Chapter 3

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# Money and Banking

Money is the commonly accepted medium of exchange. In an economy which consists of only one individual there cannot be any exchange of commodities and hence there is no role for money. Even if there is more than one individual but these individuals do not take part in market transactions, example: family living on an isolated island, money has no function for them. However, as soon as there is more than one economic agent who engage themselves in transactions through the market, money becomes an important instrument for facilitating these exchanges. Economic exchanges without the mediation of money are referred to as *barter exchanges*. However, they presume the rather improbable *double coincidence of wants*. Consider, for example, an individual who has a surplus of rice which she wishes to exchange for clothing. If she is not lucky enough she may not be able to find another person who has the diametrically opposite demand for rice with a surplus of clothing to offer in exchange. The search costs may become prohibitive as the number of individuals increases. Thus, to smoothen the transaction, an intermediate good is necessary which is acceptable to both parties. Such a good is called money. The individuals can then sell their produces for money and use this money to purchase the commodities they need. Though facilitation of exchanges is considered to be the principal role of money, it serves other purposes as well. Following are the main functions of money in a modern economy.

## 3.1 Functions of Money

As explained above, the first and foremost role of money is that it acts as a *medium of exchange*. Barter exchanges become extremely difficult in a large economy because of the high costs people would have to incur looking for suitable persons to exchange their surpluses.

Money also acts as a convenient *unit of account*. The value of all goods and services can be expressed in monetary units. When we say that the value of a certain wristwatch is Rs 500 we mean that the wristwatch can be exchanged for 500 units of money, where a unit of money is rupee in this case. If the price of a pencil is Rs 2 and that of a pen is Rs 10 we can calculate the relative price of a pen with respect to a pencil, viz. a pen is worth 10 ÷ 2 = 5 pencils. The same notion can be used to calculate the value of

money itself with respect to other commodities. In the above example, a rupee is worth 1 ÷ 2 = 0.5 pencil or 1 ÷ 10 = 0.1 pen. Thus if prices of all commodities increase in terms of money i.e., there is a general increase in the price level, the value of money in terms of any commodity must have decreased – in the sense that a unit of money can now purchase less of any commodity. We call it a deterioration in the purchasing power of money.

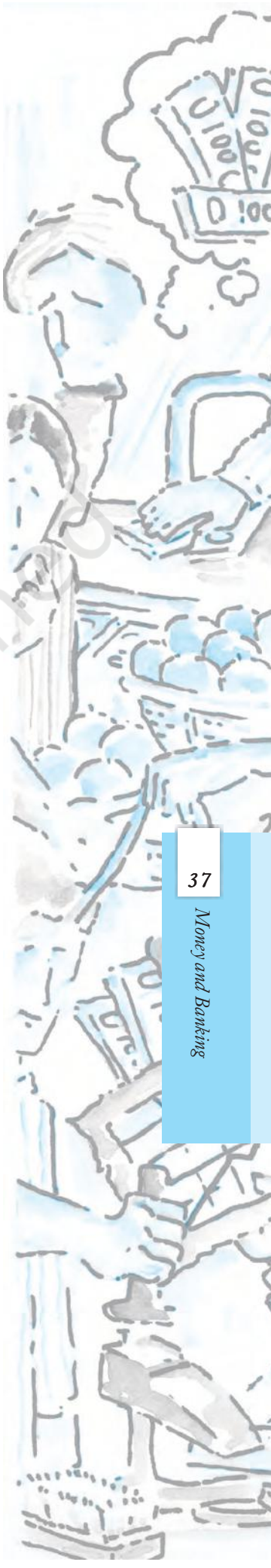
A barter system has other deficiencies. It is difficult to carry forward one's wealth under the barter system. Suppose you have an endowment of rice which you do not wish to consume today entirely. You may regard this stock of surplus rice as an asset which you may wish to consume, or even sell off, for acquiring other commodities at some future date. But rice is a perishable item and cannot be stored beyond a certain period. Also, holding the stock of rice requires a lot of space. You may have to spend considerable time and resources looking for people with a demand for rice when you wish to exchange your stock for buying other commodities. This problem can be solved if you sell your rice for money. Money is not perishable and its storage costs are also considerably lower. It is also acceptable to anyone at any point of time. Thus money can act as a *store of value* for individuals. Wealth can be stored in the form of money for future use. However, to perform this function well, the value of money must be sufficiently stable. A rising price level may erode the purchasing power of money. It may be noted that any asset other than money can also act as a store of value, e.g. gold, landed property, houses or even bonds (to be introduced shortly). However, they may not be easily convertible to other commodities and do not have universal acceptability.

Some countries have made an attempt to move towards an economy which use less of cash and more of digital transactions. A cashless society describes an economic state whereby financial transactions are not connected with money in the form of physical bank notes or coins but rather through the transfer of digital information (usually an electronic representation of money) between the transacting parties. In India government has been consistently investing in various reforms for greater financial inclusion. During the last few years' initiatives such as Jan Dhan accounts, Aadhar enabled payment systems, e –Wallets, National financial Switch (NFS) and others have strengthened the government resolve to go cashless. Today, financial inclusion is seen as a realistic dream because of mobile and smart phone penetration across the country.

## 3.2 Demand for Money and Supply of Money

### 3.2.1. Demand for Money

The demand for money tells us what makes people desire a certain amount of money. Since money is required to conduct transactions, the value of transactions will determine the money people will want to keep: the larger is the quantum of transactions to be made, the larger is the quantity of money demanded. Since the quantum of transactions to be made depends on income, it should be clear that a rise in income will lead to rise in demand for money. Also, when people keep their savings in the form of money rather than putting it in a bank which gives them interest, how much money people keep also depends on rate of interest. Specifically, when interest rates go up, people become less interested in holding money since holding money amounts to holding less of interest-earning deposits, and thus less interest received. Therefore, at higher interest rates, money demanded comes down.



### 3.2.2. Supply of Money

In a modern economy, money comprises cash and bank deposits. Depending on what types of bank deposits are being included, there are many measures of money[1]. These are created by a system comprising two types of institutions: central bank of the economy and the commercial banking system.

#### *Central bank*

Central Bank is a very important institution in a modern economy. Almost every country has one central bank. India got its central bank in 1935. Its name is the 'Reserve Bank of India'. Central bank has several important functions. It issues the currency of the country. It controls money supply of the country through various methods, like bank rate, open market operations and variations in reserve ratios. It acts as a banker to the government. It is the custodian of the foreign exchange reserves of the economy. It also acts as a bank to the banking system, which is discussed in detail later.

From the point of view of money supply, we need to focus on its function of issuing currency. This currency issued by the central bank can be held by the public or by the commercial banks, and is called the 'high-powered money' or 'reserve money' or 'monetary base' as it acts as a basis for credit creation.

#### *Commercial Banks*

Commercial banks are the other type of institutions which are a part of the money-creating system of the economy. In the following section we look at the commercial banking system in detail. They accept deposits from the public and lend out part of these funds to those who want to borrow. The interest rate paid by the banks to depositors is lower than the rate charged from the borrowers. This difference between these two types of interest rates, called the 'spread' is the profit appropriated by the bank.

The process of deposit and loan (credit) creation by banks is explained below. In order to understand this process, let us discuss a story.

Once there was a goldsmith named Lala in a village. In this village, people used gold and other precious metals in order to buy goods and services. In other words, these metals were acting as money. People in the village started keeping their gold with Lala for safe-keeping. In return for keeping their gold, Lala issued paper receipts to people of the village and charged a small fee from them. Slowly, over time, the paper receipts issued by Lala began to circulate as money. This means that instead of giving gold for purchasing wheat, someone would pay for wheat or shoes or any other good by giving the paper receipts issued by Lala. Thus, the paper receipts started acting as money since everyone in the village accepted these as a medium of exchange.

Now, let us suppose that Lala had 100 Kgs of gold, deposited by different people and he had issued receipts corresponding to 100 kgs of gold. At this time Ramu comes to Lala and asks for a loan of 25 kgs of gold. Can Lala give the loan? The 100 kgs of gold with him already has claimants. However, Lala could decide that everyone with gold deposits will not come to withdraw their deposits at the same time and so he may as well give the loan to Ramu and charge him for it. If Lala gives the loan of 25 kgs of gold, Ramu could also pay Ali with these 25 kgs of gold and Ali could keep the 25 kgs of gold with Lala in return for a paper receipt. In effect, the paper receipts, acting as money, would

[1]See the box on the measures of money supply at the end of the chapter.

have risen to 125 kgs now. It seems that Lala has created money out of thin air! The modern banking system works precisely the way Lala behaves in this example.

Commercial banks mediate between individuals or firms with excess funds and lend to those who need funds. People with excess funds can keep their funds in the form of deposits in banks and those who need funds, borrow funds in form of home loans, crop loans, etc. People prefer to keep money in banks because banks offer to pay some interest on any deposits made. Also, it may be safer to keep excess funds in a bank, rather than at home, just as people in the example above preferred to keep their gold with Lala instead of keeping at home. In the modern context, given cheques and debit cards, having a demand deposit makes transactions more convenient and safer, even when they do not earn any interest. (Imagine having to pay a large amount in cash – for purchasing a house.)

What does the bank do with the funds that have been deposited with it? Assuming that not everyone who has deposited funds with it will ask for their funds back at the same time, the bank can loan these funds to someone who needs the funds at interest (of course, the bank has to be sure it will get the funds back at the required time). So the bank will typically retain a portion of the funds to repay depositors whenever they demand their funds back, and loan the rest. Since banks earn interest from loans they make, any bank would like to lend the maximum possible. However, being able to repay depositors on demand is crucial to the bank's survival. Depositors would keep their funds in a bank only if they are fully confident of getting them back on demand. A bank must, therefore, balance its lending activities so as to ensure that sufficient funds are available to repay any depositor on demand.

## 3.3 Money Creation by Banking System

Banks can create money in a manner similar to that as given in Lala's story. Banks can lend simply because they do not expect all the depositors to withdraw what they have deposited at the same time. When the banks lend to any person, a new deposit is opened in that person's name. Thus money supply increases to old deposits plus new deposit (plus currency.)

Let us take an example. Assume that there is only one bank in the country. Let us construct a fictional balance sheet for this bank. Balance sheet is a record of assets and liabilities of any firm. Conventionally, the assets of the firm are recorded on the left hand side and liabilities on the right hand side. Accounting rules say that both sides of the balance sheet must be equal or total assets must be equal to the total liabilities. **Assets** are things a firm owns or what a firm can claim from others. In case of a bank, apart from buildings, furniture, etc., its assets are loans given to public. When the bank gives out loan of Rs 100 to a person, this is the bank's claim on that person for Rs 100. Another asset that a bank has is reserves. Reserves are deposits which commercial banks keep with the Central bank, Reserve Bank of India (RBI) and its cash. These reserves are kept partly as cash and partly in the form of financial instruments (bonds and treasury bills) issued by the RBI. Reserves are similar to deposits we keep with banks. We keep deposits and these deposits are our assets, they can be withdrawn by us. Similarly, commercial banks like State Bank of India (SBI) keep their deposits with RBI and these are called Reserves.

Assets = Reserves + Loans

**Liabilities** for any firm are its debts or what it owes to others. For a bank, the main liability is the deposits which people keep with it.

Liabilities = Deposits

The accounting rule states that both sides of the account must balance. Hence if assets are greater than liabilities, they are recorded on the right hand side as Net Worth.

Net Worth = Assets – Liabilities

### 3.3.1 Balance Sheet of a Fictional Bank

Let our fictional bank start with deposits (liabilities) equal to Rs 100. This could be because Ms Fernandes has deposited Rs 100 in the bank. Let this bank deposit the same amount with RBI as reserves. Table 3.1 represents its balance sheet.

**3.1 Balance Sheet of a Bank**

| Assets | | Liabilities | |
|---|---|---|---|
| Reserves | Rs 100 | Deposits | Rs 100 |
| | | Net Worth | Rs 0 |
| Total | Rs 100 | Total | Rs 100 |

If we assume that there is no currency in circulation, then the total money supply in the economy will be equal to Rs 100.

$M_1$ = *Currency + Deposits = 0 +100 =100*

### 3.3.2 Limits to Credit Creation and Money Multiplier

Suppose Mr. Mathew comes to this bank for a loan of Rs 500. Can our bank give this loan? If it gives the loan and Mr Mathew deposits the loan amount in the bank itself, the total bank deposits and therefore, the total money supply will rise. It seems as though the banks can go on creating as much money as they want.

But is there a limit to money or credit creation by banks? Yes, and this is determined by the Central bank (RBI). The RBI decides a certain percentage of deposits which every bank must keep as reserves. This is done to ensure that no bank is 'over lending'. This is a legal requirement and is binding on the banks. This is called the 'Required Reserve Ratio' or the 'Reserve Ratio' or 'Cash Reserve Ratio' (CRR).

**Cash Reserve Ratio (CRR) = Percentage of deposits which a bank must keep as cash reserves with the bank.**

Apart from the CRR, banks are also required to keep some reserves in liquid form in the short term. This ratio is called Statutory Liquidity Ratio or SLR.

In our fictional example, suppose CRR = 20 per cent, then with deposits of Rs 100, our bank will need to keep Rs 20 (20 per cent of 100) as cash reserves. Only the remaining amount of deposits, i.e., Rs 80 (100 – 20 = 80) can be used to give loans. The statutory requirement of the reserve ratio acts as a limit to the amount of credit that banks can create.

We can understand this by going back to our fictional example of an economy with one bank. Let us assume that our bank starts with a deposit of Rs 100 made by Leela. The reserve ratio is 20 per cent. Thus our bank has Rs 80 (100 – 20)

to lend and the bank lends out Rs 80 to Jaspal Kaur, which shows up in the bank's deposits in the next round as liabilities, making a total of Rs 180 as deposits. Now our bank is required to keep 20 per cent of 180 i.e. Rs 36 as cash reserves. Recall that our bank had started with Rs 100 as cash. Since it is required to keep only Rs 36 as reserves, it can lend Rs 64 again (100 – 36 = 64). The bank lends out Rs 64 to Junaid. This in turn shows up in the bank as deposits. The process keeps repeating itself till all the required reserves become Rs 100. The required reserves will be Rs 100 only when the total deposits become Rs 500. This is because for deposits of Rs 500, cash reserves would have to be Rs 100 (20 per cent of 500 = 100). The process is illustrated in Table 3.2.

Table 3.2: **Money Multiplier Process**

| Column 1 | Column 2 | Column 3 | Column 4 |
|---|---|---|---|
| Round | Deposit in Bank | Required Reserve | Loan made by Bank |
| 1 | 100.00 | 20.00 | 80.00 |
| 2 | 180.00 | 36.00 | 64.00 |
| . | . | . | . |
| . | . | . | . |
| . | . | . | . |
| . | . | . | . |
| ... | . | . | . |
| Last | 500.00 | 100.00 | 400.00 |

The first column lists each round. The second column depicts the total deposits with the bank at the beginning of each round. Twenty per cent of these deposits need to be deposited with the RBI as required reserves (column 3). What the bank lends in each round gets added to the deposits with the bank in the next round. Column 4 indicates the Loans made by the banks.

Table 3.3: **Balance Sheet of the Bank**

| Assets | | Liabilities | |
|---|---|---|---|
| Reserves | Rs 100 | Deposits (100+400) | Rs 500 |
| Loans | Rs 400 | | |
| Total | Rs 500 | Total | Rs 500 |

Since the bank is only expected to keep 20 per cent of its deposits as reserves, thus, reserves of Rs 100 (20per cent of 500 = 100) can support the deposits of Rs 500. In other words, our bank can give a loan of Rs 400. Table 3.3 demonstrates its balance sheet.

$M_1$ = Currency + Deposits = 0 + 500 = 500

Thus, money supply increases from Rs 100 to Rs 500.

Given a CRR of 20 per cent, the bank cannot give a loan beyond Rs 400. Hence, requirement of reserves acts as a limit to money creation.

$$\text{Money Multiplier} = \frac{1}{\text{Cash Reserve Ratio}}$$

In our example, money multiplier $= \frac{1}{20\%} = \frac{1}{0.2} = 5$. Thus, reserves of Rs 100 create deposits of Rs (5 X 100)=Rs 500.

## 3.4 Policy Tools to Control Money Supply

Reserve Bank is the only institution which can issue currency. When commercial banks need more funds in order to be able to create more credit, they may go to market for such funds or go to the Central Bank. Central bank provides them funds through various instruments. This role of RBI, that of being ready to lend to banks at all times is another important function of the central bank, and due to this central bank is said to be the **lender of last resort.**

The RBI controls the money supply in the economy in various ways. The tools used by the Central bank to control money supply can be quantitative or qualitative. Quantitative tools, control the extent of money supply by changing the CRR, or bank rate or open market operations. Qualitative tools include persuasion by the Central bank in order to make commercial banks discourage or encourage lending which is done through moral suasion, margin requirement, etc.

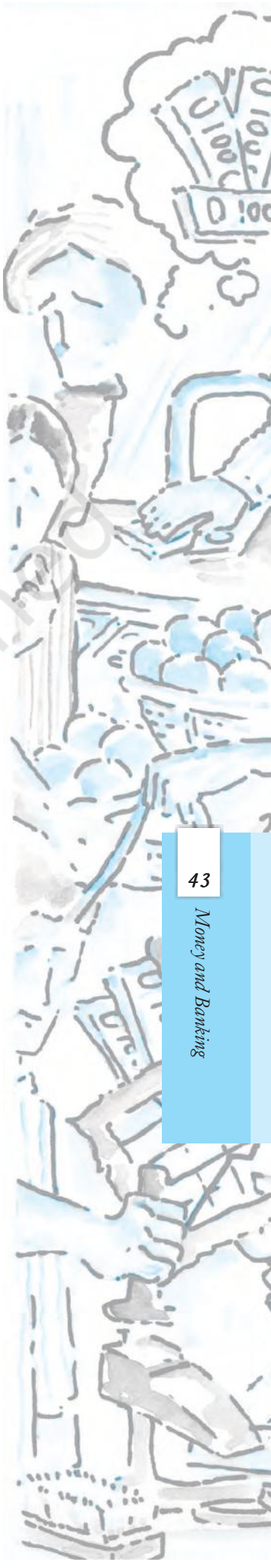
It should be evident by now that if the Central bank changes the reserve ratio, this would lead to changes in lending by the banks which, in turn, would impact the deposits and hence, the money supply. In the previously discussed example, what would the money multiplier be if the RBI increases the reserve ratio to 25 per cent? Notice that in the previous case, Rs 100 in reserves could support deposits of Rs 400. But the banking system would now be able to loan Rs 300 only. It would have to call back some loans to meet the increased reserve requirements. Hence, money supply would fall.

Another important tool by which the RBI also influences money supply is **Open Market Operations**. Open Market Operations refers to buying and selling of bonds issued by the Government in the open market. This purchase and sale is entrusted to the Central bank on behalf of the Government. When RBI buys a Government bond in the open market, it pays for it by giving a cheque. This cheque increases the total amount of reserves in the economy and thus increases the money supply. Selling of a bond by RBI (to private individuals or institutions) leads to reduction in quantity of reserves and hence the money supply.

There are two types of open market operations: outright and repo. Outright open market operations are permanent in nature: when the central bank buys these securities (thus injecting money into the system), it is without any promise to sell them later. Similarly, when the central bank sells these securities (thus withdrawing money from the system), it is without any promise to buy them

later. As a result, the injection/absorption of the money is of permanent nature. However, there is another type of operation in which when the central bank buys the security, this agreement of purchase also has specification about date and price of resale of this security. This type of agreement is called a **repurchase agreement** or **repo**. The interest rate at which the money is lent in this way is called the repo rate. Similarly, instead of outright sale of securities the central bank may sell the securities through an agreement which has a specification about the date and price at which it will be repurchased. This type of agreement is called a **reverse repurchase agreement** or **reverse repo.** The rate at which the money is withdrawn in this manner is called the reverse repo rate. The Reserve Bank of India conducts repo and reverse repo operations at various maturities: overnight, 7-day, 14- day, etc. This type of operations have now become the main tool of monetary policy of the Reserve Bank of India.

The RBI can influence money supply by changing the rate at which it gives loans to the commercial banks. This rate is called the **Bank Rate** in India. By increasing the bank rate, loans taken by commercial banks become more expensive; this reduces the reserves held by the commercial bank and hence decreases money supply. A fall in the bank rate can increase the money supply.



**Box 3.1: Demand and Supply for Money : A Detailed Discussion**

Money is the most liquid of all assets in the sense that it is universally acceptable and hence can be exchanged for other commodities very easily. On the other hand, it has an opportunity cost. If, instead of holding on to a certain cash balance, you put the money in a fixed deposits in some bank you can earn interest on that money. While deciding on how much money to hold at a certain point of time one has to consider the trade off between the advantage of liquidity and the disadvantage of the foregone interest. Demand for money balance is thus often referred to as liquidity preference. People desire to hold money balance broadly from two motives.

***The Transaction Motive***

The principal motive for holding money is to carry out transactions. If you receive your income weekly and pay your bills on the first day of every week, you need not hold any cash balance throughout the rest of the week; you may as well ask your employer to deduct your expenses directly from your weekly salary and deposit the balance in your bank account. But our expenditure patterns do not normally match our receipts. People earn incomes at discrete points in time and spend it continuously throughout the interval. Suppose you earn Rs 100 on the first day of every month and run down this balance evenly over the rest of the month. Thus your cash balance at the beginning and end of the month are Rs 100 and 0, respectively. Your average cash holding can then be calculated as (Rs 100 + Rs 0) ÷ 2 = Rs 50, with which you are making transactions worth Rs 100 per month. Hence your average transaction demand for money is equal to half your monthly income, or, in other words, half the value of your monthly transactions.

Consider, next, a two-person economy consisting of two entities – a firm (owned by one person) and a worker. The firm pays the worker a salary of Rs 100 at the beginning of every month. The worker, in turn,

spends this income over the month on the output produced by the firm – the only good available in this economy! Thus, at the beginning of each month the worker has a money balance of Rs 100 and the firm a balance of Rs 0. On the last day of the month the picture is reversed – the firm has gathered a balance of Rs 100 through its sales to the worker. The average money holding of the firm as well as the worker is equal to Rs 50 each. Thus the total transaction demand for money in this economy is equal to Rs 100. The total volume of monthly transactions in this economy is Rs 200 – the firm has sold its output worth Rs 100 to the worker and the latter has sold her services worth Rs 100 to the firm. The transaction demand for money of the economy is again a fraction of the total volume of transactions in the economy over the unit period of time.

In general, therefore, the transaction demand for money in an economy, $M^d_T$, can be written in the following form

$$M^d_T = k.T \qquad (3.1)$$

where, $T$ is the total value of (nominal) transactions in the economy over unit period and $k$ is a positive fraction.

The two-person economy described above can be looked at from another angle. You may perhaps find it surprising that the economy uses money balance worth only Rs 100 for making transactions worth Rs 200 per month. The answer to this riddle is simple – each rupee is changing hands twice a month. On the first day, it is being transferred from the employer's pocket to that of the worker and sometime during the month, it is passing from the worker's hand to the employer's. The number of times a unit of money changes hands during the unit period is called the **velocity of circulation of money**. In the above example, it is 2, inverse of half – the ratio of money balance and the value of transactions. Thus, in general, we may rewrite equation (3.1) in the following form

$$\frac{1}{k}.M^d_T = T, \text{ or, } v.M^d_T = T \qquad (3.2)$$

where, $v = 1/k$ is the velocity of circulation. Note that the term on the right hand side of the above equation, $T$, is a flow variable whereas money demand, $M^d_T$, is a stock concept – it refers to the stock of money people are willing to hold at a particular point of time. The velocity of money, $v$, however, has a time dimension. It refers to the number of times every unit of stock changes hand during a unit period of time, say, a month or a year. Thus, the left hand side, $v.M^d_T$, measures the total value of monetary transactions that has been made with this stock in the unit period of time. This is a flow variable and is, therefore, equal to the right hand side.

We are ultimately interested in learning the relationship between the aggregate transaction demand for money of an economy and the (nominal) GDP in a given year. The total value of annual transactions in an economy includes transactions in all intermediate goods and services and is clearly much greater than the nominal GDP. However, normally, there exists a stable, positive relationship between value of transactions and the nominal GDP. An increase in nominal GDP implies an increase in the total value of transactions and hence a greater transaction demand for money from equation (3.1). Thus, in general, equation (3.1) can be modified in the following way

$$M^d_T = kPY \qquad (3.3)$$

where $Y$ is the real GDP and $P$ is the general price level or the GDP deflator. The above equation tells us that transaction demand for money is positively related to the real income of an economy and also to its average price level.

### *The Speculative Motive*

An individual may hold her wealth in the form of landed property, bullion, bonds, money etc. For simplicity, let us club all forms of assets other than money together into a single category called 'bonds'. Typically, bonds are papers bearing the promise of a future stream of monetary returns over a certain period of time. These papers are issued by governments or firms for borrowing money from the public and they are tradable in the market. Consider the following two-period bond. A firm wishes to raise a loan of Rs 100 from the public. It issues a bond that assures Rs 10 at the end of the first year and Rs 10 plus the principal of Rs 100 at the end of the second year. Such a bond is said to have a face value of Rs 100, a maturity period of two years and a coupon rate of 10 per cent. Assume that the rate of interest prevailing in your savings bank account is equal to 5 per cent. Naturally you would like to compare the earning from this bond with the interest earning of your savings bank account. The exact question that you would ask is as follows: How much money, if kept in my savings bank account, will generate Rs 10 at the end of one year? Let this amount be $X$. Therefore

$$X\left(1+\frac{5}{100}\right)=10$$

In other words,

$$X=\frac{10}{\left(1+\frac{5}{100}\right)}$$

This amount, Rs $X$, is called the present value of Rs 10 discounted at the market rate of interest. Similarly, let $Y$ be the amount of money which if kept in the savings bank account will generate Rs 110 at the end of two years. Thus, the present value of the stream of returns from the bond should be equal to

$$PV=X+Y=\frac{10}{\left(1+\frac{5}{100}\right)}+\frac{(10+100)}{\left(1+\frac{5}{100}\right)^2}$$

Calculation reveals that it is Rs 109.29 (approx.). It means that if you put Rs 109.29 in your savings bank account it will fetch the same return as the bond. But the seller of the bond is offering the same at a face value of only Rs 100. Clearly the bond is more attractive than the savings bank account and people will rush to get hold of the bond. Competitive bidding will raise the price of the bond above its face value, till price of the bond is equal to its PV. If price rises above the PV the bond becomes less attractive compared to the savings bank account and people would like to get rid of it. The bond will be in excess supply and there will be downward pressure on the bond-price which will bring it back to the PV. It is clear that under competitive assets market condition the price of a bond must always be equal to its present value in equilibrium.

Now consider an increase in the market rate of interest from 5 per cent to 6 per cent. The present value, and hence the price of the same bond, will become

$$\frac{10}{(1+\frac{6}{100})}+\frac{(10+100)}{(1+\frac{6}{100})^2}=107.33\ (approx.)$$

It follows that the price of a bond is inversely related to the market rate of interest.

Different people have different expectations regarding the future movements in the market rate of interest based on their private information regarding the economy. If you think that the market rate of interest should eventually settle down to 8 per cent per annum, then you may consider the current rate of 5 per cent too low to be sustainable over time. You expect interest rate to rise and consequently bond prices to fall. If you are a bond holder a decrease in bond price means a loss to you – similar to a loss you would suffer if the value of a property held by you suddenly depreciates in the market. Such a loss occurring from a falling bond price is called a capital loss to the bond holder. Under such circumstances, you will try to sell your bond and hold money instead. Thus speculations regarding future movements in interest rate and bond prices give rise to the speculative demand for money.

When the interest rate is very high everyone expects it to fall in future and hence anticipates capital gains from bond-holding. Hence people convert their money into bonds. Thus, speculative demand for money is low. When interest rate comes down, more and more people expect it to rise in the future and anticipate capital loss. Thus they convert their bonds into money giving rise to a high speculative demand for money. Hence speculative demand for money is inversely related to the rate of interest. Assuming a simple form, the speculative demand for money can be written as

$$M^d_S=\frac{r_{max}-r}{r-r_{min}} \qquad (3.4)$$

where r is the market rate of interest and $r_{max}$ and $r_{min}$ are the upper and lower limits of $r$, both positive constants. It is evident from the above equation that as $r$ decreases from $r_{max}$ to $r_{min}$, the value of $M^d_S$ increases from 0 to $\infty$.

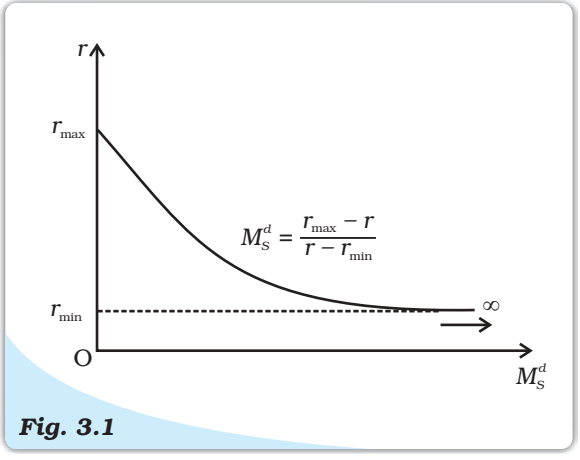



**Fig. 3.1**

*The Speculative Demand for Money*

As mentioned earlier, interest rate can be thought of as an opportunity cost or 'price' of holding money balance. If supply of money in the economy increases and people purchase bonds with this extra money, demand for bonds will go up, bond prices will rise and rate of interest will decline. In other words, with an increased supply of money in the economy the price you have to pay for holding money balance, viz. the rate of interest, should

come down. However, if the market rate of interest is already low enough so that everybody expects it to rise in future, causing capital losses, nobody will wish to hold bonds. Everyone in the economy will hold their wealth in money balance and if additional money is injected within the economy it will be used up to satiate people's craving for money balances without increasing the demand for bonds and without further lowering the rate of interest below the floor $r_{min}$. Such a situation is called a **liquidity trap**. The speculative money demand function is infinitely elastic here.

In Fig. 3.1 the speculative demand for money is plotted on the horizontal axis and the rate of interest on the vertical axis. When $r = r_{max}$, speculative demand for money is zero. The rate of interest is so high that everyone expects it to fall in future and hence is sure about a future capital gain. Thus everyone has converted the speculative money balance into bonds. When $r = r_{min}$, the economy is in the liquidity trap. Everyone is sure of a future rise in interest rate and a fall in bond prices. Everyone puts whatever wealth they acquire in the form of money and the speculative demand for money is infinite.

Total demand for money in an economy is, therefore, composed of transaction demand and speculative demand. The former is directly proportional to real GDP and price level, whereas the latter is inversely related to the market rate of interest. The aggregate money demand in an economy can be summarised by the following equation

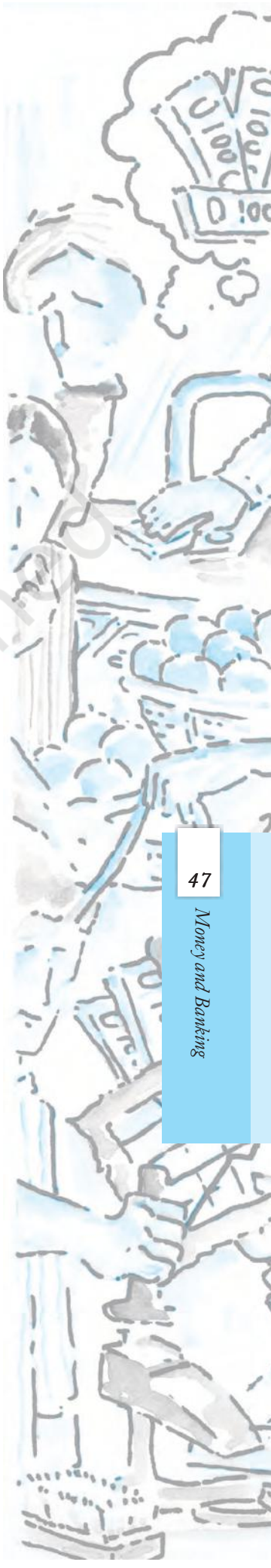
$$M^d = M_T^d + M_S^d$$

$$\text{or, } M^d = kPY + \frac{r_{max} - r}{r - r_{min}} \qquad (3.5)$$

### The Supply of Money : Various Measures

In a modern economy money consists mainly of currency notes and coins issued by the monetary authority of the country. In India currency notes are issued by the Reserve Bank of India (RBI), which is the monetary authority in India. However, coins are issued by the Government of India. Apart from currency notes and coins, the balance in savings, or current account deposits, held by the public in commercial banks is also considered money since cheques drawn on these accounts are used to settle transactions. Such deposits are called demand deposits as they are payable by the bank on demand from the account-holder. Other deposits, e.g. fixed deposits, have a fixed period to maturity and are referred to as **time deposits**.

Though a hundred-rupee note can be used to obtain commodities worth Rs 100 from a shop, the value of the paper itself is negligible – certainly less than Rs 100. Similarly, the value of the metal in a five-rupee coin is probably not worth Rs 5. Why then do people accept such notes and coins in exchange of goods which are apparently more valuable than these? The value of the currency notes and coins is derived from the guarantee provided by the issuing authority of these items. Every currency note bears on its face a promise from the Governor of RBI that if someone produces the note to RBI, or any other commercial bank, RBI will be responsible for



giving the person purchasing power equal to the value printed on the note. The same is also true of coins. Currency notes and coins are therefore called **fiat money**. They do not have **intrinsic value** like a gold or silver coin. They are also called **legal tenders** as they cannot be refused by any citizen of the country for settlement of any kind of transaction. Cheques drawn on savings or current accounts, however, can be refused by anyone as a mode of payment. Hence, demand deposits are not legal tenders.

**Legal Definitions: Narrow and Broad Money**

Money supply, like money demand, is a stock variable. The total stock of money in circulation among the public at a particular point of time is called money supply. RBI publishes figures for four alternative measures of money supply, viz. M1, M2, M3 and M4. They are defined as follows

M1 = CU + DD

M2 = M1 + Savings deposits with Post Office savings banks

M3 = M1 + Net time deposits of commercial banks

M4 = M3 + Total deposits with Post Office savings organisations (excluding National Savings Certificates)

where, CU is currency (notes plus coins) held by the public and DD is net demand deposits held by commercial banks. The word 'net' implies that only deposits of the public held by the banks are to be included in money supply. The interbank deposits, which a commercial bank holds in other commercial banks, are not to be regarded as part of money supply.

M1 and M2 are known as **narrow money**. M3 and M4 are known as **broad money**. These measures are in decreasing order of liquidity. M1 is most liquid and easiest for transactions whereas M4 is least liquid of all. M3 is the most commonly used measure of money supply. It is also known as **aggregate monetary resources**[2].



[2]See Appendix 3.2 for an estimate of the variations in M1 and M3 over time.

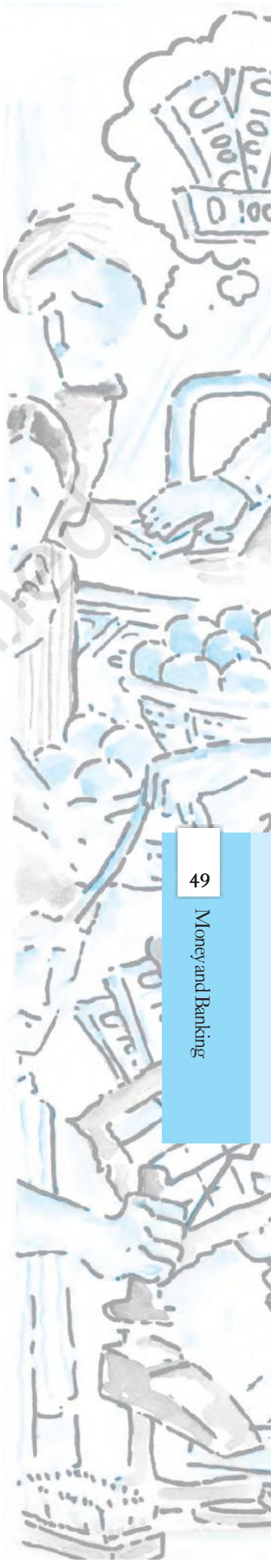
**Box No. 3.2: Demonetisation**

Demonetisation was a new initiative taken by the Government of India in November 2016 to tackle the problem of corruption, black money, terrorism and circulation of fake currency in the economy. Old currency notes of Rs 500, and Rs 1000 were no longer legal tender. New currency notes in the denomination of Rs 500 and Rs 2000 were launched. The public were advised to deposit old currency notes in their bank account till 31 December 2016 without any declaration and upto 31March 2017 with the RBI with declaration

Further to avoid a complete breakdown and cash crunch, notes government had allowed exchange of Rs 4000 old currency the by new currency per person and per day. Further till 12 December 2016, old currency notes were acceptable as legal tender at petrol pumps, government hospitals and for payment of government dues, like taxes, power bills, etc.

This move received both appreciation and criticism. There were long queues outside banks and ATM booths. The shortage of currency in circulation had an adverse impact on the economic activities. However, things improved with time and normalcy returned.

This move has had positive impact also. It improved tax compliance as a large number of people were bought in the tax ambit. The savings of an individual were channelised into the formal financial system. As a result, banks have more resources at their disposal which can be used to provide more loans at lower interest rates. It is a demonstration of State's decision to put a curb on black money, showing that tax evasion will no longer be tolerated. Tax evasion will result in financial penalty and social condemnation. Tax compliance will improve and corruption will decrease. Demonetisation could also help tax administration in another way, by shifting transactions out of the cash economy into the formal payment system. Households and firms have begun to shift from cash to electronic payment technologies.





## Summary

Exchange of commodities without the mediation of money is called Barter Exchange. It suffers from lack of double coincidence of wants. Money facilitates exchanges by acting as a commonly acceptable medium of exchange. In a modern economy, people hold money broadly for two motives – transaction motive and speculative motive. Supply of money, on the other hand, consists of currency notes and coins, demand and time deposits held by commercial banks, etc. It is classified as narrow and broad money according to the decreasing order of liquidity. In India, the supply of money is regulated by the Reserve Bank of India (RBI) which acts as the monetary authority of the country. Various actions of the public, the commercial banks of the country and RBI are responsible for changes in the supply of money in the economy. RBI regulates money supply by controlling the stock of high powered money, the bank rate and reserve requirements of the commercial banks. It also sterilises the money supply in the economy against external shocks.

## Key Concepts

Barter exchange
Money
Unit of account
Bonds
Liquidity trap
Legal tender
Broad money
Reserve deposit ratio
Money multiplier
Open market operation
Cash Reserve Ratio (CRR)
Reverse Repo Rate
Double coincidence of wants
Medium of exchange
Store of value
Rate of interest
Fiat money
Narrow money
Currency deposit ratio
High powered money
Lender of last resort
Bank Rate
Repo Rate

## Exercises

1. What is a barter system? What are its drawbacks?
2. What are the main functions of money? How does money overcome the shortcomings of a barter system?
3. What is transaction demand for money? How is it related to the value of transactions over a specified period of time?
4. What are the alternative definitions of money supply in India?
5. What is a 'legal tender'? What is 'fiat money'?
6. What is High Powered Money?
7. Explain the functions of a commercial bank.
8. What is money multiplier? What determines the value of this multiplier?
9. What are the instruments of monetary policy of RBI?
10. Do you consider a commercial bank 'creator of money' in the economy?
11. What role of RBI is known as 'lender of last resort'?



### Suggested Readings

1. Dornbusch, R. and S. Fischer. 1990. *Macroeconomics*, (fifth edition) pages 345 – 427, McGraw Hill, Paris.
2. Sikdar, S., 2006. *Principles of Macroeconomics*, pages 77 – 89, Oxford University Press, New Delhi.



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## Appendix 3.1

*The Sum of an Infinite Geometric Series*

We want to find out the sum of an infinite geometric series of the following form

$$S = a + a.r + a.r^2 + a.r^3 + ..... + a.r^n + ..... + \infty$$

where $a$ and $r$ are real numbers and $0 < r < 1$. To compute the sum, multiply the above equation by $r$ to obtain

$$r.S = a.r + a.r^2 + a.r^3 + ..... + a.r^{n+1} + ..... + \infty$$

Subtract the second equation from the first to get

$$S - r.S = a$$
$$or,\ (1 - r)S = a$$

which yields

$$S = \frac{a}{1-r}$$

In the example used for the derivation of the money multiplier, $a = 1$ and $r = 0.4$. Hence the value of the infinite series is

$$\frac{1}{1-0.4} = \frac{5}{3}$$

## Appendix 3.2

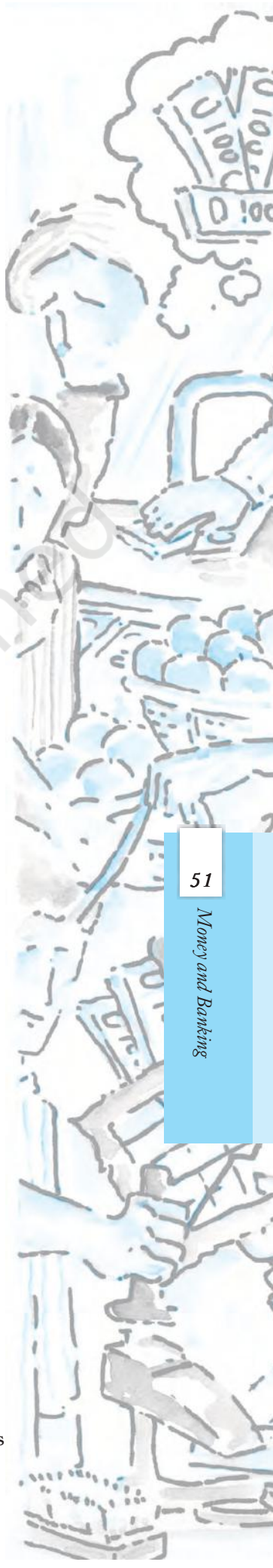
**Money Supply in India**

**Table 3.4: Changes in M1 and M3 Over Time (in crore)**

| *Year* | *M1* *(Narrow Money)* | *M3* *(Broad Money)* |
|---|---|---|
| 1999–00 | 341796 | 1124174 |
| 2000–01 | 379433 | 1313204 |
| 2001–02 | 422824 | 1498336 |
| 2002–03 | 473558 | 1717936 |
| 2003–04 | 578694 | 2005654 |
| 2004–05 | 649766 | 2245653 |
| 2005–06 | 826389 | 2719493 |
| 2006–07 | 967925 | 3310038 |
| 2007–08 | 1155810 | 4017855 |
| 2008–09 | 1259671 | 4794775 |
| 2009–10 | 1489268 | 5602698 |
| 2010–11 | 1638345 | 6504116 |
| 2011–12 | 1737394 | 7384831 |
| 2012–13 | 1897526 | 8389819 |
| 2013–14 | 2059762 | 9517386 |
| 2014–15 | 2292404 | 10550168 |
| 2015–16 | 2602538 | 11617615 |
| 2016–17 | 2681957 | 12791940 |
| 2017–18 | 3267331 | 13962587 |
| 2018–19 | 3710464 | 15432067 |
| 2019–20 | 4125948 | 16799963 |
| 2020–21 | 4794299 | 18844578 |
| 2021–22 | 5307125 | 20493129 |
| 2022–23 | 5674795 | 22343760 |

**Source:** *Handbook of Statistics on Indian Economy, Reserve Bank of India, 2022–23*

The difference in values between the two columns is attributable to the time deposits held by commercial banks.



## Changes in the Composition of the Sources of Monetary Base Over Time Components of Money Stock

**Table 3.5: Sources of Change in Monetary Base (in ₹ Crore)**

| *Year* | *Currency in Circulation* | *Cash with Banks* | *Currency with the Public* | *Other Deposit with the RBI* | *Banker's Deposit with the* RBI |
|---|---|---|---|---|---|
| 1981–82 | 15411 | 937 | 14474 | 168 | 5419 |
| 1991–92 | 63738 | 2640 | 61098 | 885 | 34882 |
| 2001–02 | 250974 | 10179 | 240794 | 2831 | 84147 |
| 2004–05 | 368661 | 12347 | 356314 | 6454 | 113996 |
| 2005–06 | 429578 | 17454 | 412124 | 6843 | 135511 |
| 2006–07 | 504099 | 21244 | 482854 | 7467 | 197295 |
| 2007–08 | 590801 | 22390 | 568410 | 9027 | 328447 |
| 2008–09 | 691153 | 25703 | 665450 | 5533 | 291275 |
| 2009–10 | 799549 | 32056 | 767492 | 3806 | 352299 |
| 2010–11 | 949659 | 37823 | 911836 | 3653 | 423509 |
| 2011–12 | 1067230 | 43560 | 1023670 | 2822 | 356291 |
| 2012–13 | 1190975 | 49914 | 1141061 | 3240 | 320671 |
| 2013–14 | 1301074 | 55255 | 1245819 | 1965 | 429703 |
| 2014–15 | 1448312 | 62131 | 1386182 | 14590 | 465561 |
| 2015–16 | 1663463 | 66209 | 1597254 | 15451 | 501826 |
| 2016–17 | 1335266 | 71142 | 124124 | 21091 | 544127 |
| 2017–18 | 1829348 | 69635 | 1759712 | 23907 | 565525 |
| 2018–19 | 2136770 | 84561 | 2052209 | 31742 | 601969 |
| 2019–20 | 2447279 | 97563 | 2349748 | 38507 | 543888 |
| 2020–21 | 2853763 | 101935 | 2751828 | 47351 | 698867 |
| 2021–22 | 3133716 | 98028 | 3035689 | 58444 | 876726 |
| 2022–23 | 3378521 | 102085 | 3276436 | 77761 | 930477 |

**Source:** *Handbook of Statistics on Indian Economy, Reserve Bank of India, 2022–23*