
UNIT 14 MONEY CREATION AND CENTRAL BANKING

Structure

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14.0 OBJECTIVES

After going through this unit, you will be able to:

- discuss the functions of the Central Bank;
- describe the process of credit creation and the role of the Central Bank in this process;
- list the instruments of monetary policy at the disposal of the Central Bank; and
- examine the operation of monetary policy in India .

14.1 INTRODUCTION

Central banks occupy a pivotal position in the institutional fabric of an economy. The functions of a modern central bank are vastly different from what was expected from the early central banks founded in Europe in the seventeenth century.

In this Unit we'll talk about the process of credit creation and the role of central bank in the process. Then we go on to the instruments of monetary policy at the disposal of the central bank to influence the monetary policy. We will also briefly discuss the main functions and structure of central bank in India. More generally, we will examine the monetary policy in the India and around major economies of the world. We will also look at role the central bank plays in market for foreign exchange and how it influences the foreign exchange reserves in an economy.

The word "bank" will generally be used to mean commercial bank in this Unit.

14.2 FUNCTIONS OF A CENTRAL BANK AND INSTRUMENTS OF MONETARY POLICY

In an economy central bank is supposed to play certain important role. These are as follows:

- i) *Issues currency and regulates the money supply* through the *tools of monetary policy* depending on the requirements of the economy.
- ii) *Act as a banker's bank*: that is making loans to commercial banks and as a lender of last resort. This function is useful in preventing bank runs by serving as the lender of last resort to any temporarily illiquid but otherwise solvent bank.
- iii) *Act as banker to the government*: Operating as a fiscal agent for national governments by issuing, servicing, and redeeming government debts. In the times of emergencies central bank also helps in raising government funds to finance these emergency expenditures.

The central bank controls the monetary policy using the tools at its disposal. These are

1. **Cash Reserve Ratio (CRR)** The **reserve requirement** (or **required reserve ratio**) is a bank regulation, which sets the minimum reserves each bank must hold to customer deposits. In most countries banks are required to keep a minimum percentage of deposits on hand, known as the **required reserve ratio**. This required reserve ratio is put into place to ensure that banks do not run out of cash on hand to meet the demand for withdrawals. These are normally in the form of fiat currency stored with the central bank.

The reserve ratio is sometimes used as a tool in monetary policy, influencing the country's economy, borrowing, and interest rates. However, in the India or the US or many other economies, the central banks rarely alters the reserve requirements. Instead, open market operations are used more commonly (discussed later). As of 2006 the required reserve ratio in India was 5% of deposits although this ratio was very high at 15 percent in the early nineties (see Appendix Table 1).

A bank that holds reserves in excess of the required amount is said to hold *excess reserves*.

2. **Statutory Liquidity Ratio (SLR)** is a term used in the regulation of banking in India. It is the amount which a bank has to maintain in the form of cash, gold or approved securities. The quantum is specified as some percentage of the total demand and time liabilities of a bank. This percentage is fixed by the Reserve Bank of India. The SLR has been used as an instrument of monetary policy to influence the country's macroeconomy. This tool helped in providing the credit to the public sector companies from the banking system in India. Presently this rate is around 24 percent (see Appendix Table 1). This ratio was very high at 38.5 percent in the early nineties.

Both high CRR and high SLR meant that the banks could only lend out less than half of their funds to private sector. This is argued to have had an adverse impact

on the profitability of the Indian banking sector. These ratios have been brought down significantly in the nineties giving the commercial banks more functional flexibility.

3. **Open market operations:** The primary way in which the central bank changes the money supply is done through the purchase and sale of Government bonds.. **To increase the money supply, the central bank buys government bonds from the public.** To decrease the money supply, the Central Bank sells government bonds to the public
4. **Bank rate:** It is also referred to as the discount rate, is the rate of interest which a central bank charges on the loans and advances that it extends to commercial banks (and sometimes also to other financial intermediaries). Changes in the bank rate are often used by central banks to control the money supply in an economy.

Evolution of Commercial Banking

Financial intermediaries are "middle-men" who funnel funds from economic agents with surplus sources of funds (households, businesses, foreign investors) to users (business, government). In principle, savers could purchase assets directly from users, as when an individual buys share of stock or a treasury bill. But in practice, most funds flow through intermediaries of various types: commercial banks, pension funds, insurance companies, and so on. Investment banks play an important role too, and also help to match borrowers and lenders. To get a rough idea where these institutions stand in India some of the numbers for 1970-71 to 2004-05 are given in *Table 1*.

As one can note from this table that share of financial assets in household savings has gone up from 57 percent to about 74 percent. It touched a peak of over 85 percent in 2000-1 but since then it has come down. This may be possibly due to the boom in the real estate sector of the economy which is emerging as another avenue for parking household savings.

Table 1: Share of Different Sectors in Financial Assets of Households (Rs Crores)

Year	1970-1	1980-1	1990-1	1991-2	1999-0	2000-1	2003-4	2004-5P
Currency	9.65	10.94	8.01	10.26	7.28	5.35	7.80	6.28
Bank deposits	20.49	37.38	24.05	22.45	28.95	32.42	30.09	26.87

Non-banking deposits	1.82	2.55	1.65	2.79	1.34	2.37	0.66	0.57
Life insurance fund	5.63	6.16	7.17	8.81	10.00	11.59	9.98	11.81
Provident and pension fund	13.32	14.29	14.29	15.72	18.83	16.39	10.41	9.57
Claims on Government	2.85	4.80	10.10	6.09	10.12	13.35	14.94	18.07
Shares & debentures	1.85	2.77	6.37	8.55	5.70	3.82	1.74	1.38
Units of UTI	0.38	0.21	4.40	11.43	0.63	-0.32	-1.64	-0.53
Other Assets	1.36	2.51	-0.58	-0.52	-0.36	0.06	-0.02	-0.04
Changes in financial assets	57.35	81.61	75.45	85.58	82.50	85.02	73.93	73.97
NDP at fc	39252	117888	457690	524684	1579479	1705104	2266148	2553334
Net Domestic Savings	3679	14848	78076	79506	286322	292154	522783	589035

Source: R B I, 2005 'Handbook of Statistics on Indian Economy'. P = Provisional

These figures should make it clear that banks are not the only financial institutions in India. In fact, their market share has been falling in recent years although they are still the most important. The other important financial institutions are the insurance companies, pension funds and mutual funds.

While many financial trends are global, there are nonetheless substantial cross-country differences in financial institutions. The most obvious of these concern banks. The Indian banking system differs from many countries both in the range of services supplied by commercial banks and in the number of them---around 88 in 2005. The 28 nationalised banks control 85 percent of branches and 50.7 percent of deposits. In comparison there are 10 banks in Canada, of which 4 or 5 have almost all of the business. Or about a hundred in the UK, where 6-8 banks control about 80 percent of the market. We could make similar statements about France, Germany, and Japan. The US, however, is different as it has around 12000 banks – larger than any other country. These banks differ, as well, in their range of activities. Banks have traditionally accepted deposits from customers (individuals and businesses) and used the proceeds to finance loans to businesses and individuals and investments in corporate and government securities. This is often allied with related businesses like credit cards, foreign currency transactions, and so on. But until recently the reach of commercial banks did not extend to investment banking activities, like underwriting. In many countries, however, banks provide a more complete range of financial services. In Germany and Japan, for instance, "universal" banks provide investment banking and insurance services also. In the US, the banking and insurance industries have been separately regulated almost from the start, and commercial and investment banking were formally segregated (by the Glass-Steagall Act of 1933---hence the separate identities now of Morgan Stanley and JP Morgan). In short, changes in regulations have had an enormous impact on the financial services industry across countries in general and commercial banking in particular, over the last twenty years or so.

Along with the reduction in the market share of commercial banking, we have seen, we are also likely to see, a sharp reduction in the number of banks.

Check Your Progress 1

1. What are the main functions of the Central Bank of a country?

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2. What are the main instruments at the disposal of the central bank to conduct monetary policy?

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3. Distinguish between the cash reserve ratio and statutory liquidity ratio.

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14.3 A THEORETICAL MODEL OF A BANKING SYSTEM

Many aspects of economic theory have been around for decades, even centuries. Past and future changes in the global financial system, however, are likely to make some of what we're about to do obsolete soon. The tradition in theory has been to emphasize the role of banks over other financial intermediaries and focus, in particular, on banks' role as suppliers of assets that are used in making transactions---cheque-facility accounts and their close relatives. But as the line between banks and other institutions gets fuzzier, and alternative means of payments arise, these two distinctions may turn out to be less useful than they have been in the past. Nevertheless, this line of study gives us a start toward understanding how the financial system operates.

The objective of this section is to provide a link between the money between the monetary aggregates used in our theory (think of this as M3) and the part of "money" that is under the direct control of the central bank (the *monetary base*, MB). We try to spell out the link between central bank policy and monetary aggregates, and the role of the banking system in this process.

A bankless economy: To get ourselves warmed up let's look at the balance sheets of the a typical Central Bank and the Private Sector in a stylized economy that has no banking system, and the effect on these balance sheets of an open market operation. Then we'll go on to see how a banking system changes the analysis. Let us say, then, that the Private Sector (excluding banks) has, among other assets, 500 of treasury bills, 100 of currency, and some equity. Its balance sheet might then be something like

Private Sector Balance Sheet

Assets

Liabilities

Currency	1000	Net worth	9000
Treasury bills	1000		
Equity	7000		

(In real life, this would be much more complicated, but since this is theory we can simplify)

The Central Bank might have, say, an inventory of 100 in treasury bills and a liability of the same 100 in currency, since currency is normally issued by Central Bank: in effect, interest free loans from the public to the Central Bank. Thus the Central Bank's balance sheet is

Central Bank's Balance Sheet

Assets	Liabilities
Treasury bills 1000	Currency 1000

(The convention is that the Central Bank has no net worth: earnings accrue to the Treasury.)

In this economy, like the one in the Keynesian model, the money supply is the supply of currency: 100. We can change this with an open market operation. If the Central Bank wants to increase the money supply by 10, it simply buys 10 worth of treasury bills from the public. This changes the composition of the balance sheets of both the public sector and the Central Bank, but not their net worth. That's what was going on behind the scenes in our discussion of monetary policy in the Keynesian model: an increase in the money supply made the composition of the private sector balance sheets more liquid, in the sense that it included more money after the open market purchase than before.

A banking system: That was practice, now we develop the same idea for an economy with a banking system. We add bank deposits (and the corresponding loans) to the private sector's balance sheet and bring banks into the picture. A possible configuration is:

Private Sector Balance Sheet

Assets	Liabilities and Net Worth
Currency 50	Bank Loans 500
Bank Deposits 1000	Net worth 9000
Treasury bills 1000	
Equity 7000	

Central Bank's Balance Sheet

Assets	Liabilities
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Treasury bills	1000	Currency	500
Reserves		500	

Commercial Banks Balance Sheet

Assets		Liabilities	
Reserves	500	Deposits	1000
Loans	1000		

You'll note that net worth is zero for the Central Bank as it is "owned" by the Treasury and Commercial Banks (owned by shareholders).

A useful example of a monetary aggregate in this economy is $M = C$ (Currency) + D (Bank Deposits). The Central Bank, on the other hand, controls the amount of currency held by the private sector (as cash) and banks (as reserves). We call this quantity the monetary base, $MB = C + R$ (Reserves).

The question is how an open market operation that changes the monetary base MB influences the monetary aggregate M ---whether, that is, we can talk about the Central Bank influencing a monetary aggregate, when policy involves the narrower monetary base. We can derive the relation between the monetary base MB and the monetary aggregate M if we make some assumptions about behavior. Let us say, first, that private agents like to hold cash and bank deposits in some strict proportion:

$$C/D = c$$

Where 'c' is some number that we might expect to be roughly constant. The idea is that we make some transactions with cash, others with cheques, and the proportion of the two doesn't change much in normal circumstances. Let us also assume that banks hold a constant fraction of their deposits as reserves:

$$R/D = r$$

This latter assumption is quite useful since the Central Bank requires them to hold reserves proportional to their deposits. From a bank's point of view this acts as a leakage on their deposits, since reserves earn no or very little interest. Even if there were no minimum reserves, banks might be expected to hold some fraction of deposits in cash as part of their day to day business. From this, we can derive a relation between the monetary aggregate and the monetary base. We know:

$$MB = R + C \quad (\text{equilibrium condition})$$

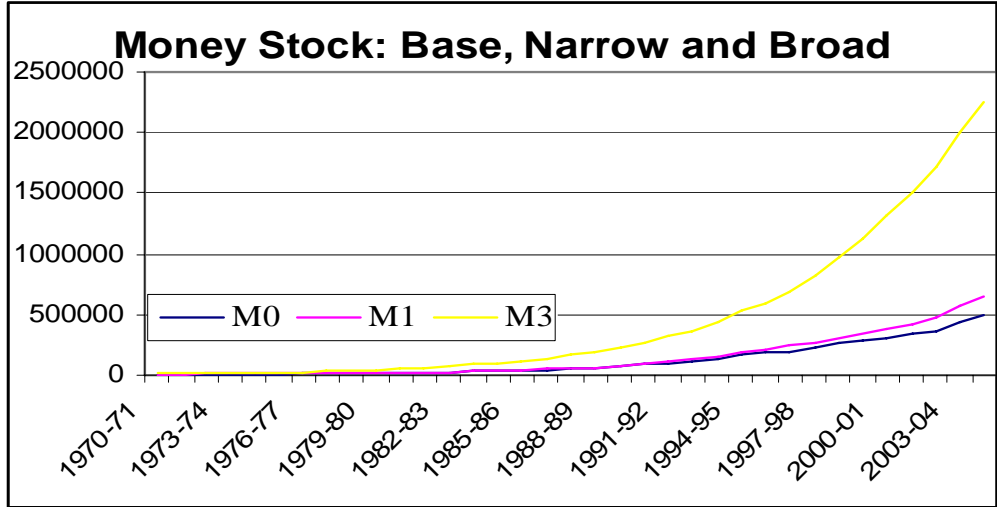
$$M = C + D \quad (\text{definition of money})$$

This leads (after some relatively simple algebra) to

$$M = [(1 + c) / (c + r)] MB = m MB$$

The expression in brackets is referred to as the money multiplier, since we generally see that the stock of money is a multiple of the monetary base.

In India, for example, the multiple (or money multiplier) has hovered in the range of 1 to 1.7 for narrow money (M1), and has gone up from 2.3 to 4.6 for broad money (M3) from 1970/1 to 2004/5 (Figure 14.1)



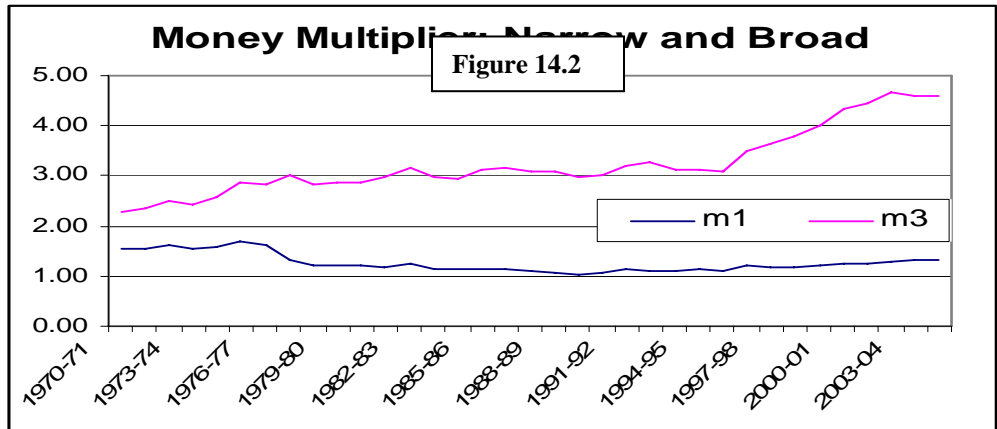
Figur

Note: M

We now have an answer to our question: if the ratios r and c are approximately constant, then by controlling the monetary base the Central Bank exerts indirect control over the broader monetary aggregates. In that sense, we can speak loosely about the RBI "controlling" M1, M3 and other aggregates.

But are the ratios constant? We can get some idea by plotting the data. In Figure 14.1 we can see how monetary aggregates and related variables have behaved over the last thirty-five years.

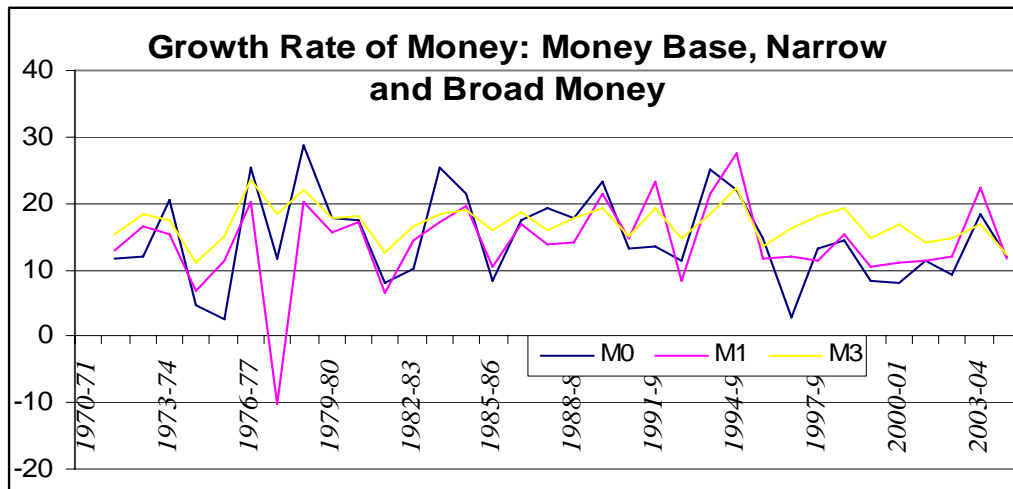
We can observe that M3 has been growing faster than MB and M1. In Figure 14.2 we see the money multipliers for the two aggregates.



Note: $MR = M0$

Figur

As one would expect there has been some variation over time since the aggregates have grown at different rates. One can see the same thing in different form in Figure 14.3 where the growth rates of MB and M1, and M3 are drawn.



In short, the money multipliers are another case of a reasonable approximation, but in the short run we see some variation which is reflected in different growth rates across aggregates. Thus the money multiplier theory is only a rough guide and in the short run, at least, the Central Bank may have a difficult time affecting monetary aggregates.

Check Your Progress 2

1. How does an open market operation influence the monetary aggregate?

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2. Distinguish between M0, M1 and M3 in the Indian context.

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3. Derive a relationship between the monetary base and monetary aggregate

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14.4 CENTRAL BANKS AND THE MARKET FOR RESERVES

As we saw above that with regard to influencing the macroeconomic activity in an economy the central bank uses three-distinct instruments of monetary policy (in India four as mentioned earlier). But by far the most important is 'open market operations', but they also control reserve requirements on deposits and the discount rate on borrowing from the Central Bank. Each of these policies is determined by a somewhat different combination of players.

Day-to-day open market operations are carried out with repurchase agreements, or repos, on Government of India securities with sanctioned security dealers (which includes many of the big financial institutions of various types, including commercial banks). In a typical "system RP" (system distinguishing this from private sector repos) the Central Bank purchases government securities and sells them back again a few days later. The terminology means that the customer has "repurchased" the securities it temporarily sold to the Central Bank. The difference between the sale and repurchase prices indicates the interest rate on the transaction. The reverse transaction is called a reverse repo by the market, and a matched sale purchase (or MSP) by the Central Bank. Both of these instruments allow the Central Bank to affect the *quantity of reserves* and *the monetary base*.

The most popular indicator of the Central Bank's open market operations is the bank rate. In the course of satisfying their reserve requirements, banks often borrow and lend reserves. A bank with more reserves than it needs will loan them to a bank that needs more, and charge interest on the loan. This market for reserves is referred to as the *call money market*, and the rate *the bank rate*. With reserve requirements imposed weekly, the loans are generally of very short duration, often only a day.

The other two policy instruments are changed less frequently. As mentioned earlier, one of the tasks of the Central Bank is to provide short-term loans to banks. These loans are secured with government securities. In the old days this took the form of banks selling securities to the Central Bank at a discount, with the result that this arm of the Central Bank is known as the discount window. The interest rate on such borrowing is called the discount rate. The discount rates are suggested by the regional banks subject to the Board of Governors and in recent times have been below market rates. The loans are made at the discretion of the Central Bank, and banks that are seen as abusing their borrowing privileges may lose them. In practice, the discount rate is not viewed as an important aspect of monetary policy, but it is often used to signal the Central Bank's intentions. A rate cut, for example, may indicate that the Central Bank foresees lower rates, and possibly looser monetary policy.

The final policy instrument of policy is cash reserve requirements. As we've seen, banks (and other depository institutions) must hold reserves against deposits in the form of cash or deposits at Central Bank. These reserves do not pay interest. In India, the Board sets these requirements within limits set by the Monetary Control Act of 1980. These requirements are changed much less often than the discount rate.

Evolution of Central Banking in India (this has been adapted from the RBI's Report on Currency and Finance, 2006)

The evolution of central banking in the Indian context has its own specificity. The Reserve Bank of India (RBI), while discharging its statutory responsibilities, has played a crucial role in the nation building process, particularly in the development of the financial sector. In fact, institution building constitutes a distinguishing feature of central banking in India (RBI, 2006).

This section describes the evolution of central banking in India over the period of seventy years since the inception of the Reserve Bank in 1935. For analytical convenience, the entire period 1935-2005 is sub-divided into three broad phases: foundation phase (1935-1950), development phase (1951-1990) and reform phase (1991 onwards). The turning points – onset of economic planning in 1951 and initiation of structural reforms in the Indian economy in 1991 –had profound implications for the working of the Reserve Bank. The Reserve Bank operated in distinctly different regimes in each of these eras. During most of the formation phase it was a private bank, though formed under a statute and overseen by the then colonial government. The functions of the Bank during this phase were confined essentially to traditional central banking, *i.e.*, note issue authority and banker to the Government. During the war and post war years, its major preoccupation was facilitation of war finance, repatriation of sterling debt and planning and administration of exchange control. Upon the nationalisation of the Bank in 1949 in terms of the Reserve Bank of India (Transfer to Public Ownership) Act, 1948 and the enactment of the Banking Regulation Act, 1949, regulation and supervision of banks received the focus. On the initiative of the Reserve Bank, the Government appointed the Rural Banking Enquiry Committee in 1949 to consider important policy issues relating to the extension of banking facilities in the country. With the launching of five-year plans, the Bank's functions became more diversified in terms of Plan financing and establishment of specialised institutions to promote savings and investment in the Indian economy and meet the credit requirements of the priority sectors. Two important events during the 1960s – the devaluation of the rupee in June 1966 and nationalisation of 14 private commercial banks in July 1969 – greatly influenced the functions of the Reserve Bank in the subsequent years. Externally, the uncertainties in the global economy following the breakdown of the Bretton Woods system of stable exchange rates and the emergence of the floating regimes exacerbated by the oil shock of 1973-74 presented serious challenges for exchange rate management and gave rise to balance of payments difficulties in India as in many other developing countries. The Government re-focused on the Foreign Exchange Regulation Act (FERA), 1947 for conserving foreign exchange rather than regulating the entry of foreign capital. The FERA, 1973 was drafted incorporating the changes necessary for effective implementation of the Government policy and removing the difficulties in the working of the existing legislation. The major responsibilities devolving on the Reserve Bank during the 1970s related to regulation and management of the country's scarce foreign exchange reserves and expansion in the volume and scope of its refinance facilities for agriculture and rural development. During the 1980s, monetary policy assumed a new focus. On the whole, the development phase was characterised by a plethora of controls and regulations in the Indian economy. In the period since 1991, which witnessed a regime shift in the Indian economy, there has been a distinct re-orientation in the functions of the Reserve Bank in the light of the domestic and global developments. The reform measures in the financial sector and the initiatives taken by the Reserve Bank for developing financial markets to ensure efficient transmission of monetary policy impulses, constituted the hallmark of this phase

The Structure of Reserve Bank of India

The Reserve Bank of India System is a curious mixture of public and private. The Board of Governors, in Mumbai, consists of 7 individuals appointed by the Ministry of Finance. Each serves a five year term. One of its members is appointed chair for a four-year term by the same procedure. YV Reddy, for example, was appointed in 2005. The length of term and the timing of chair appointments is intended to provide the RBI some short-run independence from the political process.

Central Board

The Reserve Bank's affairs are governed by a central board of directors. The board is appointed by the Government of India in keeping with the Reserve Bank of India Act.

- Appointed/nominated for a period of four years
- Constitution:
 - Official Directors
 - Full-time : Governor and not more than four Deputy Governors
 - Non-Official Directors
 - Nominated by Government: ten Directors from various fields and one government Official
 - Others: four Directors - one each from four local boards

Functions: General superintendence and direction of the Bank's affairs

Although the institutional setup varies across countries, in many developed countries, the central banks are given independence in conduct of their monetary policies.

The central banking system also includes 22 regional branches of the Reserve Bank of India Banks, whose location tells you something about the country and its politics in 1935, when the Reserve Bank of India Act was passed. These regional banks do a lot of the bank supervision, check-clearing, and other day-to-day operations of the system.

Check Your Progress 3

1. How are day-to-day operations carried out by the RBI?

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2. Distinguish between the cash reserve requirement and discount rate as instruments of monetary policy in India.

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3. Explain the concept of (a) Bank Rate and (b) Call money market.

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14.5 LET US SUM UP

In this Unit we learnt about the role of central banks in the process of money creation and also how the central bank uses the various tools available to it to influence the monetary situation in an economy. Then we went on to discuss how the central bank's actions impact the foreign exchange markets and the macro economy under the context of fixed and flexible exchange rate regime. Towards the end the monetary policies followed by other countries were also touched upon though not in detail.

In this Unit we discussed the process of credit creation and the role of central bank in the creation of credit. Then we went on to the instruments of monetary policy at the disposal of the central bank to influence the monetary policy. We also briefly discussed the main functions and structure of Central Bank in India, the Reserve bank of India. More generally, we examined the monetary policy in the India and around major economies of the world.

14.6 KEY WORDS

Desired excess reserve ratio: the amount of excess reserves banks wish to hold as a fraction of demand deposits.

Excess Reserves: reserves in excess of required reserves.

Monetary base: currency in the hands of the public plus commercial bank reserves, also called high powered money

Money multiplier: it determines the factor by which the money stock (currency plus deposits) changes as a result of change in the monetary base.

Open Market Operations: the purchase by the Central Bank of Treasury Bills issued by the government.

14.7 SOME USEFUL BOOKS

Abel, A.B., and Bernanke, B.S., (2001) *Macroeconomics, 4th edition*, Addison Wesley, Reading.

Mankiw, N.G *Macroeconomics*,
Mishkin, Frederic S. (1998) *The Economics of Money, Banking and Financial
Markets* Addison-Wesley, Reading.

Reserve Bank of India, 2006, *Report on Currency and Finance*,CF, Bombay.

RBI, , 2006 *Handbook of Statistics on Indian Economy*

14.8 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1. See Section 14.2 and answer.
2. See Section 14.2 and answer.
3. See Section 14.2 and answer.

Check Your Progress 2

1. See Section 14.3 and answer.
2. See Section 14.3 and answer.
3. See Section 14.3 and answer.

Check Your Progress 3

1. See Section 14.4 and answer.
2. See Section 14.4 and answer.
3. See Section 14.4 and answer.