9

Currency Management

Introduction

Currency management involves matching the supply of currency (notes and coins) to levels of demand, efforts to achieve self-sufficiency in the production of notes and coins, creating appropriate denomination mix, improvement in distribution networks, withdrawal and destruction of notes, and enhancement in the security features of currency notes. These responsibilities are discharged by the Department of Currency Management (DCM). The function of note issue and currency management is performed through the Reserve Bank's regional issue offices and sub-offices, and a wide network of currency chests maintained by banks and government treasuries spread across the country. The Bank also coordinates with various agencies such as the note printing presses, mints, railways, police, Indian Airlines (subsequently known as Air India) and the Indian Air Force.

The activities of the Bank in this field encompass both policy matters and institutional measures. The former includes forecasting annual requirements of coins and notes, liaising with the printing presses and mints, and dealing with security issues and counterfeits jointly with other agencies of the government. The latter includes periodic allocation of notes and coins amongst the Bank's regional offices, extending currency chest facilities to banks, processing and destruction of soiled notes, revision of policy and procedural guidelines on note exchange facility, adjudication of notes and responding to queries received in this regard, and various customer service issues.

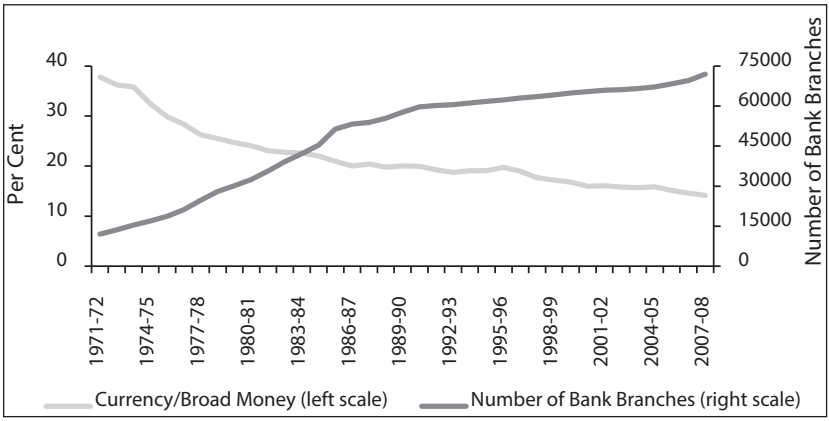
Notwithstanding the decline in the share of currency in broad money after the nationalisation of banks (July 1969, see Figure 9.1), cash remained an important mode of payment in the Indian economy. During the reference period, currency in circulation was an important indicator of economic activity, especially in rural India. Cash demand tended to increase at the beginning of the month, when salaries were spent, and tapered off towards the end of the

month. Similarly, currency seasonality, by and large, mirrored events, such as festivals, elections and the seasonality of economic activity.

The importance of cash in the economy made currency management a particularly significant operation as these impacted the economic and social fabric of a vast segment of the population in one form or other. The long-run secular decline in the share of currency in broad money, however, continued. The ratio had declined steadily from 40 per cent at the end of March 1971 to 16 per cent at the end of March 2001, and thereafter gradually to 14 per cent at the end of March 2009. The trend reflected financial deepening, increased use of credit and debit cards, and more liquid financial markets. Consistent with this trend, during the reference period, the thrust of currency management saw a shift from managing volumes to improving the quality of notes in circulation, tackling counterfeit notes and making note exchange easier.

The chapter starts with a brief account of trends in the circulation of banknotes, followed by a description of the currency chest mechanism. Three major areas of activity are taken up for discussion in the four subsequent sections: improvement of supply, management of quality, and avoidance and detection of counterfeits, partly by enhancing security features. The trends in supply and availability of coins and certain issues that surfaced in this regard are also narrated. The process of introduction of the post-print coating of notes and polymer notes, to improve the life of banknotes, forms the topic of the next section. The chapter ends with short sections on customer service and computerisation.

Figure 9.1 Share of Currency in Broad Money



Source: RBI, *Annual Report 2007–08*.

Notes in Circulation: Annual Trends

The Bank performs the function of note issue and currency management and acts as the sole currency authority for the issuance of banknotes. Notes in circulation (₹2 and above) increased by 10 per cent in 1998 over the previous year (at the end of March). In October 1997, the Bank introduced ₹500 notes in the Mahatma Gandhi series. With this, the introduction of the new family of banknotes in the Mahatma Gandhi series was complete except for notes in ₹20 denomination. To meet the demand–supply gap, 2,000 million pieces of ₹100 and 1,600 million pieces of ₹500 notes were imported.

At the end of 1999 and 2000, notes in circulation in terms of value rose by 16 per cent and 12 per cent, respectively. Against the increase of 11 per cent at the end of 2001, notes in circulation went up by 15 per cent at the end of 2002 due to the resurgence of agricultural activity. The growth in the share of various denomination groups during 1996–2001 (in terms of value and volume) showed a gradual shift towards higher denomination notes. However, a slowdown in rural economic activity in 2002–03 resulted in a deceleration in the value of notes in circulation (12 per cent at the end of 2003). In volume terms, there was a decline of 3 per cent in the circulation of notes, mainly because of the Bank's efforts to increase notes of ₹20 and ₹500 in lieu of the ₹10 and ₹100 denomination notes, respectively. The supply of fresh notes improved during the year through better capacity utilisation of the two printing presses of the Bharatiya Reserve Bank Note Mudran Private Limited (BRBNMPL), a wholly owned subsidiary of the Bank, and augmentation of capacity of the two government presses. During 2003–04, the total value of notes in circulation recorded a robust growth of 16 per cent. Efforts to keep pace with the rising volume of currency demand took the form of judicious distribution of available supplies, increase in the percentage of higher denomination notes, and ensuring recirculation of notes by use of machines for processing, verification and sorting.

In the 2000s, the demand for ₹500 denomination notes increased sharply due to the growing network of automated teller machines (ATMs). Notes of ₹100 and ₹500 denomination together accounted for 76.4 per cent of the total circulation in terms of value at the end of March 2004. During 2004–05, the value of notes in circulation registered growth of 12 per cent. However, in volume, there was a reduction of around 4 per cent, mainly due to change in the denomination-wise mix of banknotes based on region-wise and currency-chest-wise demand, an increasing number of ATMs, and a

gradual rise in the number of users of e-banking. In each of the years 2005–06, 2006–07 and 2007–08, the value of banknotes in circulation recorded a growth of around 17 per cent. There was a consistent and gradual shift towards higher denomination banknotes, particularly of ₹500 and ₹1,000. The demand for ₹500 notes picked up sharply due to the growing network of ATMs (see Box 9.1).

It may be observed from Table 9.1 that during the three years 2005–06, 2006–07 and 2007–08, there took place a consistent compositional shift (in terms of value) from lower denomination to higher denomination banknotes in circulation. The shift was evident in favour of ₹500 and ₹1,000 denominations. In contrast, the circulation of ₹5, ₹10, ₹20 and ₹50 denomination notes declined. The consistent shift from lower denomination to higher denomination banknotes could be attributed to the technological advancements (see Box 9.1), together with rising income levels. Table 9.1 reports the value of banknotes supplied by the presses in the last five years of the reference period. Figure 9.2 illustrates the process in which notes and coins entered the economic system, and were withdrawn from it. The trend in compositional shift in notes is summarised in Figure 9.3.

Box 9.1 Growth of ATMs and Demand for Higher Denomination Banknotes

Ever since the first ATM was introduced, its usage grew exponentially. The cash dispenser and the ATMs gradually became the electronic face of banking.

Foreign banks in India were the first to introduce experimental ATMs in 1988. Usage picked up in the 1990s. Although a number of services were offered through fully functional ATMs, about 98 per cent of the people used the ATMs primarily for withdrawing cash (2004–05 estimate). Banks devised competitive strategies around the ATMs, recognising that ATMs could be a potent source of value-added service to consumers through access to banking services at any time and in many places.

With the increase in the usage of ATMs, a shift took place towards stocking higher denomination banknotes – particularly ₹100 and ₹500 denominations – as banks did not find it commercially viable to stock the machines with all denominations. Lower denomination banknotes ran out sooner and increased both capital cost and operating costs. The Reserve Bank, accordingly, faced an increasing demand for fresh banknotes in ₹500 and ₹100 denominations. Given the increased demand for banknotes fit for use in ATMs, the emphasis was laid on banks using desktop sorters to salvage good quality banknotes for use in their ATMs. Incidentally, there were about 53,000 ATMs at the end of November 2007.

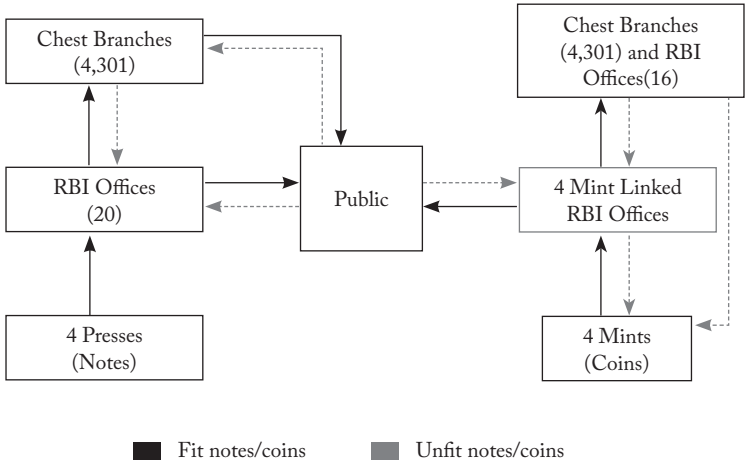
Table 9.1 Value of Banknotes (₹ Billion) Supplied by the Presses

Denomination	*2003–04*	*2004–05*	*2005–06*	*2006–07*	*2007–08*
₹5	7.35	0.90	0. 25	0. 25	-
₹10	30.70	43.32	11.83	34.80	41.93
₹20	19.18	15.10	14.12	8.76	12.72
₹50	106.45	93.10	53.16	72.92	60.65
₹100	416.10	395.60	320.84	403.48	419.90
₹500	584.00	626.00	330.65	736.55	902.50
₹1,000	209.00	257.00	129.60	589.10	699.00
Total	1,372.78	1,431.02	860.45	1,845.86	2,136.70

Source: RBI, *Annual Report*, various years.

Note: The shortfall in supply during 2005–06 was due to the delay in arrival of the cylinder mould vat watermarked bank notes (CWBN) paper with revised specifications for the printing of banknotes with new/additional security features and the decision to commence printing of new design banknotes only on exhausting old design paper to avoid mixing of old and new notes and to salvage the maximum number of old design notes from semi-processed sheets.

Figure 9.2 Currency Management Cycle



Source: RBI, *Annual Report 2006–07*.

Note: This reflects the position as at the end of March 2007.

Figure 9.3A Banknotes in Circulation: End of March 2001

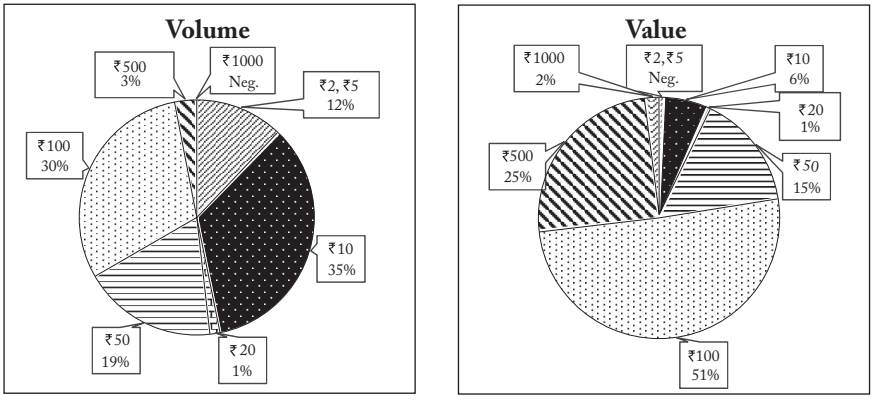
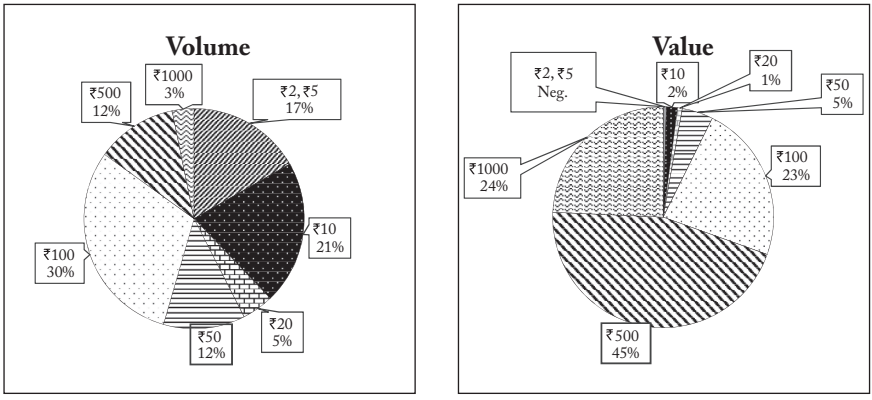


Figure 9.3B Banknotes in Circulation: End of March 2008



Sources: 9.3A: RBI, *Annual Report 2000–01*; 9.3B: RBI, *Annual Report 2007–08*.

While on this subject, two major limitations in forecasting of issue requirements of various denominations of currency notes may be mentioned. First, the effect of technological changes occurring in the payment system (introduction of plastic money) could not be modelled, as there was hardly any information on the relevant variable. Second, forecasts for denominational mix did not reflect the demand for various denominations by the general public, as the observed mix was more determined by the supply constraints, and changes in supply conditions could lead to different denominational mix.

Currency Chest Mechanism

The currency management function of the Reserve Bank grew with the number of issue offices of the Bank (including two sub-offices) increasing to eighteen in 1998–99, from seventeen in 1997–98, and the number of currency chests operated by commercial banks and treasuries increasing to 4,163 from 4,140 in 1997–98. In all, the number of currency chests functioning at the end of March 1999 stood at 4,181.

The Bank has agency agreements mainly with scheduled commercial banks (SCBs), under which a currency chest facility is granted to them at select branches. The currency chest branch is an extended arm of the Bank's Issue Department. It issues fresh banknotes and coins, retrieves soiled notes, and exchanges notes and coins, including mutilated notes. During the reference period, the total number of currency chests held with the state treasuries fell, whereas there was an increase in the number of currency chests with public and private sector banks (Table 9.2).

The network of currency chests maintained by the banking sector and with the state treasuries enabled a wider geographical reach, which otherwise would not have been possible. The stock of notes and coins held by the currency chests was taken into account for working out the cash reserve ratio (CRR) requirements of the bank concerned and allowed bank branches to operate on a lower cash balance. To elaborate: The banks holding currency

Table 9.2 Currency Chests: 1997 and 2008

Agency	*Number of Currency Chests at the End of*	
	March 1997	*June 2008*
Treasuries	423	19
State Bank of India and its associates	2,877	3,074
Nationalised banks	791	1,084
Private sector banks	19	101
Cooperative banks	0	1
Regional rural banks	0	0
Foreign banks	0	4
RBI (offices and currency chests)	17	20*
Total	4,127	4,303

Source: RBI, *Annual Report*, various years.

Note: *These include 18 issue offices of the RBI, the sub-office of the RBI Issue Department in Lucknow, and a currency chest at the RBI office in Kochi.

chests incur considerable capital expenditure at the time of establishment of currency chests. They also incur various types of recurring expenses for the maintenance of currency chests. On the other hand, these banks derive several advantages out of currency chest maintenance, most importantly in the area of cash management. Maintenance of currency chests enables them to withdraw cash as and when necessary, and deposit cash into the currency chest for receiving instant credit to their account with the Bank without actually visiting the Bank premises. This enables them to operate with very low cash balances. The balance with the Bank is used for meeting the CRR and for making investments on a day-to-day basis. Further, the banks with currency chests enjoy free transfer of funds under the Bank's Remittance Facilities Scheme, which results in a substantial saving in cost of transfer of funds between the chest branches. Had the currency chest network not been there, banks would be incurring a lot of expenditure for visiting the Bank's offices at frequent intervals for withdrawal and deposit of cash. Thus, the maintenance of currency chests results in the saving of costs involved in the physical movement of cash from and to the Bank. Currency chests also provide space for stocking fresh/re-issuable currency notes to meet the demands for payment to the public without blocking the bank's own resources. Similarly, soiled notes accepted from the public, which are not fit for circulation, are also deposited into the currency chests and credit is immediately received against the deposit.

This aspect was important because the Bank had only eighteen issue offices situated in state capitals and a few in other important towns. In order to further improve the functioning of the currency chests, as well as to help the non-chest bank branches to credit their surplus cash to their accounts to maintain a low level of cash balances, the currency chests had been allowed to charge a levy of ₹1 per packet of notes received from the non-chest branches from June 2002.

State Bank of India (SBI) and its associate banks maintained the bulk of these currency chests (70 per cent of total currency chests), followed by other commercial banks (19 per cent). The dominance of SBI and its associate banks in this area reflected historic circumstances. This group had about 23 per cent of its branches as currency chest branches, whereas other nationalised banks had only 3 per cent of their branches operating as currency chests (as in 2001–02). Nevertheless, the Reserve Bank had been persuading public sector banks to open more currency chests for broadening the distribution network.

In 2003–04 and 2004–05, the Bank followed a twofold strategy: to increase the number of currency chests in relation to 'cash management' requirements of individual banks and to progressively convert treasuries and sub-treasuries into currency chests. Foreign banks were permitted in 2003–04 to operate currency chests. Mechanisation of sorting activity of currency chests was given importance in 2004–05. Banks were required to provide desktop note-sorting machines of appropriate capacity at all their chest branches over a period. Banks with up to 100 currency chests were to install these machines by the end of May 2005, and those with more than 100 were to do so by the end of November 2005. As a further move, the Bank initiated the exercise in 2007–08 to procure and install desktop note-sorting machines in certain non-currency chest branches, based on the volume of cash handled, proximity to the international border and quantum of detection of counterfeit notes.

Improvements in Supply and Quality of Notes

Improving the supply and quality of notes and coins in circulation, and avoidance and detection of counterfeits were the two major goals of currency management during the reference period. Specific measures undertaken included mopping up of soiled and mutilated notes, withdrawal of lower denominations from circulation and their destruction, direction to banks to stop stapling note packets, mechanisation of note processing and eco-friendly destruction of soiled notes, widening of the currency chest network (see previous section), computerisation of the currency management information system, and speeding up the process of handing over and taking over of remittances by the chests. Anti-counterfeit measures were continued in coordination with the government and through public awareness campaigns.

Mechanisation of note processing and destruction of non-issuable currency notes became major thrust areas of the Bank as a part of its 'Clean Note Policy'. It commissioned two systems to facilitate the process, the currency verification and processing system (CVPS), and the shredding and briquetting system (SBS). CVPS is an electronic mechanical device designed for examination, authentication, counting and sorting, and 'online' destruction of notes unfit for further circulation. The system can sort the notes on the basis of denomination,

design and level of soilage. Generally, the system sorts the notes into 'fit', 'unfit', 'reject' and 'suspect' categories. The unfit notes are shredded 'online'. The fit notes are retrieved from the system in packets of 100 pieces. These packets are banded by the system and relevant information, such as denomination, date of processing, the name of the office, and operator code, is printed on the label to facilitate easy identification. The notes under the reject and suspect categories are segregated for manual examination and verification.

The SBS replaced the process of incineration of notes, which was not considered to be environmentally friendly. The system first cuts the notes into small pieces and then converts them into fine shreds. These shreds are then automatically channeled into the briquetting system where they are compressed under high pressure, resulting in the formation of briquettes. The SBS are of two types – online and offline. The online systems accept the shreds of notes for briquetting both from its shredder and from the CVPS. The offline systems accept shreds of notes for briquetting only from the shredder.

In 1998–99, four CVPS were installed at two offices, Bhopal and Chandigarh, as a pilot project. These systems sorted the notes into issuable and non-issuable categories, detected counterfeit notes, and destroyed the non-issuable notes in an eco-friendly manner through shredding and briquetting systems. The issue offices in Belapur, Kolkata, Mumbai and New Delhi were provided with SBSs during 1999–2000. SBSs obviated the need for incineration of cancelled notes and thus addressed the issues raised by State Pollution Boards.

In July 1997, a Forged Note Vigilance Cell was set up in the DCM. Besides building up a database on forgeries, the cell closely monitored major forgeries. Banknotes of ₹1,000 were reintroduced in October 2000 in unregistered form, following an amendment to the High Denomination Bank Notes Demonetisation Act, 1978. The ₹1,000 notes, along with ₹500 and ₹10,000 notes in registered form, had been demonetised in 1978. Further, new notes of ₹500 were introduced in November 2000 with a revised colour scheme to facilitate easy distinction from ₹100 denomination notes. In addition to the usual security features, these notes incorporated additional overt security features, such as optically variable ink, or OVI (or colour-shifting ink) and readable security threads. Five-rupee notes in the existing design with the Ashoka Pillar watermark were introduced to supplement the supply of coins of the same denomination.

Banknotes are printed at four note presses, of which the Currency Note Press (CNP), Nashik, and Bank Note Press (BNP), Dewas, are owned by the Security Printing and Minting Corporation of India Ltd., a union government enterprise. The other two presses at Mysore and Salboni are owned by the BRBNMPL. The presses at Mysore and Salboni were made fully operational from March 1999 and September 1999, respectively. With these systems in place and improvements in distribution, the perennial problem of short supply of fresh notes had been solved to a great extent. In 2000–01, the Bank launched or continued various measures as a prelude to ushering in clean notes in circulation. The printing capacity of the four note presses was augmented. For the first time in recent years, the Bank's indent for fresh notes was met by the printing presses fully in 2000–01.

The Government of India was importing rupee coins at times to supplement indigenous production. Automated coin dispensing machines were commissioned at select regional offices on a pilot basis to cater to low-volume requirements. The feasibility of expanding the channels for distribution of coins beyond the banking system was explored, which became a reality a few years later.

Consequent to the amendment to Section 43A of the Companies Act, the BRBNMPL became a private limited company from 24 February 2002. After the modernisation of the presses at Nashik and Dewas, the combined capacity of the four presses was augmented. The BRBNMPL was awarded the ISO 9001:2000 certification by RheinischWestfalischer TUV, Germany, in March 2001. It became one of the first banknote presses in the world to be so certified.

Cost of Printing Banknotes

The cost of printing notes escalated towards the second half of the reference period (Table 9.3). However, in view of the rise in the average denomination and better quality of printed notes, there was an overall increase in efficiency in the production of notes. The selling rate of banknotes was intimated by the presses for each financial year (April–March). The rates fixed by the government presses were in accordance with the formula laid down by the Ministry of Finance, whereas the BRBNMPL had constituted an internal cost committee for finalising selling rates. The rates fixed by the government presses continued to be higher than those fixed by the BRBNMPL.

Table 9.3 Supply and Cost of Banknotes: 2003–08

Year	*SPMCIL*		*BRBNMPL*	
	Supply (million pieces)	*Cost (₹ billion)*	*Supply (million pieces)*	*Cost (₹ billion)*
2003–04	5,065	8.94	8,101	8.15
2004–05	4,622	7.83	7,971	6.60
2005–06	2,697	4.06	4,194	6.29
2006–07	5,136	10.42	7,348	9.78
2007–08	5,442	9.08	8,488	11.48

Source: RBI, *Annual Report*, various years.

Notes: SPMCIL: Security Printing and Minting Corporation of India Ltd.

In the 15 July 2002 meeting of the Central Board of Directors held in Chennai, the following statement was made by the DCM in reply to a query as to why there was a substantial variation in the rates for the supply of banknotes during 2001–02 – even for the same denomination – from different presses.

> During 2001–02 (April–March), the BNP was mostly occupied in printing ₹50 notes (45.6 per cent of its total production) while the CNP mostly printed ₹10 notes (48.5 per cent of its production). The BRBNMPL presses printed a reasonable mix of denominations. The higher denominations had more security features and, hence, involved more expensive inputs and processes. Normally, payments to the government presses were made by the Bank in respect of the notes supplied on the basis of provisional rates. The final rates for the relevant period were generally determined by the government after a lapse of two to three years, after which the Bank paid the differential. The BRBNMPL, however, determined its rates during the relevant period itself. Therefore, the rates charged by government presses and those of the BRBNMPL are not strictly comparable, though there was a difference in the rates charged by the different presses even with the same denomination.

Accumulation of Soiled Notes in Bank Vaults

While the mechanical processing of distribution of currency notes was pursued, the Bank took a number of steps to improve the quality of notes in circulation. In this context, it became essential that soiled notes be simultaneously withdrawn from circulation. In order to achieve these objectives, the Bank introduced various changes in the systems and procedures relating to currency management,

beginning from 2001–02. These included mechanisation of currency processing operations in the issue offices of the Bank, instructions to currency chest branches to send soiled note remittances to the issue offices in unstapled condition (which was a prerequisite for processing of notes on these machines), and delegation of full powers to the currency chest branches of SBI and its associate banks and other public sector banks in regard to handling soiled notes lying with them.

One important aspect of the implementation of the Clean Note Policy was to make available reasonably good quality notes to the public and withdraw soiled notes from circulation. The soiled notes, accumulated in the vaults of currency chests with banks over a period of time, were removed, examined and destroyed expeditiously. The Reserve Bank had adequate stock of fresh and re-issuable notes but could not deliver them to the public as bank branches with many currency chests were choked with soiled notes. Due to this, the bank branches did not sort clean notes that were fit for re-issue and apparently issued soiled, cut and mutilated notes to the public.

By 2000–01, with the perennial problem of short supply of fresh notes from the presses having been resolved, the Bank's efforts were directed towards replacing the soiled notes in circulation with fresh and reasonably good quality notes. The first effort was to mop up the circulation of soiled and mutilated notes by liberalising their acceptance and payment in exchange. Second, soiled notes withdrawn by bank branches were quickly removed from their currency chests. Third, the Bank adopted special measures (within the Bank) for disposal of lower denomination notes up to ₹10 by counting only bundles and packets. Such special measures, as well as random sample checks, were also occasionally applied for ₹20 and ₹50 notes. The CVPSs installed at the issue offices were used for extended hours for processing soiled notes received from government departments (major customers of the Bank). The adoption of these measures on a continuous basis increased the disposal capacity of the systems, so much so that during 2007–08, as many as 10,696 million pieces of soiled notes (24 per cent of banknotes in circulation) were processed and removed from circulation. Within the category of soiled notes, ₹100 notes constituted the largest share, followed by ₹10 notes.

Non-Stapling of Note Packets

Another major initiative to improve the quality of notes in circulation was the decision to discontinue stapling banknote packets, which, however, became a complete reality only after November 2001.

Stapling was an old practice. A stitched note packet was equated with the assurance that there were 100 notes in a packet and made counting money easier in bank branches. However, stapling these 100-piece bundles reduced the life of notes, and imposed hardship on customers who had to struggle to remove the staples. The general rule was that a packet, whether stitched or banded, must contain 100 note pieces. In 1996, the Bank issued advice to all banks to stop stapling fresh note packets. In 1998, the instructions were reiterated in the case of re-issues.

However, this issue assumed a sense of urgency in March 2000 when, answering a parliamentary question, the Minister of State for Finance expressed the view that the Reserve Bank would need to issue instructions to banks and all financial institutions to avoid stapling note packets. This was conveyed to the Bank for necessary action in April 2000. In pursuance thereof, the DCM requested the Department of Banking Operations and Development (DBOD) to issue a directive to all commercial banks to stop the practice of stapling banknote packets. The DBOD, in consultation with the Legal Department, issued a directive to commercial banks on 7 November 2001. This directive, on being satisfied that it was necessary and expedient in 'public interest to do so', directed banks, inter alia, to (*a*) do away with the stapling of fresh/re-issuable/non-issuable note packets and instead secure note packets with paper bands, (*b*) sort notes into issuable and non-issuable categories, (*c*) issue only clean notes to the public, (*d*) tender soiled notes in unstapled condition to the Bank in inward remittances through currency chests and (*e*) forthwith stop writing of any kind on the watermark window of banknotes.

To implement these instructions, it took some time. Initially, banks did not evince keen interest in implementing the provisions of the directive. Added to this, some major trade unions in the banking industry had a few misgivings about the new dispensation, mainly on grounds of security considerations (involving the staff handling the note packets) and the possible retrenchment of labour. However, the Bank was able to successfully remove these misconceptions and impress on them the need for compliance, which was in any case mandatory on the banks' part. In this endeavour, Deputy Governor Vepa Kamesam, who was in charge of the currency management portfolio, played a major role.

As a follow-up, after the issue of the 7 November 2001 Directive, Deputy Governor Kamesam, in his letter dated 21 December 2001 to the chairmen of banks, advised them to initiate necessary steps to implement the directive. The banks were informed that the Reserve Bank had started installing CVPS for speeding up the disposal process of soiled notes received in its issue offices and

improving the quality of notes in circulation and that this necessitated these notes to be fed in the machines in a loose condition, that is, without any wire staple or binding aid. In his letter dated 13 March 2003 to the chairman of the Indian Banks' Association, Deputy Governor Kamesam stressed that it was the responsibility of the banks to implement the Clean Note Policy as envisaged by the Bank from time to time, failing which, revocation of currency chests would commence apart from other measures under the Banking Regulation Act. There are several other instances where strict adherence to the procedure was stressed upon by Deputy Governor Kamesam.

In other words, the process of implementation of the directive was not smooth, and faced resistance from banks, even though the response from the general public was supportive. For example, the bank employees' unions from some public sector banks expressed concerns over the shift to the new system. In two letters to the Reserve Bank dated 11 and 20 May 2002, the Bank Employees Federation of India, Kolkata, contended that the new system exposed the bank cashiers to financial risk. The Federation wanted to revert to the old practice of issuing new notes in stitched packets. The letter also contended that the high risk involved in the handling of cash in unstapled packets could not be removed by installing more note-counting machines. The United Forum of Bank Unions in a letter to the Reserve Bank (18 February 2003) voiced similar concerns. There were complaints from bank branches as well. Newspapers (for example, *Financial Express* on 5 June 2003), too, reported the widespread reluctance to implement the Reserve Bank decision. Deputy Governor Kamesam in a letter (27 March 2003) to V. Leeladhar, Chairman and Managing Director of Union Bank of India, wrote, 'I am increasingly convinced that many of our frontline operating staff including branch managers are the persons responsible for raising excuses' for not implementing the policy and for carrying imaginary fears.

Banks eventually came round to using the new system of banding rather than stapling notes. But there were occasional lapses. To cite an instance, in March 2004, Governor Jalan, after his retirement, was given a stapled bundle of currency notes by a bank branch in New Delhi.

Some Incidental Matters

The Reserve Bank of India (Note Refund) Rules, 1975, were last amended in 1980 to enlarge the scope of services provided to the public. With a view

to further simplify and liberalise the Note Refund Rules, it was proposed to make comprehensive changes therein. After obtaining the approval of the Committee of the Central Board at its meeting on 11 April 2007, the draft of the revised Note Refund Rules, 2007, was sent to the government. The government's approval was conveyed in November 2007. The Note Refund Rules came into force on 4 August 2009. The revised rules were easy to comprehend and administer, especially by the designated banks and their branches and, therefore, were expected to bring about better customer service.

Supply of Coins

Trends in Supply

The authority to issue ₹1 notes and all coins is vested with the Government of India in terms of the provisions of the Reserve Bank of India (RBI) Act, 1934, and the Indian Coinage Act, 1906. Under Section 38 of the RBI Act, the central government cannot put into circulation any rupee coin except through the Bank.

In the first few years of the reference period, there was a persistent shortage of coins. The regional offices of the Bank took several initiatives in 2001–02 for better distribution of coins by installing coin vending machines in the banking hall of the Issue Departments as also by encouraging banks in their jurisdiction to install such machines in their premises. The regional offices continued with the practice of sending coin bags to city centres to distribute coins directly to the public. The availability of coins in 2002–03 was not a cause for concern due to the satisfactory supply of coins by the mints. With the improvement in the supply position, the Bank made special efforts to deliver coins to the people, particularly in rural areas. The banks were directed that their currency chests in the rural areas should issue coins of at least ₹0.1 million daily. Public sector enterprises like the railways and the postal department, SCBs and regional rural banks (RRBs) were also involved in the distribution of coins. A service charge of ₹250 per bag was paid to banks to meet the holding and distribution costs. The mints at Mumbai and Hyderabad started supplying coins packed in sachets of 100 pieces.

The demand for 25 paise and 50 paise coins sharply declined. Therefore, the Bank requested the government (in January 2005) to stop minting these. Further, as part of the Long Term Coinage Policy, the Bank had earlier suggested to the government (in December 2003) to introduce ₹10 coins to

reduce dependence on the small value and low life of ₹10 notes. A decision was taken to issue coins (including ₹10) in a new metallic form in January 2005.

Two developments, with respect to the circulation of coins among the public during the last few years of the reference period, are worth mentioning here. The total value of coins in circulation during 2004–05 declined by 2 per cent against an increase of 4 per cent in 2003–04, mainly due to falling demand for small denomination coins. The demand for ₹5 coins recorded subdued growth due to the parallel issue of ₹5 banknotes. Coins of smaller denominations, such as 5, 10 and 20 paise, were no more in demand. Consequently, the Bank decided to phase out from circulation all coins of denominations below ₹1. There was a reverse flow of coins during the year, which compensated for the shortfall in supply. In response to complaints from the public regarding non-acceptance of coins by bank branches, the Bank advised all banks to accept coins of all denominations and make arrangements with the mints to take back coins in excess of public demand. The overall stock of coins with the Bank increased considerably, causing strain on storage and distribution of coins. This trend continued for almost the next two years. In view of the comfortable stock of coins at currency chests/small coin depots and the Bank itself, the Bank did not place any indent for coins with the mints for 2005–06 and 2006–07.

However, there was a reversal of this trend from October 2006 due to a sudden spurt in the demand for ₹2 coins. In view of the reported melting of ₹2 cupro-nickel coins on account of rising metal prices, the government, in consultation with the Bank, decided to mint all denomination coins in ferritic stainless steel (FSS). An indent of 700 million pieces was placed in December 2006 for ₹2 FSS coins and these coins were issued. For 2007–08, the Bank placed an indent of 300 million pieces, which was subsequently raised to 500 million pieces for ₹1 coins; 1,500 million pieces for ₹2 coins; and 300 million pieces for ₹5 coins. The total value of coins (including small coins in circulation) increased by 11 per cent during 2006–07 (2 per cent in 2005–06). In volume terms, the increase was 6.5 per cent in 2006–07 (2 per cent in 2005–06). The value of coins relative to the value of banknotes remained fairly small.

An independent survey commissioned by the Bank during 2002–03 through the Administrative Staff College of India (ASCI), Hyderabad, revealed a satisfactory level of availability of coins in Maharashtra, Madhya Pradesh, Gujarat and Karnataka. On the other hand, it was found that banks were either reluctant to distribute the coins or the public preferred to obtain these coins from private distributors for the sake of convenience.

During 2003–04, the Bank experienced a reverse flow of coins, for the first time, to such an extent that the overall stock of coins increased considerably, causing a strain on their storage capacity and distribution. The Bank was also forced to drastically reduce the indent for fresh coins from the mints. There had been no regular or even cyclical pattern of growth in circulation of coins and, in all probability, the large increases and decreases from year to year reflected the large fluctuations/variations in the minting of coins plus imports of coins. To tackle the situation, the Bank made special arrangements, removed the monetary incentive for distribution of coins, advised commercial banks to accept coins, published public advisories to the effect that small coins continued to be legal tender and advised banks to remit to the mints all coins of 1 paise, 2 paise, 3 paise, 5 paise and cupro-nickel coins of 25 paise, 50 paise and ₹1.

With adequate availability of coins from the mints, in 2003–04, the Bank made intensive efforts to ensure that the shortage of coins that happened in the recent past was not repeated. The Bank allowed its offices to engage private transport operators for remittance of coins to the interior parts of the country. Coins were distributed through mobile vans. Banks were persuaded to distribute coins in marketplaces and to keep their branches open on Sundays in certain places. Services of postal authorities, RRBs, cooperative banks, and state transport undertakings were utilised for distribution of coins.

In 2005–06, the Bank commissioned a study, 'The Need and Use Behaviour for Small Coins', by S. K. Velayudhan of the Birla Institute of Technology and Science (BITS), Pilani. The study reaffirmed that there was no shortage of coins. However, in the case of small denomination coins, especially 25 paise, the problem was more of acceptance than of availability.

The production of coins by the mints, their collection and their dispatch by the mint linked offices were closely monitored by the Bank to ensure that the entire quantity produced by the mints was lifted and dispatched to various destinations. Banks were also advised to identify additional locations at prominent places to install coin vending machines. The mints were requested to pack coins in pouches of 100 pieces to enable easier retail distribution.

Correspondence with the Government

The Government of India is the issuing authority of coins and supplies coins to the Reserve Bank on demand and the latter puts coins into circulation on

behalf of the government. The division of responsibility in respect of supply and distribution of coins sometimes created irksome situations, especially when perceptions about demand and supply differed.

Since 2003, the Ministry of Finance on several occasions raised the issue of the Bank not collecting coins promptly from the mints for disbursement during the indent year. In November 2003, the Ministry was of the view that there was no correlation between the denomination-wise indents placed by the Bank and the actual production by the mints. This distorted the requirement of coins in value terms. The Bank clarified (letter of 20 November 2003) that its regional offices had in the past lifted the entire production from the mints, but agreed that the pace of lifting was slightly hampered by the sudden lack of demand for coins from the public. The Bank's offices on 20 November 2003 had almost 800,000 coin bags in their vaults and there was no space to accommodate additional coin bags. The reverse flow of coins aggravated the situation. In fact, the Bank had been receiving a large number of complaints about non-acceptance of coins by banks.

On 9 December 2003, the Bank reported to the government that due to several measures taken, there was an abundant supply of coins. The reintroduction of ₹5 note by the government, against the advice of the Bank, affected and altered the demand pattern of coins, and the Bank had during April–November 2003 lifted more than 2 billion coins of all denominations. In a meeting (12 December 2003) between Deputy Governor Kamesam and D. C. Gupta, Finance Secretary, the latter expressed apprehension that if the Bank did not accept coins from the mints it would lead to stockpiling of raw materials and worsen industrial relations in the mints. In another meeting (9 February 2004), the Bank reiterated that it would be able to manage without the ₹10 coins since all its issue offices (as well as most of the currency chests and small coin depots) were holding large stocks of coins. Further, the reverse flow of coins of all denominations continued, which made it difficult for banks to accept fresh supply. The public preferred ₹5 notes against the coins and, therefore, it was preferable not to print ₹5 notes and encourage the demand for ₹5 coins to increase. In view of these factors, the Bank submitted a revised indent for 2004–05.

The problem did not end there though. Finance Secretary Gupta, in his letter to Governor Reddy (22 September 2004), conveyed the concerns of the government over the Bank not lifting coins from the mints. Moreover, frequent revisions of the indents adversely affected the production programme

of the mints and the procurement of stores. The mint labour unions had gone to court against a reduction in working hours and curtailment of overtime resulting from a reduction in indents. Large stock of coins had accumulated. The Finance Secretary requested the Governor to make more reliable coin estimates and to lift the coins minted as per the indent.

Deputy Governor K. J. Udeshi responded (25 October 2004), explaining the circumstances under which the Bank had to balance the supply and distribution cycle of coins. The long-term projection of coins for 2003–04 and 2004–05 were based on the anticipated gross domestic product growth, inflation and notes in circulation. It was also presumed that the printing of ₹5 notes, restarted by the government in August 2002, would be discontinued, which did not happen. Mints had been earlier unable to meet the Bank's requirements in full. In this context, the Bank had, in October 2002, suggested to the government to consider the import of coins to meet the demand–supply gap. With the import of coins and special efforts made by the Bank to reach coins to rural and semi-urban areas, the shortage disappeared by the middle of 2003. By that time, the Bank had also put in circulation about 4,300 million pieces of ₹5 notes. Further, the transport undertakings, railways and traders had adjusted prices in multiples of the full rupee. These factors combined to reduce the demand for coins. The Bank had kept the government informed about the ongoing decline in demand and issued instructions to its regional offices to lift the maximum number of coins from the mints. But the regional offices had not been able to push coins into circulation for lack of demand. In January 2005, the Bank and the Secretary (Economic Affairs) agreed that fresh small denomination coins need not be minted.

In February 2005, a committee consisting of representatives from the Ministry of Finance and the Bank conducted a demand-study of coins for five years starting from 2006–07. The study became necessary in view of the uneven trend in demand for coins since 1993–94, and occasional mismatches between supply and demand. Further, the simultaneous issue of notes and coins in the same denominations complicated public preferences towards notes and coins. There was also in general a decline in the demand for and use of small denomination coins. The study recommended a system of reviews at six-monthly intervals so that fine-tuning could be done based on the latest available data. The production of ₹10 coins was important, for their availability had been factored in while projecting the printing requirement of ₹10 notes.

In April 2005, the Ministry of Finance (Currency and Coinage Division) forwarded a copy of a letter written by Gurudas Dasgupta, Member of Parliament, to the Finance Minister. The letter raised three points. First, the problems of production of coins in the government mints were due to the 'inconsistency' in demands from the Bank upon mints. Second, in the event of the Bank not placing an indent, it would slow down the functioning of the mints and eventually result in import of coins as in the past. Third, the assessment of the requirement of coins made by the Bank was often found to be 'incorrect' and 'wrong'. Under the circumstances, the recommendation of the Bank that there was no need for a supply of coins by the mints, the letter stated, should be held in abeyance. The Bank, in its response sent on 13 August 2005, clarified its position on why it believed that the existing stock was sufficient to meet the demand for coins, and discussed the findings of the joint study. The findings of the BITS Pilani study mentioned earlier were also relevant in this context. The letter to the government concluded that the Bank had advised its regional offices to lift the maximum number of coins from the mints (out of the indent for 2004–05), but they were unable to push the coins into circulation due to a lack of demand.

Avoidance and Detection of Counterfeits

The Indian economy was predominantly cash oriented, even though rapid strides were made in other modes of payment. The volume of notes in circulation being relatively large, counterfeiting was a serious problem for currency management. The geographic spread of the country and the size and composition of the population handling the notes added to that difficulty. A further complication was the political nature of the problem. It was stated that notes were counterfeited not only for commercial reasons but also sometimes with the objective of destabilising the economy.[1]

Indian currency notes incorporated – and continue to do so – certain security features. A special type of paper made from cotton and cotton rag, containing a secret watermark and optical fibres visible under ultraviolet (UV) lamp, was used for printing. All the notes being issued had a three-dimensional watermark with the portrait of Mahatma Gandhi. Intaglio printing of various portions of the note (including an identification mark on different denominations for the visually impaired) was done for the denominations of ₹20 and above. Notes up to ₹50 contained a readable

but fully embedded security thread, while the higher denomination notes had a readable and windowed security thread. The OVI feature in ₹500 and ₹1,000 notes meant that a colour shifting ink was used for printing the denominational numerals. Other main features incorporated included front-to-back perfect registration of some portions, micro-lettering, latent image and fluorescence of certain sections of the note, including the security thread. A counterfeit note could be detected by checking if all these features were present or not (see Box 9.2).

The designing of Indian banknotes is normally done by a committee constituted by the government, which includes the Bank and the printing presses. The security features in banknotes are reviewed by the Bank periodically and changes are made in them from time to time with the approval of the government.

Counterfeit notes posed a serious problem for the authorities in detecting them and in prosecuting the culprits. The number and value of counterfeit notes detected in different Reserve Bank offices increased over the period 1996–97 to 2002–03. In volume terms, the share of detected forged notes to the overall notes in circulation worked out to around five per 1 million notes (2003). This was a small ratio. But it was disconcerting that the quality of counterfeiting was improving. Before 2003, counterfeiting was normally done by criminals by the offset printing method. These were detected and nabbed relatively easily. With the advent of high-quality digital technology, there was a great improvement in the quality of counterfeit notes during the latter half of the reference period, particularly in the denominations of ₹100, ₹500 and ₹1,000. If such notes were included inside a packet or accepted in a hurry, or under semi-dark conditions, detection was difficult. In fact, after 2003, technology improved so much that even the OVI feature was successfully replicated in some cases, and the quality of the paper and ink used were comparable to the genuine notes to a reasonable extent.

In 1996, a major revision of the security features in Indian banknotes was carried out. In July 1997, a Forged Note Vigilance Cell was set up in the DCM, central office. Besides building up a database on forgeries, the Cell closely monitored major forgeries. The Bank also launched a public awareness campaign on the security features of banknotes and introduced additional security features (see Box 9.2). Banks were advised to equip their branches with UV detectors and the staff from banks, government departments, police and other enforcing agencies were regularly familiarised with security features in banknotes so as to facilitate detection of forgery.

Box 9.2 Security Features in Indian Banknotes

Watermark: The Mahatma Gandhi series of banknotes contained the Mahatma Gandhi watermark with a light and shade effect and multidimensional lines in the watermark window.

Security thread: ₹1,000 notes introduced in October 2000 contained a readable, windowed security thread alternately visible on the obverse with the inscriptions 'Bharat' (in Hindi), '1000' and 'RBI', but totally embedded on the reverse. The ₹500 and ₹100 notes had a security thread with similar visible features and inscriptions 'Bharat' (in Hindi) and 'Reserve Bank of India'. When held against the light, the security thread on the ₹1,000, ₹500 and ₹100 notes could be seen as one continuous line. The ₹5, ₹10, ₹20 and ₹50 notes contained a readable, fully embedded security thread with the inscription 'Bharat' (in Hindi) and 'Reserve Bank of India'. The security thread appeared to the left of Mahatma Gandhi's portrait. Notes issued prior to the introduction of the Mahatma Gandhi series had a plain, non-readable fully embedded security thread.

Latent image: On the obverse side of the ₹1,000, ₹500, ₹100, ₹50 and ₹20 notes, a vertical band on the right side of Mahatma Gandhi's portrait contained a latent image showing the respective denominational value in numerals. The latent image was visible only when the note was held horizontally at eye level.

Microlettering: This feature appeared between the vertical band and Mahatma Gandhi's portrait. It contained the word 'RBI' in ₹5 and ₹10 notes. The notes of ₹20 and above also contained the denominational value of the letters in microletters. This feature could be seen better under a magnifying glass.

Intaglio printing: The portrait of Mahatma Gandhi, the Reserve Bank's seal, the guarantee and promise clause, the Ashoka Pillar emblem on the left, and the Bank Governor's signature were printed in intaglio, that is, raised prints, which could be felt by touch, in ₹20, ₹50, ₹100, ₹500 and ₹1,000 notes.

Identification mark: A special feature in intaglio was introduced on the left of the watermark window on notes of ₹20 and above denomination. This feature was in different shapes for different denominations (₹20–vertical rectangle, ₹50–square, ₹100–triangle, ₹500–circle and ₹1,000–diamond) and helped the visually impaired to identify the denomination.

Fluorescence: Number panels of the notes were printed in fluorescent ink. The band at the centre portion of the notes was also printed in fluorescent ink. The notes had optical fibres. Both could be seen when the notes were seen under UV lamp. The security thread in ₹5, ₹10, ₹20 and ₹50 notes fluoresced in blue

(*Contd.*)

(*Contd.*)

colour from the obverse and reverse when seen under an ultraviolet lamp. In ₹100 and ₹500 notes, the security thread fluoresced in blue colour on the visible portion of the windows from the obverse and as a continuous line from the reverse. In ₹1,000 note, the security thread fluoresced in rainbow colour on the visible portion of the windows from the obverse and as a continuous line from the reverse.

Optically variable ink: This was a new security feature incorporated in the ₹500 notes with revised colour scheme introduced in November 2000, and in ₹1,000 notes issued from October 2000. The numerals 1,000 and 500 on the obverse of ₹1,000 and ₹500 notes, respectively, was printed in optically variable ink. The colour of the numeral 1,000 and 500 appeared green when the note was held flat but would change to blue when the note was tilted. Notes of ₹500 issued before November 2000 and which were in circulation as legal tender did not have this feature.

See-through register: The small floral design printed on both the front (hollow) and the back (filled up) of the note in the middle of the vertical band next to the watermark has an accurate back to back registration. This appeared as a floral design when seen against the light.

Between 1997 and 2000, a decision was taken to withdraw ₹500 denomination banknotes in the Ashoka Pillar series as counterfeit notes of this particular design was reported on a large scale (Box 9.3). In 2000, the government formed a High-Level Committee of Experts headed by the Joint Secretary, Department of Economic Affairs, and with representatives from the Bank, presses and security agencies, and other experts. The committee submitted its report in May 2002. Their recommendations included the adoption of India-specific machine-readable magnetic colour shift, security thread and machine-readable M-feature (mixing specific pigment ink with printing ink). These features would allow for authentication of notes without any mechanical aid. A technical subcommittee constituted by the government fine-tuned the specifications in consultation with the manufacturers.

All currency chest branches of banks, and certain identified non-chest branches, which were close to international borders and had heavy cash transactions, were equipped with note-sorting machines to detect and curb the circulation of counterfeit notes. The note-sorting machines helped detect counterfeit notes at the time of entry into the banking channel. Thus, the

installation of these machines at currency chests proved to be helpful in the early detection of counterfeit notes. The Reserve Bank coordinated with the investigating agencies as well as state police authorities for information sharing. In January 2008, state level committees headed by the Director Generals of Police were formed to deal with the issue. The Bank conducted training programmes for employees of banks and other organisations handling bulk quantities of cash and placed extensive information on security features of Indian banknotes on its website. Posters on 'Know Your Banknotes' were displayed at bank branches and a film on 'Know Your Banknotes' was prepared by the Bank through the Films Division and supplied across all its issue offices, currency chests, public utilities, theatres and other media for screening.

In 2002–03, the Ministry of Finance constituted a committee, comprising officials from the CNP, Nashik, BNP, Dewas, BRBNMPL, Mysore, Security Paper Mill, Hoshangabad, and the Bank, for preparing a technical profile of high-quality and low-quality fake Indian currency notes (FICN), headed by a senior officer from the DCM. In 2003, there were press reports that these forged notes were printed in a neighbouring country and were released in India by underworld elements, thus posing a challenge to national security. Security had become an absolute priority. On 20 October 2003, the DCM made a presentation on forged notes in the Ministry of Home Affairs. On 25 November 2003, the Department, in association with the Central Bureau of Investigation (CBI), organised a day's seminar in Delhi on the subject. The seminar was attended by the nodal officers in-charge of the economic offences wings of the state police authorities.

In 2003, the DCM, central office, detected large volumes of counterfeit notes that were in circulation in Bihar, West Bengal and the northeastern states and enquired with the Kolkata office about the steps taken. The latter, in its reply dated 16 October 2003, mentioned that investigation was delayed because the response from the CNP and the Central Forensic Laboratory – the agencies authorised to offer expert opinion on forged notes – had been delayed. They agreed that such authority may be extended to the BRBNMPL to facilitate a quick follow-up action by the police. Under Governor Reddy's initiative, in February 2004, a Task Force was formed by the Patna office to study matters relating to forged notes detected by that office during 2003–04. The Task Force in its report of 31 March 2004 said that of 203 currency chests (31 December 2003) under the jurisdiction of the Patna office, 129 contained forged notes numbering 22,321 pieces. The major share of forged

notes was of ₹100 in the old design notes of Ashoka Pillar series. Forged notes appeared mainly in bank branches in Patna, Purnea, Muzaffarpur, Ranchi and Gaya. The main method of forgery was the direct printing of fake notes, followed by photocopying and computer scanning and printing. The report pointed out that there were many cashiers and other officers in currency chest branches who were still not familiar with the security features of banknotes.

The police investigation was a slow process for genuine reasons. As of 24 October 2003, there were more than 240,000 cases pending with various police authorities, some for more than ten years, and there was no conviction. Due to the long delay in getting an expert opinion from the CNP, the police found it difficult to prosecute culprits. The government decided to authorise forensic laboratories and other note printing presses to give an expert opinion regarding suspected notes. The Ministry of Finance constituted a committee for recommending an infrastructure for setting up forensic laboratories for the purpose under the Criminal Procedure Code. A senior officer from the DCM was in the committee. The committee prepared a manual of procedure to be followed by forensic laboratories and printing presses for examining suspected notes and giving their opinion. The committee also recommended the purchase of equipment required for examination of forged notes.

Given these problems with the prosecution, the Bank suggested that a nodal agency, preferably the CBI or the Intelligence Bureau, might be designated for reporting the cases. Such an agency would coordinate with other regulatory bodies, including the state police, forensic laboratories and printing presses. In October 2003, the government nominated the CBI as the nodal agency to monitor currency counterfeiting. At the state level, one senior police officer was designated as the nodal officer to coordinate efforts against currency counterfeiting. The government, however, was yet to amend (by 2003–04) the Indian Penal Code and the Criminal Procedure Code to strengthen the procedure regarding certification of counterfeit currency and penal provisions. On 10 August 2004, the CBI Joint Director advised that no purpose would be served by lodging first information reports (FIRs) when only a few fake currency notes were detected in bulk remittances sent by banks to the Reserve Bank. But when such notes were detected at the counter itself and their number was substantial, registration of an FIR by the local police would be useful.

The Chief General Manager, DCM, RBI, in a letter dated 18 June 2004 to the Economic Offences Wing, CBI, drew attention to the problem faced by the Bank's regional offices in filing FIRs and handing over the fake notes to the local police station for further investigation. Due to the increase in fake note detection, the local police stations were sometimes reluctant to deal with these cases. When Reserve Bank offices could prevail upon the local police authority to register FIRs, the fake notes handed over to the police in such cases were not returned to the Bank's offices. In turn, the police had their own difficulties in conducting an investigation because fake notes were detected in the bulk remittances received from distant bank branches. The

Box 9.3 The Shift from the Ashoka Pillar Series to the Mahatma Gandhi Series Notes

The replacement of the Ashoka Pillar series notes with the Mahatma Gandhi series is the most important instance of phasing out during the reference period. The former had deteriorated in quality. Moreover, in the absence of advanced security features in the Ashoka Pillar series notes, the public was finding it difficult to identify counterfeit notes. The government and the Reserve Bank, therefore, decided to phase out the series. Accordingly, the Bank's issue offices and currency chest branches of commercial banks were instructed not to reissue these notes to the public. These notes, however, continued to be legal tender. Furthermore, the Ashoka Pillar emblem, a national symbol and pride, continued to be printed on the notes of the Mahatma Gandhi series.

Portraits of human beings have been recognised as a strong security feature on banknotes all over the world. The watermark with a human face is a unique and inimitable feature, which provides the desired light and shade effects. A human face brings into focus the shine/gleam in the eyes. The portraits involve deep engravings with very minute details and are difficult to counterfeit. The choice of the personality from the security point of view should be such that the face should be expressive and should have lots of lines and folds, so that there is ample scope for engravings of different depths, which would be difficult for counterfeiters.

The Mahatma Gandhi series was introduced in 1996. Some additional security features, such as the windowed security thread, latent (hidden) denominational image, microprinting, registration mark and raised identification mark for identification of a denomination by the visually impaired, were also incorporated in these notes as anti-counterfeiting measures. The printing of notes with the Ashoka Pillar emblem was then discontinued.

Bank had, in October 2003, instructed the offices not to file FIRs with the police and retain the fake notes with them. It had simultaneously taken up the matter with the Ministry of Home Affairs. The police could not conduct a meaningful investigation as these forged notes were from the bulk receipts and the individual tenderer could not be traced or identified.

A meeting with the Chairmen and Managing Directors of commercial banks and cooperative banks was held in June 2006. Banks were advised to disseminate the Reserve Bank's instructions on counterfeit banknotes to branches, monitor implementation of these instructions, compile data on the counterfeit banknotes, ensure installation of note-sorting machines of appropriate capacity at all currency chests and report the steps taken in this regard.

From 16 April 2006, the Criminal Procedure Code was amended to include the officers of all the note printing presses, the security printing press and forensic science laboratories as experts for rendering evidence on suspected fake currency notes. This reduced, to a considerable extent, the time lag experienced in getting an expert opinion by the law enforcement authorities.

An updated master circular on detection and impounding of forged notes was placed on the Bank's website on 2 July 2007. Instructions to issue offices of the Bank reiterated the need to create public awareness of the security features of banknotes. All banks were advised to lay more emphasis on imparting training to members of staff in the detection of counterfeits so that detection took place at the entry point itself. Steps taken by the Bank to check counterfeit included planned phased withdrawal of banknotes of earlier series (pre-2005) that were being counterfeited the most, advice to regional offices to liaise with law enforcement agencies, as also to step up training to various agencies and stakeholders. The nodal agency would examine the legal aspects of moving away from the current system of reporting and recording FIR, and the Prevention of Money Laundering Act (PMLA), 2002, now included FICN offences.

Against the backdrop of the persistent increase in seizures of FICN and the growing nexus between FICN and other crimes, the Central Economic Intelligence Bureau organised a workshop on 30 October 2007 in New Delhi. The Bank's Executive Director, in a letter to Leela K. Ponappa, Deputy National Security Adviser, requested the government's urgent intervention in certain issues that had emerged at the meeting. The workshop noted that the offence pertained not simply to the possession of counterfeit notes but to

Table 9.4 Detection of Fake Notes through Banking Channels: 1999–2000 to 2007–08

Year	*₹10*	*₹20*	*₹50*	*₹100*	*₹500*	*₹1,000*	*Total Pieces*	*Total Value (₹million)*
1999–2000	729	125	887	19,001	16,781	-	37,523	10.3
2000–01	752	127	1,832	43,082	56,888	6	102,687	32.9
2001–02	588	72	3,013	67,168	53,661	13	124,515	33.7
2002–03	198	34	3,488	172,597	35,398	39	211,754	35.2
2003–04	77	56	4,701	182,361	17,783	248	205,226	27.6
2004–05	79	156	4,737	161,797	14,400	759	181,928	24.4
2005–06	80	340	5,991	104,590	12,014	902	123,917	17.7
2006–07	110	305	6,800	68,741	25,636	3,151	104,743	23.2
2007–08	107	343	8,119	110,273	66,838	10,131	195,811	55.0

Source: RBI, *Annual Report*, various years.

Note: Data do not include seizures made by the police and other enforcement agencies.

the possession thereof 'with the intention to use them as genuine'. This legal position needed to be reiterated to the police. The Bank was of the view that there had been cases where officials from bank branches where counterfeit notes were detected were arrested based on FIRs filed by the Bank, and such bank officials typically moved the courts for relief. Also, in some cases, the bank officials were reported to have destroyed counterfeit notes to avoid police harassment. As a result, prompt reporting on counterfeits was not done.

The combined effect of these efforts was a gradual fall in the total value of counterfeits detected after 2003 until 2006–07, as Table 9.4 shows.

Security Features

Security features of banknotes need to be reviewed and upgraded from time to time to take advantage of changing technology. The notes issued in any series/design by the Bank continue to be legal tender for all time, although, over a period, notes in a particular series/design may not be seen anymore because of discontinuation of printing. In some countries, where the volume of notes in

circulation is small, a new design replaces an old design once every five to six years, and the old design is discontinued as legal tender. In such a situation, the prevention of counterfeiting is relatively easier. In India, while it was difficult to remove an old design by way of withdrawing its legal tender, the Bank attempted to phase out the old design by not reissuing it once it came to the currency chests or the Bank's offices.

Although the predominant reason for new security features is to make counterfeiting difficult, they also assume importance in the context of the mechanised cash processing activities. The success of these systems depends greatly on the notes having machine-readable security features.

In 2002, the Bank, in association with the Ministry of Finance, decided to introduce additional security features in Indian notes. The existing security features were in place for about seven years. Based on the suggestions of a high-level committee, the government approved (February 2004) incorporation of additional security features. A Price Negotiation Committee, headed by Executive Director P. K. Biswas, was constituted to conduct negotiations with the suppliers of exclusive security features for Indian banknotes. The committee, after conducting a series of discussions with the suppliers, signed the exclusivity agreement for India-specific security features, namely M-feature, a chemical to be incorporated in the paper-making stage, and colour shift thread for notes of ₹100 and higher denomination.

The Bank introduced banknotes with new/additional security features in a phased manner from 24 August 2005. The details of the security features are given in Box 9.2.

Post-print Coating and Polymer Notes

A longer circulation lifetime of banknotes should lead to lower demand for new banknotes. Cost reduction in the supply of notes, therefore, can be achieved by increasing the durability of notes. There are several factors that are responsible for the decreased longevity of Indian banknotes: method of handling, varied climatic conditions and pollution. The physiological factors include contact with sweat and saliva or soiling. Banknotes handled in fresh vegetable or fish markets, or as *puja* offerings, bring them routinely in contact with moisture and organic substances. The acidic environment also reduces the life of the banknotes to a great extent.[2] The major denominations which suffer from reduced life are ₹10, ₹20 and ₹50, which are especially common in small-value transactions.

Post-print Coating

In December 1999, a committee formed by the government examined the option of coating the notes after printing. The committee requested SICPA (Switzerland), BCS Security Private Ltd (India), Louisenthal (Germany), Joh. Enschedé (Netherland) and Oberthur Fiduciaire (France) to supply chemical solutions for conducting trials on the post-printing coating. The trials were carried out on sample notes of ₹10 and ₹100 denominations. These notes were subjected to laboratory tests at the Security Paper Mill, Hoshangabad. The committee recommended that printing of Indian banknotes on a paper substrate and carrying out post-printing coating was the best option to increase the life of banknotes in the Indian environment. The member from the Bank, while agreeing with the recommendation, suggested that the option to introduce polymer notes for ₹10 should not be foreclosed in view of ongoing developments in polymer research.

The Joint Secretary, Ministry of Finance, in a letter of 16 April 2002 to Deputy Governor Kamesam, informed that the government had examined the proposal to introduce post-print coating of ₹5 and ₹10 denominations, with the proposal to coat 500 million pieces each of these denominations. In a letter of 29 April 2002, the Bank stated that it was not in favour of coating, but was open to trials. On 11 June 2002, the government pointed out that the stand taken by the Bank was contrary to the recommendations of the expert committee, which also included officers from the Bank. Deputy Governor Kamesam responded on 27 June 2002, citing three reasons for the Bank's reluctance. First, in view of the adequate availability of note-printing capacity, the coating of banknotes was not necessary. Second, the Bank preferred to replace ₹5 and ₹10 notes with coins within three to four years. Third, it was desirable to ascertain the credentials, capabilities and security arrangements of the firms considered before taking this step.

Governor Reddy, in his noting dated 2 July 2004, raised queries on the selection of this particular product only. In view of this comment, the matter of choice of appropriate chemical was examined further. It was learned that a few countries, such as Hong Kong, Jordan, Malaysia, South Africa and Tanzania, did use varnish coating on post-printed notes. But no information on the material used was forthcoming. In August 2004, the Ministry of Finance clarified that in 2000–01, the technical committee had witnessed the presentations made by twelve firms, compared the advantages and the disadvantages of cotton-based and polymer-based substrates and also carried

out certain tests on all the coating materials. It was concluded that BCS Security showed exceptionally good performance.

In November 2004, the BRBNMPL was asked to prepare and forward a project report for setting up testing facilities. They prepared the report and identified the machines that would be needed. Correspondence on the matter dragged on until 2005. On 19 October 2005, the Deputy Governors' meeting stressed the need for trial coating of post-printed banknotes in view of the counterfeit problem. In December 2005, the Bank formed a technical group to carry out the tests.

At the end of February 2007, the Swiss company SICPA had already coated the specimen banknotes and plain sheets at their works in Switzerland and returned these to the Bank along with their report. Giesecke & Devrient and Joh. Enschedé en Zonen had collected the plain banknote sheets and specimen banknotes for varnishing at their works. The supply of coated samples was expected by the end of February 2007. BCS Security had not collected the specimen for coating despite reminders, nor did the firm give any time frame for carrying out the coating. Specimens were sent in the last week of June 2007 to the Central Institute of Plastic Technology, Chennai, and the Central Pulp and Paper Research Institute, Saharanpur, for laboratory testing. The test results were forwarded to the National Chemical Laboratory (NCL), Pune, in January 2008 for comments. Their reply was received in March 2008. The main observations of the NCL were that the plastic banknotes performed better than paper or coated paper banknotes in most mechanical properties except tear resistance, where the paper-based banknotes performed better. Also, the new coated paper banknote samples showed considerable improvement in chemical resistance and soiling resistance compared to both uncoated paper and previous coated paper banknote samples.

Polymer Notes

At a senior management committee meeting held on 3 August 1999, it was decided that the Bank should consider printing ₹10 note on an experimental basis using polymer substrates supplied by two firms. The polymer notes supplied by both the firms were used at the Mysore press of the BRBNMPL to print notes on a trial basis. However, there were problems with regard to simulating the watermark and security thread in the substrates.

In January 2000, the Ministry of Finance referred the Bank's proposal to the committee of experts constituted by them. The committee, in their report of 28 March 2001, suggested that the testing of the polymer product in the Indian environment should be done in 'totality' and, therefore, decided that a three-member subcommittee be formed. The subcommittee conducted the tests, and their report was against the introduction of polymer notes, and for post-print coating on paper. The Ministry of Finance wrote to the Bank (in November 2004) to have a 'fresh look' into the matter. The Bank informed (letter dated 8 December 2004) that information from the countries using poly-substrate banknotes was being collected. The survey found that all the countries received technical assistance from a single company called Securency. However, the number of polymer banknotes issued in these countries was considerably smaller than the number of banknotes in circulation in India.

The matter came up for consideration in the meeting of the committee of the Reserve Bank's Central Board held on 28 September 2005. It was decided to study the experience of Singapore and Australia closely. In reply to the concerns of the Ministry of Finance (November 2005), the Bank stated that the test results of the BRBNMPL samples will finally determine the introduction of polymer notes – the ₹10 denomination notes.

The laboratory tests conducted by the Central Pulp and Paper Research Institute and the Central Institute of Plastic Engineering and Technology showed that the properties of polymer banknotes were indeed much better compared to paper banknotes.

In September 2006, discussions took place on production agreement, whereby Securency would provide technology for the substrate and the Bank would undertake manufacture. The draft memorandum of understanding (MoU) and the mutual confidentiality deed received from Securency were vetted by the Legal Department in April 2007. In July 2007, a draft MoU was prepared to be signed by the BRBNMPL with Securency for technology transfer, for both production of substrate and printing of polymer notes.

In May 2008, the Bank's officials made study visits to three countries that had introduced polymer notes on a trial basis. Thereafter, the Bank recommended to the government to go for polymer notes of ₹10 or smaller denomination on a field trial basis. The Ministry of Finance, in its letter dated 7 October 2008, left it to the Bank to decide upon the procurement procedure.[3]

Customer Service

The Bank made efforts to conduct currency management operations with a view to ensuring an optimal supply of good quality and secure banknotes and coins in the country. In this process, improvement of customer service with reference to issue and acceptance of notes and coins from the public and exchange of soiled and mutilated banknotes became a priority. Modernisation of the technological infrastructure, diffusion of information technology initiatives in computerisation of bank branch operations (relating to note processing) and advances in communication facilities were intended to improve customer satisfaction and create the necessary environment for improvement in currency management. Some of the more prominent features during the period under review are highlighted below.

- The regional offices of the Bank took several initiatives for better distribution of coins by installing coin vending machines in the banking hall of the Issue Departments, and by encouraging banks to install such machines in their premises.
- During 2001–02, the Bank issued a master circular for the guidance of the general public on the note exchange facility.
- Various measures were initiated for mopping up soiled and mutilated notes of ₹1, ₹2 and ₹5 denominations and distribution of coins. The issue offices launched campaigns through mobile vans and bank branches to encourage people to get such notes held with them exchanged.
- Currency chests were instructed to stop reissuing soiled and mutilated banknotes in these small denominations.
- The Bank's 'Currency Link' on its website covered various aspects relating to Indian currency and coinage, images and security features of contemporary banknotes in the Mahatma Gandhi series, frequently asked questions (FAQs), and press releases on the issue of currency.

The Bank introduced a 'single window customer service' at its issue offices whereby coins and notes of all denominations were either issued or accepted at one counter. Similarly, mutilated notes were accepted in a drop box (even beyond normal banking hours) without any limit.

A noteworthy development in 2003–04 was the constitution of a Committee on Procedures and Performance Audit on Public Services (CPPAPS)[4] to study, inter alia, the services relating to currency management. The major recommendations of the committee, which were accepted, were,

steps to improve transparency in currency management, early introduction of ₹10 coins, phasing out of ₹5 notes, revision of Currency Chest Agreement to incorporate a provision for monetary penalty for non-compliance with the Bank's instructions, a Systems Study of Banking Hall arrangements in the Mumbai office of the Bank in the interest of smooth flow of transactions, introduction of measures to separate location/time for services to money changers, Citizens' Charter for Currency Exchange Facilities to be made available to customers, bank branches to exhibit permanently a notice that soiled and mutilated notes were freely exchanged at the branch, the Bank's Note Refund Rules to be written in easily understandable language, the practice of pasting of mutilated notes when these were exchanged should be reviewed, and action to be taken against violation of instructions by banks on exchanging soiled and mutilated notes. By 2004–05, all issue offices had implemented the major recommendations of this Committee.

Based on the recommendations of the CPPAPS, the Bank revised the 'Citizens' Charter' and placed it on its website, opted for ISO Certification on Currency Management, instructed its regional offices to initiate necessary steps to achieve international standards in customer service in currency management (2004–05) and, in association with the National Film Development Corporation, developed a film on the security features of banknotes (2007–08). All commercial banks, cooperative banks and RRBs were advised (through the regional offices of the Reserve Bank) to disseminate information on the availability of exchange facilities of both coins and notes prominently in their banking premises. The regional offices were advised to conduct surprise checks to ensure that such facilities were made available by the bank branches. The Citizens' Charter was updated during 2006–07.

Further, during 2003–04, the procedures and practices followed in the issue offices for the exchange of notes in the Claims Section and access to the public counters were simplified.

Integrated Computerised Currency Operations and Management System (ICCOMS)

In the early 2000s, the Bank took the decision to design, develop and implement an integrated computerised currency operations and management system (ICCOMS), both in the regional offices of the Bank and in the DCM, central office. ICCOMS comprised three components: currency chest

Table 9.5 Components of ICCOMS

Currency Chest Reporting System	*Issue Department*	*Currency Management Information System (CMIS) in the Department of Currency Management*
The general purpose is to facilitate prompt and accurate reporting and flow of information. This component enables the currency chests to transmit and receive data to and from the Issue Departments and their link offices through INFINET or the respective bank's network. Similarly, the link offices of the banks submit consolidated data on currency transactions of the chests of the region to the respective Issue Department. Its implementation has facilitated prompt, efficient and error-free reporting and accounting of the currency chest transactions and seamless flow of information.	This component facilitates automation of all the operations of the Issue Department. The package consists of twenty-four modules. Of these, the chest accounts module is the key to the receipt and transmission of data to chest/link offices of the banks.	This component provides for online monitoring of all issue offices and for collection and processing of information/data electronically received from all the issue offices. It facilitates trend analysis at the DCM.

reporting system (CCRS), ICCOMS-Issue Department (ICCOMS-ID), and currency management information system (CMIS) in the DCM, central office, Issue Departments in regional offices and currency chests maintained by various banks (Table 9.5). The 'live run' of the CCRS component under ICCOMS, which commenced in 2006–07, stabilised in 2007–08. It enabled the Bank to account for currency transfer transactions efficiently.

Conclusion

The reference period, especially the last six years of the period, witnessed a continuation and strengthening of initiatives to improve technology and

distribution to mitigate shortages of notes and coins, deal with counterfeits, and improve the quality of notes. Chronic supply shortages of coins were mitigated, and a gradual shift occurred in the denominations of banknotes with the increasing popularity of ATMs. Anti-counterfeit measures were continued in coordination with the government and through public awareness campaigns and paid off in the progressive reduction in the value of counterfeits detected. Finally, a major initiative was started on introducing polymer notes, though no definite progress was made during the reference period.

Notes

1. Meeting of the High-Level Technical Committee of Experts for examination of the problems caused by the circulation of Fake Currency Notes, 17 April 2008, New Delhi, convened by the Ministry of Finance, Department of Economic Affairs.
2. Government of India, *The Report on Increasing the Life of Indian Bank Notes* (New Delhi: Ministry of Finance, 2000).
3. This stand was reiterated by the Finance Ministry in a letter dated 19 June 2009.
4. Chairman: S. S. Tarapore.