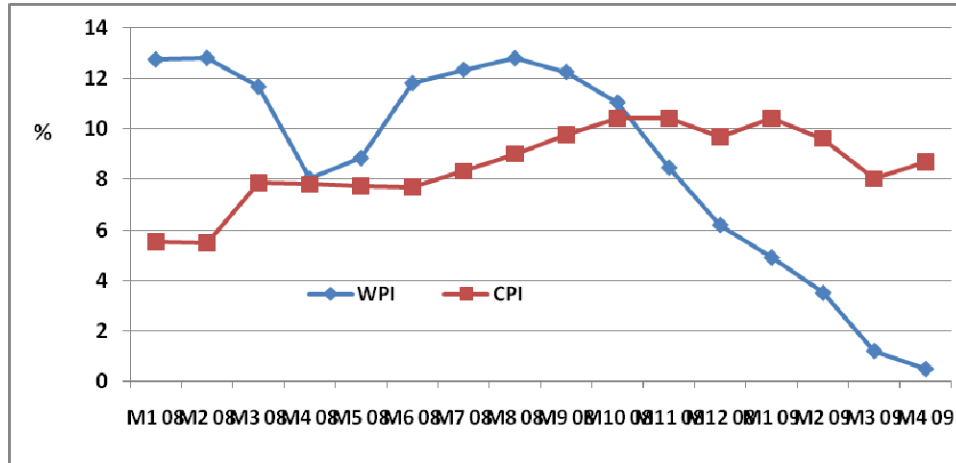
Source: Based on the Reserve Bank of India, www.rbi.org.in and the Ministry of Statistics and Programme Implementation, Government of India.

3.1 RBI's monetary policy actions and impact

Given the RBI's concerns about inflation, it continued to maintain a tight monetary stance until September 2008. However, thanks to the collapse of commodity prices and the knock-on demand-reducing effects of the global financial crisis, inflation started to subdue, especially in terms of the wholesale price index (WPI) (see Figure 9). Concurrently, the gravity of the financial crisis became apparent, and from mid September–October 2008, the RBI took several policy measures to ease both the rupee

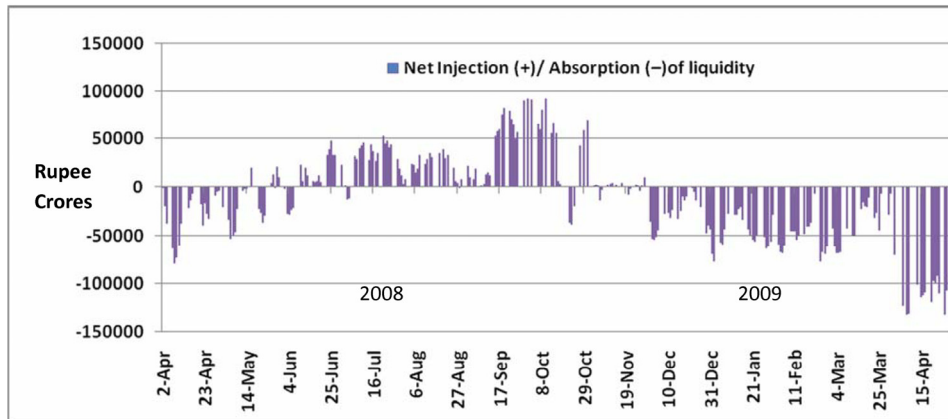
and the foreign exchange liquidity conditions in the financial system. With regard to domestic liquidity, the RBI reduced the key policy rates (the repo and the reverse repo) via the LAF (Figure 10; also see Figure 7), while the CRR and SLR were cut sharply.¹⁶ Fresh government bond issuances under market stabilisation scheme (MSS) were stopped and existing MSS bonds was undertaken.¹⁷

Figure 9 Change in wholesale price index (WPI) and consumer price index (CPI) (year-on-year variation), M1:2008–M4: 2009 (see online version for colours)



Source: Based on Labour Bureau, Ministry of Labour, Government of India.

Figure 10 Net injections and absorption of liquidity under the LAF on daily basis, 2008–2009 (see online version for colours)



Source: Based of Reserve Bank of India, Available at: www.rbi.org.in.

Foreign exchange liquidity was eased by loosening restrictions on external commercial borrowings (ECBs) and short-term trade credits, while interest rate ceilings on non-resident deposits were raised in order to attract more foreign funds into the country. The RBI which had allowed the rupee to depreciate until September 2008, shifted to currency intervention to manage the rupee decline by leaning-against-the-wind, hence releasing further foreign exchange into the market.¹⁸ The monetary policy operation and the extension of liquidity facilities released liquidity amounting to over Rs. 490,000 crore (about 9% of India's GDP) from mid-September 2008 to March 2009 (Table 1).

How did these monetary measures affect the growth of reserve money, broad money and non-food credit. As can be seen in Figure 11, since June 2008 the growth of reserve money has declined sharply (year-on-year) until March 2009. The two main reasons for this deceleration were the decline in net foreign assets (NFA) due to a loss of foreign exchange reserves, and more importantly, the decline in the CRR, which implied lower net domestic assets (NDAs) due to a fall in bank reserves with the RBI. Infusions of liquidity by the RBI via the LAF and other quasi-open market operations helped to offset partially some of these declines.¹⁹ More importantly for the economy is the fact that credit and broad money continued to grow at a stable and robust rate. The decline in reserve money and consequent increase in broad money inevitably implied a sharp rise in the money multiplier (Figure 12), in sharp contrast to the USA, as discussed above. The fact that credit was rising robustly implies that there was no significant credit crunch in India during the period under consideration.

To further emphasise this point one can also look at the broad picture of credit by examining trends in the ratios of monetary and credit to GDP. As monthly GDP data are not available we have employed the industrial production index (IPI) as a proxy of GDP. As depicted in Figure 13, neither the M3-to-IPI nor credit-to-IPI ratios dropped below their past trends and have in fact increased marginally. Hence, contrary to prevailing perceptions, analysis based on different indicators shows that monetary and credit growth in India have been maintained at their historic growth trends even in the midst of severe global economic crisis.

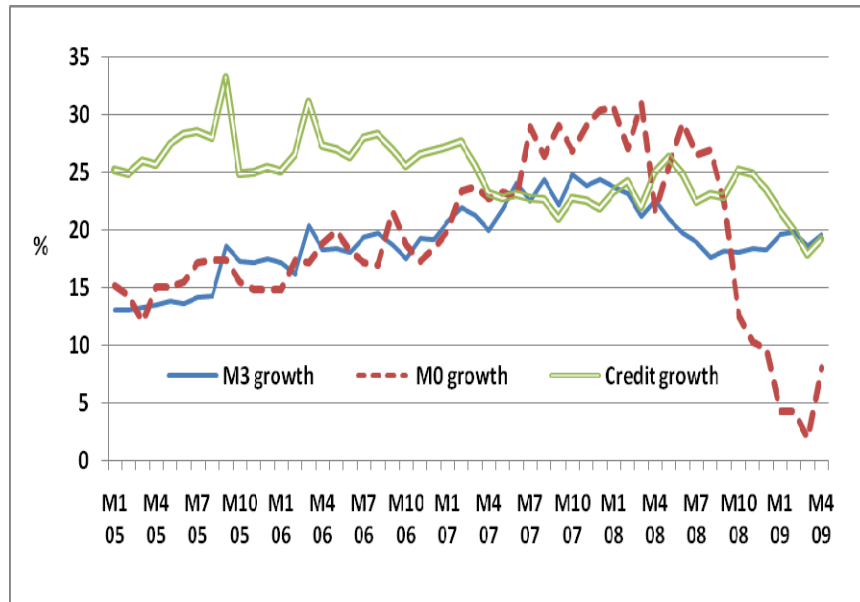
Table 1 Actual/potential release of primary liquidity

<i>Measure/facility</i>	<i>Amount (Rs. crore)</i>
<i>Monetary policy operations</i>	
1 CRR reduction	160,000
2 Open market operations	68,835
3 MSS unwinding/de-sequestering	97,781
<i>Extension of liquidity facilities</i>	
4 Term repo facility	60,000
5 Increase in export credit refinance	25,512
6 Special refinance facility for SCBs (non-RRB)	38,500
7 Refinance facility	16,000
8 Liquidity facility for NBFCs through SPV	25,000
Total (1–8)	491,628
<i>Memo</i>	
SLR reduction	40,000

Note: SCB: scheduled commercial bank, RRB: regional rural bank, SPV: special purpose vehicle.

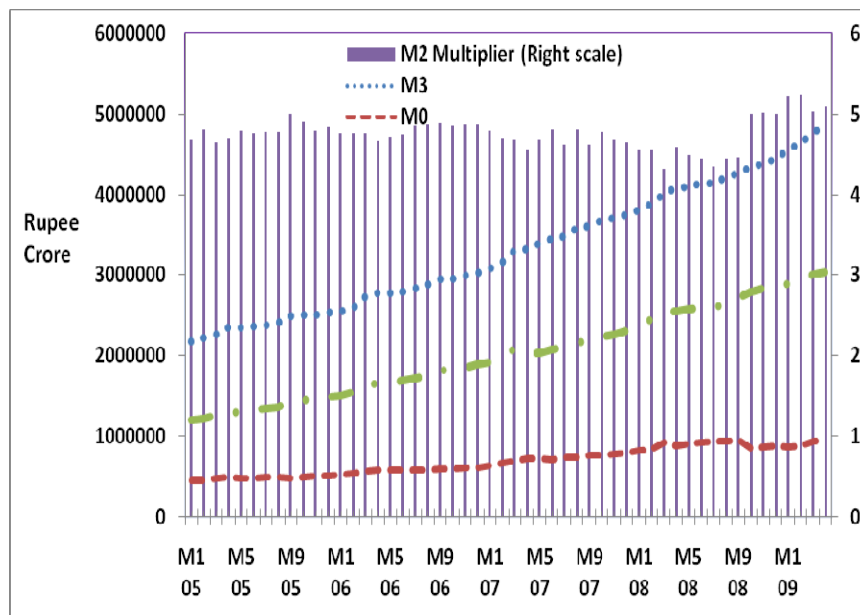
Source: Mohan (2009a) and Subbarao (2009).

Figure 11 Year-on-year growth in base money, broad money and commercial credit, M1:2005–M4:2009 (see online version for colours)

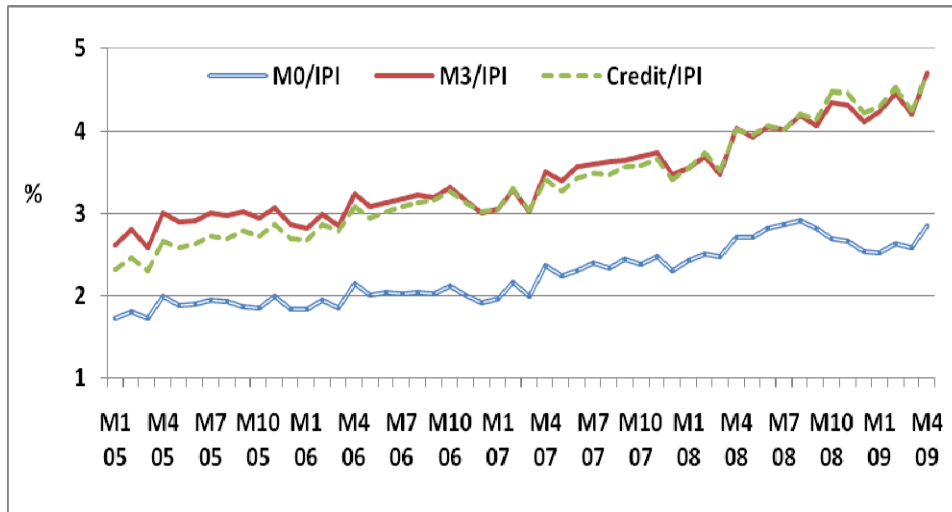


Source: Based on Reserve Bank of India, Available at: www.rbi.org.in.

Figure 12 Trends in base money, broad money, credit and broad money multiplier in India, M1:2005–M4:2009 (see online version for colours)



Source: Based on Reserve Bank of India, Available at: www.rbi.org.in.

Figure 13 Change in the ratios of base money to IPI, broad money to IPI and commercial credit to IPI, M1:2005–M4 2009 (see online version for colours)

Source: Based on the Reserve Bank of India, Available at: www.rbi.org.in and the Ministry of Statistics and Programme Implementation, Government of India.

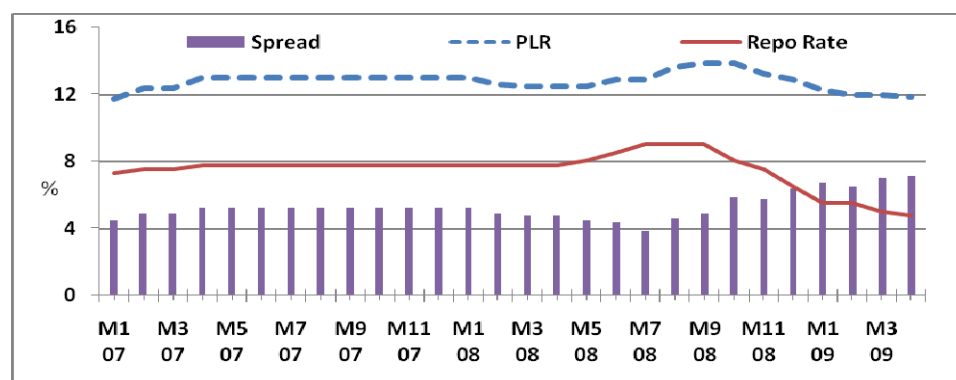
Overall, the monetary actions clearly eased the liquidity crunch in India, as seen by the decline in the call rates which mostly remained within the informal corridor set by the repo and reverse repo rates of the LAF (see Figure 7). The added liquidity has partly offset the drying-up of non-bank sources of funds. For instance, by December–January of the fiscal year 2008–2009, credit from the banking sector accounted for 60% of the total credit, whereas non-bank was the source of 55% of credit in comparable period of 2007–2008.²⁰

3.2 Bank lending in India during the crisis

Despite the seeming success of RBI's policy interventions to offset any potential credit crunch, surprisingly bank lending rate has not declined in line with the RBI's credit easing policies. As depicted in Figure 14, the repo rate has declined sharply but the prime lending rate (PLR) has not fallen at the same pace, with the result that the spread between the two rates remains high. However, the credit-deposit (C/D) ratio has fluctuated between 72% and 75% which is comparable with the record high C/D ratios in recent years. So banks were clearly lending.²¹

Conceptually, one can reconcile these seemingly contradictory facts, viz. robust lending but downward rigidity in lending rates, if one believes that the increase in supply of loans was also matched by an increase in demand, such that overall lending grows but there is little or no change in lending rates (point 3 in Figure 1). As noted, in the case of India, there was a significant rise in demand for funds domestically as many corporate shifted from overseas borrowing (which had dried up) to domestic sources, including banks.

Figure 14 The interest rate spread between repo rate and prime lending rate, M1:2007–M4:2009 (see online version for colours)



Source: Based on the Reserve Bank of India, Available at: www.rbi.org.in.

In addition, there are some structural issues concerning further downward adjustments in *prime lending rates*. The PLR adjustment is directly linked to the rate of inflation and deposit rates. The WPI inflation in India has declined in the recent past but the consumer price inflation (CPI) has still hovered at about 8% to 10% as it tends to react with a lag (Figure 9). The deposit rates in commercial banks are generally 2% higher than the CPI inflation rate to ensure that savers get positive returns. The inability of banks to reduce deposit rates may have limited their scope somewhat to lower lending rates despite the lower repo rates. In addition, the maturity period of deposits may be another consideration when banks cut lending rates. Indian banks raised the saving deposit (those with higher maturity periods, 1–3 years) during high inflation period. These rates cannot automatically be adjusted downward even if inflation rate comes down. The bulk of banks' time deposits continue to be at fixed interest rates. Banks may, therefore, need some time to reprice their loans. Further complicating things are that the interest rates on small savings are not market-determined and cannot be reduced easily.

Apart from structural problems that hinder the reduction of the PLR, the other issue is moral suasion. The RBI has been able to influence the public sector banks – that accounted for over 70% loan growth in 2008–2009²² – to reduce PLR and increase credit flows, but private and foreign commercial banks have been rather reluctant or slow to respond to such calls.²³ As shown in Tables 2 and 3, the private sector and foreign commercial banks showed clear conservatism, both in terms of increasing credit flows to the private sector in March 2008–2009. Private and foreign banks appear to have chosen to park some of the excess liquidity at the RBI's reverse repo window and investing in SLR securities (Figures 10 and 15). This explains why there has been a rise in SLR bonds despite the RBI having lowered the SLR rate.

Table 2 Credit flows from scheduled commercial banks (in %, year-on-year changes)

	4 January 2008	4 January 2009	28 March 2008	28 March 2009
Public sector banks	19.8	28.6	22.5	20.4
Private banks	24.2	11.8	19.9	10.9
Foreign banks	30.7	16.9	28.5	4.0

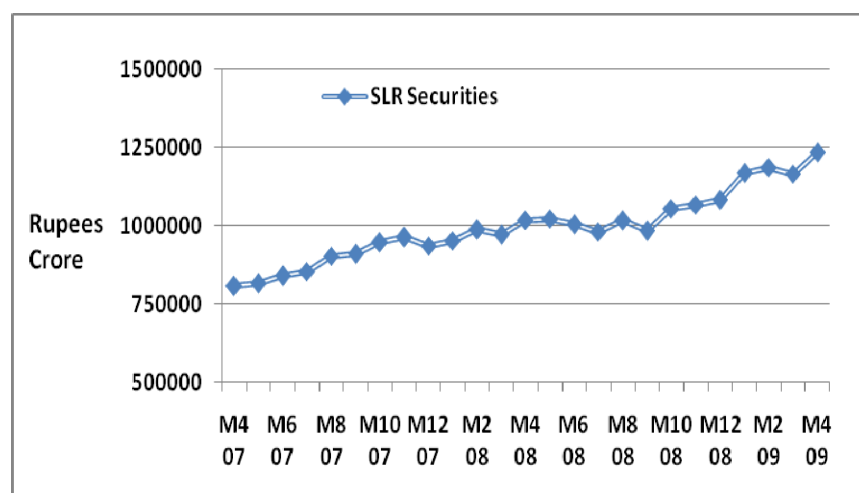
Source: Macroeconomic and Monetary Development, Various Issues, RBI.

Table 3 Reduction in deposit and lending rates in India: M10:2008 to M4 2009 (in basis point)

	<i>Deposit rate</i>	<i>Lending rate</i>
Public sector banks	125–250	125–225
Private sector banks	75–200	100–125
Top 5 foreign banks	100–200	0–100

Note: A basis point is one-hundredth of 1%.

Source: Business Standard (29 April 2009).

Figure 15 Investment in SLR securities, M4:2007–M4:2009 (see online version for colours)

Source: Based of Reserve Bank of India, Available at: www.rbi.org.in.

4 Conclusions

One might reasonably argue that the RBI, being an inflation hawk, was insufficiently sensitive to the global financial crisis early on by not lowering policy interest rates fast enough in the first instance as it was fighting the last battle (i.e. commodity price-induced inflation).²⁴ Nonetheless, once the RBI realised the magnitude of the problem, its response was swift and decisive. In the face of huge reversals in foreign capital flows to India, the RBI's injection of domestic liquidity stabilised the domestic credit markets, hence minimising the negative fallout of the global turmoil on the real economy. Monetary policy response was especially important in India given the limited fiscal space compared to China and its other East Asian neighbours (Rajan, 2009).²⁵ These responses were especially effective since India by-and-large has had a strong and well-capitalised banking system.²⁶

Bank lending will always remain an important source of finance for SMEs that may not be able to access alternative sources of finance. However, the global liquidity crisis has emphasised that during the period of acute global risk aversion and distress, domestic banks in India were critical as a sources of financing even to large corporates that might otherwise raise funds in the international capital markets. The bank lending channel in India operated fairly well in the midst of the global credit crunch, and India does not

appear to have faced a severe domestic credit crunch as experienced in the USA and elsewhere. This in turn may have been because the Indian banking sector is largely controlled by public sector banks (in terms of total assets, deposits and advances).²⁷ These public banks have been more responsive to the RBI's moral suasion and other credit easing measures compared to private sector banks – particularly foreign banks – which have shown severe conservatism in terms of bank lending during the crisis period. This may have lessons for further liberalisation of India's banking sector going forward, though these possible macro stability gains must be traded-off against possible microeconomic benefits from greater private sector competition.

Acknowledgements

Comments by an anonymous referee are appreciated. The usual disclaimer applies.

References

- Bernanke, B.S. and Blinder, A.S. (1998) 'Credit, money, and aggregate demand', *American Economic Review Papers and Proceedings*, Vol. 78, May, pp.435–439.
- Bernanke, B.S. (2007) 'The financial accelerator and the credit channel', *Speech Delivered at the Credit Channel of Monetary Policy in the Twenty-first Century Conference*, Federal reserve Bank of Atlanta, Georgia, 15 June.
- Bernanke, B.S. and Gertler, M. (1995) 'Inside the black box: the credit channel of monetary policy transmission', *Journal of Economic Perspectives*, Vol. 9, pp.27–48.
- Business Standard (2009) *Will Banks Now Start Lending More*. 27 April.
- Gopalan, S. and Rajan, R.S. (2009) 'Financial sector deregulation in emerging Asia: focus on foreign bank entry', *The Journal of World Investment and Trade*, Vol. 11, pp.91–108.
- Government of India (2009) 'Economic Survey 2008-09', Available at: <http://indiabudget.nic.in/ub2008-09/ubmain.htm>.
- Harrison, E. (2008) 'Libor-OIS spread at an All-time High', *RGE Monitor*, 25 September.
- Mishkin, F. (1996) 'The channels of monetary transmission: lessons for monetary policy', *Banque De France Bulletin Digest*, No. 27, March.
- Mohan, R. (2007) 'Development of financial markets in India', Available at: <http://www.bis.org/review/r070523e.pdf>.
- Mohan, R. (2009a) 'Global financial crisis: causes, impact, policy responses and lessons', *RBI Bulletin*, May.
- Ouyang, A. and Rajan, R.S. (2008) 'Reserve stockpiling and managing its liquidity impact: the case of India', *Macroeconomics and Finance in Emerging Market Economies*, Vol. 1, pp.75–91.
- Pandit, B.L., Mittal, A., Roy, M. and Ghosh, S. (2006) *Transmission of Monetary Policy and the Bank Lending Channel: Analysis and Evidence from India*, Study No. 25, Department of Economic Analysis and Policy, Reserve Bank of India.
- Rajan, R.S. (2009) 'Asia and the global financial crisis: a broad overview', *ISAS Insights* No. 76, 13 July, Institute of South Asian Studies, Singapore.
- Rangarajan, C. and Arif, R.R. (1990) 'Money, output and prices, a macroeconomic model', *Economic and Political Weekly*, Vol. 25, pp.837–852.
- Reserve Bank of India (1998) *Report on Trend and Progress of Banking in India*, RBI: Mumbai.

- Shah, A. (2008) 'The policy rate expressed in real terms', Available at: <http://ajayshahblog.blogspot.com/2009/04/policy-rate-expressed-in-real-terms.html>.
- Subbarao, D. (2009) 'Third quarter review of monetary policy 2008-09', Available at: http://www.business-standard.com/general/pdf/rbi_270109_01.pdf.

Notes

- ¹We assume – quite realistically – that prices are sticky, such that changes in nominal variables impact the real economy in the short-term at least.
- ²Tobin's q is the ratio of the market value of a firm's assets (as measured by the market value of its outstanding stock and debt) to the replacement cost of the firm's assets. It is believed that investment demand is positively associated with this ratio.
- ³Bernanke and Gertler (1995) discuss the limitations of the monetary channel of monetary policy. According to the authors, it is difficult to explain the magnitude, timing and the composition of the economy's response to monetary policy shocks merely in terms of neoclassical cost-of-capital effects.
- ⁴The bank lending channel of monetary policy was formalised by Bernanke and Blinder (1998). For a readable overview of the various channels of monetary policy, see Mishkin (1996). The other notable channel within the Credit view is the balance sheet channel which works as follows: expansionary monetary policy causes a rise in equity prices that raises the net worth of firms leading to higher investment spending and aggregate demand. Also see Bernanke (2007).
- ⁵Also see Rangarajan and Arif (1990).
- ⁶There is also which is the rate at which RBI lends to the commercial banks the bank rate. However, this rate is used very inactively by the RBI and the repo rate has become a *de facto* policy rate.
- ⁷Alternatively there may be no credit crunch in that lending has decreased because the demand for lending has actually gone down and firms and consumers cut spending.
- ⁸In August 2006 before the credit crisis, this spread averaged eight basis points but reached 200 basis points in September 2008 (Harrison, 2008).
- ⁹As conventional monetary policy reached its limit (following short-term interest rate coming down to near zero), the Fed switched to a policy of quantitative easing.
- ¹⁰The monetary base is defined as currency in circulation and bank demand deposits at the Fed or central monetary authorities.
- ¹¹M2 refers to broad money in the case of USA and M3 to India.
- ¹²For instance, in April 2009, the total reserves (US\$882 billion) accounted for 50% of M0 (US\$1.75 trillion). Of this, US\$824 billion was bank's excess reserves and only US\$58 billion (or 6% of the total reserves) was available for credit (see Fed St Louis website for details).
- ¹³See Rajan (2009).
- ¹⁴The non-bank sources of funds include issuances in capital markets, commercial paper, non-banking financial companies (NBFCs), financial institutions, ECBs, issuances of American Depository Receipts (ADRs)/Global Depository Receipts (GDRs) and foreign direct investment (FDI). See Mohan (2009a) for details on the extent of drying up of these external sources of finance.
- ¹⁵CBLO stands for Collateralised borrowing and lending obligations and it is a type of money market instrument. Mohan (2007) offers a useful description of the CBLO: "In line with the objective of widening and deepening of the money market and imparting greater liquidity to the market for facilitating efficient price discovery, new instruments, such as collateralised lending and borrowing obligations (CBLO), have been introduced. Money market instruments such as market repo and CBLO have provided avenues for non-banks to manage their short-term liquidity mismatches and facilitated the transformation of the call money market into a pure inter-bank market" (p.2).

¹⁶The repo rate was reduced by 350 basis points to 5.5% in mid-October 2008 to 4.75% in April 2009, and the reverse repo rate was cut by a cumulative 200 basis points from 6% to 4% point in December 2008 to 3.25% in April 2009. The CRR was reduced from 9% in September 2008 to 5% by early January 2009 of net demand and time liabilities (NDTL) (Subbarao, 2009).

¹⁷MSS balances declined from Rs. 175,362 crore at end-May 2008 to around Rs. 88,000 crore by end-March 2009. See Ouyang and Rajan (2008) for a discussion of the MSS and monetary sterilisation in India pre-crisis.

¹⁸In addition, further rupee depreciation could have worsened the balance sheets of corporates that had borrowed in foreign currency on an unhedged basis. While FII outflows had stabilised somewhat by late 2008, the rupee in turn was under downward pressure primarily because corporates sold funds raised locally to repay external foreign currency loans that were due and not being rolled-over.

¹⁹Sharp declines in NFA (5% reduction in 2008–2009 compared to an expansion of over 25% in the corresponding period previous year) translated into a fall in reserve money growth (Economic Survey 2008–2009, Government of India). Nevertheless, the year-on-year growth in M0 (adjusted for changes in the CRR) was 19% at end-March 2009 compared with 25% in the previous year (Mohan, 2009a).

²⁰Macroeconomic and Monetary Development, January 2009, RBI.

²¹In India, the C-D ratios were 74.6 in 2006–2007, 74.2 2007–2008 and 72.3 in 2008–2009. However, in April 2009, the ratio was 70 (RBI Bulletin, various issues).

²²As of March 2009 (RBI, 2009).

²³See the Appendix for a brief discussion of where the lending by public banks was concentrated.

²⁴For instance, see Shah (2008).

²⁵This is not to suggest that fiscal policy was not effective. The fiscal policy responses taken during the crisis in the form of additional capital spending, cuts in indirect taxes, expanded guarantees for SMEs and infrastructure spending all helped, though the exact magnitude of the stimulus imparted is unclear.

²⁶Also see Mohan (2009a).

²⁷The public sector banks in India accounted for 69.9%, 73.9% and 72.6% of assets, deposits and loans in 2007–2008 (RBI, 2008). Also see Gopalan and Rajan (2010).

Appendix

Public bank lending during the crisis

While public banks were the ones that were increasing lending during the crisis period, it would be interesting to examine to whom these banks were lending. Table A1 exhibits the disaggregated data on sectoral deployment of non-food bank credit (NFC) (y-o-y growth). The credit growth in agriculture sector prior to and during the crisis has held steady and mainly been channelled to infrastructure, petroleum, coal products and nuclear fuels, iron and steel, engineering, construction, and chemical and chemical products industries. The last two columns show that 52.5% of the incremental non-food credit was absorbed by industry as compared with 45.2% in the corresponding period previous year. However, personal loans that accounted for 10.7% of the incremental NFC witnessed some moderation owing to a deceleration in personal loans and housing loans growth which arguably were more the domain of private bank lending. Of course, a cursory examination of NFC growth figures might not suffice to draw a conclusion that the bank lending has been channelled towards productive sectors. The monthly growth of IPI data can help somewhat answer the above concern. As depicted in Figure A1 petroleum, coal products and nuclear fuels, iron and steel, infrastructure have maintained a steady growth after September–October 2008 though they declined in the last two months of the fiscal year 2008–2009. Textile production was hardest hit but bounced back sharply likely as credit stresses eased with the RBI actions.

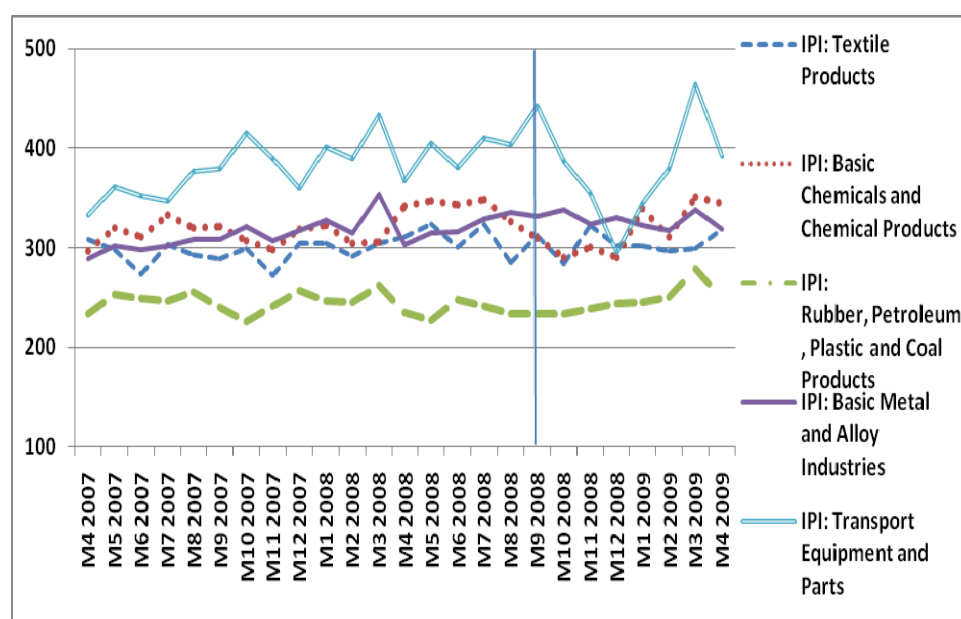
Table A1 Sectoral allocation of non-food bank credit: year-on-year variations (in %)

<i>Sector/industry</i>	<i>December 2007</i>	<i>December 2008</i>	<i>February 2008</i>	<i>February 2009</i>
Non-food bank credit	21.8	24.8	22.0	19.5
Agriculture and allied activities	19.3	22.7	16.4	21.5
Industry (small, medium and large)	24.9	30.2	25.9	25.8
<i>Small industries</i>	35.6	7.4	NA	NA
Personal loan	15.9	14.6	13.2	8.5
Housing	14.6	8.8	12.0	7.5
Advances against fixed deposit	12.8	23.6	15.6	6.7
Credit cards	45.3	69.6	51.3	8.8
Consumer durables	5.9	0.6	5.9	−14.5
Services	24.8	27.6	28.4	19.2
Transport	29.9	30.6	43.3	17.6
Trade	17.8	19.7	17.5	14.9
Real estate loans	35.8	48.1	26.7	61.4
Priority sector	19.6	13.0	16.9	19.2
Micro and small enterprises (Manufacturing and services)	NA	NA	67.4	35.4

Table A1 Sectoral allocation of non-food bank credit: year-on-year variations (in %) (continued)

Sector/industry	December 2007	December 2008	February 2008	February 2009
Industry (small, medium and large)	24.9	30.2	25.9	25.8
Textiles	24.0	18.4	23.0	12.5
Petroleum, coal products and nuclear fuels	18.6	114.5	23.3	78.2
Chemicals and chemical products	13.7	28.0	13.9	19.4
Rubber, plastic and their products	18.8	34.0	16.1	34.0
Iron and steel	31.8	24.7	19.2	37.0
Engineering	29.0	28.3	26.2	31.2
Construction	37.3	57.0	33.3	58.8
Infrastructure	37.1	38.5	42.1	35.1

Source: Macroeconomic and Monetary Development, Various Issues, RBI.

Figure A1 IPI for mining, manufacturing and electricity, April 2007–2009 (see online version for colours)

Source: Ministry of Statistics and Programme Implementation, Government of India.